HILMA

Quick Die and Mold Change Systems

Die Clamps ■ Die Lifters ■ Power Units ■ Magnetic Systems

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Carr Lane Roemheld Mfg. Co.

HILMA QUICK DIE AND MOLD CHANGE

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Hilma Div. of Carr Lane Roemheld provides quality quick die and mold change components and systems for stamping, forging and molding presses.

With a broad range of hydraulic, mechanical, electrical and magnetic clamps, as well as hydraulic and mechanical lifters, we can provide solutions for most die clamp and lift applications.

The systems are configured to suit the needs of the customer. The clamps, die lifters, pumps and valve packages are selected with the customer to provide a safe, effective die change.

This catalog represents products from Hilma Roemheld in Germany, as well as equipment manufactured here in the USA.

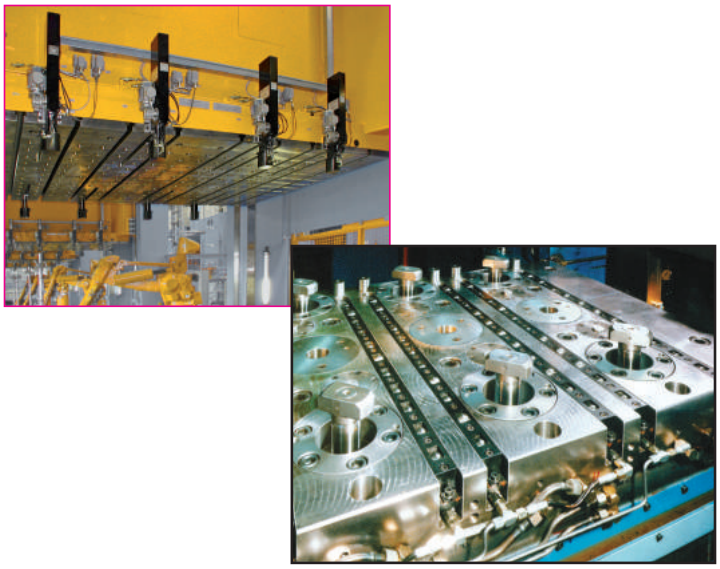
The systems are sold and marketed directly to end users, press builders or through our specialized Hilma representatives.

If you have interest in reducing your press downtime and improving press room productivity, please contact us directly.

Our engineers, regional managers and Hilma representatives will work with you to select and develop a die clamp and handling system that is best suited for your needs.

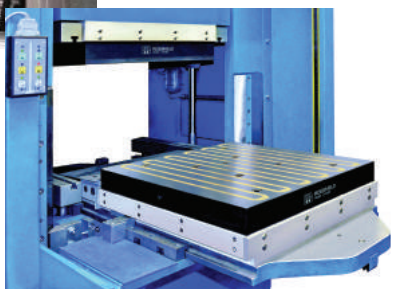
Hilma is a division of
Carr Lane Roemheld Mfg. Co.

Quick Die Change



Quick Mold Change

Plastics



Rubber

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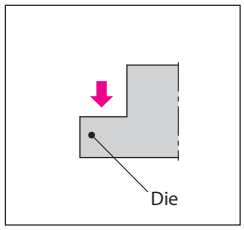
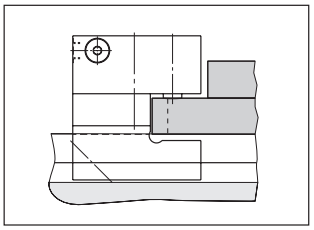
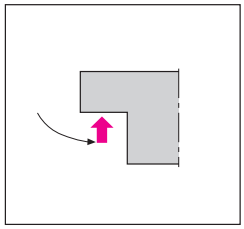
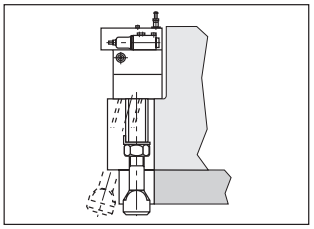
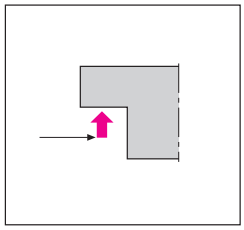
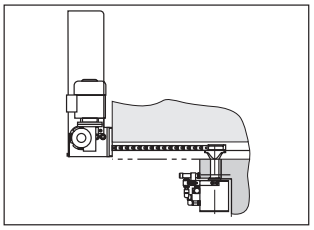
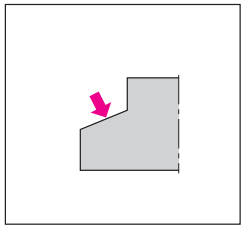
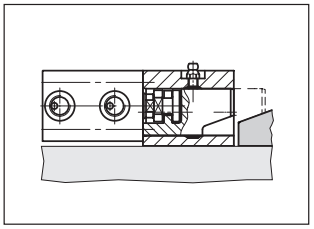
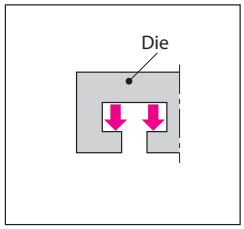
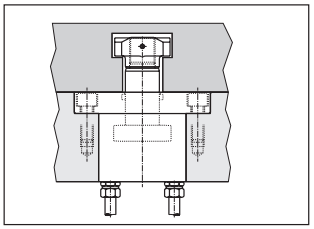
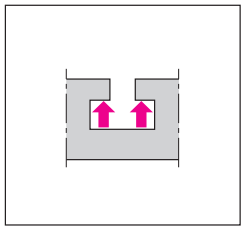
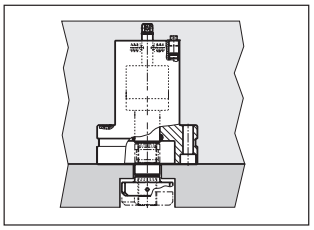
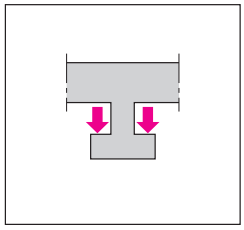
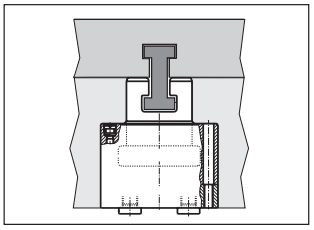
Clamping principles

Clamping principles	Examples of clamping	Clamping element	Product group
		Sliding clamp, angular clamps Clamping bars, hollow piston cylinders Wedge clamps with a flat clamping edge Spring clamping cylinders Extending clamps Clamping screws	**2 + 3** **6**
		Pivot and pull clamps Wedge swing clamp Electromechanical clamping elements	**2 + 5**
		Rapid clamping system with pusher chain Hollow piston cylinder Angular clamp, electromechanical	**3** **5**
		Wedge clamp for dies with a tapered clamping edge	**2**
		Double-T clamping bars Pull clamping element	**2 + 4**
		Swivel and pull clamps, hydraulic Swivel and pull clamps, electrical Swing-sink clamping element Swing clamping element	**4 + 5**
		Pull clamping element with T-slot	**4**

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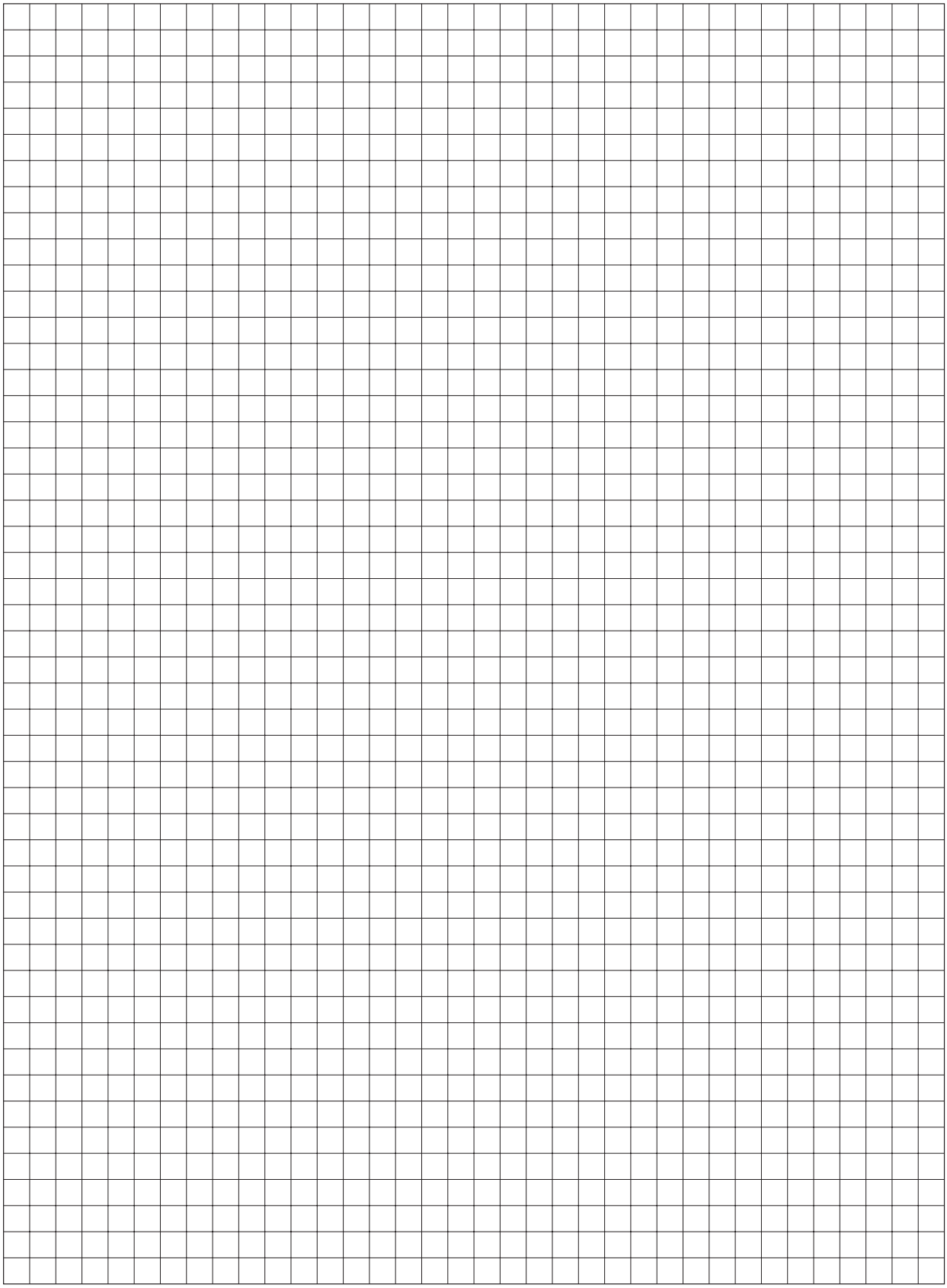


QDC APPLICATION DATA SHEET

Contact Name: _____ Company Address: _____

Company Name: _____ _____

Phone Number: _____ _____

E-Mail Address: _____ _____

Press Information:

Manufacturer: _____ Press Model No.: _____ ☐New ☐Retrofit ☐Rebuild

Stroke: _____ Shut Height (SDAU): _____ Tonnage: _____

SPM: _____ Adjustment: _____ Max Stripping Force: _____

Press Type: ☐Straight Side ☐OBI ☐Press Brake ☐Other _____

Operation: ☐Punch ☐Form ☐Blank ☐Mold ☐Forge ☐Other _____

Slide Information:

Slide Dimensions L-R: _____ F-B: _____ Thickness: _____

Slide Adapter Plate L-R: _____ F-B: _____ Thickness: _____

Number of T-Slots L-R: _____ F-B: _____ Other: _____

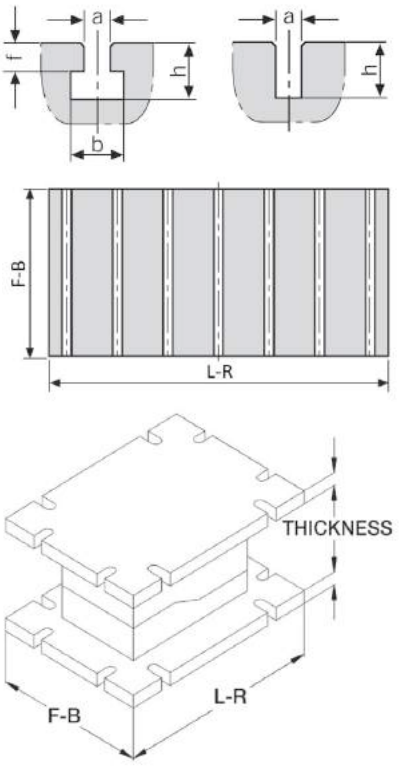
Dimensions of T-Slot a: _____ b: _____ f: _____ h: _____

Bed Information:

Bolster Dimensions L-R: _____ F-B: _____ Thickness: _____

Number of T-Slots L-R: _____ F-B: _____ Other: _____

Dimensions of T-Slot a: _____ b: _____ f: _____ h: _____



Die Information:

Maximum Weight: _____ lbs, Upper: _____ lbs, Lower: _____ lbs

Dimensions: Maximum L-R: _____ F-B: _____

Minimum L-R: _____ F-B: _____

Tool Shut Height: Maximum: _____ Min: _____

Clamping Height Standardized: _____ Thickness: _____

Dies Loaded From: _____ Dies Unloaded From: _____

Standardized Subplates: ☐Yes ☐No, Size L-R: _____ F-B: _____

No. of bolts now used to clamp dies on bed: _____ slide: _____ size: _____

Temperature at clamping point: _____ ☐F ☐C

Type of clamping wanted for the slide:

Clamp type: _____ ☐ Fixed Position ☐ Sliding

Type of clamping wanted for the bed:

Clamp type: _____ ☐ Fixed Position ☐ Sliding

Pump	**Valve**	**Electrical Controls**
☐ Electric, Voltage: _____ VAC 3Φ	☐ Solenoid 120 VAC	☐ Control Panel
☐ Air/Oil Power Unit	☐ Solenoid 24 VDC	☐ Remote Hand Held Pendant
☐ Manual (for die lifters only)	☐ Manual	☐ PLC Control Panel
		☐ Without Controls

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Die Lifters (Rollblocks):

☐ Spring Loaded ☐ Ball (for movement in all directions) ☐ High Temp:_____ ☐F ☐C

☐ Hydraulic ☐ Roller (movement in one direction)

Does the press bed have an opening? ☐No ☐Yes; if yes, please provide a drawing.

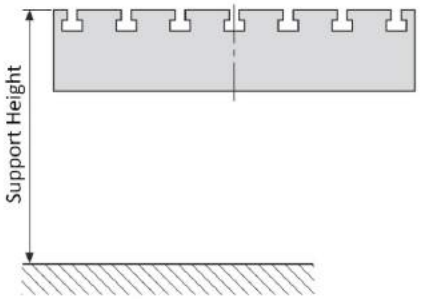
Die Lifter Pump:

☐ Manual Toggle ☐ Solenoid Valve 120 VAC ☐ Solenoid Valve 24 VDC ☐ Pressure Switch

Carrying Consoles:

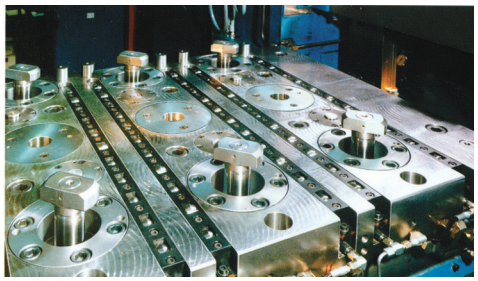
☐ Hanging ☐ Supported ☐ Swiveling

Support Height:_____

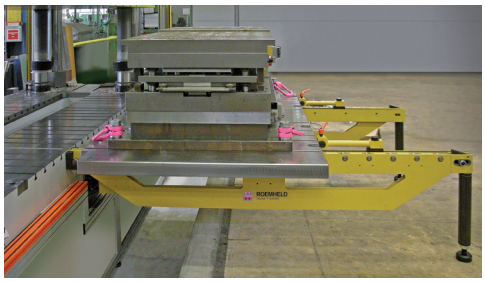


Notes/Sketch:

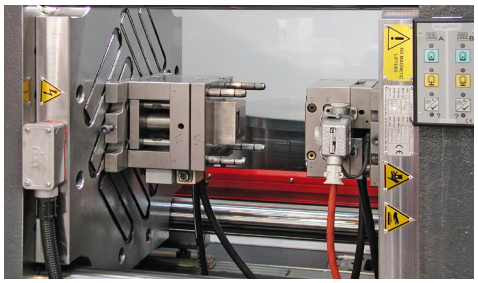
INNOVATIVE CLAMPING SOLUTIONS



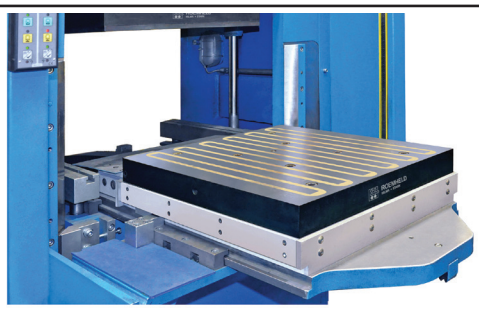
Quick Die Change



Die Handling

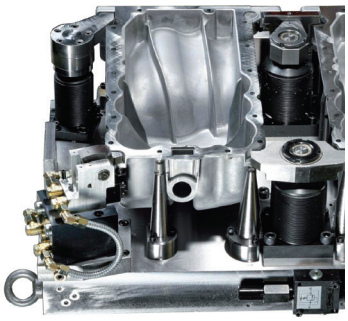


Quick Mold Change for Plastics

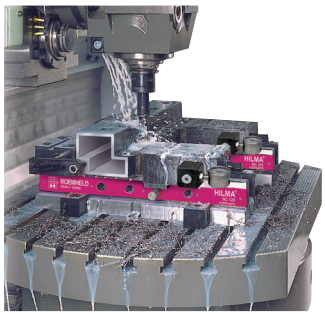


Quick Mold Change for Rubber

For More Information On Our Supporting Product Lines, Visit roemheld-usa.com.

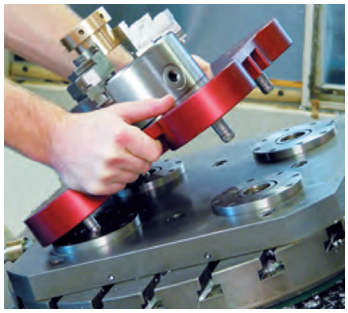


Power Workholding



CNC Machine Vises

Assembly and Handling



Zero Point Mounting

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Quick Die Clamping And Changing Systems

We can offer a wide range of quick die change solutions for your press. Contact our Hilma engineers to find the system that works best for your needs!

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General
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Information

General information

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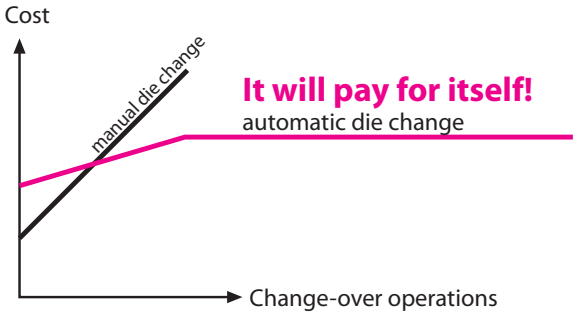
Why die clamping systems?



Innovative technology and many years of experience are the basis for our range of die clamping and changing systems.

Rationalize your operation by using automatic die changing systems.

Improved productivity

- **More capacity**
  thanks to **reduced set-up times**
- **Less downtime**
  e.g. due to tool breakage or reworking of dies
- Short test period

Operating facility

- Operate under extreme **circumstances**
  (high temperature, spray)
- Die clamping in barely **accessible** positions
- Clamping using **high clamping forces**
- Dies may be changed by relatively **unskilled workers**
- **Repeatable** die changing process

Automation

- **Power operated** elements
- **Monitoring devices**, in particular for pressure and position
- **Short cycles** thanks to automatic triggering of functions
- Integration with **process monitoring and control**

Economy

- Short **set-up times** even for small batches, smaller stock of parts
- **Simplified** die change, can be carried out by the machine operator
- Fewer **jigs and fixtures required**
- Enhanced **tool life** as a result of less wear
- Reduced **run-in period** for tools and dies, fewer test pieces and less time needed

Improved quality

- **Consistent quality**
- **Repeatability** of die position
- **Low-distortion clamping**

Reduced rate of wear

- **Uniform and low-distortion clamping, high clamping forces**
- **Compensating clamping force** (elasticity)
- **Repeatable** positioning and clamping operation
- Optimum **selection of clamping points**

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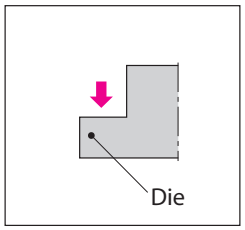
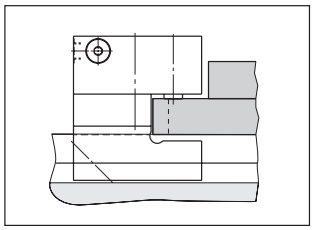
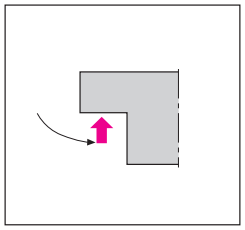
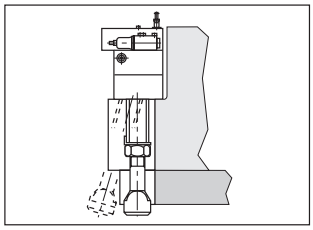
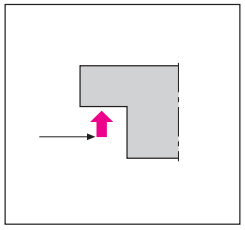
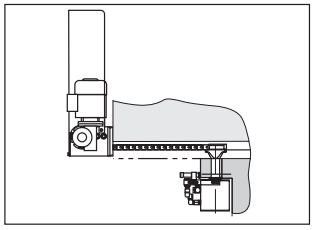
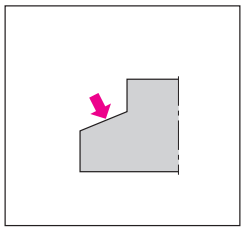
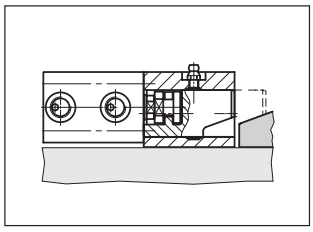
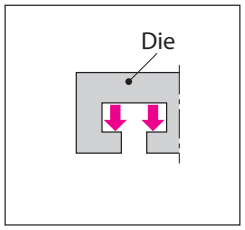
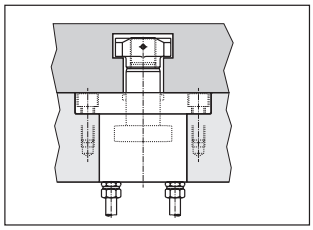
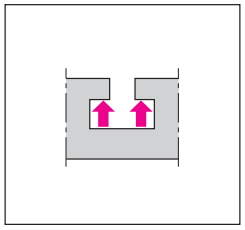
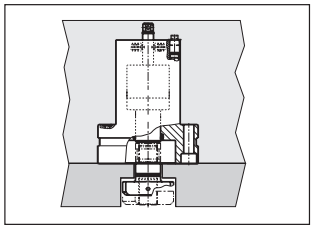
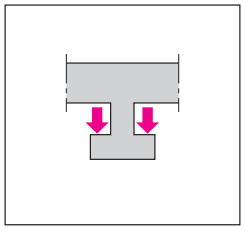
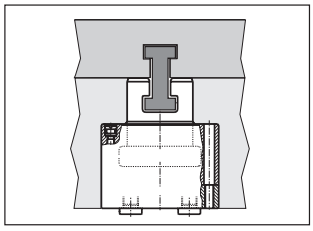
		Sliding clamp, angular clamps Clamping bars, hollow piston cylinder Wedge clamps with a flat clamping edge Spring clamping cylinders Extending clamps Clamping screws	**2 + 3** **6**
		Pivot and pull clamp Wedge swing clamp Electromechanical clamping elements	**2 + 5**
		Rapid clamping system with pusher chain Hollow piston cylinder Angular clamp, electromechanical	**3** **5**
		Wedge clamp for dies with a tapered clamping edge	**2**
		Double-T clamping bars Pull clamping element	**2 + 4**
		Swivel and pull clamps, hydraulic Swivel and pull clamps, electrical Swing-sink clamping element Swing clamping element	**4 + 5**
		Pull clamping element with T-slot	**4**

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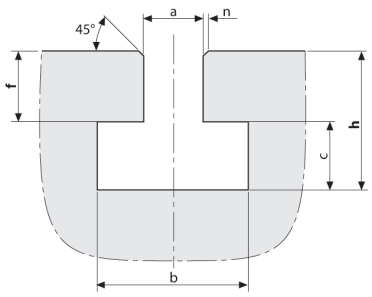
T-slot dimensions according to DIN 650 or ANSI spec

T-slot dimensions according to DIN 650 or ANSI spec

Dimensions and tolerances for T-slots according to DIN 650 or ANSI spec. Applicable to machine beds, pallets or die clamping devices on presses.

a (mm)	18 H8	22 H8	28 H8	36 H8	a (in)	$^{13}/_{16}$	$1\text{-}^{1}/_{16}$
f min. (mm)	16	20	26	33	f min. (in)	0.562	0.750
f max. (mm)	24	29	36	46	f max. (in)	1.062	1.250
b (mm)	30^{+2}	37^{+3}	46^{+4}	56^{+4}	b (in)	$1.375^{+.09}$	$1.531^{+.09}$
c (mm)	12^{+2}	16^{+2}	20^{+2}	25^{+3}	c (in)	$0.594^{+.03}$	$0.781^{+.04}$
h min. (mm)	30	38	48	61	h min. (in)	1.156	1.531
h max. (mm)	36	45	56	71	h max. (in)	1.687	2.078
n max. (mm)	1,6	1,6	1,6	2,5	n max. (in)	0.03	0.06



The **slot depth h** and the **web height f** must be exactly measured and checked for possible tolerances. If your T-slot is not within the specified tolerance range, customized solutions are also possible.

Recommended clamping forces for T-slots acc. to DIN 650

T-slot	Clamping force max.
18 mm	40 kN
22 mm	60 kN
28 mm	100 kN
36 mm	160 kN

If the above clamping forces are exceeded, permanent deformation of the T-slot may be caused.

Conversion factors

Temperature

	K	°C	° F
K	1	°C +273,15	(°F-459,67) x 5/9
°C	K-273,15	1	(°F-32) x 5/9
°F	K x 9/5 +459,67	°C x 9/5 +32	1

K = Kelvin
°C = Degrees centigrade
°F = Degrees Fahrenheit

Pressure

	1 MPa	1 bar	1PSI
1 MPa	1	10	145,04
1 bar	0,1	1	14,504
1 PSI	0,00689	0,0689	1

MPa = Mega-Pascal
PSI = Imperial pound per square inch

Length

	mm	inch
1 inch	25,399	1
1 mm	1	0,0393

inch = Imperial unit of length

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Clamping force, Clamping time, Calculations

Clamping force

Thread, property class 8.8	M6	M8	M10	M12	M14	M16	M20	M24	M30	M36	M42	M48
Permissible test load to DIN 267 sheet 3 (kN)	12	21	34	49	67	91	143	205	326	478	652	856
Max. permissible preload (utilising 2/3 of the yield point) (kN)	8	14	23	32	45	60	95	136	217	318	434	570
Required tightening torque (Nm)	9	22	44	76	120	190	380	620	1200	2100	3400	5000
Maximum manual clamping force* (kN)	8	14	23	32	45	56	67	70	70	70	70	70
Clamping force using a clamping arm (leverage = 2 :1) (kN)	5	9	15	21	30	37	44	46	46	46	46	46
Number x piston Ø for obtaining the preload specified in line 3 at 400 bar (mm)	1x16	1x20	1x25	1x32	1x40	1 x 44 2 x 32 3 x 25	1 x 55 2 x 40 3 x 32	1 x 63 2 x 50 3 x 40	1 x 80 3 x 50 4 x 40	1 x100 4 x 50 6 x 40	1 x 120 2 x 80 6 x 50	1 x140 3 x 80 8 x 50
Mechanical clamping and unclamping time per clamping point ** (s)	11	12	13	15	17	18	22	26	36	(50)	(70)	(100)
Hydraulic clamping and unclamping time per clamping point *** (s)	0,8	0,9	1,0	1,1	1,2	1,3	1,5	1,8	2,2	3,0	4,0	5,0
Recommendations	**If there are several clamping points, hydraulic clamping is recommended**			**Transition from manual to hydraulic clamping**			**Max. permissible clamping force cannot be achieved manually; hydraulic clamping is preferred**			**Manual clamping is no longer appropriate; hydraulic clamping only**		

* Clamping force that can be achieved manually using a wrench to DIN 894, by applying a manual force of 150N and a coefficient of friction of 0.14.

** Total time required in case of mechanical clamping and unclamping to obtain the clamping force specified in line 5, without taking account of time required for providing single components. Clamping stroke = 6 mm

When **working overhead** or when using **clamping claws**, the clamping and unclamping time must be increased by about 50%.

*** Total time required for hydraulic clamping and unclamping to obtain the clamping force specified in line 3. Electric power unit with solenoid valves. Pump delivery 40 cm^3/s at 400 bar. Clamping stroke = 6 mm.

Clamping time ...

... for other clamping strokes

Time for mechanical clamping = $\frac{t \times h}{6}$ (s)

Time for hydraulic clamping = $\frac{t \times h \times m}{6}$ (s)

t = Clamping time specified in lines 8 and 9
h = Clamping stroke (mm)
m = Stroke factor 0.8 for stroke >6 mm
Stroke factor 1.2 for stroke <6 mm

Calculations

Clamping time, t $t = \frac{q \times s \times z}{16 \times Q}$ [s]

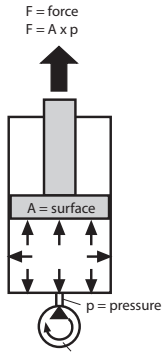
Piston velocity, v $v = \frac{160 \times Q}{A \times z}$ [mm/s]

Pump delivery, $Q = \frac{q \times s \times z}{16 \times t}$ [l/min]

Motor power on continuous duty, P $P = 2{,}7 \times n \times V \times p$ [W]

Pressure loss in pipes, Δp $\Delta p = \frac{1 \times L}{4 \times d} \times v^2$ [bar]

t = Clamping time [sec]
q = Oil required per 1 mm piston stroke acc. to catalogue [cm^3/mm]
s = Clamping stroke [mm]
z = Number of clamping cylinders
Q = Pump delivery [l/min]
A = Piston area [cm^2]
n = Motor speed [rpm]
V = Pump delivery (l/min.)
p = Operating pressure [bar]
Assumed: λ= 0,055, p = 700 Ns^2/m^4, volumetric efficiency 0.96, motor efficiency 0.88
L = Pipe length [m] (straight, smooth pipe)
d = Pipe inner diameter [mm]
v = Flow velocity [m/s]
$v_{max.}$ = 6 m/s for pressure pipes, 2 m/s for return pipes



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The clamping force to be applied for upper and lower die depends on:

- the **stripping force** on the slide
- the **ejection force**
- the **acceleration force**
- the **die weight**

The total clamping force to be produced by the clamping elements must be higher **than the greatest of all forces acting in a specific case. In general, the following approximate value may be assumed as the total clamping force for the upper or the lower die**

Total clamping force = 10 % - 20 % of the pressing force

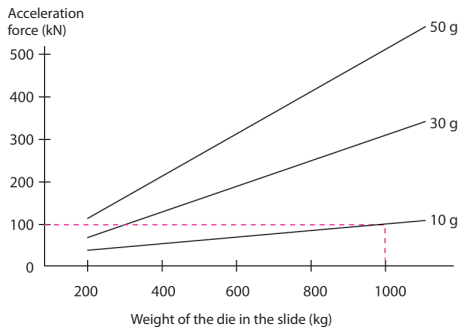
Based on the total clamping force, the required number of clamping elements is determined taking account of their clamping force and local conditions (symmetry, clearance, etc.)

Stripping force on the slide
This is the force acting on the die's clamping points after deduction of losses due to friction and acceleration. In the case of die casting machines, this force is referred to as the opening force. In a specific case it must be checked whether this force has to be taken into consideration when designing the clamping elements. Under normal operating conditions, the full machine potential is not utilized. Often it only becomes evident when the die halves have become stuck. The clamping elements must be designed in such a way that they are not damaged or broken in such cases of emergency. (Approximate values as per VDI guidelines 3145, see below.)

Ejection force
If ejectors are used, the maximum ejection force must be taken into account. The ejection force acts on the die, if the ejector cylinders do not move against their own stops but when the die is used as stop. Thus, ejection forces must be considered in any case. (Approximate values as per VDI guidelines 3145, see below.)

Approximate values as per VDI guidelines 3145
- Stripping force on the slide:
  5 % – 20 % of the pressing force
- Ejection force in the bed: 5 % – 20% of the pressing force
- Ejection force in the slide: 1 % –10 % of the pressing force

Acceleration force
The acceleration force must be taken into consideration when using very heavy dies and/or in case of high slide acceleration. The acceleration depends on the press drive, on the mechanical properties (elasticity, rigidity) of the press frame and on the operations being carried out.
The following approx. values may be assumed:
approx. 50 g for high-speed automatic punching presses
approx. 30 g for open-front presses
approx. 6 g for car body presses
For determining the occurring acceleration force, the die weight must be known. The interrelation is shown in the diagram below:



Example of calculation
Hydraulic double-column press, without drawing operation, max. stripping force 400 kN;
weight of upper and lower dies: 1000 kg each.

Approximate value for the total clamping force per die half: 20% of the pressing force = approx. 400 kN.
Determination on the basis of the acceleration force: with an acceleration of 10 g and a weight of 1000 kg, the acceleration force (as per diagram) is approx. 100 kN.

In view of the low acceleration force, the clamping force is determined on the basis of the stripping force.
Thus, the required total clamping force is 400 kN.

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Assistance in reaching a decision
'When does an investment pay for itself?'

The subject of quick die changing on forming presses and injection molding machines should not be interpreted too closely. The term 'clamping' includes the complete part of the process which is capable of being automated, i.e. feeding to and positioning in the machine, clamping and transporting outside the machine and, in a broader sense, also storage of dies.

Hilma-Roemheld offers system solutions which are suitable for adaptation to customers' specific needs. There may be many reasons for automation, the degree being dependent of the criteria prevailing in a company with respect to production and to the workplace.

A decision for automation may be influenced by the following criteria:

- improving productivity
- minimizing set-up times
- increasing flexibility
- rationalization measures
- humanization of work
- safety

This means that the decision for an automation of the die changing process is not only taken on the basis of a cost-benefit analysis but it is also influenced by workplace-related optimizing approaches.

In order to approach a solution by taking account of both quantity- and quality-related aspects, the so-called **efficiency analysis** may be applied.

This method for an alternative assessment offers the possibility of including also those criteria which cannot be expressed in units of money.

In addition to the fixed and variable costs of an investment, quality-related features such as—

- guaranteed conditions
- availability of spare parts
- safety
- service life
- advice and training
- ease of operation
- compatibility with the environment, etc.

—can also be taken into account.

For each criterion included, an **evaluation** is determined which reflects the importance of the criterion concerned. In the second step, each alternative relevant for the decision is assigned a mark, based on its **compliance with the various criteria.**

By multiplying these dimensionless figures, a partial efficiency is obtained for each criterion. Addition of the partial efficiency obtained for the alternative under consideration will give the overall efficiency.

In the example, two alternative solutions for press automation are at choice. Using this model of an analysis of the efficiency **(scoring model)** decisions can also be made taking account of quality criteria.

		Die changing system A		Die changing system B	
Criterion	Evaluation %	Degree of compliance [2]	Efficiency	Degree of compliance	Efficiency
Acquisition costs	25	8	2,00	3	0,75
Maintenance	20	4	0,80	6	1,20
Safety	30	5	1,50	9	2,70
Operation	15	2	0,30	10	1,50
Spare parts	8	5	0,40	9	0,72
Training	2	3	0,06	9	0,18
Overall efficiency	**100**	**–**	**5,06**	**–**	**7,05**

2) The degree of compliance is expressed in marks between 1 and 10, 10 being the best.

Although the price of die changing system B does not meet with expectations (assigned degree of compliance = 3), this alternative has a higher overall efficiency. For more details, we recommend reference to examples on the Internet, catchword: Analysis of efficiency.

When simply comparing costs, only the investment costs of two or more alternatives are compared with the anticipated benefit.

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Calculation of payback period
In this method, the acquisition costs (purchase price, calculatory depreciation and interest), the operating costs (energy, maintenance, expenses for the room where the machine is installed, follow-up costs for dies) as well as wage costs (set-up times, run-in period after die change) are calculated and, related to the planned die changing frequency, compared with the savings in time and costs.

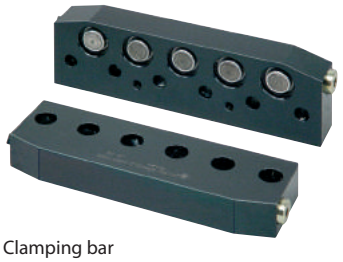
Example of calculation
Using the example of an existing press, two alternative proposals for die changing are compared. The production conditions are as follows:

- 2-shift operation, 810 min./day
- one die change per shift
- the dies are being used in the press
- roller bars and support consoles for loading the die are already fitted to the press

Example A
Die change is carried out using ten M24 mechanical clamping screws on the slide and six M24 clamping screws on the bed.

The acquisition costs are negligible compared with alternative B.

Example B
On the slide, die change is carried out using quick clamping systems from product group 3, i.e. hollow piston cylinders type HILMA 8.2135.2802 (8x). On the bed, die change is carried out using clamping bars of product group 2 type HILMA 2095-120 (4x).



Clamping bar

Hollow piston cylinder

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Calculation of payback period

Comparison of costs

		Example A	Example B
General data			
Transfer press (existing)	number	1	1
Existing dies	number	5	5
Planned dies	number	3	3
Die changing system			
Clamping elements on the slide	€	0	3.200
Clamping elements on the bed	€	0	1.600
Power unit (including controls)	€	0	4.300
Installation / Commissioning	€	0	4.700
Rework of existing dies	€	0	16.900
Costs of the die changing system	€	**0**	**30.700**
Set-up times			
Die clamping on the slide	min.	6,5	0,5
Die clamping on the bed	min.	3,9	0,5
Die unclamping on the slide	min.	6,5	0,5
Die unclamping on the bed	min.	3,9	0,5
Die transport	min.	4,0	4,0
Die set-up times	min.	**24,8**	**6,0**
Die changing			
Die changes / shift	number	1	1
Manpower / number of die changes	number	1	1
Set-up time / month	h	**17,3**	**4,2**
Hourly machine rate	€/h	280	280
Set-up costs / month	€	4.844	1.176
Set-up costs / year	€ /year	**58.128**	**14.112**
Hourly wage	€/h	25,56	25,56
Wage costs / year	€	**5.306**	**1.288**
Calculatory depreciation	years	10	10
	€/year	**0**	**3.070**
Calculated interests	€/year	**0**	**767**
Sum of costs	€/**year**	**63.434**	**19.237**

If die change is carried out once per shift, about 500 die changes are carried out per year.

Die change	Number/year	500*		500
Costs / change	€	126,87		38,47
Cost advantage	€/change		88,40	

Amortisation of die change ~ 347 die changes (€ 30.700 / 88,40)
this corresponds to approx. 8,33 months

* 500 die changes/year = 2 die changes/day x 250 working days

Under the given marginal conditions, an investment of € 30,700 quoted as an example in alternative B will have paid off after approx. 8.33 months or 347 die changes.

The production time gained by the reduction in the set-up times has not been taken into account.

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Rough calculation
As a first approach, the following formula can be used for determining the payback period with sufficient accuracy:

$$\textbf{Payback period} = \frac{\text{costs}}{\text{benefit}} = \frac{\text{investment (quick die clamping) - investment (conventional)}}{\text{saving of time x hourly machine rate x die change}}$$

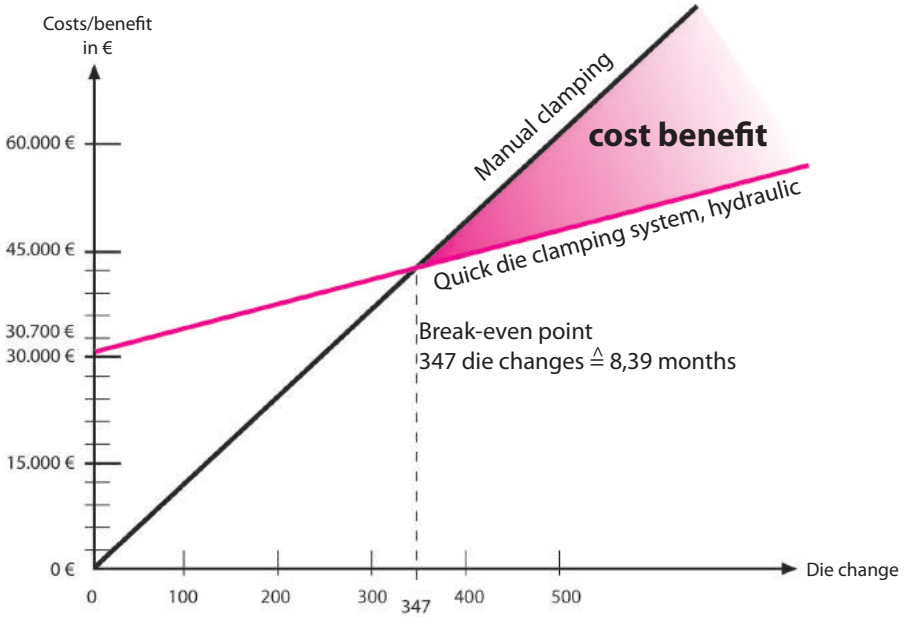
Parameters:
Investment costs (quick die clamping/changing system B) [€]
Investment costs (conventional clamping/changing system A) [€]
Saving of time = quick die clamping [min] - conventional clamping [min]
Hourly machine rate [€/min]
Die change [changes/month]
Payback period [months]

For the above example, a rough calculation gives the following results:

$$\textbf{Payback period} = \frac{(30.700 - 0)}{(24{,}8 - 6) \times (280/60) \times (500/12)}$$

$$= \textbf{8,39 months}$$

The payback period of 8.39 months determined by this method is almost identical with the payback period determined by way of calculation and thus is sufficiently accurate.



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Hydraulic parameters and recommendations

Data contained in the catalog:
All parameters are quoted in accordance with the VDI Guidelines 3267 to 3284. Designations and symbols according to ISO 1219.
Dimensions in SI units, according to DIN 1301.
Dimensions without tolerance indication: DIN 7168, medium.

Clamping elements:

Constant working pressure:	see catalog sheets
Ambient temperature:	-10°C to 70°C (other temperatures on request)
Mounting position:	any, unless otherwise stated
Piston velocity:	0.01 to 0.25 m/s
Oil leakage rate:	at 400 bar 20°C hydraulic oil HLP 32
- dynamic:	0.0001 g per double stroke (Ø = 32, stroke = 40, V = 0.1 m/s) 0.0003 g per double stroke (Ø = 40, stroke = 40, V = 0.1 m/s)
- static:	0.03 g in 24 hours

Oil recommendation:

Oil temperature (°C)	Designation acc. to DIN 51524	Viscosity acc. to DIN 51519
0 - 40	HLP 22	ISOVG 22
10 - 50	HLP 32	ISOVG 32
20 - 60	HLP 46	ISOVG 46

(Other hydraulic fluids are available on request)

Influence of temperature:
Fluids expand differently under the influence of increasing temperatures. If no space is available for expansion, the change results in a pressure increase. Since the clamping system is a closed system, there will be a pressure increase. Conversely, a decrease in temperature results in a decrease in pressure.
As a rule of thumb one can say that a 10°C increase in temperature results in a 100 bar increase in pressure. In the case of a significant decrease in temperature, e.g. during the night in unheated workshops, the pressure will decrease accordingly. It is therefore recommended that systems which are isolated from the pressure generator are fitted with a pressure accumulator, in order to reduce any decrease in pressure.

Pipe fittings:
According to DIN 2353. screwed plugs type B to DIN 3852, sheet 2 (sealing by sealing edge) should be used. Do not use additional sealing materials such as Teflon tape!

Connecting threads:
Whitworth pipe threads type X to DIN 3852, sheet 2 (for cylindrical screwed plugs).

Piping:
Seamless, plain ended steel pipes as per DIN 2391 NBK.
Preferably:

Outer 0 (mm)	Wall thickness (mm)	Hydraulic pressure (bar)	Fitting
8	1,5	400	G 1/4
8	2,0	500	G 1/4
12	2,5	400	G 3/8
12	3,0	500	G 3/8
16	3,0	400	G 1/2
(inch)	(inch)	(psi)	
1/4	0.049	6,650	G 1/4
5/16	0.065	7,250	G 1/4
3/8	0.065	5,900	G 3/8

Pipe runs should be as short as possible. The length of pipes for single-acting cylinders with a spring return should not exceed 5 m, pipes for double-acting cylinders may be longer. Make sure that pipes are installed with a large bending radius.

Hose connections:
For connection of the clamping elements we recommend high-pressure hoses with 4 x safety factor at an operating pressure of 500 bar. Special designs should be used for hoses subject to constant movement, e.g. hoses for oil supply to the slide. Observe the minimum radius bends.

Starting the system, maintenance:
Read the operating instructions before starting the system. Use clean and fresh oil. Bleed the complete system by operating the pump at low pressure (~20 bar) until the oil which emerges at the highest point is free from bubbles (rinsing). Since hydraulic valves are very sensitive to dirt, make sure that no impurities are carried into the hydraulic oil. A change of oil should be carried out once a year.

Dynamic pressure in the hydraulic system:
Due to friction in pipes, screw fittings, valves and cylinders a pressure of 1 – 2 bar is necessary for proper oil circulation. The retracting springs in cylinders with a spring return are designed for a maximum dynamic pressure of 2 bar. If the cylinders move slowly, or if they do not retract properly, the dynamic pressure must be reduced (larger pipe diameter, shorter pipes, fewer screw fittings, connection in parallel rather than in series, reduced weight on the piston). In applications with double-acting cylinders dynamic pressure is likely to occur when pressure is applied to the rod side and the larger oil volume from the piston side must flow back to the oil reservoir through narrow pipes and valves.
Normally, dynamic pressure has no negative effect. However, if in applications with swing clamps and swing sink clamps the drop is in excess of 50 bar, this may cause premature wear of the swing mechanism and result in a malfunction (see catalog sheets).

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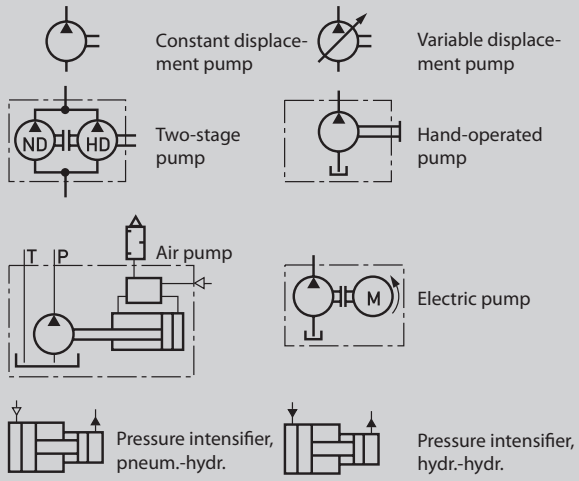
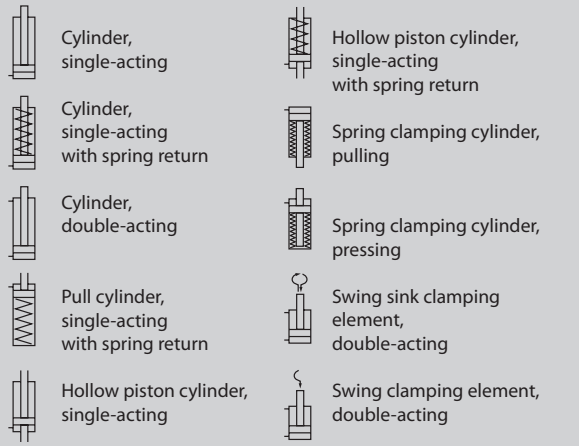
Symbols and designations used in hydraulic clamping systems

ROEMHELD
HILMA ▪ STARK

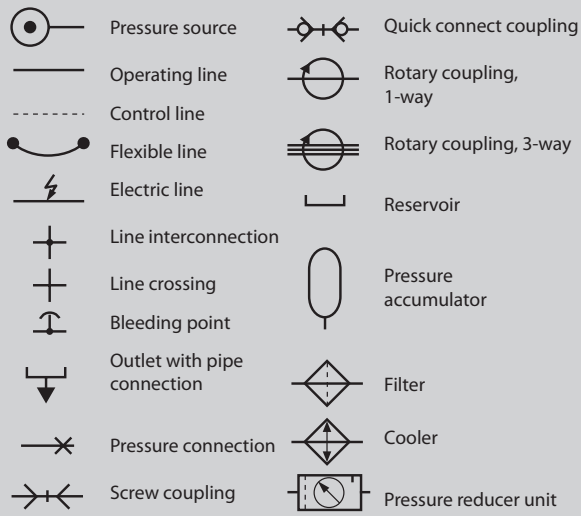
Pressure generators



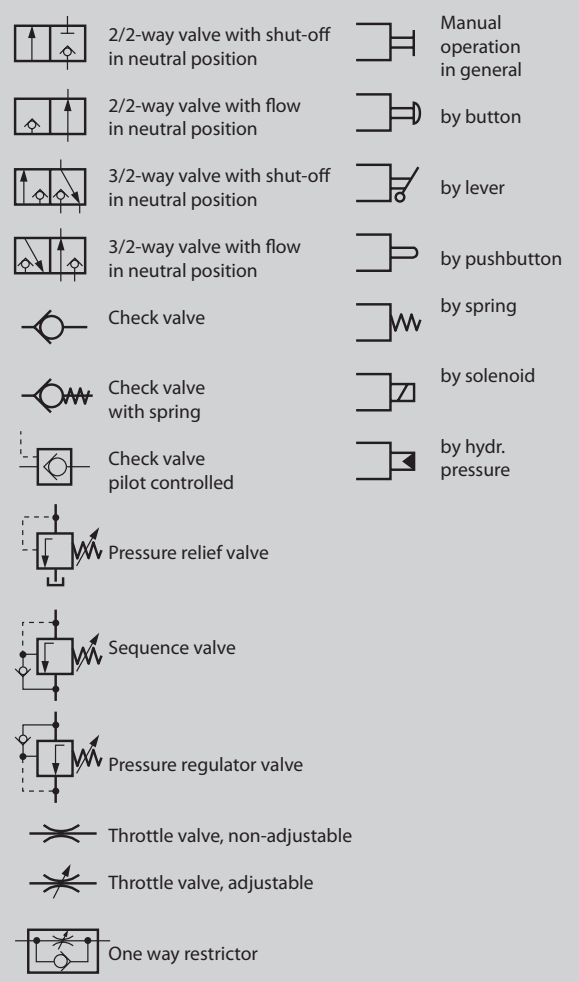
Hydraulic cylinders



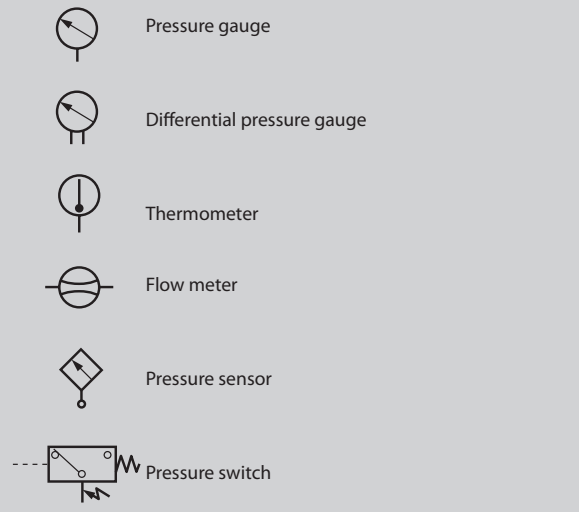
Energy transmission Hydraulic oil supply and accessories



Valves



Other equipment



Excerpt from ISO 1219, DIN 24300

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Safety levels are determined by different safety requirements and manufacturing technologies.
Based on the state of technical development, hydraulic die clamping systems can be classified into one of three safety levels.

Safety level no. 1:

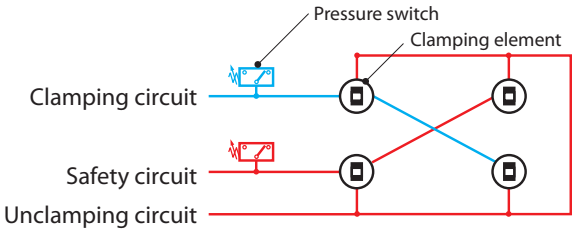
Preferably for presses with column-guided dies:

Pressure switches in every clamping circuit for controlling the clamping force, used for machine safety.

Two independent hydraulic circuits.

Clamping circuit	= 50% of the clamping elements in bed and slide
Safety circuit	= 50% of the clamping elements in bed and slide

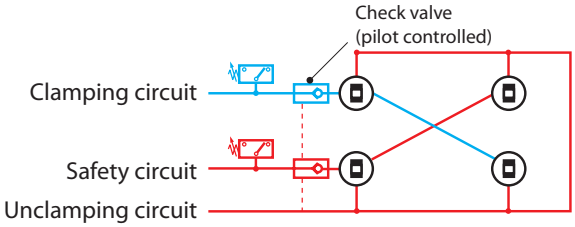
If one circuit fails, the upper or lower die is still clamped with 50% of the total clamping power.



Safety level no. 2:

For presses with dies which are not column-guided

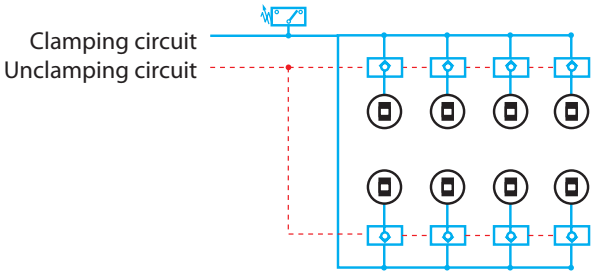
A check valve (pilot controlled) maintains pressure in the clamping and safety circuits even when the pressure drops in the remaining system.



Safety level no. 3:

For power presses and car body presses with dies which are not column-guided.

All clamping elements are secured by pilot controlled check valves. If pressure drops by more than 20% of the operating pressure, the pressure switch stops the press. The check valves maintain the clamping force for many days.



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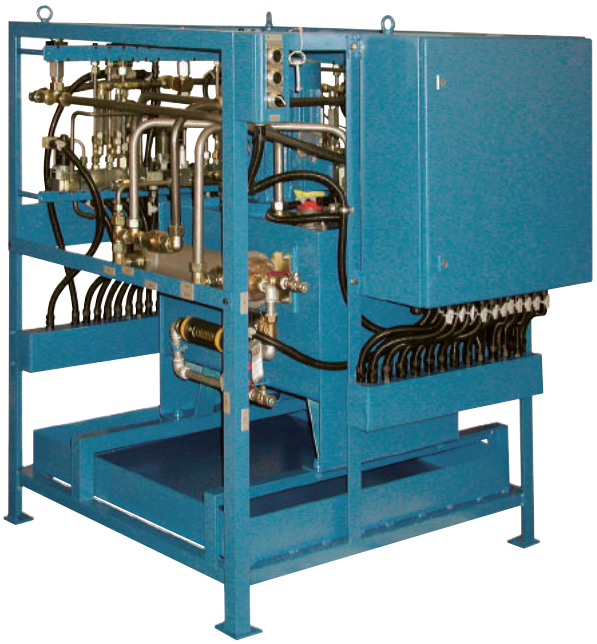
Hydraulic power units used for clamping applications need low oil volumes but high pressures, other than those used for applications involving motion.

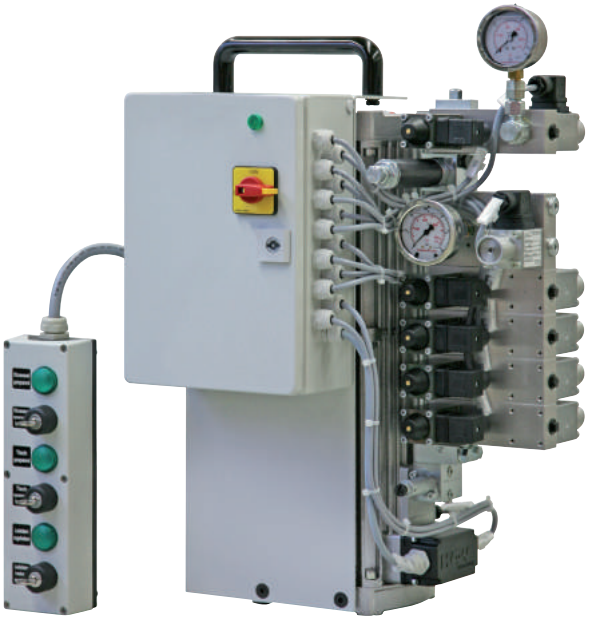
The power unit operates intermittently under automatic pressure control, i.e. when the set pressure of 400 bar is reached the motor is automatically switched off. If the pressure drops below 360 bar, the pressure switch causes the motor to start again. The valves used are of the seat-valve type. This ensures that oil loss in each clamping circuit is restricted to a minimum.

The solenoids of the valves are designed for a 24V DC supply and for continuous duty. They are idle when the clamping elements are clamped. In addition to a high service life, this ensures that even in the case of power failure the clamping force is maintaine For power units of this design only small oil reservoirs are required, since the oil is only slightly heated up. The energy balance is very favorable.

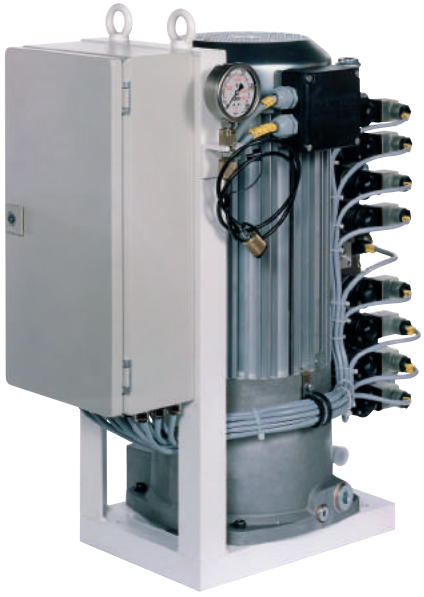


Frame-type unit for 3 forging presses:
12 clamping circuits with pressure reduction for compensation of temperature
high-pressure 4.2 l/min., 400 bar
cooling return 45 l/min., 10 bar

"Modular system enables individual solutions"



Power unit, series 7: 2.8 l/min., max. 400 bar



Power unit, 4.2 l/min., max. 400 bar
ready for connection and immediate use

For more technical information on power units, please refer to product group 7.

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QUICK DIE CHANGE
Automatic or Manual

Manual Clamping Nut
See Section 6

Hilma has been safely clamping dies for more than 50 years. We work with you to develop an automatic or manual die change system to suit your needs.

We provide the products and support to keep you competitive in today's manufacturing environment.

New Automatic Flexline Traveling Clamp
See Section 3

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hydraulic

Hydraulic clamping elements
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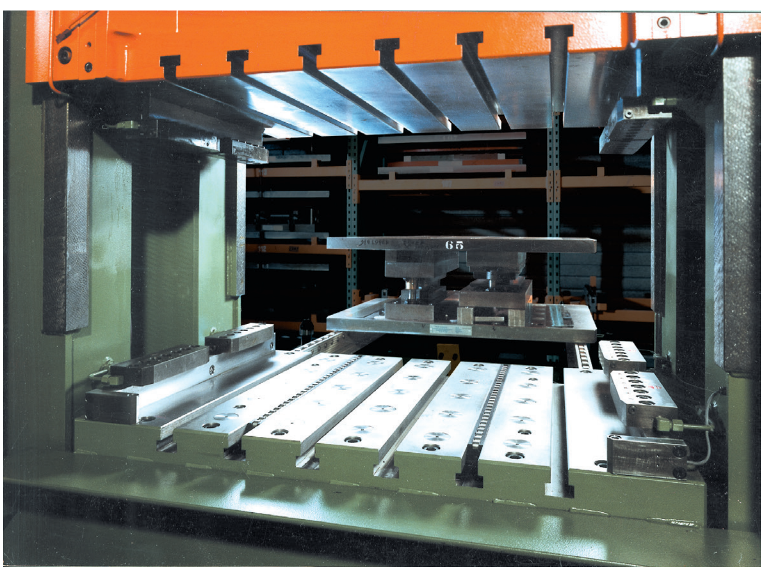

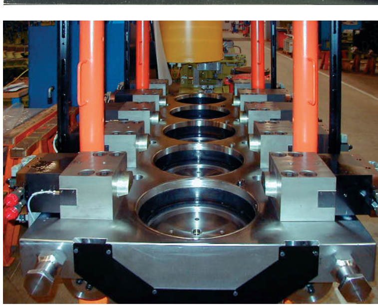

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Products | for | productivity

Contents
Product group 2

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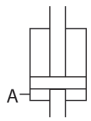

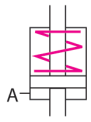

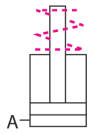

Application:

- In connection with tie rods, lead screws and threaded rods, for clamping and locking dies on presses and machines

Hollow piston cylinder, single-acting, without spring return, as a pulling or pressing cylinder
Can be attached, screwed or flange-mounted in any position. The clamping force is built up by applying pressure to the piston and the piston is returned by external action. The piston is provided with a through hole and is hardened and ground. The housing is made from heat-treatable steel and its surface is burnished.

Hollow piston cylinder, single-acting, with spring return, as a pulling or pressing cylinder
Can be attached, screwed or flange-mounted in any position. The clamping force is built up by applying pressure to the piston and the piston is returned by a spring. The piston is provided with a through hole and is hardened and ground. The housing is made from heat-treatable steel and its surface is burnished.

Hollow piston cylinder, single-acting, as a pulling or pressing cylinder
This cylinder is very suitable for clamping mechanical clamping bars on die bending presses and folding presses. The clamping force is built up by applying pressure to the piston and the piston is returned by a spring which is installed in the clamping bar. The piston is provided with a through hole and is hardened and ground. For an optimum adaptation to the clamping surface, the hollow piston cylinder may be provided with a spherical washer.

Special features:

- flat and compact design
- steady piston movement
- stroke limited even with max. working pressure
- rapid and easy retrofit
- ideal power transmission

For power units
please see product group 7

For accessories
please see product group 11

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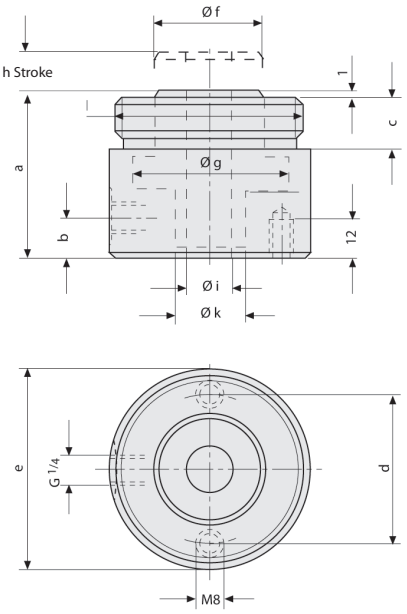
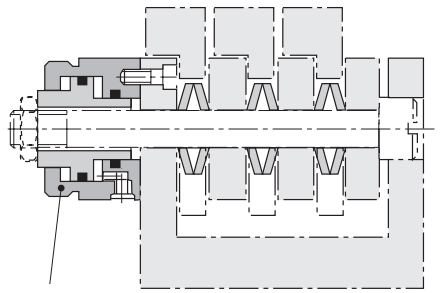
Hollow piston cylinder single-acting, without spring return

Clamping force at 100 bar (kN)	8,7	13,5	21	34,3
400 bar (kN)	34,8	54	84	137,2
Stroke h (mm)	12	12	15	15
Piston restoring force (kN)	0,18	0,27	0,42	0,70
Piston area (cm²)	8,7	13,5	21	34,3
Oil consumpt./1 mm stroke (cm³)	0,9	1,4	2,1	3,5
a (mm)	61	61	72	72
b (mm)	11	15	18,5	24
c (mm)	22	22	27,5	27,5
d (mm)	44	55	68	84
e (mm)	60	75	93	113
f (mm)	28	38	54	60
g (mm)	40	50	63	80
i (mm)	16,5	20,5	24,5	30,5
k (mm)	22	28	36	45
l (mm)	M52 x 1,5	M72 x 1,5	M90 x 2	M110 x 2
Weight (kg)	1	1,7	3,1	4,6
Part no.	**HCR-1303-003**	**HCR-1305-003**	**HCR-1307-003**	**HCR-1309-003**

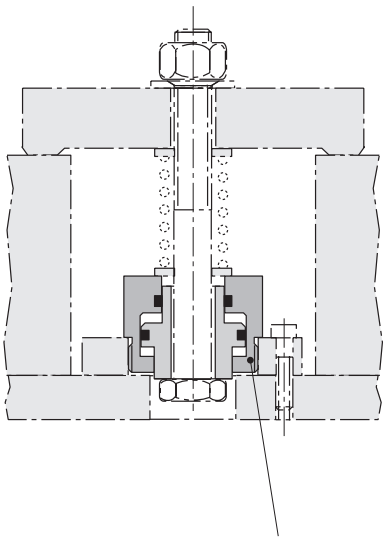


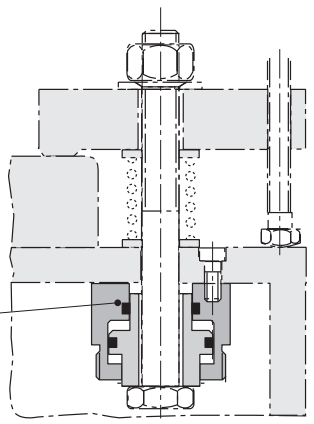
max. operating pressure: 400 bar.
Special designs are available on request.

Examples of application



Hollow piston cylinder





Hollow piston cylinders

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Hollow piston cylinder single-acting, with spring return

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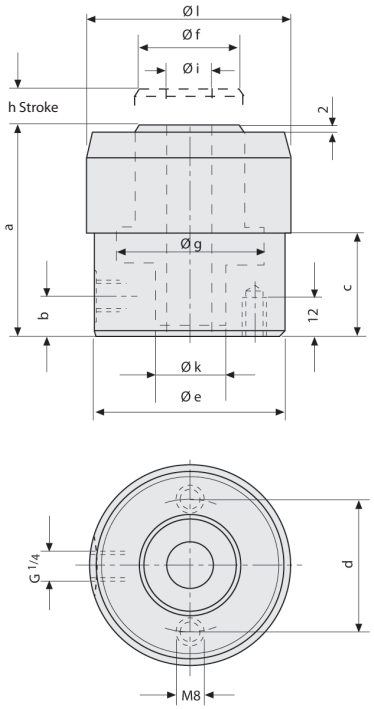
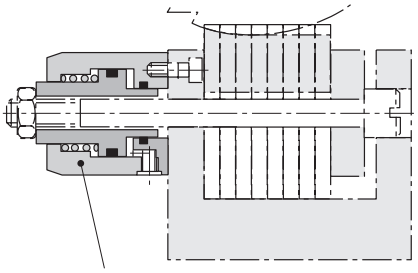
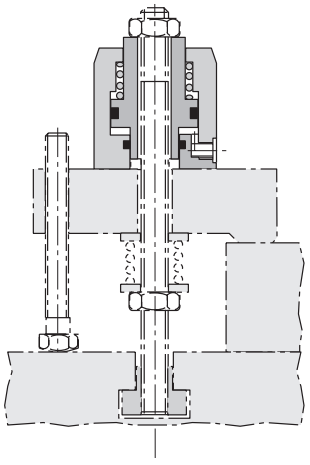


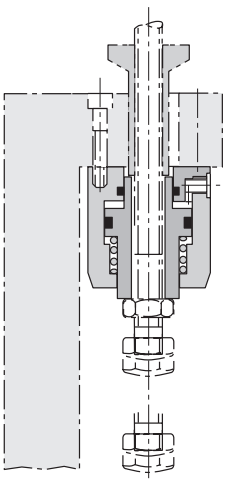
Clamping force at 100 bar (kN)	8,7	13,5	21	34,3
400 bar (kN)	34,8	54	84	137,2
Stroke h (mm)	12	12	15	15
Spring power (kN)	0,26	0,36	0,50	0,75
Piston area (cm^2)	8,7	13,5	21	34,3
Oil consumpt./1 mm stroke (cm^3)	0,9	1,4	2,1	3,5
a (mm)	76	76	97	97
b (mm)	11	15	18,5	24
c (mm)	38	38	41	41
d (mm)	44	55	68	84
e (mm)	60	75	93	113
f (mm)	28	38	45	58
g (mm)	40	50	63	80
i (mm)	16,5	20,5	24,5	30,5
k (mm)	22	28	36	45
l (mm)	60	80	100	120
Weight (kg)	1,3	2,2	4,2	6,1
Part no.	**HCR-1323-003**	**HCR-1325-003**	**HCR-1327-003**	**HCR-1329-003**

max. operating pressure: 400 bar.
Special designs are available on request.



Hollow piston cylinder





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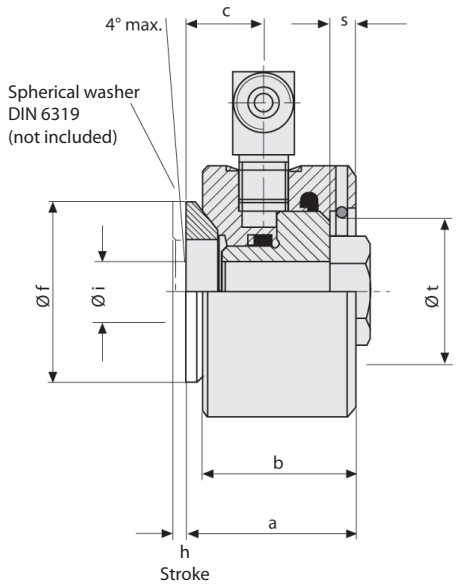
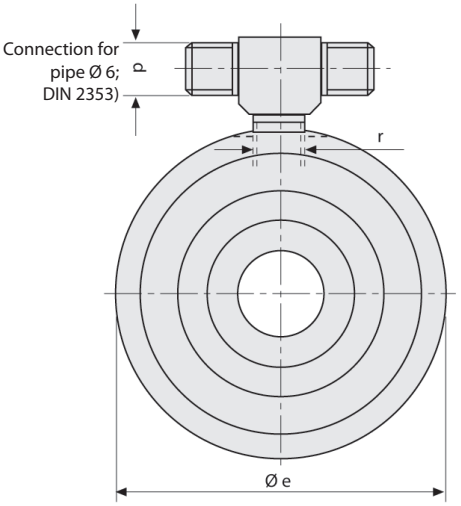
Short-stroke hollow piston cylinder, single-acting

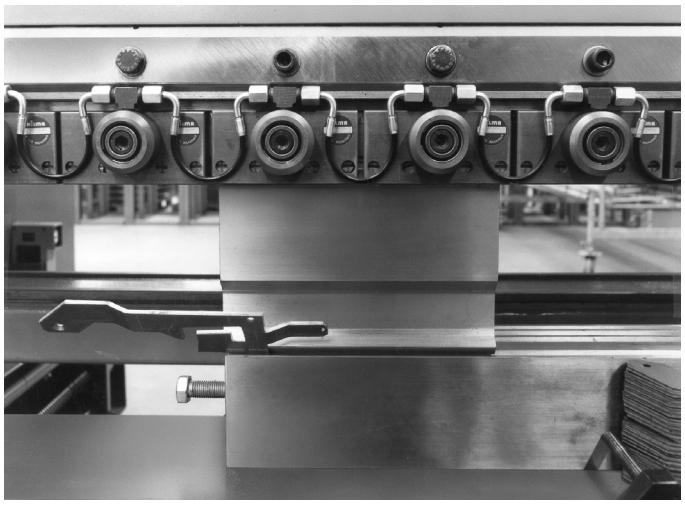
Clamping force at 100 bar (kN)	**5,5**	**13,5**
400 bar (kN)	**22**	**54**
for screw	M 12	M 16
Stroke h (mm)	2,5	3,0
Pull-back spring power (kN)	0,27	0,67
Piston area (cm^2)	5,5	13,5
Oil consumpt./1 mm stroke (cm^3)	0,6	1,4
a (mm)	33	46
b (mm)	30,6	41
c (mm)	15	20
d (mm)	12	18
Ø e (mm)	50	80
Ø f (mm)	36	56
Spherical washer	C 21	C 31
Ø i (mm)	13	18
Ø k (mm)	22	30
p	M 12 x 1,5	M 14 x 1,5
r	G ⅛	G ¼
s (mm)	5,2	8,6
Øt (mm)	30	48
Weight (kg)	0,4	1,4
Part no.	**HCR-1830-011**	**HCR-1830-012**
Spherical washer Part no.	**HCR-5700-028**	**HCR-5700-029**
Pull-back spring Part no.	**HCR-5700-031**	**HCR-5700-032**

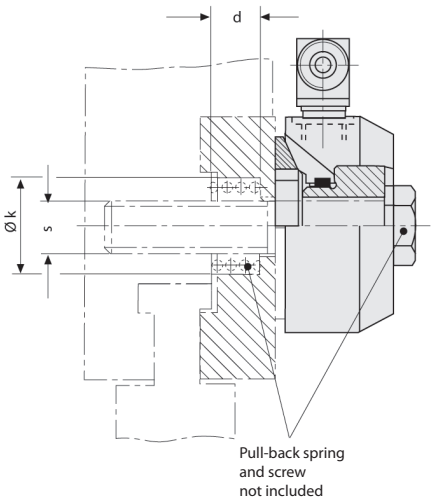
max. operating pressure: 400 bar.
Special designs are available on request.





Examples of application
Clamping of a form tool using a short-stroke hollow piston cylinder and a mechanical flat clamping bar





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Spring clamping cylinder pulling, with hydraulic return

Application:

- unpressurized long-term clamping of movable machine parts, dies, fixtures, pallets and workpieces

Function:

The force of the spring clamping cylinder is mechanically transmitted to the tie rod or the clamping spindle by a preloaded Belleville spring assembly. Hydraulic power is only required for unclamping the clamping cylinder.

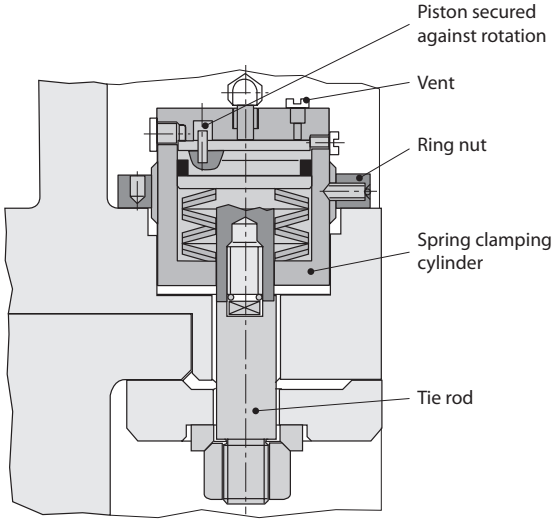
Special features:

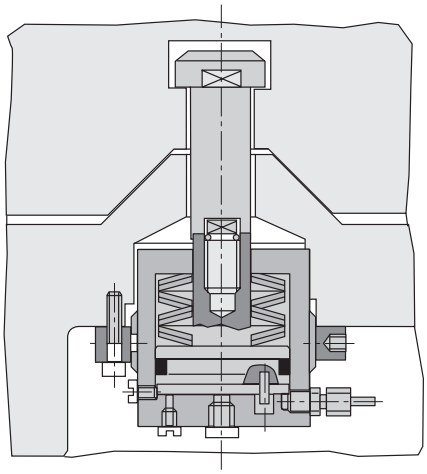
- large choice of clamping forces
- long service life ensured by low-friction Belleville springs placed between hardened and ground thrust washers
- piston secured against rotation
- radial and axial oil ports
- rapid and easy installation

For power units
please see product group 7

For accessories
please see product group 11

Examples of application





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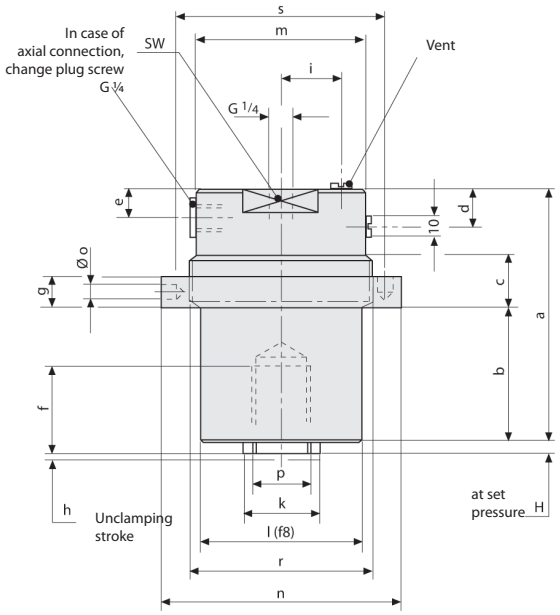
Spring clamping cylinder pulling, with hydraulic return

Adjustment of clamping force, clamping and unclamping

1. Apply set pressure to spring clamping cylinder.
2. Adjust clamping position to be free from play by means of ring nut.
3. Secure ring nut against torsion. If necessary, secure cylinder against sliding. See examples for application.
4. For clamping, reduce set pressure.
5. For unclamping, apply unclamping pressure.
6. Check play of clamping point after approx. 1000 load changes at set pressure. If necessary, retighten ring nut and secure again.

Please consult our technical sales staff
- if clamping forces have changed
- in case of an unclamping stroke > 1 mm
- in case of load cycles > 1 min.
- if aggressive fluids are used
- in case of temperatures below -15°C or above +60°C
- if the unclamping stroke must be limited
- if you require special versions



Clamping force (kN)	16	25	40	63	100	160	250	400
Set pressure (bar)	165	165	185	215	250	230	230	215
Unclamping pressure h = 0,5 mm (bar)	210	200	210	235	275	265	250	235
Unclamping pressure h = 1,0 mm (bar)	255	235	235	255	315	300	270	255
Oil consump. / 1mm stroke (cm³)	1,3	2,0	2,9	3,9	5,0	9,5	14,3	25,4
a (mm)	95	105	120	132	147	170	230	280
b (mm)	45	50	60	70	80	75	100	130
c (mm)	20	20	25	25	30	45	55	65
d (mm)	22	22	22	23	23	33	62	65
e (mm)	11	11	11	12	12	28	57	62
f (mm)	24	30	36	45	45	50	60	65
g (mm)	13	14	14	16	16	18	20	50
i (mm)	18	20,5	27	32	36	34	38	50
k (mm)	20	25	30	40	40	50	70	90
l (f8) (mm)	55	65	75	85	95	142	170	220
m (mm)	55	65	75	89	99	137	163	212
n (mm)	85	95	110	125	140	180	220	270
o (mm)	6	8	8	8	8	10	10	15
p (mm)	M 14 x 1,5	M 18 x 1,5	M 22 x 1,5	M 30 x 1,5	M 30 x 1,5	M 38 x 1,5	M 45 x 1,5	M 58 x 2
r (mm)	M 58 x 1,5	M 68 x 1,5	M 78 x 1,5	M 92 x 1,5	M 102 x 1,5	M 140 x 2	M 168 x 3	M 218 x 4
H (mm)	4	4	4	6	6	6	6	6
SW (mm)	50	60	70	80	90	130	-	-
s (mm)	72	82	94	109	121	165	194	244
Weight (kg)	1,8	2,6	3,9	5,7	7,8	18,7	36,3	83
Part no.	**CLR-1401-010-HC**	**CLR-1402-010-HC**	**CLR-1403-010-HC**	**CLR-1404-010-HC**	**CLR-1405-010-HC**	**HCR-1406-010**	**HCR-1407-010**	**HCR-1408-010**

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Spring clamping cylinder pulling, with hydraulic return power-stroke pressure diagrams

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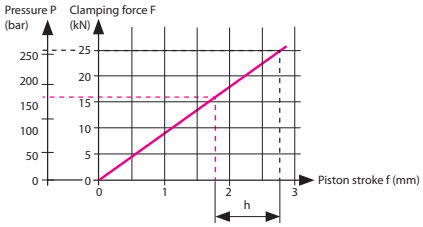
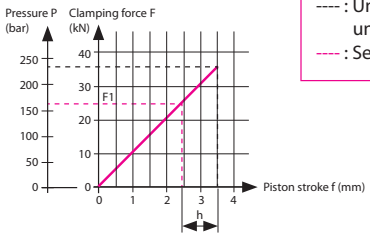
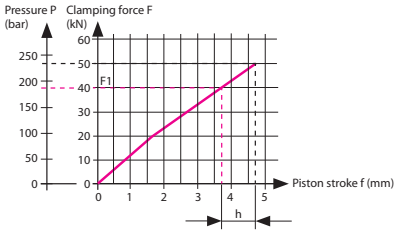
h : Unclamped stroke
---- : Unclamped pressure for unclamped stroke h - 1 mm
---- : Set pressure



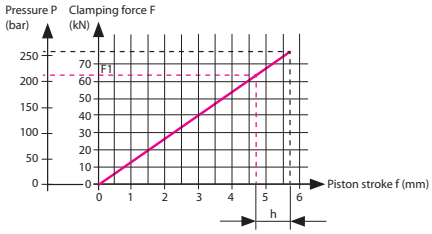
Clamping force (kN) at set pressure 165 bar	**16**
Unclamping pressure (bar) at unclamping stroke h 0.5 mm	210
Unclamping pressure (bar) at unclamping stroke h 1 mm	255
Operating pressure max. bar	270
Part no.	**CLR-1401-010-HC**



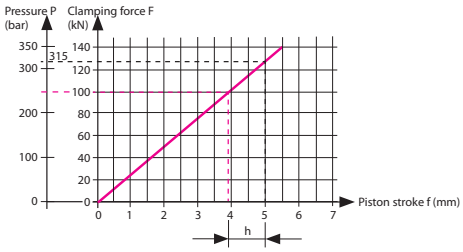
Clamping force (kN) at set pressure 165 bar	**25**
Unclamping pressure (bar) at unclamping stroke h 0.5 mm	200
Unclamping pressure (bar) at unclamping stroke h 1 mm	235
Operating pressure max. bar	250
Part no.	**CLR-1402-010-HC**



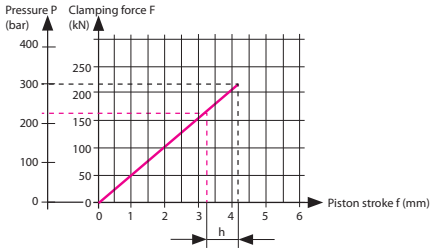
Clamping force (kN) at set pressure 185 bar	**40**
Unclamping pressure (bar) at unclamping stroke h 0.5 mm	210
Unclamping pressure (bar) at unclamping stroke h 1 mm	235
Operating pressure max. bar	250
Part no.	**CLR-1403-010-HC**



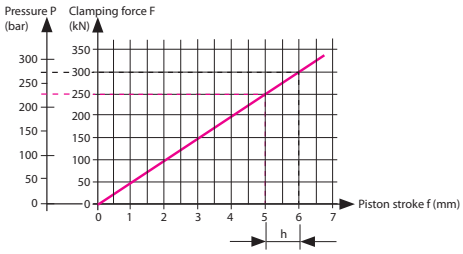
Clamping force (kN) at set pressure 215 bar	**63**
Unclamping pressure (bar) at unclamping stroke h 0.5 mm	235
Unclamping pressure (bar) at unclamping stroke h 1 mm	255
Operating pressure max. bar	270
Part no.	**CLR-1404-010-HC**



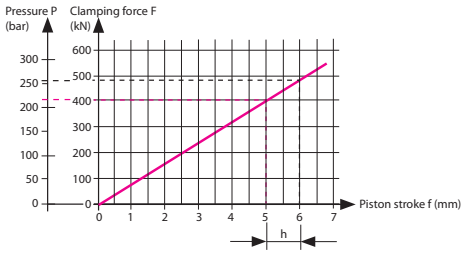
Clamping force (kN) at set pressure 250 bar	**100**
Unclamping pressure (bar) at unclamping stroke h 0.5 mm	275
Unclamping pressure (bar) at unclamping stroke h 1 mm	315
Operating pressure max. bar	320
Part no.	**CLR-1405-010-HC**



Clamping force (kN) at set pressure 230 bar	**160**
Unclamping pressure (bar) at unclamping stroke h 0.5 mm	265
Unclamping pressure (bar) at unclamping stroke h 1 mm	300
Operating pressure max. bar	320
Part no.	**HCR-1406-010**



Clamping force (kN) at set pressure 230 bar	**250**
Unclamping pressure (bar) at unclamping stroke h 0.5 mm	250
Unclamping pressure (bar) at unclamping stroke h 1 mm	270
Operating pressure max. bar	285
Part no.	**HCR-1407-010-HC**



Clamping force (kN) at set pressure 215 bar	**400**
Unclamping pressure (bar) at unclamping stroke h 0.5 mm	235
Unclamping pressure (bar) at unclamping stroke h 1 mm	255
Operating pressure max. bar	270
Part no.	**HCR-1408-010**

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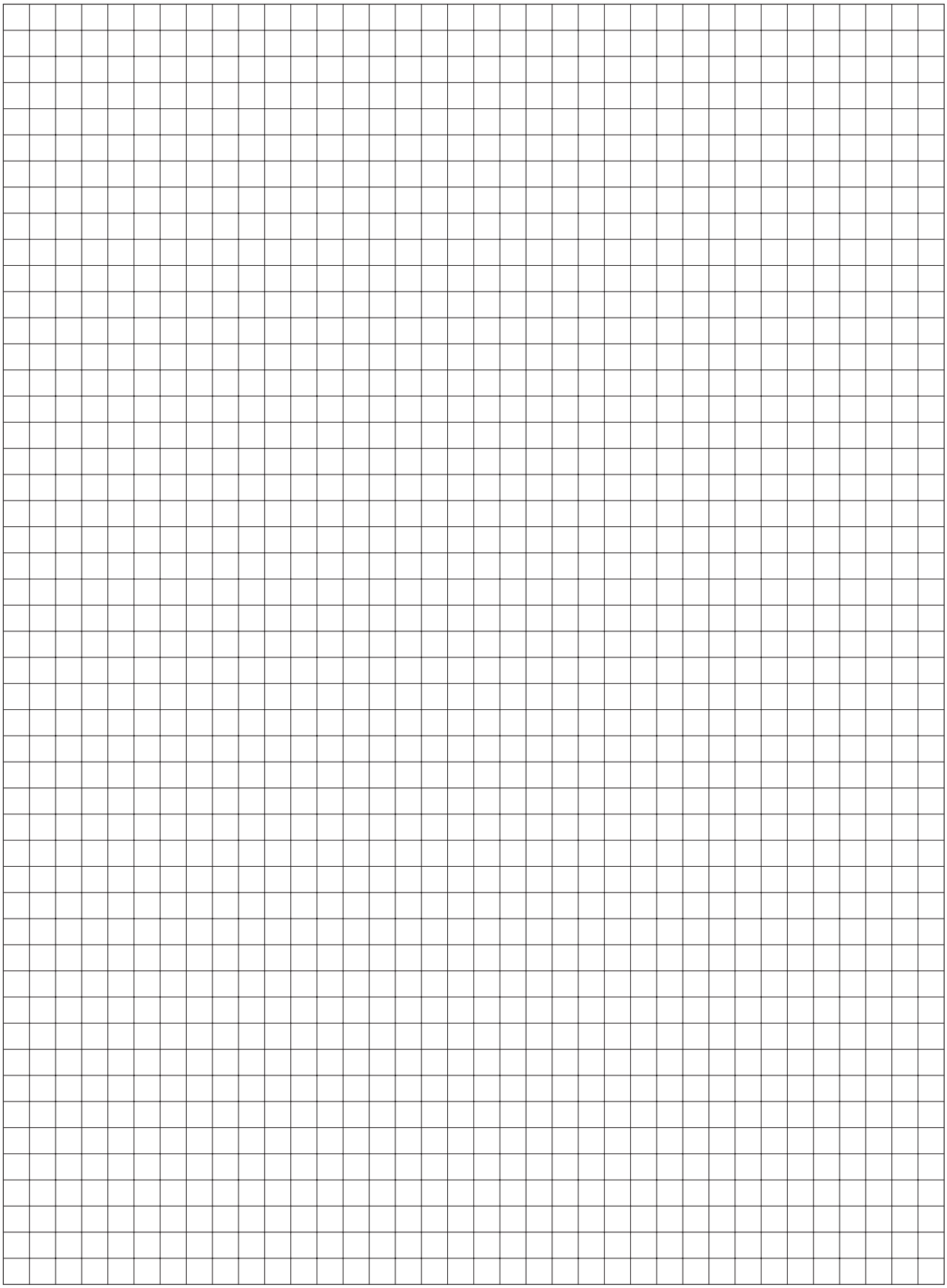

Double-T clamping bar

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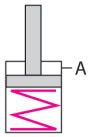

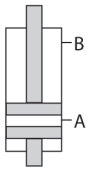

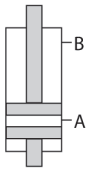

Since double-T bars are composed of modular segments, various lengths are available.

Applications:

- for clamping dies on press bed and press slide
- when the available space is limited

Double-T clamping bar, single-acting with spring return, without support rollers: usually for use in a press slide but also suitable for use in a press bed.

The double-T clamping bar is installed by pushing it into the T-slots of the press slide or the press bed in any desired position. The bar is manually secured in position using locking screws in the root of the T-slot.
The double-T design requires T-slots in the die and in the press slide or press bed.
The clamping force is generated by applying hydraulic pressure to the pistons, and unclamping is carried out mechanically by spring return.

Double-T clamping bar, double-acting without support rollers: usually for use in a press ram but also suitable for use in a press bed.
Installation of the double-T clamping bar and generation of the clamping force are as described above, but with one additional clamping circuit for unclamping. The bar is automatically secured in position using locking pistons in the root of the T-slot.

Double-T clamping bar, double-acting with support rollers for lifting and clamping: usually for use in a press bed.
Installation and generation of the clamping force as described above, but with additional support rollers. A double-acting piston causes the support rollers to lift the die and to be clamped by a second clamping circuit. Before clamping the die is placed on the support rollers, i.e. it is not in contact with the press bed and can easily be moved in a linear direction and be positioned.
Lifting, moving, positioning and clamping uses only one element.

Special features:

- max. operating pressure 400 bar, therefore no low-pressure circuit is required
- the complete clamping surface can be used
- no collision edges
- easy and quick retrofit
- ideal, uniform power transmission.

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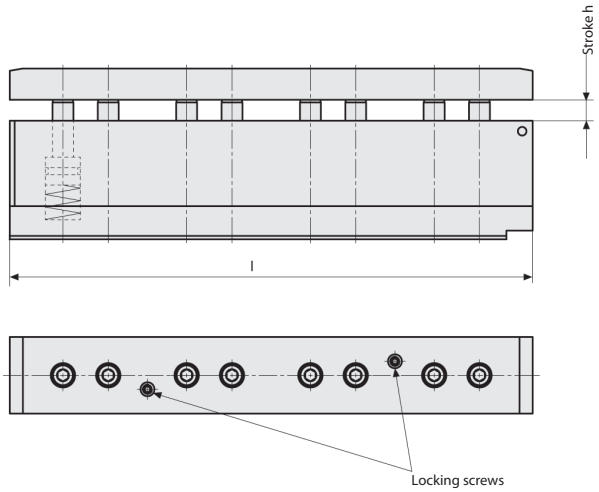
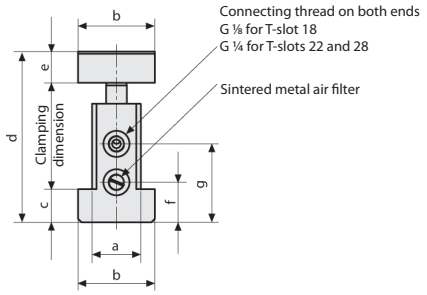
Double-T clamping bar single-acting with spring return



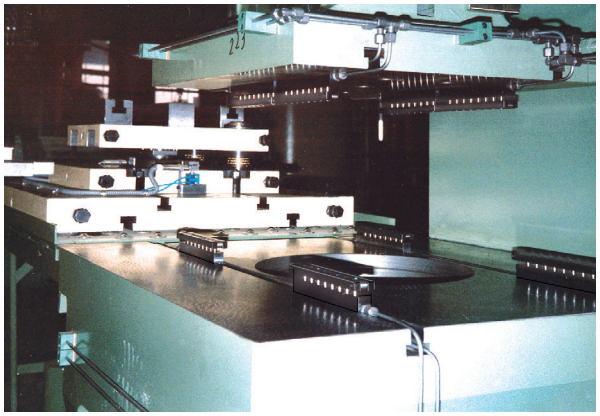


Slot a (mm)	18	22	28
b (mm)	28	35	44
c (mm)	11,5	15,0	19,0
d min (mm)	55	70	89
d max (mm)	63	80	101
e (mm)	11	15	18
g (mm)	30,5	41,0	46,0
Clamping dimension (mm)	33,5 + 6	41,0 + 8	53,0 + 10
Stroke h* (mm)	8	10	12
Max. operating pressure (bar)	400	400	400

* Reduction of stroke on request

Part no.	T-slot (a) (mm)	Length (l)* (mm)	Clamping force (kN) at 400 bar	Oil consumpt. (cm^3) clamping
HCR-8.1832.1810**	18	150	16,6	3,3
HCR-8.1832.1812	18	300	33,2	6,6
HCR-8.1832.1814	18	450	49,8	9,9
HCR-8.1832.1816	18	600	66,4	13,2
HCR-8.1832.1818	18	750	83,0	16,6
HCR-8.1832.2210**	22	300	39,2	9,8
HCR-8.1832.2212	22	600	78,4	19,6
HCR-8.1832.2214	22	900	117,6	29,4
HCR-8.1832.2216	22	1200	156,8	39,2
HCR-8.1832.2218	22	1500	196,0	49,0
HCR-8.1832.2810**	28	300	64,0	19,3
HCR-8.1832.2812	28	600	128,0	38,6
HCR-8.1832.2814	28	900	192,0	57,9
HCR-8.1832.2816	28	1200	256,0	77,2
HCR-8.1832.2818	28	1500	320,0	96,5

* Intermediate length dimensions and extra-long bars are available on request.
** Connection thread on one end



Double-T clamping bar on press bed and press slide

The double-T clamping bars are composed of individual segments. When clamping or unclamping, make sure that there is an overlap of >90% of the length of the segment.

Length of the segment: T-slot 18 ≙ 150 mm
T-slot 22 ≙ 300 mm
T-slot 28 ≙ 300 mm

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Double-T clamping bar double-acting

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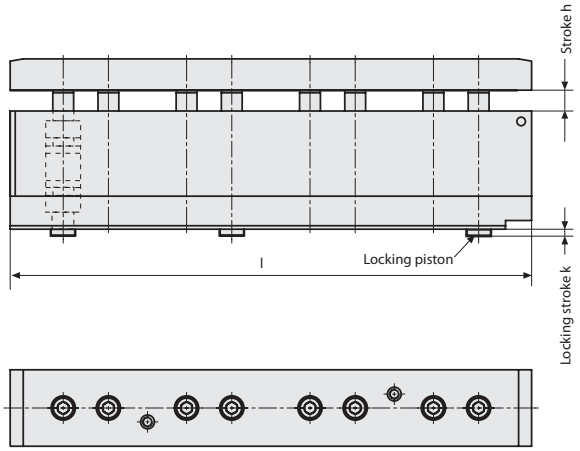
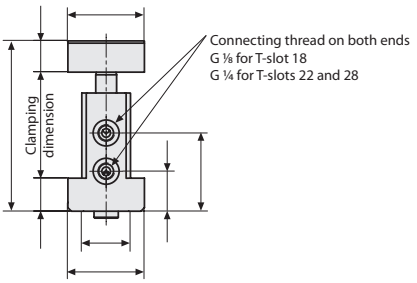




Slot a (mm)	18	22	28
b (mm)	28	35	44
c (mm)	11,5	15,0	19,0
d min (mm)	55	70	89
d max (mm)	63	80	101
e (mm)	11	15	18
f (mm)	13,5	18,0	23,0
g (mm)	30,5	41,0	46,0
Clamping dimension (mm)	33,5 + 6	41,0 + 8	53,0 + 10
Stroke h* (mm)	8	10	12
Locking stroke k** (mm)	2,5	3,0	4,0
Max. operating pressure (bar)	400	400	400

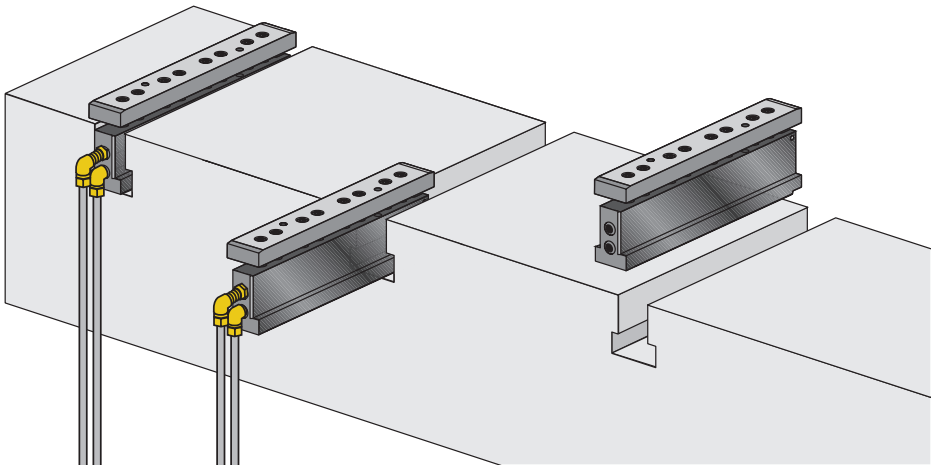
* Reduced stroke is available on request
** Locking screw (see double-T bar single-acting) instead of locking piston is available on request.

The double-T clamping bars are composed of individual segments. When clamping or unclamping, make sure that there is an overlap of >90% of the length of the segment.

Length of the segment: T-slot 18 ≙ 150 mm
T-slot 22 ≙ 300 mm
T-slot 28 ≙ 300 mm

Part no.	T-slot (a) (mm)	Length (l) (mm)*	Clamping force (kN) at 400 bar	Oil consumpt. (cm^3) clamping	unclamp.
HCR-8.1832.1820**	18	150	16,6	3,3	6,4
HCR-8.1832.1822	18	300	33,2	6,6	12,9
HCR-8.1832.1824	18	450	49,8	9,9	19,4
HCR-8.1832.1826	18	600	66,4	13,3	25,8
HCR-8.1832.1828	18	750	83,0	16,6	32,3
HCR-8.1832.2220**	22	300	39,2	9,8	20,9
HCR-8.1832.2222	22	600	78,4	19,6	41,8
HCR-8.1832.2224	22	900	117,6	29,4	62,7
HCR-8.1832.2226	22	1200	156,8	39,2	83,6
HCR-8.1832.2228	22	1500	196,0	49,0	104,5
HCR-8.1832.2820**	28	300	64,0	19,3	40,2
HCR-8.1832.2822	28	600	128,0	38,6	80,4
HCR-8.1832.2824	28	900	192,0	57,9	120,6
HCR-8.1832.2826	28	1200	256,0	77,2	160,8
HCR-8.1832.2828	28	1500	320,0	96,5	201,0

* Intermediate length dimensions and extra-long bars are available on request.
** Connection thread on one end



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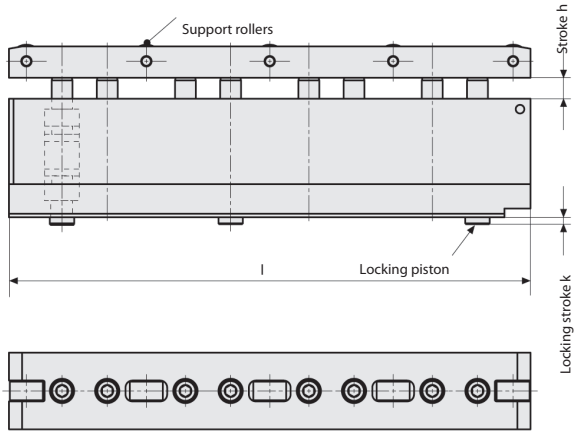
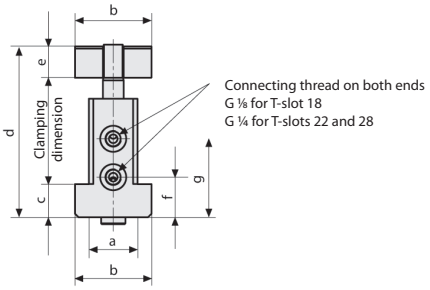
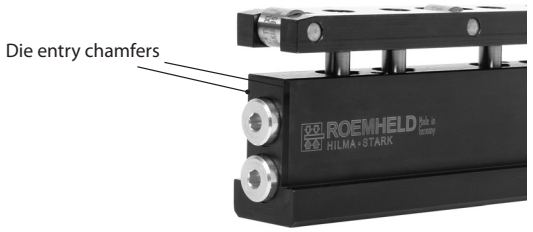
Double-T clamping bar double-acting lifting and clamping





The double-T clamping bars are composed of individual segments. When clamping or unclamping, make sure that there is an overlap of >90% of the length of the segment.

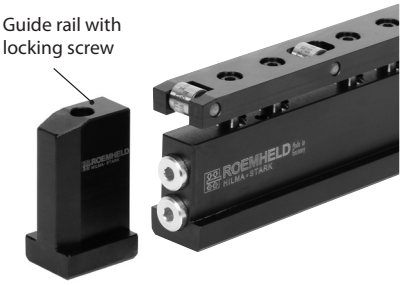
Length of the segment: T-slot 18 ≙ 150 mm
T-slot 22 ≙ 300 mm
T-slot 28 ≙ 300 mm



If the dies have a slight lateral offset when loading into the machine, the double-T clamping bars are protected by die entry chamfers at the connection end.

Slot a (mm)	18	22	28
b (mm)	28	35	44
c (mm)	11,5	15 ,0	19,0
d min (mm)	56	71	90
d max (mm)	64	81	102
e (mm)	12	16	19
f (mm)	13,5	18,0	23,0
g (mm)	30,5	41,0	46,0
Clamping dimension (mm)	33,5 + 6	41,0 + 8	53,0 + 10
Stroke h* (mm)	8	10	12
Locking stroke k** (mm)	2,5	3,0	4,0
Max. operating pressure (bar)	400	400	400

* Reduced stroke is available on request



If the lateral offset of the dies is more significant (up to 1.5 mm), or if the dies are not loaded into the machine at the connection end of the double-T clamping bars, it is recommended that separate guide rails are used. They are fastened in the T-slot using clamping bolts. Special guide bar designs are available on request (e.g. with hydraulic ports for the connection end).

Part no.	T-slot (a) (mm)	Length (l) (mm)*	Load-bearing (kN) at 400 bar	Clamping force (kN) at 400 bar	Number of support rollers	Oil consumption (cm^3) clamping	Oil consumption (cm^3) unclamp.
HCR-8.1832.1830**	18	150	9	16,6	3	3,3	6,4
HCR-8.1832.1832	18	300	18	33,2	6	6,6	12,9
HCR-8.1832.1834	18	450	27	49,8	9	9,9	19,4
HCR-8.1832.1836	18	600	36	66,4	12	13,3	25,8
HCR-8.1832.1838	18	750	45	83,0	15	16,6	32,3
HCR-8.1832.2230**	22	300	32	39,2	5	9,8	20,9
HCR-8.1832.2232	22	600	64	78,4	10	19,6	41,8
HCR-8.1832.2234	22	900	96	117,6	15	29,4	62,7
HCR-8.1832.2236	22	1200	128	156,8	20	39,2	83,6
HCR-8.1832.2238	22	1500	160	196,0	25	49,0	104,5
HCR-8.1832.2830**	28	300	37,5	64,0	5	19,3	40,2
HCR-8.1832.2832	28	600	75,0	128,0	10	38,6	80,4
HCR-8.1832.2834	28	900	112,5	192,0	15	57,9	120,6
HCR-8.1832.2836	28	1200	150,0	256,0	20	77,2	160,8
HCR-8.1832.2838	28	1500	187,5	320,0	25	96,5	201,0

* Intermediate length dimensions and extra-long bars are available on request.
** Connection thread on one end

Guide rail for slot T 18
HCR-7.1832.0015

Guide rail for slot T 22
HCR-7.1832.0016

Guide rail for slot T 28
HCR-7.1832.0017

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Swivel and pull clamp double-acting

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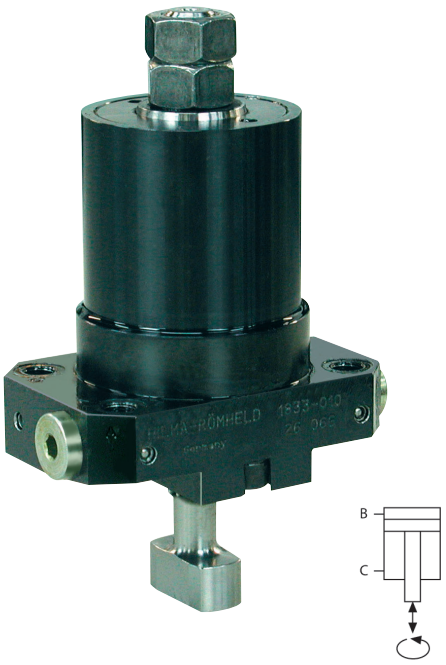


Applications:

- for presses and high-speed punching presses
- when the available space is limited

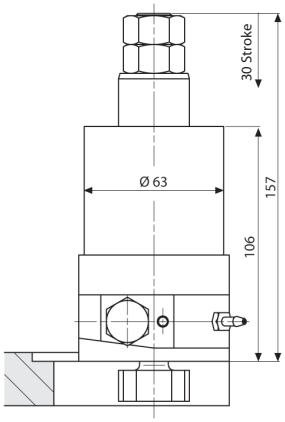
Design:

Swivel and pull clamping element double-acting with 90° swivelling angle. The clamping element consists of a hollow piston cylinder and a swivel cylinder.
The clamping bolt held in the hollow piston cylinder is provided with teeth which engage in the toothed rack of the swivel cylinder. The clamping position is pneumatically monitored. Optionally, monitoring is also possible by inductive proximity switches.

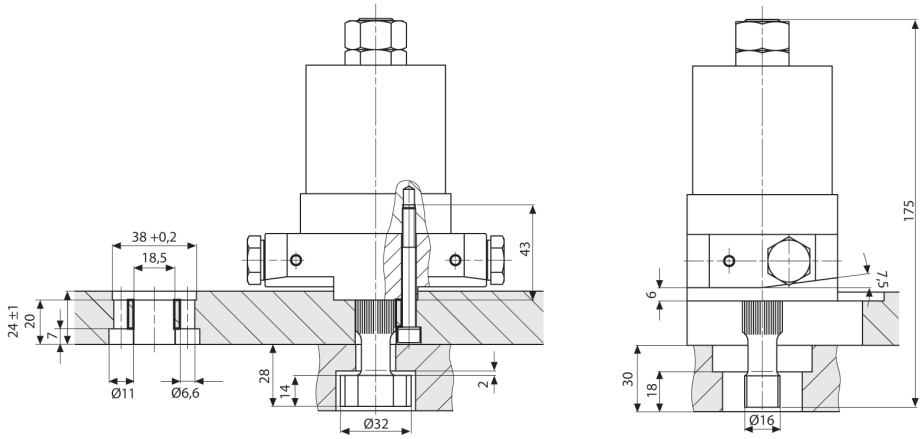
Special features:

- very suitable for retrofit
- ideal power transmission
- compact design
- optimum utilization of bed and slide surface as there are no parts protruding when inserting the die
- die clamping even in barely accessible positions

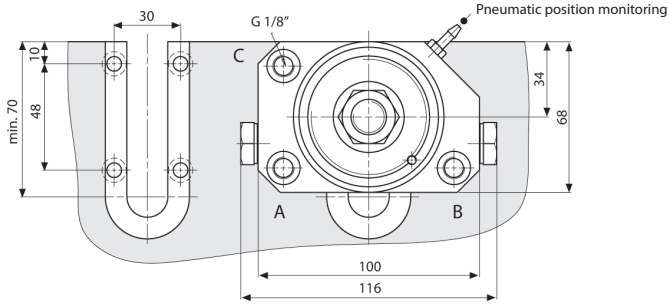
Tie rod retracted
Swivelling angle 0°

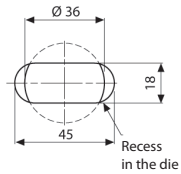


Tie rod extended by 30 mm
Swivelling angle 90°



Connections:
A: Swivelling
B: Extending
C: Retracting / clamping





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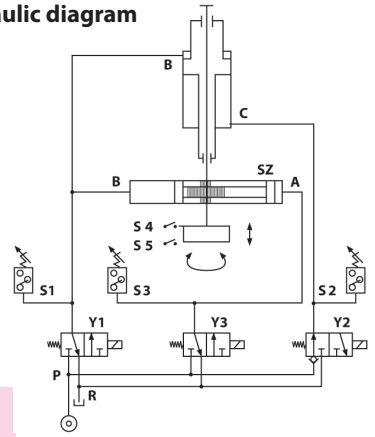
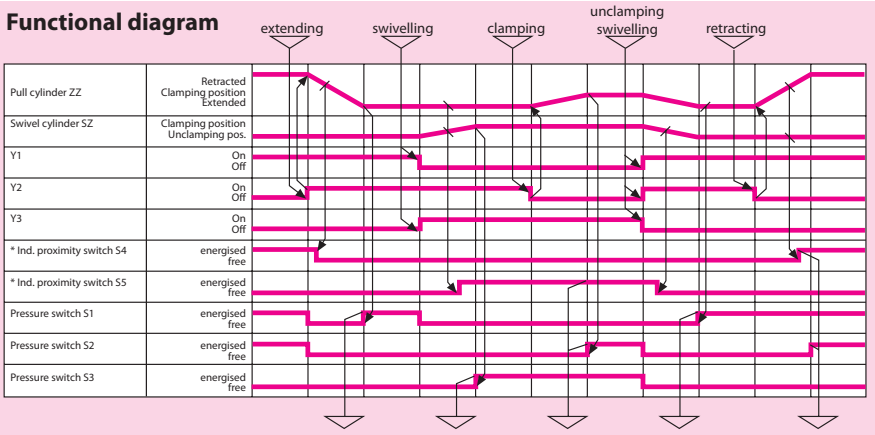
Swivel and pull clamp double-acting

Clamping force 400 bar (kN)	**30,4**
Max. operating pressure (bar)	400
Stroke (mm)	30
Max. volume flow (cm^3/s)	15
Oil consumption retraction (cm^3)	24
Oil consumption extension (cm^3)	15
Weight (kg)	3,2
with pneumatic position monitoring for the clamping position Part no.	**HCR-1833-010**
with inductive position monitoring Part no.	**HCR-1833-013**

Hydraulic diagram



Functional diagram



Control
The valve control is shown in the hydraulic diagram. The valves have different initial positions, in order to avoid pressure drop during clamping in case of power failure. This is ensured by the check valve in the P-port of Y2.

Important!
The P-port of valve Y1 must not be provided with a check valve, as during retraction pressure is applied to the piston from both sides (differential system).
Otherwise, due to the different piston areas, the pressure may be intensified and thus exceed the permissible operating pressure.

Starting up
It is very important to completely bleed all lines.
Proceed as follows: adjust a low pressure on the power unit (20 - 50 bar). Start with the most distant swivel and pull clamping element, unscrew the lock nut and keep the power unit operating until the emerging oil is free from bubbles. Repeat this procedure at each port.
After bleeding, retighten all screws. Adjust the defined operating pressure (see hydraulic diagram) on the power unit (see operating manual). Prior to clamping a die, the functional sequence should be checked in accordance with the functional diagram.
Position monitoring, however, can only be checked with the die clamped.

Functional sequence according to operational diagram:
1. Retracted position.
   Y1 is energized, Y2 and Y3 are de-energized, pressure is applied to cylinder ports B and C.

2. Extending
   When Y3 is energized, the pressure applied to C drops, the swivel and pull clamping element extends.

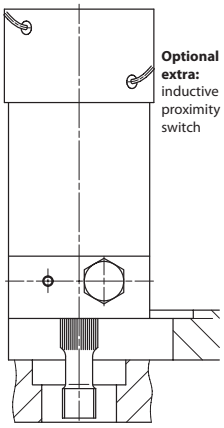
3. Swivelling
   Y1 is de-energized, Y3 is energized, pressure is applied to A only, the clamping bolt swivels by 90°.

4. Clamping
   Y2 is de-energized, pressure is applied to A and C, the element retracts with the clamping bolt swivelled, de-energize Y3

5. Extending, unclamping, swivelling
   Y1 and Y2 are energized, Y3 is de-energized, pressure is applied to B only, the clamping bolt extends and swivels back by 90°

6. Retracting
   Y2 is de-energized. pressure is applied to B and C. Due to the larger piston area of C, the element retracts.

Replacement of the clamping bolt
If it is necessary to remove the clamping bolt, it is very important that re-installation of the replacement part is made in the same toothing position. The counternuts have a tightening torque of 210 Nm. Make sure that there is still sufficient axial play for an easy turning of the clamping bolt (0.1 - 0.3 mm).



*** Position monitoring (on request)**
By means of the position monitoring system pneumatic or inductive control of both the clamping and unclamping position is possible.
Pneumatic position monitoring is made by a nozzle which is closed in the corresponding position.
The position signal is generated by a pneumatic flow switch.
Data sheets of the inductive proximity switches will be made available on request.

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Clamping bar with press-in piston single-acting, with spring return

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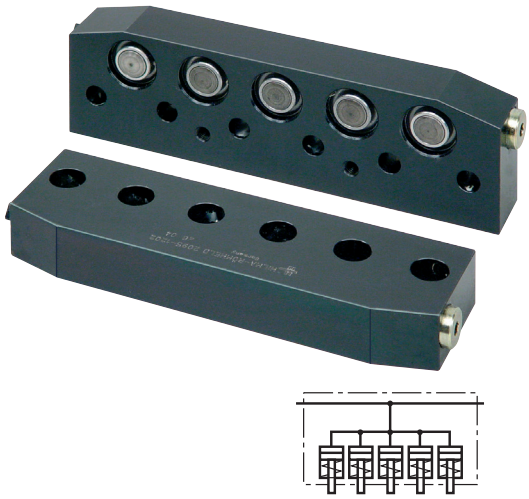


Applications:

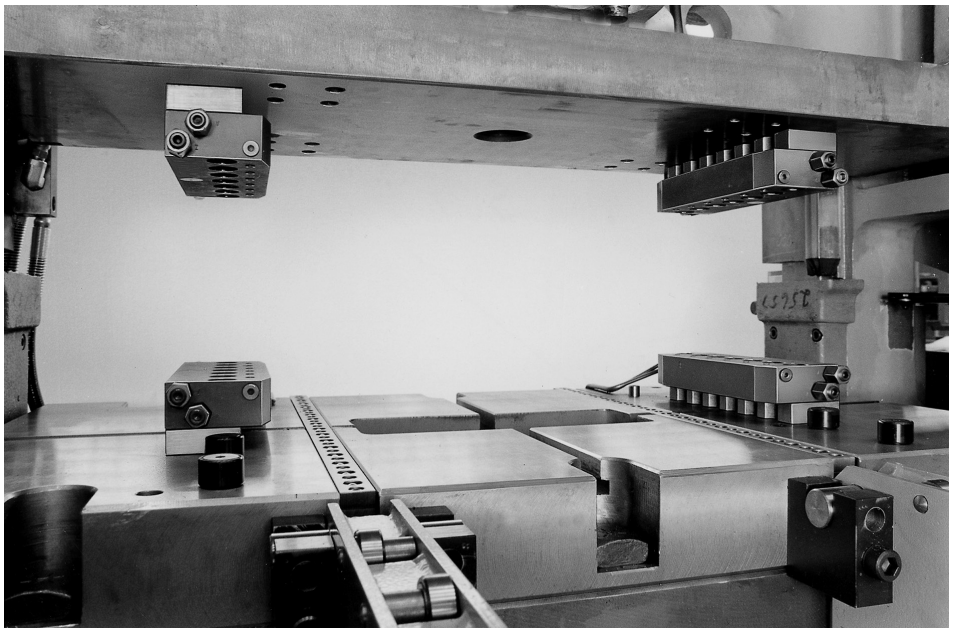
- stationary installed on press beds and rams
- on machines and equipment for clamping and locking
- clamping force up to 35 kN, piston stroke 6 mm

Function:

The clamping bar is mounted on the press bed or ram using a spacer ledge. Clamping is carried out on the die clamping edge by applying hydraulic pressure to the 5 pistons which are arranged side by side with a pressure medium and mechanical unclamping by a spring return. Hydraulic oil is supplied through G¼ ports provided on both sides. Flat design with die inlet chamfers. Clamping force up to 35 kN uniformly distributed over 5 pistons.
When using several clamping bars in a row, the elements are interconnected by means of hoses or pipes.

Special features:

- *piston stroke 6 mm*
- very flat and compact design
- the full length of the stroke may be used
- easy fastening
- rapid and easy retrofit

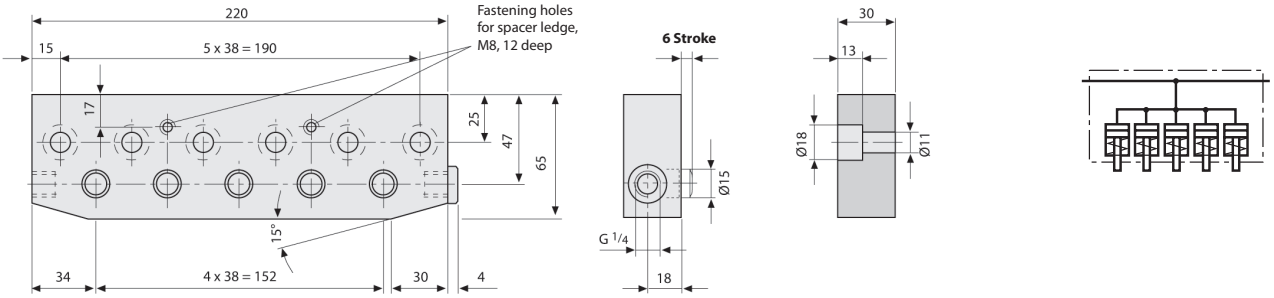


Clamping bars installed in press bed and ram.
Easy loading of dies using die change consoles and lateral guide rollers.

Carr Lane Roemheld Mfg Co.
927 Horan Drive, Fenton, MO 63026
Phone 800-827-2526 Fax 636-386-8034 www.roemheld-usa.com

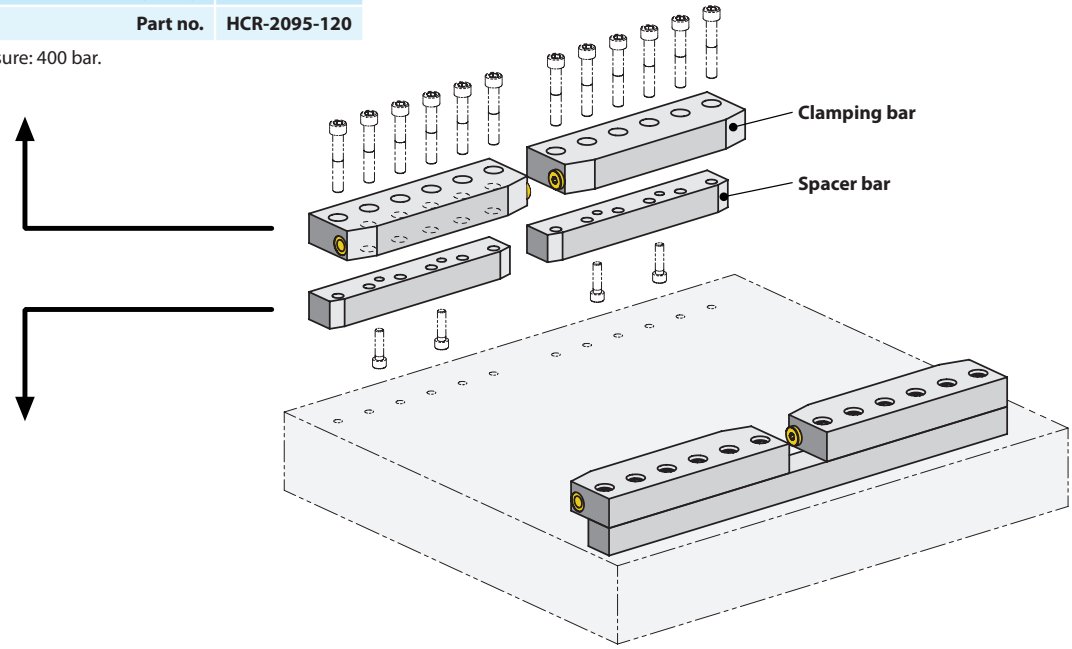
Clamping bar with press-in piston single-acting with spring return

Clamping bar



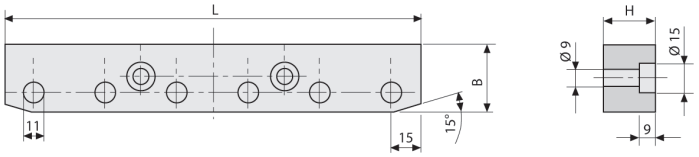
Clamping force at 400 bar (kN)	**35,0**
100 bar (kN)	**8,7**
Stroke (mm)	6,0
Oil consumption (cm³)	5,3
Number of pistons	5,0
Piston Ø (mm)	15,0
Weight (kg)	3,2
Part no.	**HCR-2095-120**

max. operating pressure: 400 bar.



Spacer bar

for obtaining the required clamping edge height



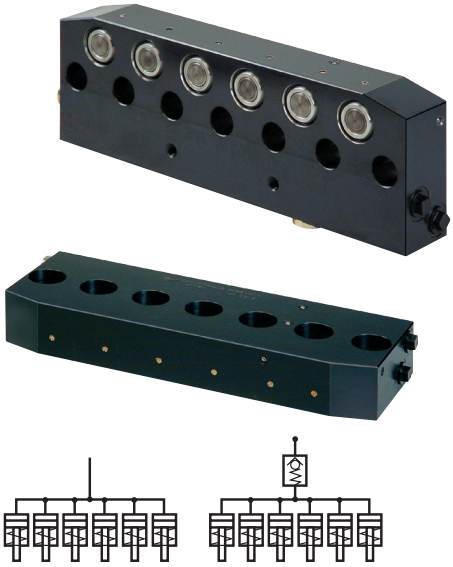
Length L (mm)	220
Width B (mm)	35
Height H (inch)	X.XXX
for clamping edge (mm)	H-.118±.06
Part no.	**HCR-HM-2095-5-XXXX**

Other clamping edge heights H are available on request.

Carr Lane Roemheld Mfg Co.
927 Horan Drive, Fenton, MO 63026
Phone 800-827-2526 Fax 636-386-8034 www.roemheld-usa.com

Clamping bar with built-in piston single-acting with spring return

ROEMHELD
HILMA ▪ STARK



Applications:

- stationary installed on press beds and rams
- on machines and equipment for clamping and locking
- clamping force up to 116 kN, piston stroke 8 mm

Function:

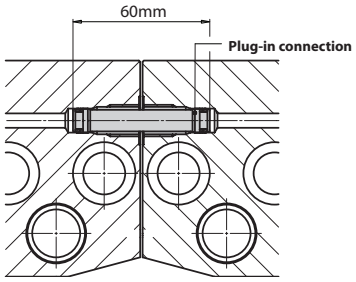
The clamping bar is mounted on the press bed or ram using a spacer ledge. Clamping on the die clamping edge by applying hydraulic pressure to the 2, 3 or 6 pistons which are arranged side by side, mechanical unclamping by a spring return. Hydraulic oil is supplied through G ¼ ports provided on both sides. Flat design with die inlet chamfers.

When using several clamping bars in a row, the elements are interconnected by means of hoses or pipes (see picture).

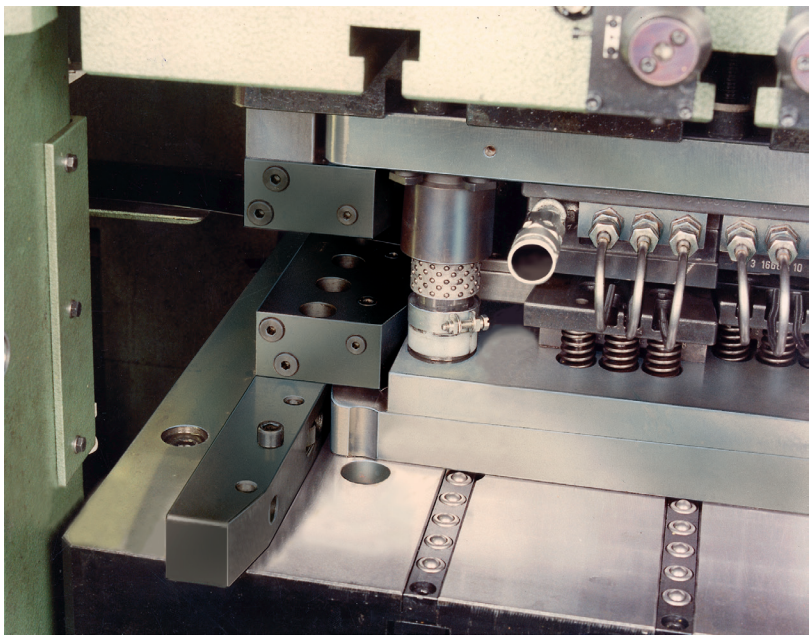
Special features:

- *piston stroke 8 mm*
- design with or without check valve
- flat and compact design
- stroke limitation fully utilizable
- easy fastening
- suitable for retrofit

Plug-in connection
for clamping bars arranged in series
Part no. HCR-8.0530.0040



*Other dimensions / spacings on request



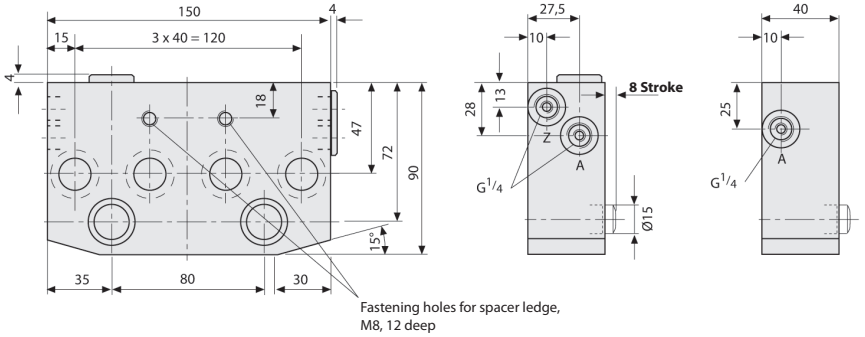
Retrofit of a double-column press.
Easy loading of dies using chamfered spacer ledges and ball bars.

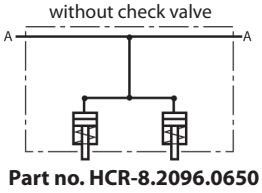
Carr Lane Roemheld Mfg Co.
927 Horan Drive, Fenton, MO 63026
Phone 800-827-2526 Fax 636-386-8034 www.roemheld-usa.com

Clamping bar with built-in piston single-acting with spring return

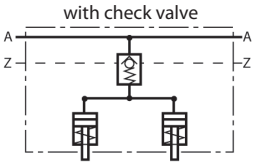
Clamping force 38.6 kN with 400 bar, weight 3.9 kg

Oil consumption clamping, stroke 4 mm: 3.9 cm³





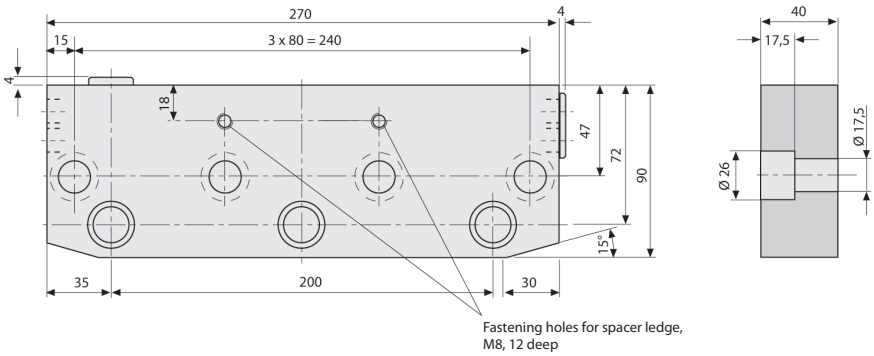
Part no. HCR-8.2096.0650

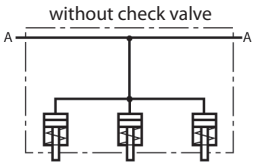


Part no. HCR-8.2096.0750

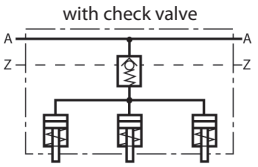
Clamping force 58 kN with 400 bar, weight 6.9 kg

Oil consumption clamping, stroke 4 mm: 5.8 cm³





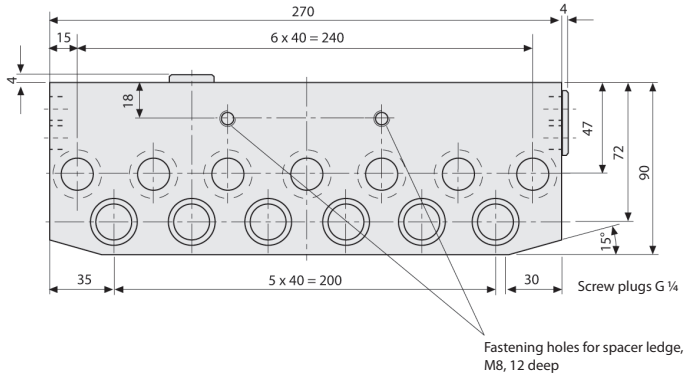
Part no. HCR-8.2096.0450

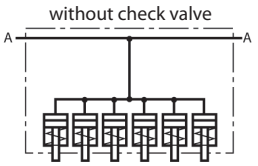


Part no. HCR-8.2096.0550

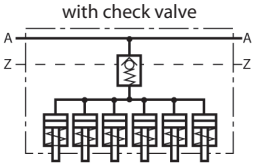
Clamping force 116 kN with 400 bar, weight 7.2 kg

Oil consumption clamping, stroke 4 mm: 11.6 cm³





Part no. HCR-8.2096.0850

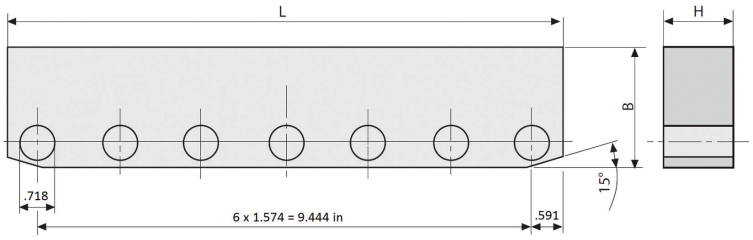


Part no. HCR-8.2096.1050

Spacer bar

for obtaining the required clamping edge height

* all dimensions in inch



Part no.	for clamps	L (in)	B (in)	H (in)	for clamping edge
HCR-HM-2096-2-XXXX	0650/0750	5.905	2.283	X.XXX	H-.157 ±.06
HCR-HM-2096-3-XXXX	0450/0550	10.630	2.283	X.XXX	H-.157 ±.06
HCR-HM-2096-6-XXXX	0850/1050	10.630	2.283	X.XXX	H-.157 ±.06

Special design spacers are available on request.

Carr Lane Roemheld Mfg Co.
927 Horan Drive, Fenton, MO 63026
Phone 800-827-2526 Fax 636-386-8034 www.roemheld-usa.com

Clamping Bars double acting with built-in pistons clamping force up to 116 kN, piston stroke 8 mm

ROEMHELD
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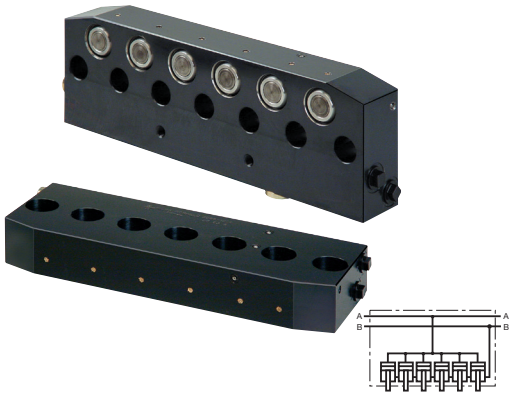
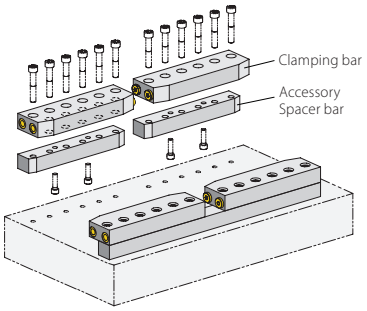


Advantages:

- piston stroke 8 mm
- arrangement in series of several clamping bars with plug-in connectors
- flat and compact design
- fully resilient stroke limitation
- easy installation
- easy to retrofit

Application:

The clamping bars are used permanently installed on press beds and rams, on machines and plants for clamping and locking.



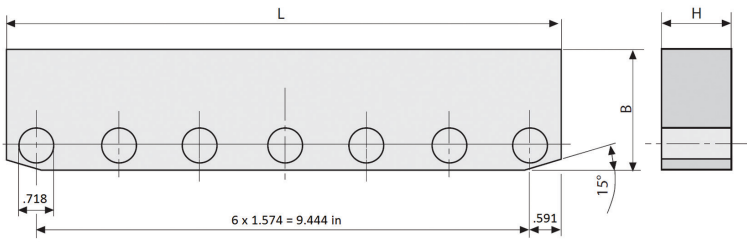
Description:

The clamping bar is directly screwed on the press bed or ram using a spacer bar. Clamping is carried out on the die clamping edge by applying hydraulic pressure to the port of the 2, 3 or 6 pistons which are arranged side by side with a pressure medium. Unclamping is made by pressurizing the port B. Hydraulic oil is supplied through G 1/4 ports provided on both sides. Flat design with die inlet chamfer.

Accessories:

Spacer bar

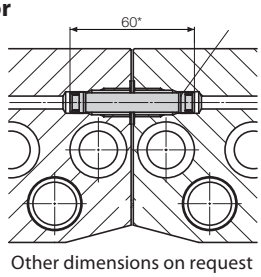
for obtaining the required clamping edge height
* all dimensions in inch



Part no.	for clamps	L (in)	B (in)	H (in)	for clamping edge
HCR-HM-2096-2-XXXX	0650/0750	5.905	2.283	X.XXX	H-.157 ±.06
HCR-HM-2096-3-XXXX	0450/0550	10.630	2.283	X.XXX	H-.157 ±.06
HCR-HM-2096-6-XXXX	0850/1050	10.630	2.283	X.XXX	H-.157 ±.06

Special design spacers are available on request.

Plug-in connector

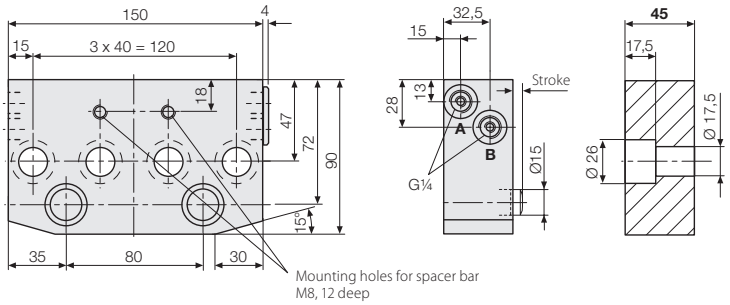


Other dimensions on request

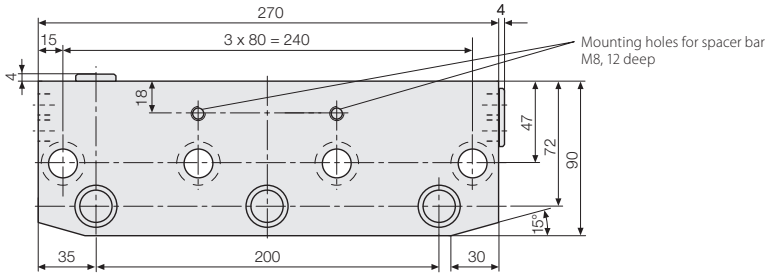
Carr Lane Roemheld Mfg Co.
927 Horan Drive, Fenton, MO 63026
Phone 800-827-2526 Fax 636-386-8034 www.roemheld-usa.com

Clamping bars double acting with built-in pistons clamping force up to 116 kN, piston stroke 8 mm

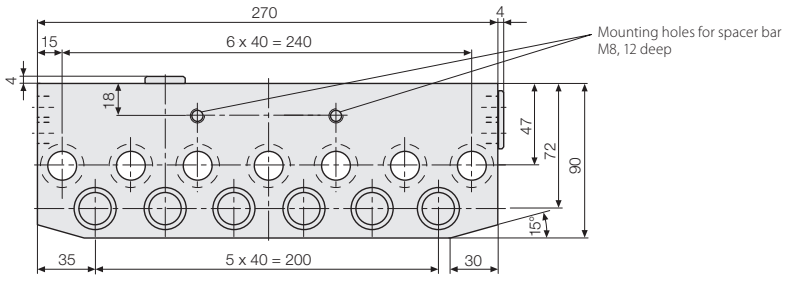
Clamping bars with 2 built-in pistons



Clamping bars with 3 built-in pistons



Clamping bars with 6 built-in pistons



All dimensions in mm

Technical data

Clamping force at max. operating pressure	[kN]	38.6	58	116
Max. operating pressure	[bar]	400	400	400
Clamping force at 100 bar	[kN]	9.65	14.5	29
No. of pistons		2	3	6
Piston/piston rod Ø	[mm]	25/15	25/15	25/15
Stroke	[mm]	8	8	8
Oil volume clamping	[cm^3]	7.8	11.6	23.2
Weight	[kg]	4.1	7.4	8.9
Part no.		**HCR-8.2097.0650**	**HCR-8.2097.0450**	**HCR-8.2097.0850**

Carr Lane Roemheld Mfg Co.
927 Horan Drive, Fenton, MO 63026
Phone 800-827-2526 Fax 636-386-8034 www.roemheld-usa.com

Pivot and pull clamp
double-acting, max. 400 bar

Applications:

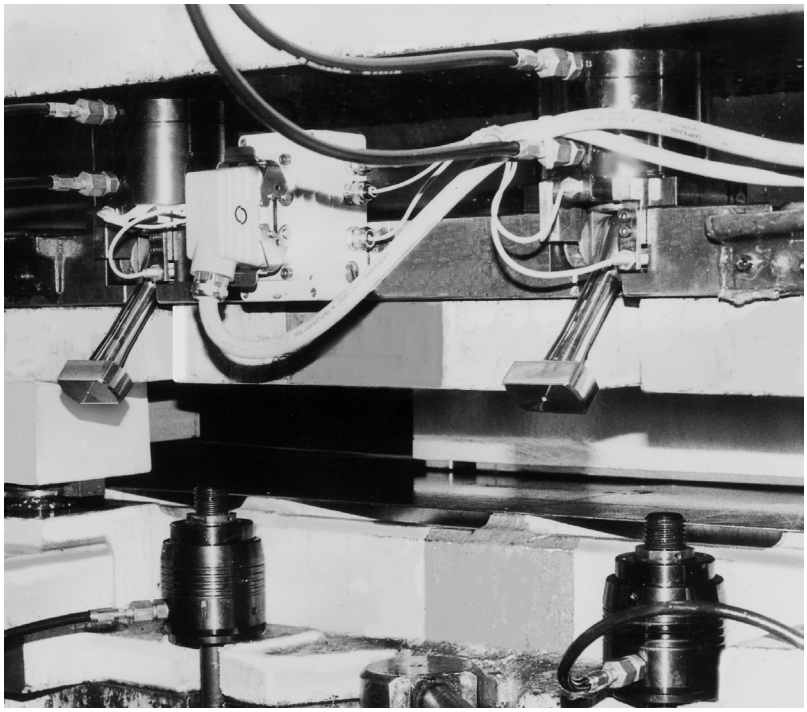
- for automatic clamping of dies on press rams

Function:

A control mechanism translates the stroke of the double-acting piston into a tilting and lifting movement of the tie rod. For releasing the die, the tie rod pivots by 15°.
The clamping force is transmitted to the clamping point in the axial direction of the tie rod. The clamping and unclamping positions are monitored by inductive proximity switches.
Max. temperature: 85°C.
Higher temperatures upon request.

Special features:

- 10 mm clamping stroke, therefore high adaptability to varying heights of clamping edges
- high functional reliability ensured by position monitoring and an automatic cycle
- the tie rod can be pivoted, therefore no collision edges when inserting the die
- optimum utilization of the ram surface
- easy and rapid installation
- very suitable for retrofitting



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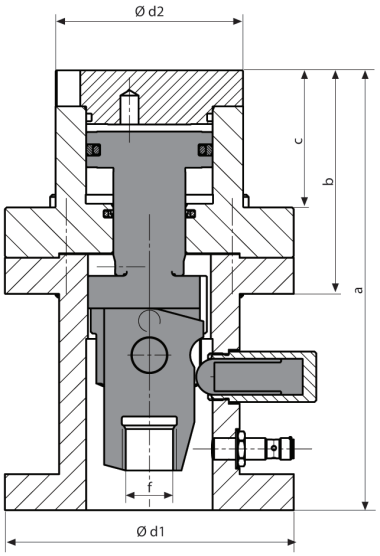
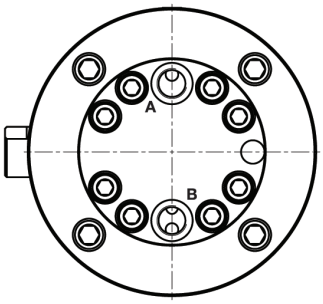
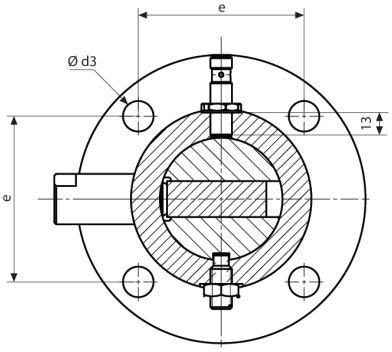
Pivot and pull clamp
double-acting, max. 400 bar







Suitable for temperatures of up to 85°C
(higher temperatures upon request)

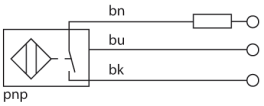
Max. flow rate: 16 cm³

Clamping force at 400 bar (kN) (other clamping forces on request)	**104**	**160**
Clamping stroke max. (mm)	7	7
Clamping range (mm)	15 – 22	15 – 22
Total stroke (mm)	24	26
Swing stroke (mm)	10	10
Oil consumption clamping (cm³)	52	108
Oil consumption unclamping (cm³)	77	158
a (mm)	244	348
b (mm)	124	147
c (mm)	76	87
d1 Ø (mm)	160	192
d2 Ø (mm)	104	126
d3 Ø (mm)	17	21
e (mm)	92	114
f (mm)	M30	M36
Part no.	**HCR-8.2185.1000**	**HCR-8.2186.1000**

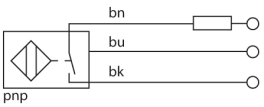
Position monitoring

Nominal tripping cycle S_N	2 mm
Ambient temperature T_A	-40° .... +85°C
Operating voltage U_B	10 - 30 V DC
Max. constant current	200 mA
Switching function	N/O contact (PNP)

Initial settings



S1 unclamping position (N/O contact)



S2 clamping position (N/O contact)

Recommended accessories:

10 m connecting cable for inductive proximity switches:
Part no. HCR-5700-014

5 m connecting cable angled at 90°:
Part no. HCR-2.0975.0024

Carr Lane Roemheld Mfg Co.
927 Horan Drive, Fenton, MO 63026
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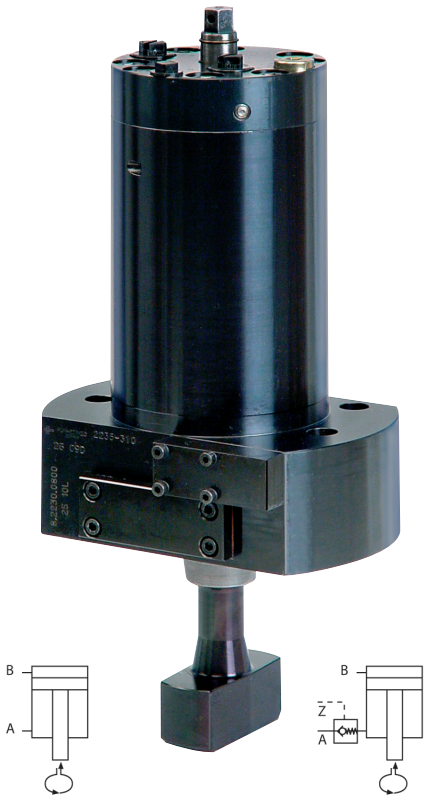
Swing sink clamp
double-acting for external clamping



For power units
please see product group 7

For accessories
please see product group 11

Applications:

- for direct fastening to a press bed and a press slide
- when the available space is limited

Design:

Double-acting swing sink clamp with 90° swing cycle. The piston is guided by a guide pin in such a way that during the stroke a 45° rotation is carried out.
For clamping, the tie rod is rotated by 90° from the unclamping position and pulled against the clamping surface through the existing clamping slots.
The unclamping, change-over and clamping positions are monitored by inductive proximity switches. The swing mechanism is protected by a spring-loaded overload safety device and equipped with manual emergency operation.

Advantages:

- very suitable for retrofit
- ideal power transmission
- compact design
- high functional reliability ensured by position monitoring, manual emergency operation and overload safety device
- suitable for large clamping edge tolerances (± 1.5 mm)
- optimum utilization of bed and slide surfaces so there are no parts protruding when inserting the die
- die clamping even in barely accessible positions
- tie rod available up to a length of 2000 mm

Carr Lane Roemheld Mfg Co.
927 Horan Drive, Fenton, MO 63026
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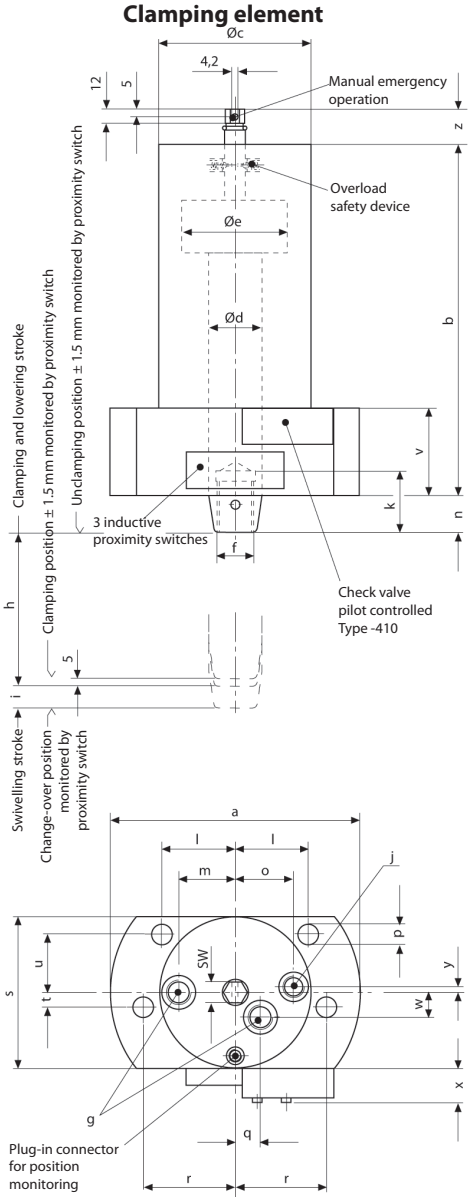
Swing sink clamp
double-acting for external clamping

Clamping force at 400 bar (kN)	104	216
100 bar (kN)	26	54
Piston-Ø e (mm)	70	100
Rod-Ø d (mm)	40	56
Max. clamping edge height (mm)	68	68
Swivelling stroke (i) (mm)	15	23
Clamping and lowering stroke (h) (mm)	105	112
Oil consumption clamping (cm^3)	514	1211
Oil consumption unclamping (cm^3)	388	948
Max. volume flow (cm^3 s)	50	120
a (mm)	170	212
b (mm)	240	270
c (mm)	104	146
f (mm)	M27x1,5	M36x2
g*	G ⅜	G ½
j	G ¼	G ¼
k (mm)	42	55
l (mm)	50	71
m (mm)	38	57
n (mm)	25	34
o (mm)	39,8	62
p (mm)	14	18
q (mm)	17,3	27,6
r (mm)	62,5	84
s (mm)	104	146
t (mm)	10	23
u (mm)	40	50
v (mm)	60	65
w (mm)	16,7	27,6
x (mm)	22,6	22,6
y (mm)	4,2	0
z (mm)	24	31
SW (mm)	14	22
Weight (kg)	16,5	35
without check valve Part no.	**HCR-2235-310**	**HCR-2237-310**
with check valve pilot controlled Part no.	**HCR-2235-410**	**HCR-2237-410**

max. operating pressure 400 bar.
*Adaptor fittings or SAE ports available on request.
Other sizes and special versions are available on request.

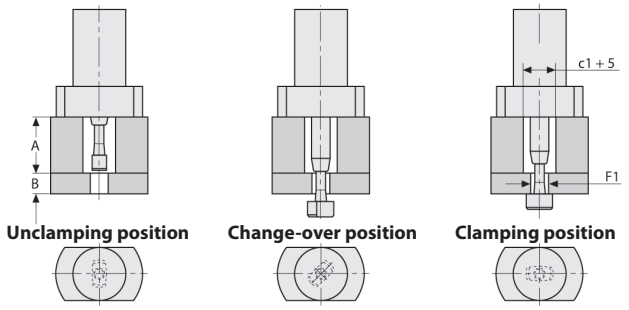
Clamping element



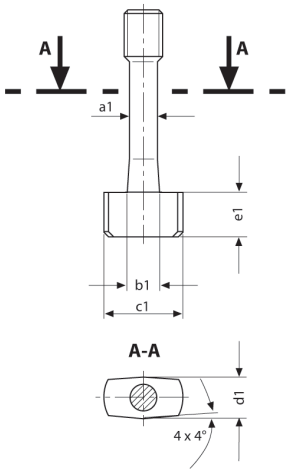
Tie rod dimensions

Swing sink clamp	HCR-2235-XXX				HCR-2237-XXX		
F1 clamping slot in the die (mm)	32	40	45	50	45	50	60
a1 (mm)	22	22	22	22	32	32	32
b1 (mm)	28	28	28	28	40	40	40
c1 (mm)	54	62	67	72	77	82	92
d1 (mm)	28	28	28	28	40	40	40
e1 (mm)	30	30	30	30	37	37	37

When ordering, please specify the dimensions A (ram plate), B (die clamping edge thickness) and F1 (clamping slot)



Tie rod



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Swing sink clamp
double-acting for external clamping

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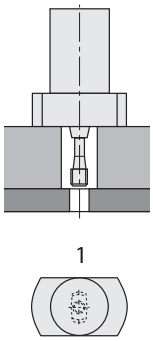
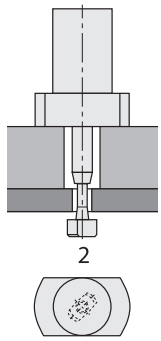
Functional description

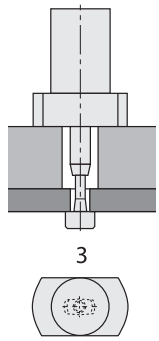
The piston of the double-acting swing sink clamp is guided by a guide pin in such a way that during part of the stroke a 45° rotation is carried out just before reaching or after leaving the upper piston end position. Rotation is always to the left regardless of whether the piston is retracting or extending.



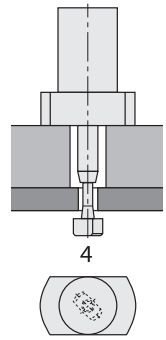
1. Unclamping position
The piston has completely retracted. Easy die change, as there are no parts protruding above bed or slide level.



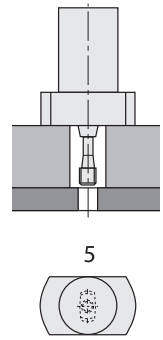
2. Change-over position for clamping
Pressure is applied to piston side B. The tie rod has passed through the slot of the clamping point and has then rotated by 45°.



3. Clamping position
Pressure is applied to rod side A. The tie rod has rotated by another 45° and is now in a transverse position in relation to the clamping point. *The die is clamped.* Proximity switch 2S3 monitors this position.

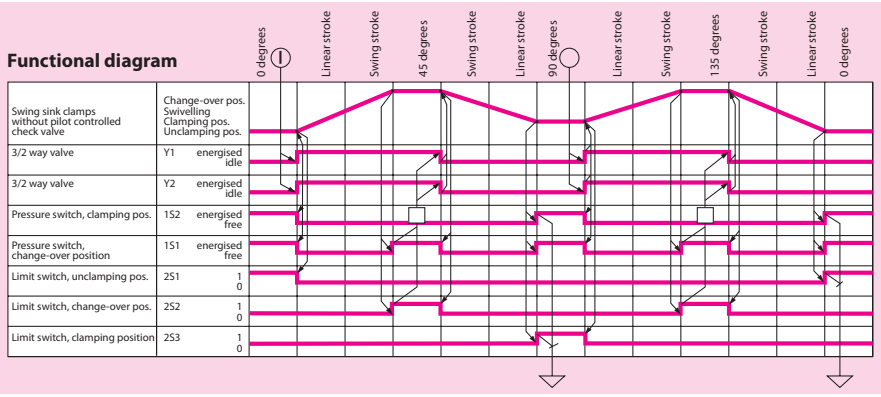


4. Change-over position for unclamping
Pressure is applied to piston side B. The tie rod has extended and has rotated by another 45°. Proximity switch 2S2 monitors this position.



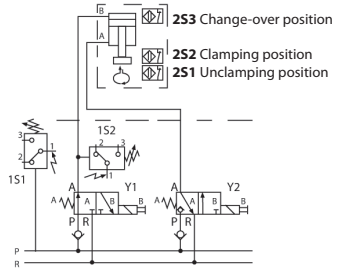
5. Unclamping position
Pressure is applied to rod side A. After having carried out another 45° rotation, the tie rod has again passed through the slot of the clamping point and then to the end position. Proximity switch 2S1 monitors this position.
The die is unclamped.

Functional diagram

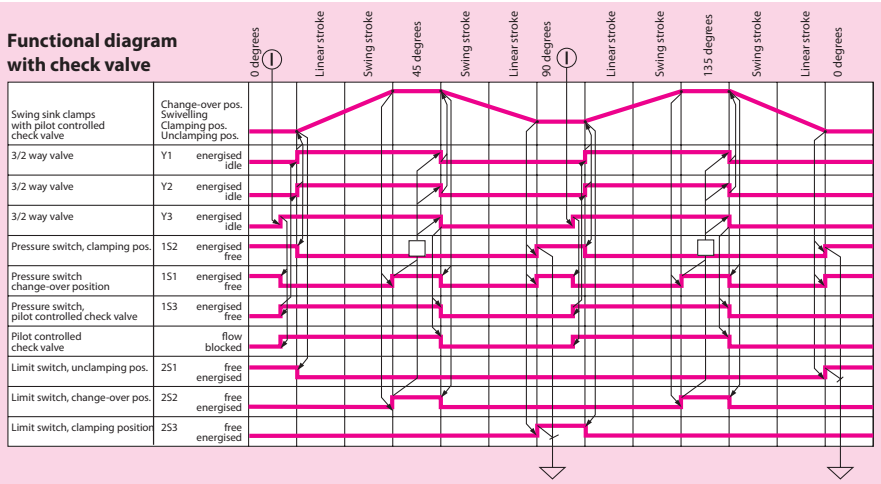


Swing sink clamps without pilot controlled check valve	Change-over pos. Swivelling Clamping pos. Unclamping pos.		
3/2 way valve	Y1	energised idle	
3/2 way valve	Y2	energised idle	
Pressure switch, clamping pos.	1S2	energised free	
Pressure switch, change-over position	1S1	energised free	
Limit switch, unclamping pos.	2S1	1 0	
Limit switch, change-over pos.	2S2	1 0	
Limit switch, clamping position	2S3	1 0	

Hydraulic diagram without check valve

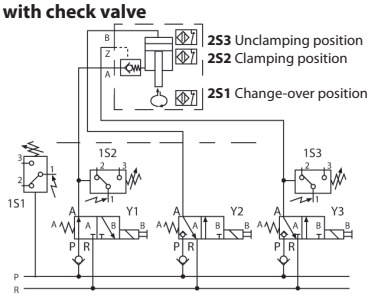


Functional diagram with check valve



Swing sink clamps with pilot controlled check valve	Change-over pos. Swivelling Clamping pos. Unclamping pos.		
3/2 way valve	Y1	energised idle	
3/2 way valve	Y2	energised idle	
3/2 way valve	Y3	energised idle	
Pressure switch, clamping pos.	1S2	energised free	
Pressure switch change-over position	1S1	energised free	
Pressure switch, pilot controlled check valve	1S3	energised free	
Pilot controlled check valve		flow blocked	
Limit switch, unclamping pos.	2S1	free energised	
Limit switch, change-over pos.	2S2	free energised	
Limit switch, clamping position	2S3	free energised	

Hydraulic diagram with check valve



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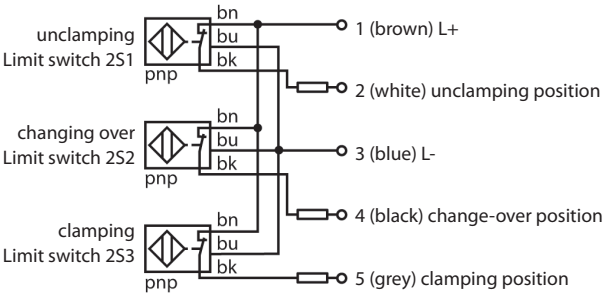
Swing sink clamp
double-acting for external clamping

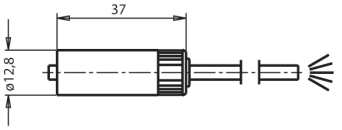
Electrical installation

Pin assignment for three-wire proximity switches

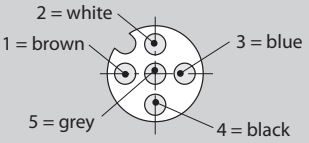


Supply voltage: 10-30 V DC
Constant current: ≤ 100 mA
Type: inductive, NC pnp

5-pole connecting lead with screw coupling



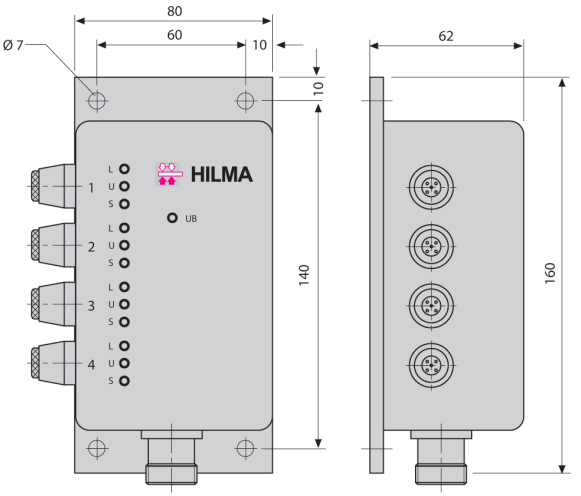
Cable length 5 m	**Part no.**	**HCR-5700-013**
Cable length 10 m	**Part no.**	**HCR-5700-014**



Distribution block with LED display

for connecting 4 clamping elements

Easy installation.
LED display of the unclamping, change-over and clamping position of each clamping element.
Scope of delivery: 1 distribution block
4 coupler plugs, 5 poles
1 coupler plug, 16 poles



Part no.	**HCR-5700-015**

Wiring of output plug:

Pin 1 = L+
Pin 2 = L
Pin 3 = 1L
Pin 4 = 1U
Pin 5 = 1S
Pin 6 = 2L
Pin 7 = 2U
Pin 8 = 2S
Pin 9 = 3L
Pin 10 = 3U
Pin 11 = 3S
Pin 12 = 4L
Pin 13 = 4U
Pin 14 = 4S
Pin 15 = free
Pin 16 = free

L = Unclamping position
U = Change-over position
S = Clamping position

Hydraulic installation

Read the operating instructions before commissioning the system.
Adjust the displacement of the power unit so that clamping and unclamping cycles between 10 and 30 seconds are obtained. In order to prevent the swing mechanism from premature wear, the dynamic pressure at port B should not exceed 50 bar while the tie rods retract through the slot.
Swing sink clamps which are grouped together should be connected to distribution blocks, in order to avoid series connection. Use pipes with larger diameter for connection to the power unit.

If in doubt, please send the installation plan to be reviewed.
Provide a pressure gauge connection in every hydraulic circuit for adjustment and to check operational data.
Other parameters and recommendations for hydraulic installation of die clamping systems, are given in chapter no. 1 “General information”.

Please note:
The full stroke of the piston must be realized, otherwise the swing mechanism may be damaged.

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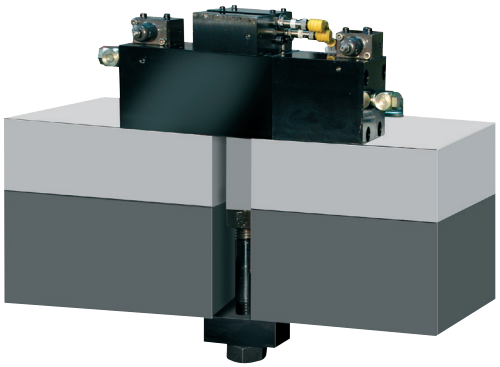
Wedge swing clamp
double-acting, with mechanical lock



Tie rod
(to be ordered separately)

Applications:

- on press beds and rams
- when the available space is limited

Function:

A wedge converts the stroke of the double-acting piston into a stroke of the tie rod. In order to release the die, the tie rod pivots by a maximum of 15°. The swing movement of the tie rod is performed by a separate swivel cylinder which is actuated by sequence valves. The clamping force is transmitted to the clamping point in the axial direction of the tie rod. The clamping and unclamping positions are monitored by inductive proximity switches. The mechanically locked wedge prevents unintentional unclamping of the die even if there is a loss of pressure.

Special features:

- clamping stroke up to 9.5 mm, therefore high adaptability to different clamping edge heights
- high functional reliability ensured by
  - mechanical lock
  - position monitoring
  - automatic cycle
- only 2 hydraulic ports
- very suitable for retrofit to press bed and slide

Position monitoring

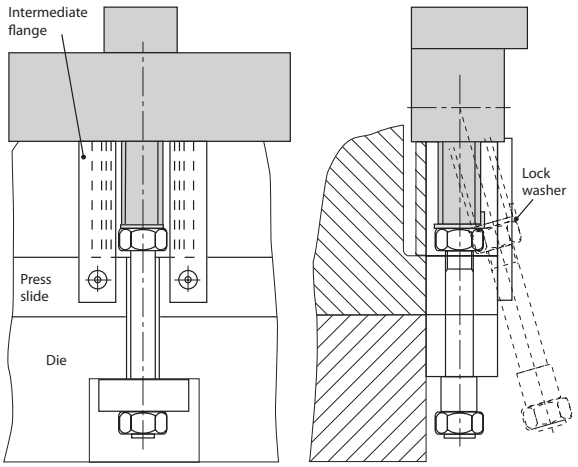
The wedge swing clamp is supplied with proximity switches for monitoring the clamping and unclamping position. The switch for the clamping position only reacts if the tie rod is in a vertical position and within the clamping range. If the clamping element performs the full clamping stroke, the proximity switch is released, and the signal disappears. The proximity switches are installed on the side of the swivel cylinder (see drawing). In case of part no. HCR-4607-000, the proximity switches are installed on the front side of the housing.

Proximity switches PNP

Supply voltage: 12 - 24V DC
Nom. tripping cycle 2 mm
Load: 200 mA
Proximity switch and LED display
Plug with 5 m connecting cable 3 x 0.34

Retrofit

Retrofitting to existing presses can be achieved using an intermediate flange.



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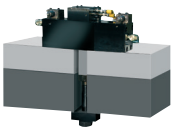
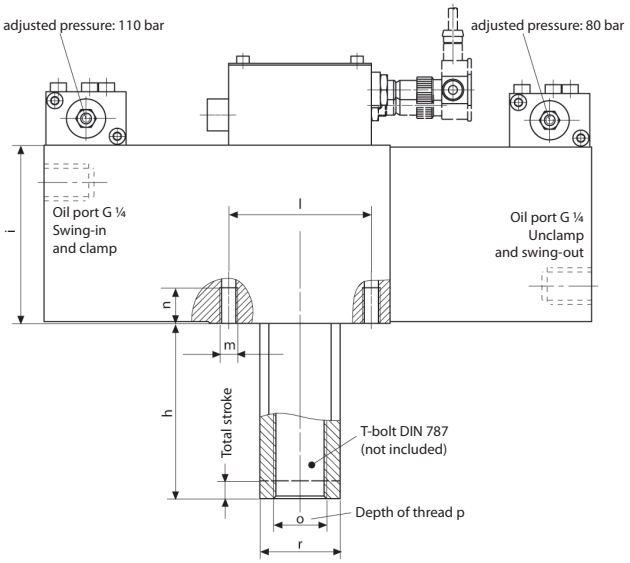
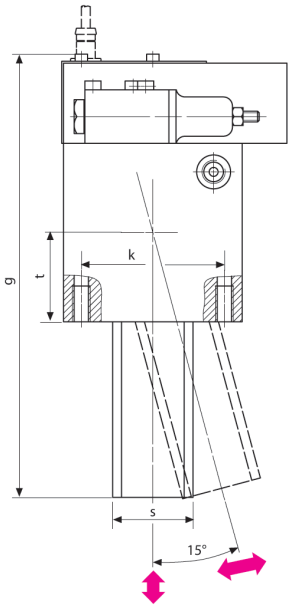
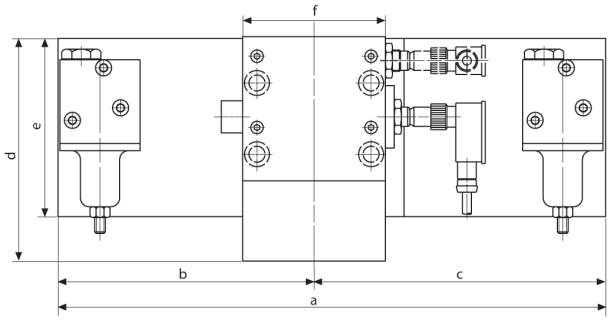


Wedge swing clamp
double-acting, with mechanical lock







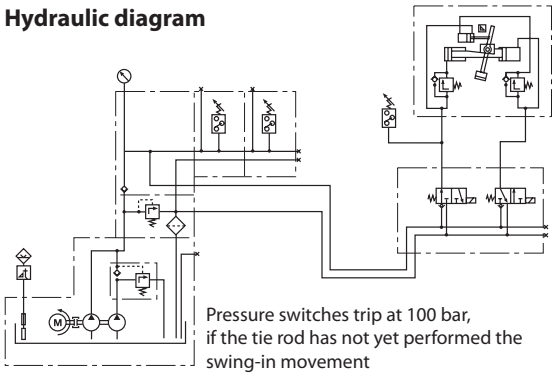
Max. clamping force max. (kN)	50	100
Total stroke (mm)	8	10
Usable clamping stroke (mm)	7,5	9,5
Perm. volume flow (cm³/s)	70	70
Min. operating pressure (bar)	150	150
Max. operating pressure (bar)	240	280
Oil consumption clamping (cm³)	80	101
Oil consumption unclamping (cm³)	82,5	152
a (mm)	254	307
b (mm)	120	143,5
c (mm)	134	163,5
d (mm)	120,5	125
e (mm)	80	100
f (mm)	70	80
g (mm)	186	248,5
h (mm)	63	98,5
i (mm)	80	100
k (mm)	60	80
l (mm)	60	80
m (mm)	M 10	M 10
n (mm)	15	20
o (mm)	M 20	M 30
p (mm)	28	45
r (mm)	36	45
s (mm)	40	45
t (mm)	40	50
Part no.	**HCR-4607-000**	**HCR-4607-001**

Control port for tie rod operation

As an option, the wedge swing clamp is available with an additional pipe connection for separate control of the swing-in movement of the swivel cylinder. In this case, the integral sequence valve (see drawing, left side) is replaced by a hydraulic oil port. Thus, each element must be connected by three pipes. Combined with a suitable control, this system enables clamping only after all tie rods of the clamping elements have performed the swing-in movement.

If 4 or more clamping elements are used, two clamping circuits can be arranged diagonally as an additional safety measure.

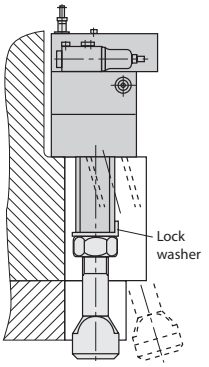
Hydraulic diagram



Pressure switches trip at 100 bar, if the tie rod has not yet performed the swing-in movement

Safety information

The tie rod is secured with a lock nut.
In order to prevent it from loosening, a lock washer should be added.



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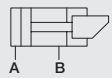
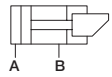
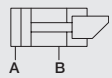
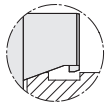
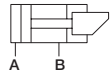
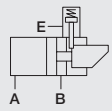
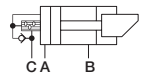
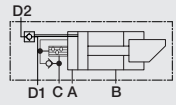
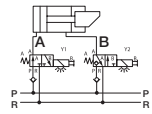
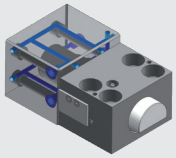
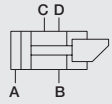
Wedge clamps for tapered clamping edge
double acting, max. clamping force 25 to 630 kN

	without position monitoring with position monitoring at the side	max. 160 °C max. 100 °C			WZ 2.2401
	with adjustable position monitoring at the back	max. 120 °C			WZ 2.2402
	with safety step without position monitoring with position monitoring	max. 160 °C max. 100 °C			WZ 2.2403
	with form-fit safety step and position monitoring	max. 100 °C			WZ 2.2404
	with locking bolt without position monitoring with position monitoring	max. 160 °C max. 100 °C			WZ 2.2405
	with sequence valve control without safety step with safety step	max. 160 °C			WZ 2.2407
	with double sequence valve control without safety step with safety step	max. 160 °C			WZ 2.2407
	with single valve control without safety step with safety step	max. 100 °C			WZ 2.2409
	with cooling circuit without safety step	max. 250 °C			WZ 2.2410

Higher temperatures on request

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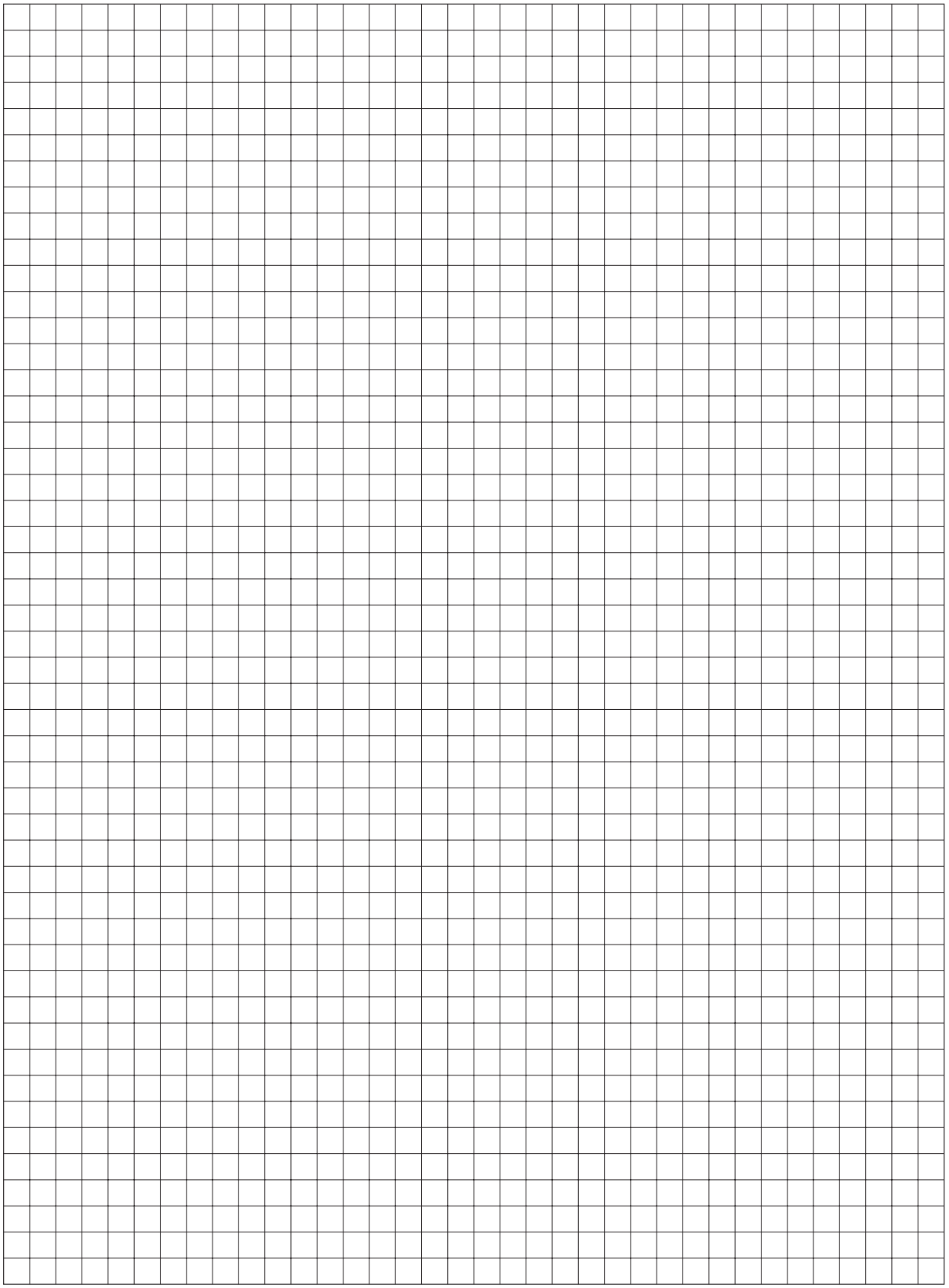

Wedge clamps for tapered clamping edge double acting, max. clamping force 25 to 630 kN, without and with position monitoring at the side

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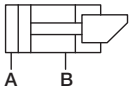


Application

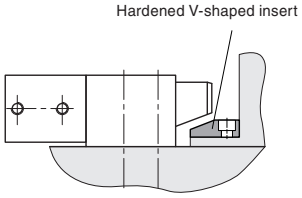
Double-acting wedge clamp for clamping molds or dies on a press bed or ram or in injection moulding machines, machines and installations.

Description

The wedge clamp consists of a hydraulic block cylinder and a piston guided in a housing. The clamping bolt is provided with 20° bevel to clamp on the tapered clamping surface of the mould/die.
Based on the internal design of the wedge clamp and the 20° bevel of the clamping bolt, the system is providing internal friction.

Retrofitting to wedge clamping

Wedge clamping of existing moulds/dies is possible by retrofitting V-shaped inserts as shown below. Max. hardness 50 HRc



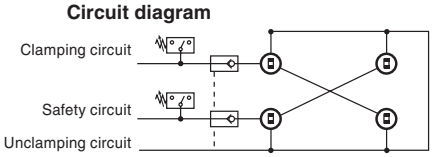
Advantages

- safe clamping of molds/dies with tapered clamping edge
- high operational safety by position monitoring and automatic motion sequence
- very sturdy design
- long service life
- sizes up to 1250 kN are available on request

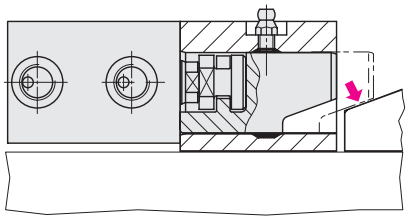
Important notes

In case of incorrect operation of the wedge clamps, the clamping bolt may fully retract into the guide housing and thus cause the upper mould/die falling off the ram.
The greasing intervals (high temperature grease) should be adapted to the existing operating conditions. Please note that greasing of the wedge bolt should only be made with the elements being retracted.
The clamping elements must be protected against dirt, scale, swarf, coolant, etc. by means of a suitable covering.
Molds or dies clamped by means of wedge clamps are subject to side loads that may be strong enough to displace them. Thus, positioning is required to absorb the side loads. Therefore, location pins or suitable limit stops should be provided to keep the molds and dies in their correct position.
When using wedge clamps on the press ram, it is recommended that multiple-circuit hydraulic supply of the clamping elements and pilot-controlled check valves are used for securing hydraulic clamping.

Circuit diagram



For safety reasons and in the sense of the machine tool guide lines ML 2006/42/ EC the hydraulic pressure must be maintained.
When upper molds/dies are clamped by wedge clamps, they must be secured mechanically when maintenance work is carried out.



Versions

- without position monitoring max. temperature: 160 °C (300 °C on request)
- with position monitoring at the side max. temperature: 100 °C

Position monitoring

The integrated position monitoring is coupled to the clamping bolt in a very space-saving way at the side and signals:

1. Clamping bolt in unclamping position
2. Clamping bolt in clamping position
3. Error message when overrunning the clamping position

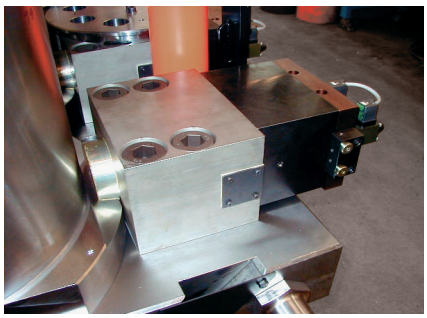
Clamping force

This is the force the clamping element applies to the mold or die. The mold or die is clamped on the fixture plate by means of this force.
The external forces acting on mold or die (e.g. ejecting force or die cushion force) shall not exceed the totality of the elements' clamping force.

Maximum admissible operating force

This is the force that can be absorbed by the clamping element and the fastener (screws).
It must be ensured that in cases of emergency, e.g. workpiece jammed in mold or die, the sum total of the elements' operating forces is not exceeded.

Application example



Wedge clamps on a forging press

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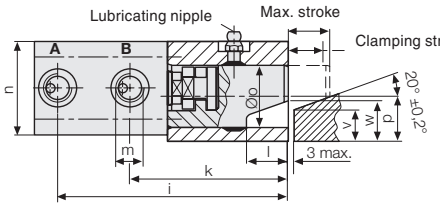
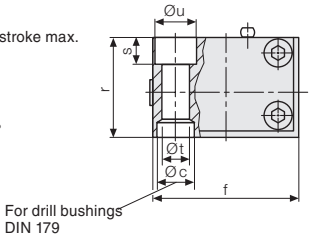
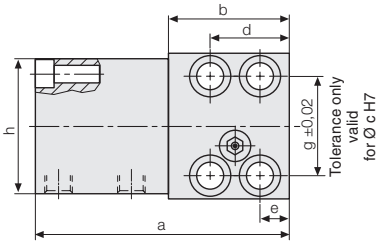
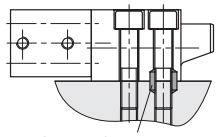


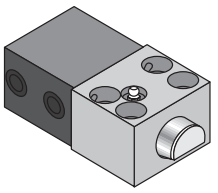






Accessories:
Drill bushings

Installation of drill bushings to absorb side loads
The occurring side loads must be absorbed by drill bushings to be inserted into the fixture plate.



Technical data
Temperature resistance up to 160 °C

Clamping force max.	**[kN]**	**25***	**50**	**100**	**160**	**250**	**400**	**630**
Max. admissible operating force	[kN]							
Screw DIN 912 8.8		35	65	130	210	320	520	820
Max. operating pressure	[bar]	350	275	350	350	350	350	350
Cylinder Ø	[mm]	25	40	50	63	80	100	125
Max. stroke	[mm]	20	25	25	30	32	40	40
Clamping stroke (from/to)	[mm]	15 – 18	18 – 22	19 – 22	23 – 27	24 – 29	30 – 36	30 – 36
Max. oil consumption	[mm]	10	31	49	94	161	314	491
a	[mm]	122	157	190	227	267	310	375
b	[mm]	58	78	100	125	150	180	225
Ø c H7 x depth	[mm]	18/7	26/9	30/11	35/11	48/13	55/16	62/16
d	[mm]	38	46	58	75	78	95	108
e	[mm]	14	16	20	25	26	32	38
f	[mm]	70	95	120	150	200	240	280
g	[mm]	48	65	85	106	140	180	210
h	[mm]	65	85	100	125	160	200	230
i	[mm]	111	146	177	210	246	285	344
k	[mm]	76	102	127	151	184	215	272
l	[mm]	20	25	26	32	40	45	50
m		G 1/4	G 1/4	G 1/4	G 1/2	G 1/2	G 1/2	G 1/2
n	[mm]	45	63	75	95	120	150	180
Ø o	[mm]	30	40	55	70	80	100	125
p	[mm]	21.5	28	37	49	55	75	85
r	[mm]	48	65	80	105	125	160	190
s	[mm]	13	18	20	26	32	38	44
Ø t	[mm]	13	17	21	26	33	39	45
Ø u	[mm]	20	26	32	40	48	57	66
v	[mm]	15	18	25	30	30	50	60
w	[mm]	19.5	23.5	30.5	37	38	60	70
Screw DIN 912-8.8 (4 off)		M 12	M 16	M 20	M 24	M 30	M 36	M 42
Tightening torque	[Nm]	86	210	410	710	1450	2520	4050
Weight	[kg]	2.4	5.8	10.6	21	40	74	125
Part no.		**HCR-4604-620**	**HCR-4604-621**	**HCR-4604-622**	**HCR-4604-623**	**HCR-4604-634**	**HCR-4604-635**	**HCR-4604-636**
Accessories								
Drill bushings DIN 179	[mm]	12 x 12	17 x 16	21 x 20	26 x 20	32 x 25	38 x 30	44 x 30
Part no.		**CLR-3300-285**	**CLR-3300-287**	**CLR-3300-288**	**CLR-3300-289**	**HCR-3300-420**	**HCR-3300-430**	**HCR-3300-440**

* lubricating nipples of the version with a clamping force of 25 kN are offset by 9.5 mm and protrude by 5 mm

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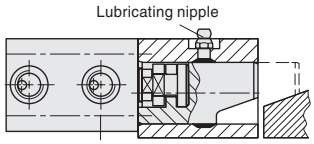
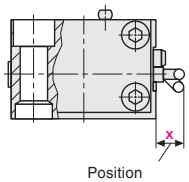
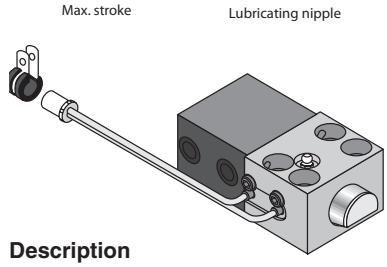
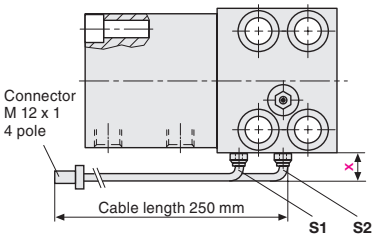
Wedge clamps
with position monitoring at the side









Description

The proximity switches are installed in the guide housing. They are activated by means of the wedge bolt. The positions of the bolt in off-position or in clamping position are displayed.

S1: Clamping bolt in unclamping position
S2: Clamping bolt in clamping position
S2 is overrun: Clamping bolt in final position (message for no mold/die available or mold/die not clamped)

Special versions with signal up to final bolt position are available on request.

Technical data

Temperature resistance up to 100 °C

Clamping force max. [kN]	25*	50	100	160	250	400	630
x Position monitoring [mm]	12	5	0	0	0	0	0
Part no.	**HCR-8.2403.0500**	**HCR-8.2404-.0500**	**HCR-8.2405.0500**	**HCR-8.2406.0500**	**HCR-8.2407.0500**	**HCR-8.2408.0500**	**HCR-8.2409.0500**

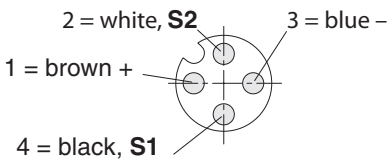
* lubricating nipples of the version with a clamping force of 25 kN are offset by 9.5 mm and protrude by 5 mm

Accessories

Connecting cable with screw coupling

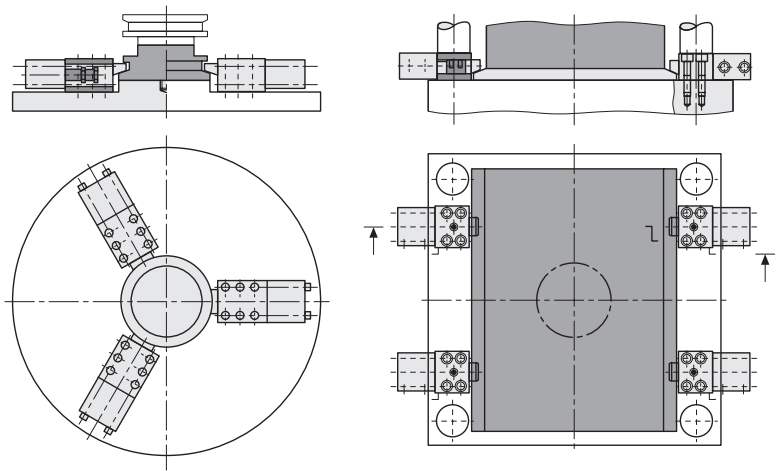
Cable length 5 m **Part no. HCR-5700-013**
Cable length 10 m **Part no. HCR-5700-014**

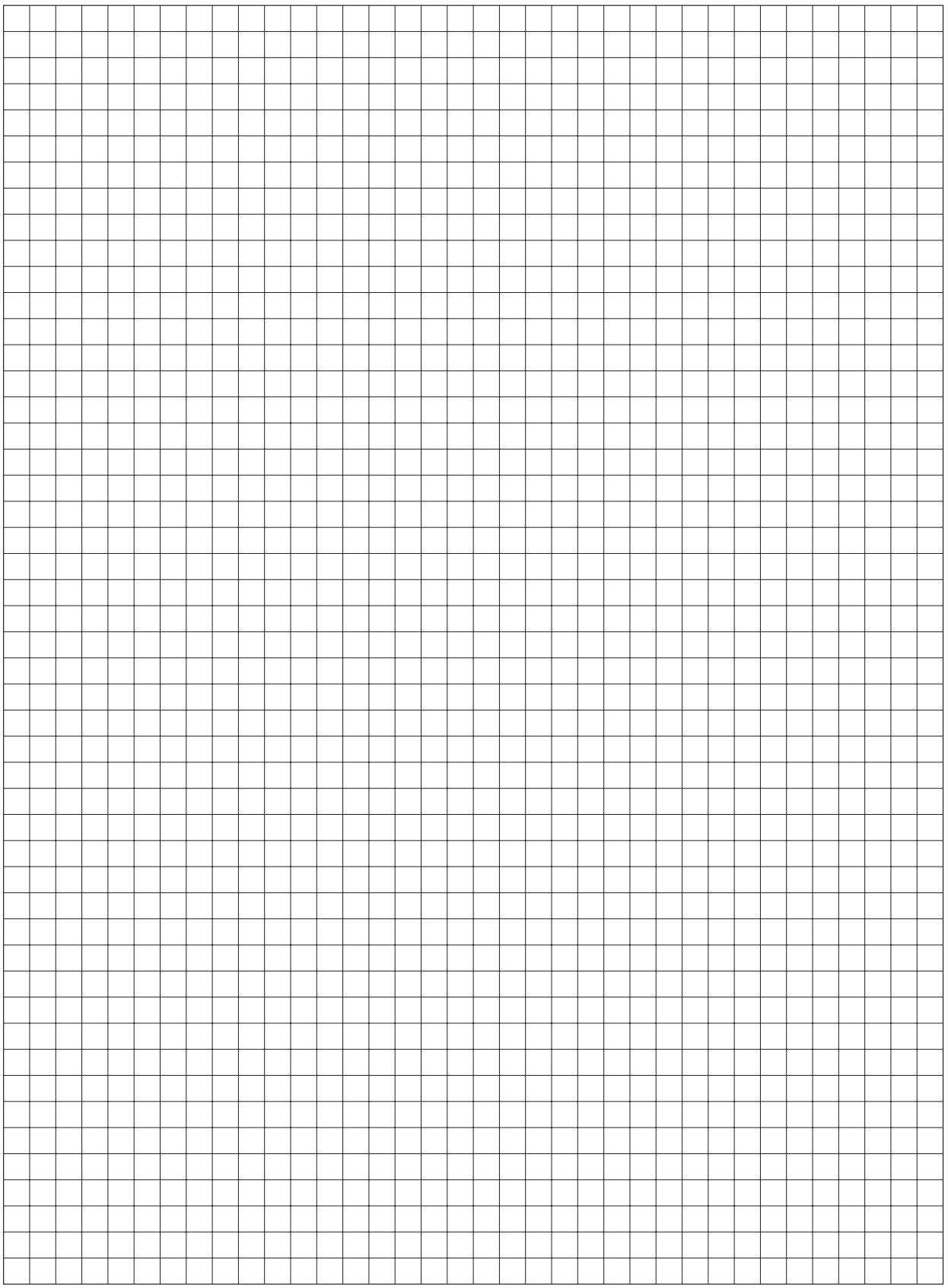
Pin assignment 4-pole



Principle of die or mold clamping

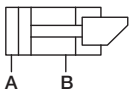
In general, molds/dies with round geometry are clamped by using three clamping elements for each half, whereas mold/dies with square geometry are clamped by using four clamping elements for each half (see figure).





Wedge clamps
double acting, max. clamping force 25-630kN, with position monitoring at the back, adjustable

ROEMHELD
HILMA ▪ STARK



Application

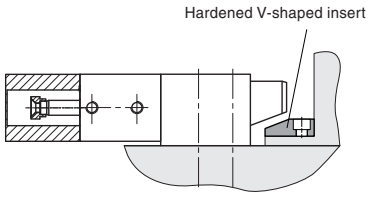
Double-acting wedge clamp for clamping molds or dies on a press bed or ram or in injection molding machines, machines and installations.

Description

The wedge clamp consists of a hydraulic block cylinder and a piston guided in a housing. The clamping bolt is provided with 20° bevel to clamp on the tapered clamping surface of the mold/die.
Based on the internal design of the wedge clamp and the 20° bevel of the clamping bolt, the system is providing internal friction.

Retrofitting to wedge clamping

Wedge clamping of existing molds/ dies is possible by retrofitting V-shaped inserts as shown below. Max. hardness 50 HRc



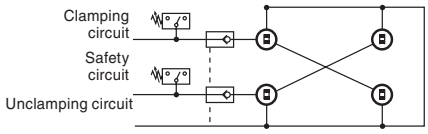
Advantages

- the clamping range can be flexibly adjusted
- safe clamping of molds/dies with tapered clamping edge
- high operational safety by adjustable position monitoring and automatic motion sequence
- very sturdy design
- high safety standard
- long service life
- sizes up to 1250 kN are available on request

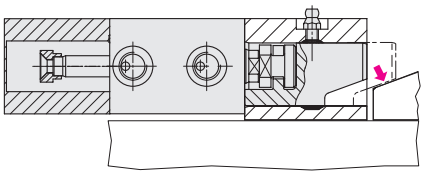
Important notes

In case of incorrect operation of the wedge clamps, the clamping bolt may fully retract into the guide housing and thus cause the upper mold/die falling off the ram.
The greasing intervals (high temperature grease) should be adapted to the existing operating conditions. Please note that greasing of the wedge bolt should only be made with the elements being retracted.
The clamping elements must be protected against dirt, scale, swarf, coolant, etc. by means of a suitable covering.
Molds or dies clamped by means of wedge clamps are subject to side loads that may be strong enough to displace them. Thus, positioning is required to absorb the side loads. Therefore, location pins or suitable limit stops should be provided to keep the molds and dies in their correct position.
When using wedge clamps on the press ram, it is recommended that multiple-circuit hydraulic supply of the clamping elements and pilot-controlled check valves are used for securing hydraulic clamping.

Circuit Diagram



For safety reasons and in the sense of the machine tool guide lines ML2006/42/ EC the hydraulic pressure must be maintained. When upper molds/ dies are clamped by wedge clamps, they must be secured mechanically when maintenance work is carried out.



Versions

- with position monitoring at the back
  max. temperature: 80 °C (type A and B)
  max. temperature: 120 °C (type C)

Position monitoring

Inductive proximity switches installed in the flange-mounted housing. The proximity switches are activated by a control cam connected to the piston.
The position monitoring will be screwed on at the cylinder bottom and can also be mounted in a position rotated by 180°.
Different versions are available according to the application conditions.
The integrated position monitoring is coupled to the clamping bolt in a very space-saving way at the back and signals:

1. **Clamping bolt in unclamping position**
2. **Clamping bolt in clamping position**
3. **Error message when overrunning the clamping position**

Clamping force

This is the force the clamping element applies to the mold or die. The mould or die is clamped on the fixture plate by means of this force.
The external forces acting on mold or die (e.g. ejecting force or die cushion force) shall not exceed the totality of the elements' clamping force.

Maximum admissible operating force

This is the force that can be absorbed by the clamping element and the fastener (screws).
It must be ensured that in cases of emergency, e.g. workpiece jammed in mold or die, the sum total of the elements' operating forces is not exceeded.

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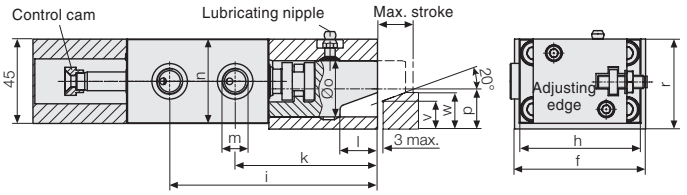
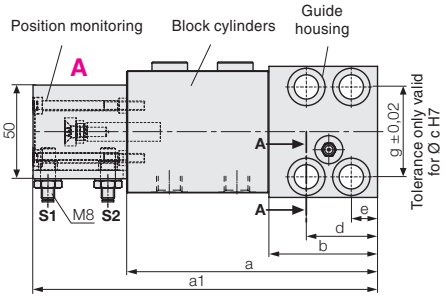
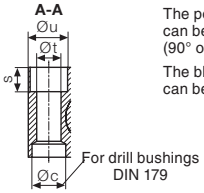
Position monitoring, with position monitoring at the back, adjustable

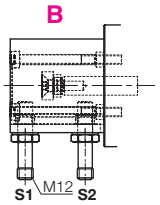


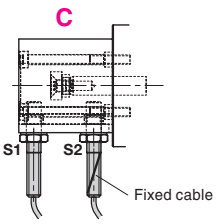




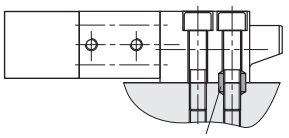
The position monitoring can be rotated by 180°. (90° on request)

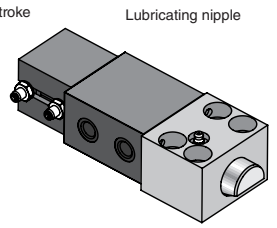
The block cylinder can be rotated by 180°.





Installation of drill bushings to absorb side loads
The occurring side loads must be absorbed by drill bushings to be inserted into the fixture plate.





The position monitoring is available in 3 variants:

Type A – compact version for connector M8

Type B – sturdy long version for connector M12

Type C – High-temperature version up to 120 °C with attached cable (L = 5 m)

Please indicate the desired type in your order, behind the part no., e.g.: HCR-4604-670-X

- **A = Type A**
- **B = Type B**
- **C = Type C**

Technical data- Temperature resistance see page 3 of this series.

Clamping force max.	**[kN]**	**25***	**50**	**100**	**160**	**250**	**400**	**630**
Max. admissible operating force Screw DIN 912 8.8	[kN]	35	65	130	210	320	520	820
Max. operating pressure	**[bar]**	**350**	**275**	**350**	**350**	**350**	**350**	**350**
Cylinder Ø	[mm]	25	40	50	63	80	100	125
Max. stroke	[mm]	20	25	25	30	32	40	40
Clamping stroke (from/to)	[mm]	15 – 18	18 – 22	19 – 22	23 – 27	24 – 29	30 – 36	30 – 36
a	[mm]	134	168	200	235	270	310	375
a1	[mm]	184	218	250	285	330	370	435
b	[mm]	58	78	100	125	150	180	225
Ø c H7 x depth	[mm]	18/7	26/9	30/11	35/11	48/13	55/16	62/16
d	[mm]	38	46	58	75	78	95	108
e	[mm]	14	16	20	25	26	32	38
f	[mm]	70	95	120	150	200	240	280
g	[mm]	48	65	85	106	140	180	210
h	[mm]	65	85	100	125	160	200	230
i	[mm]	111	146	177	210	246	285	344
k	[mm]	76	102	127	151	184	215	272
l	[mm]	20	25	26	32	40	45	50
m		(4x) G 1/4	(4x) G 1/4	(4x) G 1/4	(4x) G 1/2	(2x) G 1/2	(2x) G 1/2	(2x) G 1/2
n	[mm]	45	63	75	95	120	150	180
Ø o	[mm]	30	40	55	70	80	100	125
p	[mm]	21.5	28	37	49	55	75	85
r	[mm]	48	65	80	105	125	160	190
s	[mm]	13	18	20	26	32	38	44
Ø t	[mm]	13	17	21	26	33	39	45
Ø u	[mm]	20	26	32	40	48	57	66
v	[mm]	15	18	25	30	30	50	60
w	[mm]	19.5	23.5	30.5	37	38	60	70
Screw DIN 912-8.8 (4 off)		M 12	M 16	M 20	M 24	M 30	M 36	M 42
Tightening torque	[Nm]	86	210	410	710	1450	2520	4050
Weight	[kg]	3.0	6.5	11.4	21.7	41	74.7	126
Part no.		**HCR-4604-670**	**HCR-4604-671**	**HCR-4604-672**	**HCR-4604-673**	**HCR-4604-674**	**HCR-4604-675**	**HCR-4604-676**
Accessories								
Drill bushings DIN 179	[mm]	12 x 12	17 x 16	21 x 20	26 x 20	32 x 25	38 x 30	44 x 30
Part No.		**CLR-3300-285**	**CLR-3300-287**	**CLR-3300-288**	**CLR-3300-289**	**HCR-3300-420**	**HCR-3300-430**	**HCR-3300-440**

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Description

Inductive proximity switches installed in the flange-mounted housing. The proximity switches are activated by a control cam connected to the piston.
The position monitoring will be screwed on at the cylinder bottom and can also be mounted in a position rotated by 180°.
Different types are available according to the application conditions. A control cam is provided at the extended piston rod causing the activation of the proximity switches. Adjustment of the switching position is effected by displacement of the proximity switches in the lateral groove. The proximity switches are switched on in a stroke range of approx. 6 mm by means of the control cam. The minimum distance to the positions to be monitored depends on the switch type and is indicated in the chart.

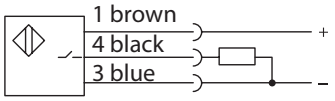
Design

Careful design is required, corresponding application conditions and safety measures have to be planned and guaranteed.

Message of proximity switches

S1: Clamping bolt in unclamping position
S2: Clamping bolt in clamping position
S2 is overrun: Clamping bolt in final position (message for no mold/die available or mould/die not clamped)

Electric circuit diagram

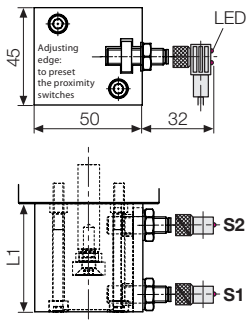


Technical data

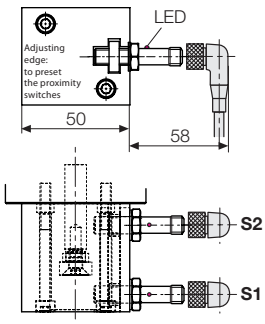
for inductive proximity switches

Operating voltage	10 … 30 V DC
Ripple	max. 15 %
Switching function	interlock
Output	PNP
Housing material	steel, corrosion resistant
Code class (DIN 40050)	IP 67

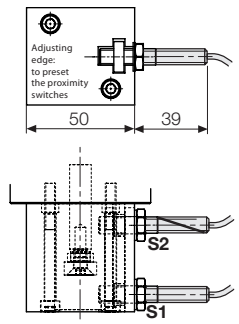
Type A
Compact version M8



Type B
Long version M12



Type C
High ambient temperature



		Type A	Type B	Type C
Environmental temperature TA		–25°… +80 °C	–25°… +80 °C	–25°… +120 °C
Min. distance of the switching positions	[mm]	8	13	8
Type of connection		Connector	Connector	Teflon cable 3 x 0.14 mm²
LED function display		in the connector	yes	no
Constant current max.	[mA]	200	200	200 – (from 70 °C) 100
Rated operating distance	[mm]	1.5	1.5	2
Protected against short circuits		yes	yes	no
Connecting cable	[m]	5	5	5
Proximity switches	**Part no.**	**HCR-6.3829.0980**	**HCR-2.5012.0064**	**HCR-6.3829.0870**
Connector with cable	**Part no.**	**CLR-3829-099**	**HCR-2.0975.0024**	**firmly connected**
L1 complete (without connector) up to type 4604-673	[mm]	50	50	50
Position monitoring up to a total stroke of 30 mm	**Part no.**	**HCR-7.6282.0010 A**	**HCR-7.6282.0010 B**	**HCR-7.6282.0010 C**
L1 complete (without connector) from type 4604-674	[mm]	60	60	60
Position monitoring up to a total stroke of 50 mm	**Part no.**	**HCR-7.6282.0011 A**	**HCR-7.6282.0011 B**	**HCR-7.6282.0011 C**

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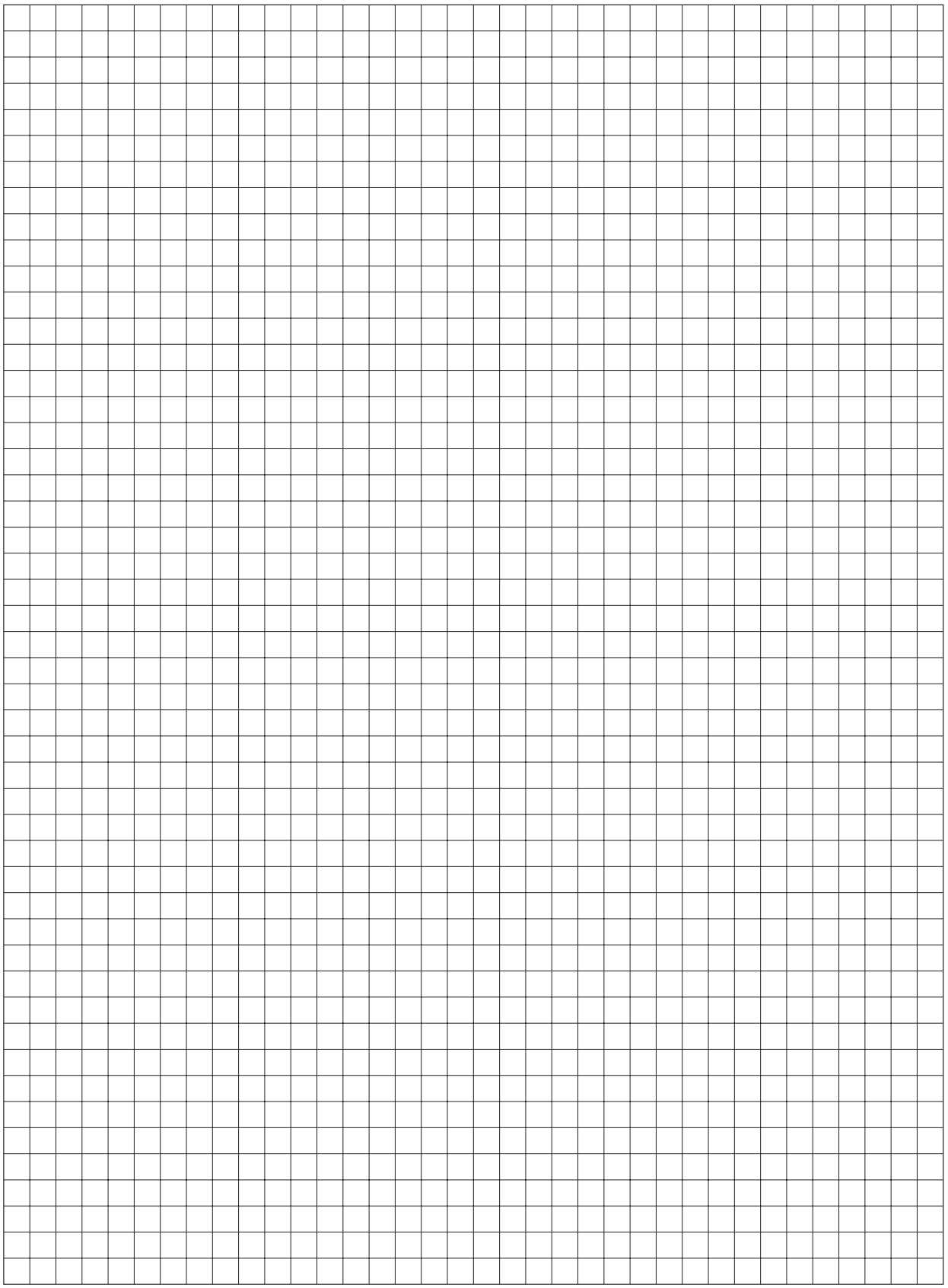

Wedge clamp for tapered clamping edge double acting, max. clamping force 25-630kN with saftey step, without and with position monitoring

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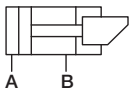
HILMA ▪ STARK



Application

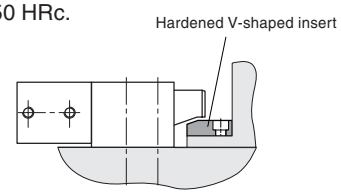
Double-acting wedge clamp with safety step at the clamping bolt for clamping molds or dies on a press bed or ram or in injection molding machines, machines and installations.

Description

The wedge clamp consists of a hydraulic block cylinder and a piston guided in a housing. The clamping bolt is provided with 20° bevel to clamp on the tapered clamping surface of the mold/die.
Based on the internal design of the wedge clamp and the 20° bevel of the clamping bolt, the system is providing internal friction.

Retrofitting to wedge clamping

Wedge clamping of existing moulds/dies is possible by retrofitting V-shaped inserts as shown below. Max. hardness 50 HRc.



A high level of safety

The clamping bolt of this version has an additional support surface parallel to the clamping edge.
In the case of pressure drop (machine failure or down time) the upper mold/die can be lowered to the safety step and safely held.

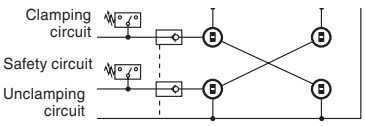
Advantages

- safety step for the support of the upper die or mold half when the pressure drops
- safe clamping of molds/dies with tapered clamping edge
- high operational safety by position monitoring and automatic motion sequence
- very sturdy design
- high safety standard
- long service life
- sizes up to 1250 kN are available on request

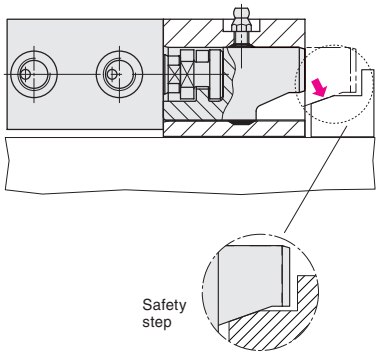
Important notes

In case of incorrect operation of the wedge clamps, the clamping bolt may fully retract into the guide housing and thus cause the upper mold/die falling off the ram.
The greasing intervals (high temperature grease) should be adapted to the existing operating conditions. Please note that greasing of the wedge bolt should only be made with the elements being retracted.
The clamping elements must be protected against dirt, scale, swarf, coolant, etc. by means of a suitable covering.
Moulds or dies clamped by means of wedge clamps are subject to side loads that may be strong enough to displace them. Thus, positioning is required to absorb the side loads. Therefore, location pins or suitable limit stops should be provided to keep the molds and dies in their correct position.
When using wedge clamps on the press ram, it is recommended that multiple-circuit hydraulic supply of the clamping elements and pilot-controlled check valves are used for securing hydraulic clamping.

Circuit diagram



For safety reasons and in the sense of the machine tool guide lines ML2006/42/EC the hydraulic pressure must be maintained.



When upper molds/dies are clamped by wedge clamps, they must be secured mechanically when maintenance work is carried out.

Versions

- without position monitoring
  max. temperature: 160 °C
  (300 °C on request)

- with position monitoring at the side
  max. temperature: 100 °C

Position monitoring

The integrated position monitoring is coupled to the clamping bolt in a very space-saving way at the side and signals:

1. Clamping bolt in unclamping position
2. Clamping bolt in clamping position
3. Error message when overrunning the clamping position

Clamping force

This is the force the clamping element applies to the mold or die. The mould or die is clamped on the fixture plate by means of this force.
The external forces acting on mould or die (e.g. ejecting force or die cushion force) shall not exceed the totality of the elements' clamping force.

Maximum admissible operating force

This is the force that can be absorbed by the clamping element and the fastener (screws).
It must be ensured that in cases of emergency, e.g. workpiece jammed in mold or die, the sum total of the elements' operating forces is not exceeded.

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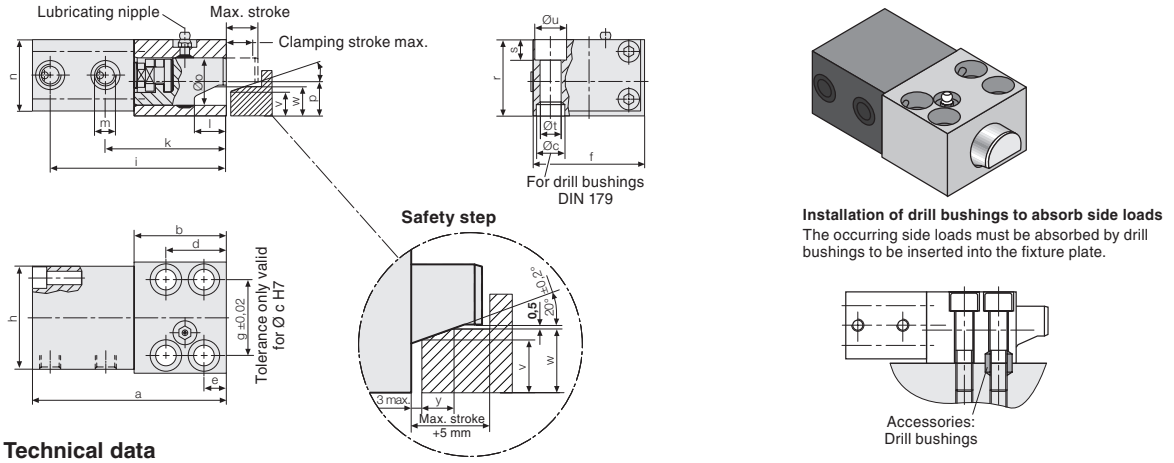
Wedge clamps with safety step



Technical data

Temperature resistance up to 160 °C

Clamping force max.	[kN]	25*	50	100	160	250	400	630
Max. admissible operating force - Screw DIN 912 8.8	[kN]	35	65	130	210	320	520	820
Max. operating pressure	**[bar]**	**350**	**275**	**350**	**350**	**350**	**350**	**350**
Cylinder Ø	[mm]	25	40	50	63	80	100	125
Max. stroke	[mm]	20	25	25	30	32	40	40
Clamping stroke (from/to)	[mm]	15 – 18	18 – 22	19 – 22	23 – 27	24 – 29	30 – 36	30 – 36
Max. oil consumption	[mm]	10	31	49	94	161	314	491
a	[mm]	122	157	190	227	267	310	375
b	[mm]	58	78	100	125	150	180	225
Ø c H7 x depth	[mm]	18/7	26/9	30/11	35/11	48/13	55/16	62/16
d	[mm]	38	46	58	75	78	95	108
e	[mm]	14	16	20	25	26	32	38
f	[mm]	70	95	120	150	200	240	280
g	[mm]	48	65	85	106	140	180	210
h	[mm]	65	85	100	125	160	200	230
i	[mm]	111	146	177	210	246	285	344
k	[mm]	76	102	127	151	184	215	272
l	[mm]	20	25	26	32	40	45	50
m		G 1/4	G 1/4	G 1/4	G 1/2	G 1/2	G 1/2	G 1/2
n	[mm]	45	63	75	95	120	150	180
Ø o	[mm]	30	40	55	70	80	100	125
p	[mm]	21.5	28	37	49	55	75	85
r	[mm]	48	65	80	105	125	160	190
s	[mm]	13	18	20	26	32	38	44
Ø t	[mm]	13	17	21	26	33	39	45
Ø u	[mm]	20	26	32	40	48	57	66
v	[mm]	15	18	25	30	30	50	60
w	[mm]	17.5	21.2	28.2	34.7	35.3	57.3	67.3
y	[mm]	7	9	10	14	14	20	21
Screw DIN 912-8.8 (4 off)		M 12	M 16	M 20	M 24	M 30	M 36	M 42
Tightening torque	[Nm]	86	210	410	710	1450	2520	4050
Weight	[kg]	2.4	5.8	10.6	21	40	74	125
Part no.		**HCR-8.2403.1000**	**HCR-8.2404.1000**	**HCR-8.2405.1000**	**HCR-8.2406.1000**	**HCR-8.2407.1000**	**HCR-8.2408.1000**	**HCR-8.2409.1000**
Accessories								
Drill bushings DIN 179	[mm]	12 x 12	17 x 16	21 x 20	26 x 20	32 x 25	38 x 30	44 x 30
Part no.		**CLR-3300-285**	**CLR-3300-287**	**CLR-3300-288**	**CLR-3300-289**	**HCR-3300-420**	**HCR-3300-430**	**HCR-3300-440**

* lubricating nipples of the version with a clamping force of 25 kN are offset by 9.5 mm and protrude by 5 mm

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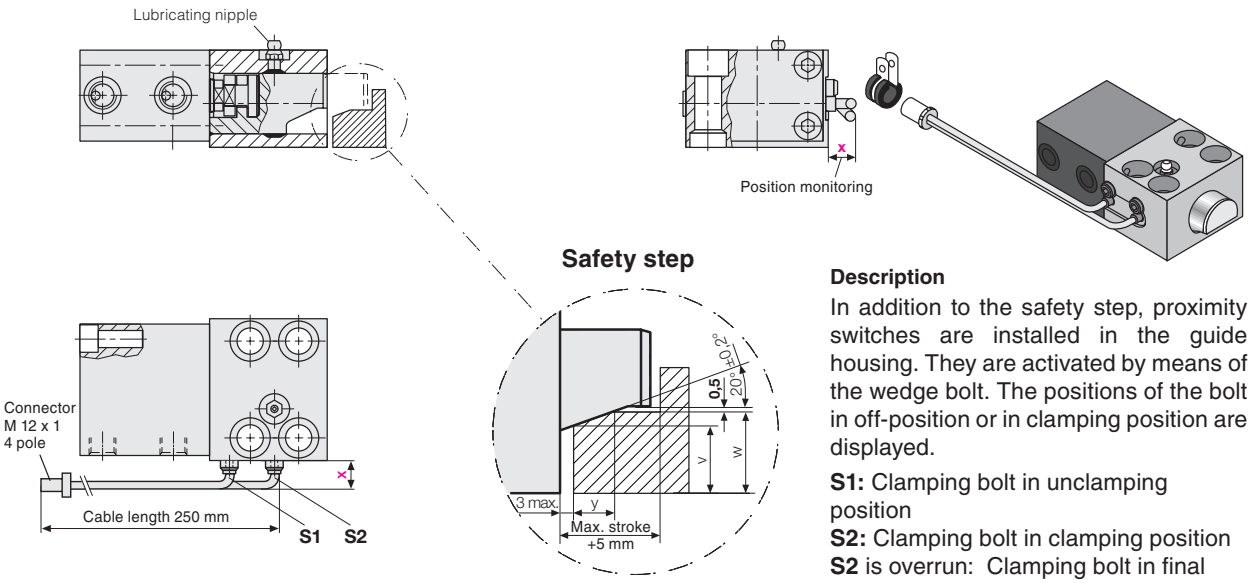
Wedge clamp
with safety step + position monitoring



Description

In addition to the safety step, proximity switches are installed in the guide housing. They are activated by means of the wedge bolt. The positions of the bolt in off-position or in clamping position are displayed.

S1: Clamping bolt in unclamping position
S2: Clamping bolt in clamping position
S2 is overrun: Clamping bolt in final position
(message for no mold/die available or mould/die not clamped)

Special versions with signal up to final bolt position are available on request.

Technical data

Temperature resistance up to 100 °C

Clamping force max.	**[kN]**	25*	50	100	160	250	400	630
x Position monitoring	**[mm]**	12	5	0	0	0	0	0
Part no.		**HCR-8.2403.2000**	**HCR-8.2404-.2000**	**HCR-8.2405.2000**	**HCR-8.2406.2000**	**HCR-8.2407.2000**	**HCR-8.2408.2000**	**HCR-8.2409.2000**

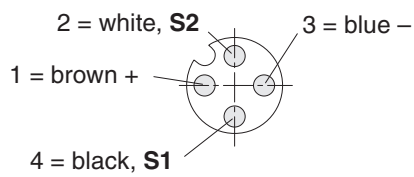
* lubricating nipples of the version with a clamping force of 25 kN are offset by 9.5 mm and protrude by 5 mm

Accessories

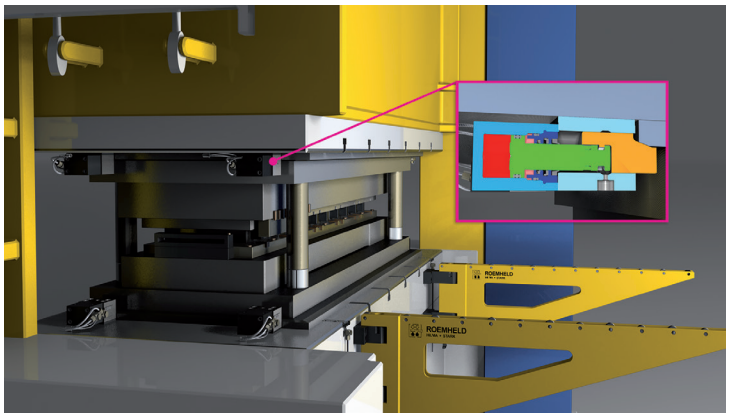
Connecting cable with screw coupling

Cable length 5 m **Part no. HCR-5700-013**
Cable length 10 m **Part no. HCR-5700-014**

Pin assignment 4-pole



Application example



Wedge clamp with safety step in the press ram

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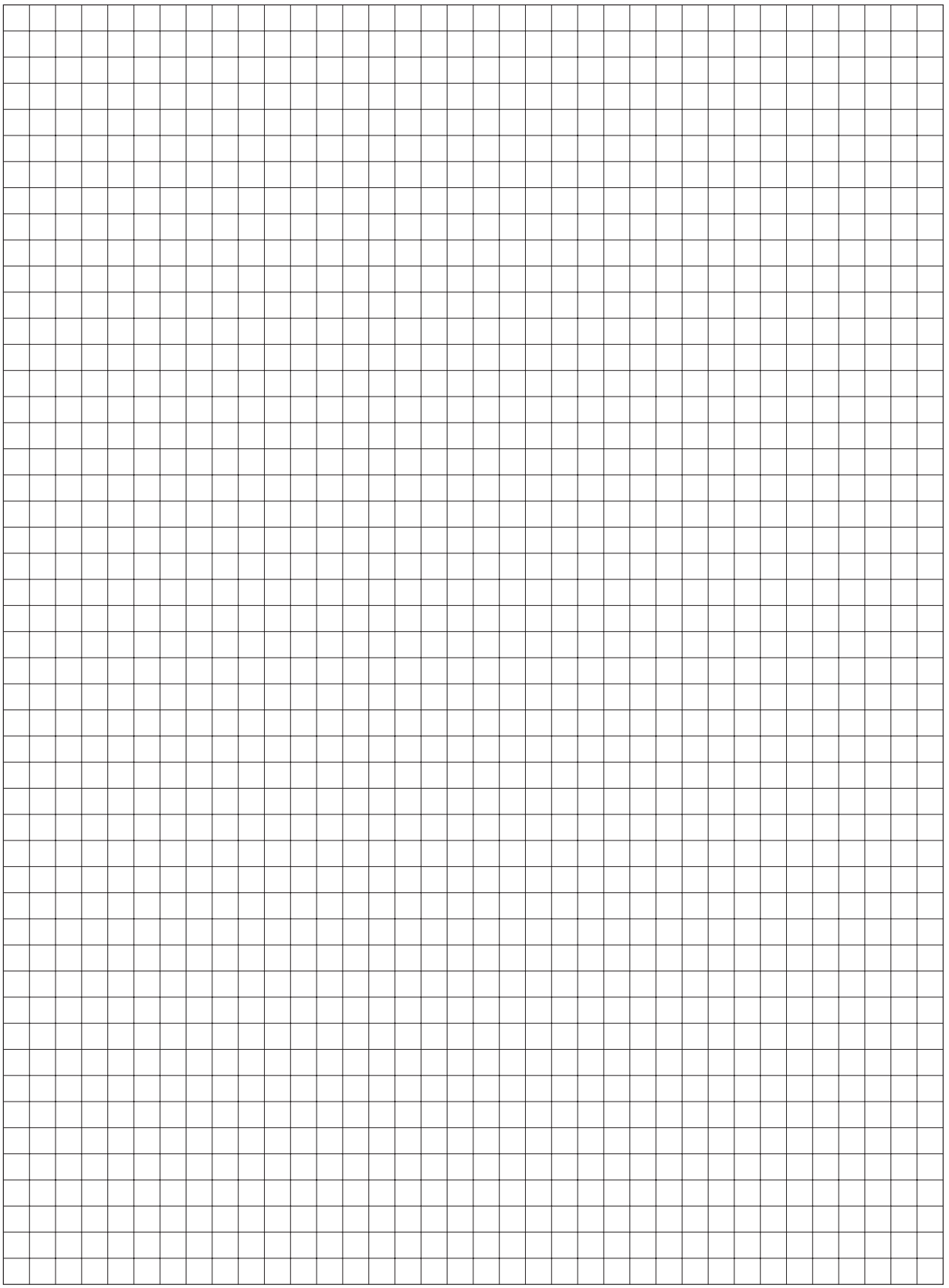

Wedge clamps for tapered clamping edge double acting, max. clamping force 50 to 400 kN, with form-fit safety step and position monitoring

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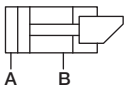
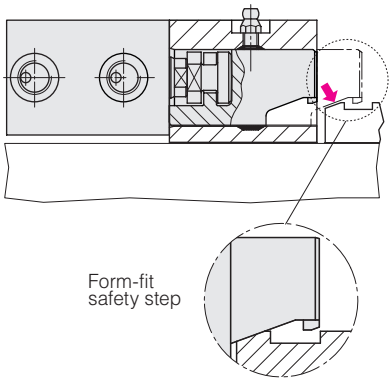


Advantages

- Safety step for form-fit holding of dies or moulds when the pressure drops
- Safe clamping of molds/dies with tapered clamping edge
- High operational safety by position monitoring and automatic motion sequence
- Very sturdy design
- High safety standard
- Long service life
- Patented design

PATENT



Application

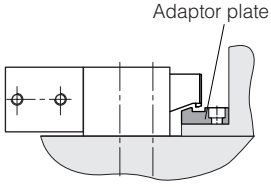
Double-acting wedge clamp with a form-fit safety lug at the clamping bolt for clamping dies on a press bed or ram or for clamping dies in injection molding machines, machines and installations. Preferably for use on the press ram.

Description

The wedge clamp consists of a hydraulic block cylinder and a piston guided in a housing. The clamping bolt is provided with 20° bevel to clamp on the tapered clamping surface of the mold/die.
Based on the internal design of the wedge clamp and the 20° bevel of the clamping bolt, the system is providing internal friction. This patented design has a form-fit safety step in the form of a lug at the clamping bolt, which has the same shape as the adapter on the mold/die clamping edge. In the case of pressure drop (machine failure or down time) the upper mould/die lowers to the safety step onto the safety lug and is safely held by form fit. The clamping bolt can not be returned to the unclamping position and the upper mold/die is safely held.

Retrofitting to wedge clamping

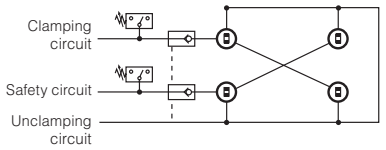
Retrofitting of already available moulds/dies to wedge clamping with form-fit safety step, can be made with adapter plates that are available as accessories (see page 3 of this series).



Important notes

The greasing intervals (high temperature grease) should be adapted to the existing operating conditions. Please note that greasing of the wedge bolt should only be made with the elements being retracted.
The clamping elements must be protected against dirt, scale, swarf, coolant, etc. by means of a suitable covering.
Molds or dies clamped by means of wedge clamps are subject to side loads that may be strong enough to displace them. Thus, positioning is required to absorb the side loads. Therefore, location pins or suitable limit stops should be provided to keep the molds and dies in their correct position.
When using wedge clamps on the press ram, it is recommended that multiple-circuit hydraulic supply of the clamping elements and pilot-controlled check valves are used for securing hydraulic clamping.

Circuit diagram



For safety reasons and in the sense of the machine tool guide lines ML 2006/42/EC the hydraulic pressure must be maintained.
When upper molds/dies are clamped by wedge clamps, they must be secured mechanically when maintenance work is carried out.

Versions

- with position monitoring at the side max. temperature: 100 °C

Position monitoring

The integrated position monitoring is coupled to the clamping bolt in a very space-saving way at the side and signals:

1. **Clamping bolt in unclamping position**
2. **Clamping bolt in clamping position**
3. **Error message when overrunning the clamping position**

Clamping force

This is the force the clamping element applies to the mold or die. The mould or die is clamped on the fixture plate by means of this force.
The external forces acting on mould or die (e.g. ejecting force or die cushion force) shall not exceed the totality of the elements' clamping force.

Maximum admissible operating force

This is the force that can be absorbed by the clamping element and the fastener (screws).
It must be ensured that in cases of emergency, e.g. workpiece jammed in mold or die, the sum total of the elements' operating forces is not exceeded.

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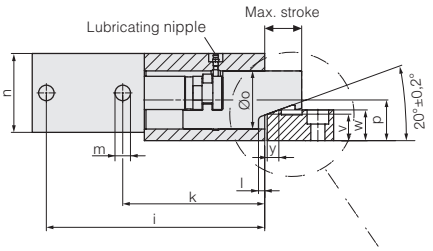
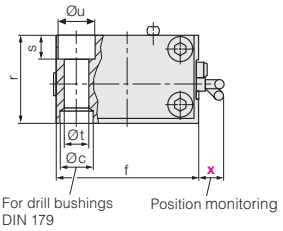
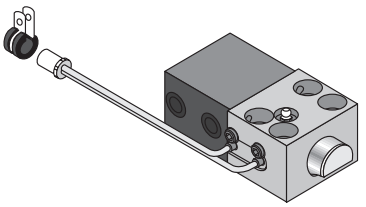
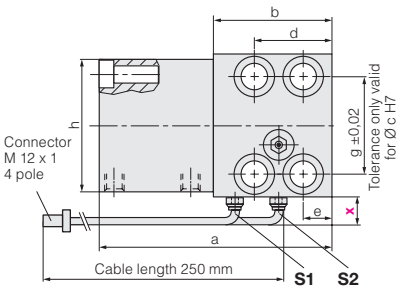
Wedge clamps for tapered clamping edge double acting, max. clamping force 50 to 400 kN, with form-fit safety step and position monitoring

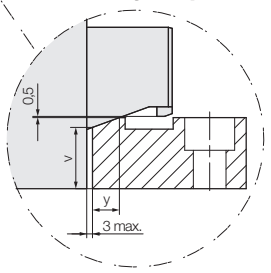




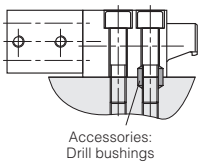




Form-fit safety step



Installation of drill bushings to absorb side loads
The occurring side loads must be absorbed by drill bushings to be inserted into the fixture plate.



Technical data

Temperature resistance up to 100 °C

Clamping force max.	**[kN]**	**50**	**100**	**160**	**250**	**400**
Max. admissible operating force						
Screw DIN 912 8.8	[kN]	65	130	210	320	520
Max. operating pressure	**[bar]**	**275**	**350**	**350**	**350**	**350**
Cylinder Ø	[mm]	40	50	63	80	100
Max. stroke	[mm]	50	50	63	50	80
Clamping stroke (from/to)	[mm]	40 – 44	40 – 44	44 – 48	45 – 49	66 – 70
Max. oil consumption	[mm]	63	98	196	251	628
a	[mm]	207	235	280	295	380
b	[mm]	103	120	145	160	210
Ø c H7 x depth	[mm]	26/9	30/11	35/11	48/13	55/16
d	[mm]	46	58	75	78	95
e	[mm]	16	20	25	26	32
f	[mm]	95	120	150	200	240
g	[mm]	65	85	106	140	180
h	[mm]	85	100	125	160	200
i	[mm]	196	222	263	274	355
k	[mm]	127	147	171	194	245
l	[mm]	45	56	52	65	75
m		G 1/4	G 1/4	G 1/2	G 1/2	G 1/2
n	[mm]	63	75	95	120	150
Ø o	[mm]	40	55	70	80	100
p	[mm]	28	37	49	55	75
r	[mm]	65	80	105	125	160
s	[mm]	18	20	26	32	38
Ø t	[mm]	17	21	26	33	39
Ø u	[mm]	26	32	40	48	57
v	[mm]	14.9	22.8	31.9	34.5	46.9
w	[mm]	20	29	37	39.6	55.6
x Position monitoring	[mm]	3	3	3	3	3
y	[mm]	14	14	14	14	24
Screw DIN 912-8.8 (4 off)		M16	M20	M24	M30	M36
Tightening torque	[Nm]	210	410	710	1450	2520
Weight	[kg]	8	13.3	25.6	43.7	93.2
Part no. (including proximity switch)		**HCR-8.2404.6000**	**HCR-8.2405.6000**	**HCR-8.2406.6000**	**HCR-8.2407.6000**	**HCR-8.2408.6000**

Accessories

Drill bushings DIN 179	[mm]	17 x 16	21 x 20	26 x 20	32 x 25	38 x 30
Part no.		**CLR-3300-287**	**CLR-3300-288**	**CLR-3300-289**	**HCR-3300-420**	**HCR-3300-430**

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Wedge clamps for tapered clamping edge proximity switches, adaptor plates

Description

The proximity switches are installed in the guide housing. They are activated by means of the wedge bolt. The positions of the bolt in off-position or in clamping position are displayed.

S1: Clamping bolt in unclamping position

S2: Clamping bolt in clamping position

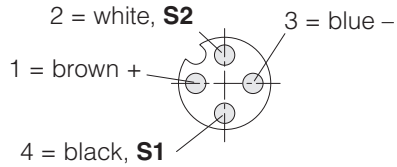
S2 is overrun: Clamping bolt in final position (message for no mold/die available or mold/die not clamped)

Special versions with signal up to final bolt position are available on request.

Connecting cable with screw coupling

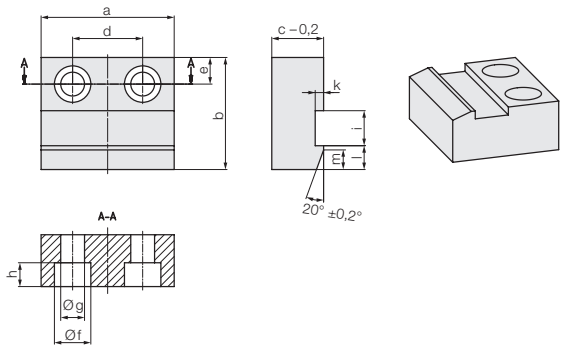
Cable length 5 m **Part no. HCR-5700-013**
Cable length 10 m **Part no. HCR-5700-014**

Pin assignment 4-pole



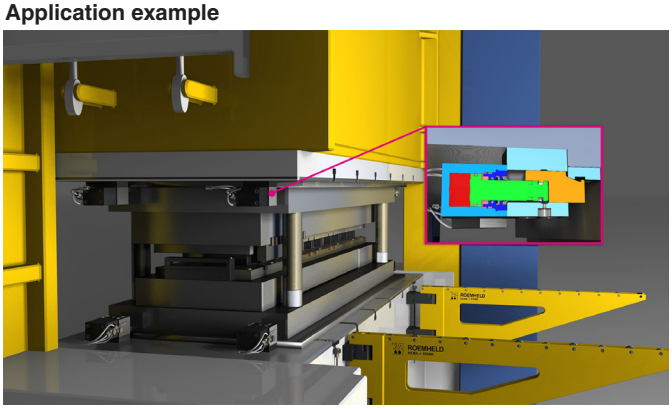
Accessories

Adaptor plates



for wedge clamp		HCR-8.2404.6000	HCR-8.2405.6000	HCR-8.2406.6000	HCR-8.2407.6000	HCR-8.2408.6000
a	[mm]	50	80	95	105	130
b	[mm]	55	70	80	80	105
c	[mm]	20	29	37	39.6	55.6
d	[mm]	30	40	50	60	70
e	[mm]	9	16	19	19	20.5
Ø f	[mm]	15	20	26	26	26
Ø g	[mm]	9	13.5	17	17	17
h	[mm]	8.6	12.6	17	17	17
i	[mm]	20	21	25	27	34
k	[mm]	5	5	6	6	8
l	[mm]	17	17	17	17	30
m	[mm]	14	14	14	14	24
Part no.		**HCR-5.1028.0073**	**HCR-5 .1028.0074**	**HCR-5.1028.0065**	**HCR-5.1028.0066**	**HCR-5.1028.0067**

Application example



Wedge clamp with form-fit safety step in the press ram

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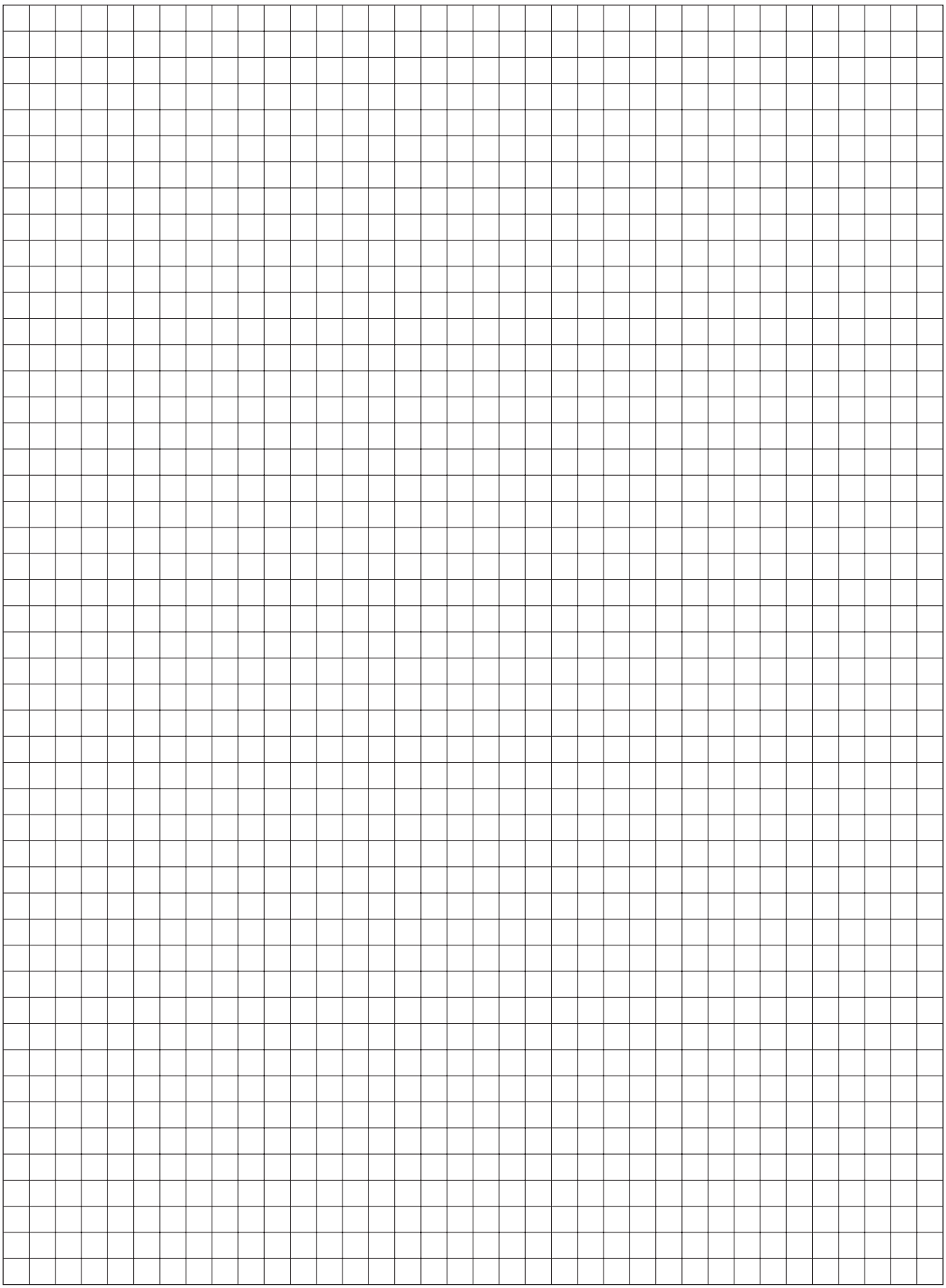

Wedge clamps for tapered clamping edge double acting, max. clamping force 25 to 630 kN, with locking bolt, without & with position monitoring at the side

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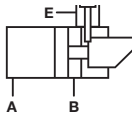
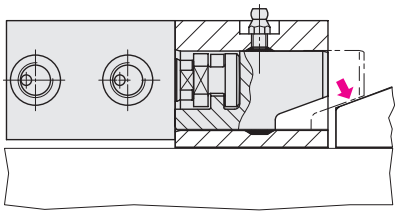


Advantages

- safe clamping of molds/dies with tapered clamping edge
- high operational safety by locking bolt and position monitoring at the side
- very sturdy design
- additionally increased safety standard
- long service life



Application

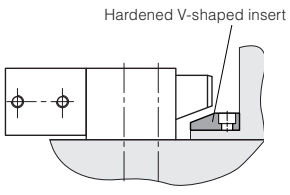
Double-acting wedge clamp for clamping molds or dies on a press bed or ram or in injection moulding machines, machines and installations.

Description

The wedge clamp consists of a hydraulic block cylinder and a piston guided in a housing. The clamping bolt is provided with 20° bevel to clamp on the tapered clamping surface of the mold/die.
Based on the internal design of the wedge clamp and the 20° bevel of the clamping bolt, the system is providing internal friction.
The clamping bolt of this wedge clamp is secured against retraction with an additional locking cylinder and locking bolt. Leaving the clamping position is only possible by unlocking the locking bolt.

Retrofitting to wedge clamping

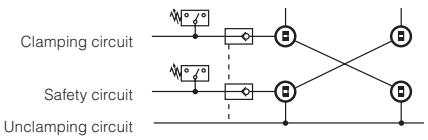
Wedge clamping of existing molds/dies is possible by retrofitting V-shaped inserts as shown below. Max. hardness 50 HRc



Important notes

The greasing intervals (high temperature grease) should be adapted to the existing operating conditions. Please note that greasing of the wedge bolt should only be made with the elements being retracted.
The clamping elements must be protected against dirt, scale, swarf, coolant, etc. by means of a suitable covering.
Molds or dies clamped by means of wedge clamps are subject to side loads that may be strong enough to displace them. Thus, positioning is required to absorb the side loads. Therefore, location pins or suitable limit stops should be provided to keep the molds and dies in their correct position.
When using wedge clamps on the press ram, it is recommended that multiple-circuit hydraulic supply of the clamping elements and pilot-controlled check valves are used for securing hydraulic clamping.

Circuit diagram



For safety reasons and in the sense of the machine tool guide lines ML2006/42/ EC the hydraulic pressure must be maintained.
When upper molds/dies are clamped by wedge clamps, they must be secured mechanically when maintenance work is carried out.

Versions

- without position monitoring
  max. temperature: 160 °C
  (300 °C on request)

- with position monitoring at the side
  max. temperature: 100 °C

Position monitoring

The integrated position monitoring is coupled to the clamping bolt in a very space-saving way at the side and signals:

1. **Clamping bolt in unclamping position**
2. **Clamping bolt in clamping position**
3. **Error message when overrunning the clamping position**

Clamping force

This is the force the clamping element applies to the mould or die. The mould or die is clamped on the fixture plate by means of this force.
The external forces acting on mold or die (e.g. ejecting force or die cushion force) shall not exceed the totality of the elements' clamping force.

Maximum admissible operating force

This is the force that can be absorbed by the clamping element and the fastener (screws).
It must be ensured that in cases of emergency, e.g. workpiece jammed in mold or die, the sum total of the elements' operating forces is not exceeded.

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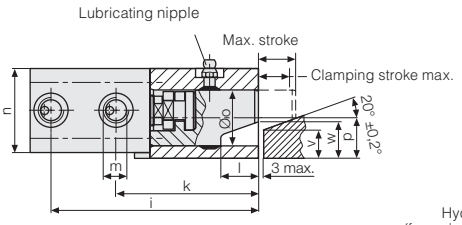
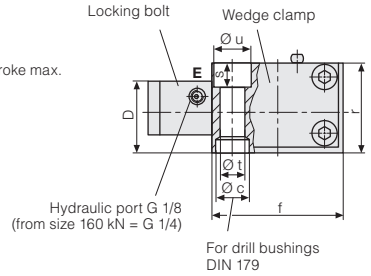
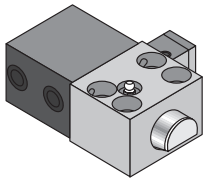
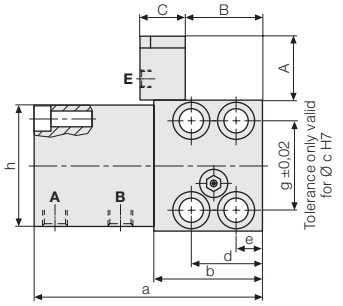
Wedge clamps for tapered clamping edge with locking bolt



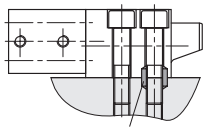






Installation of drill bushings to absorb side loads

The occurring side loads must be absorbed by drill bushings to be inserted into the fixture plate.



Technical data

Temperature resistance up to 160 °C

Clamping force max.	**[kN]**	**25***	**50**	**100**	**160**	**250**	**400**	**630**
Max. admissible operating force Screw DIN 912 8.8	[kN]	35	65	130	210	320	520	820
Max. operating pressure	**[bar]**	**350**	**275**	**350**	**350**	**350**	**350**	**350**
Cylinder Ø	[mm]	25	40	50	63	80	100	125
Max. stroke	[mm]	20	25	25	30	32	40	40
Clamping stroke (from/to)	[mm]	15 – 18	18 – 22	19 – 22	23 – 27	24 – 29	30 – 36	30 – 36
Oil consumption max. clamping/unlocking [mm]		10/3	31/3	49/3	94/2.5	161/2.5	314/2.5	491/2.5
a	[mm]	122	157	190	227	267	310	375
b	[mm]	58	78	100	125	150	180	225
Ø c H7 x depth	[mm]	18/7	26/9	30/11	35/11	48/13	55/16	62/16
d	[mm]	38	46	58	75	78	95	108
e	[mm]	14	16	20	25	26	32	38
f	[mm]	70	95	120	150	200	240	280
g	[mm]	48	65	85	106	140	180	210
h	[mm]	65	85	100	125	160	200	230
i	[mm]	111	146	177	210	246	285	344
k	[mm]	76	102	127	151	184	215	272
l	[mm]	20	25	26	32	40	45	50
m		G 1/4	G 1/4	G 1/4	G 1/2	G 1/2	G 1/2	G 1/2
n	[mm]	45	63	75	95	120	150	180
Ø o	[mm]	30	40	55	70	80	100	125
p	[mm]	21.5	28	37	49	55	75	85
r	[mm]	48	65	80	105	125	160	190
s	[mm]	13	18	20	26	32	38	44
Ø t	[mm]	13	17	21	26	33	39	45
Ø u	[mm]	20	26	32	40	48	57	66
v	[mm]	15	18	25	30	30	50	60
w	[mm]	19.5	23.5	30.5	37	38	60	70
A	[mm]	57.5	57.5	57.5	60	60	65	65
B	[mm]	27	44	66	94	119	144.5	189.5
C	[mm]	40	40	40	45	45	40	40
D	[mm]	48	58	67	89	95	110	120
Screw DIN 912-8.8 (4 off)		M 12	M 16	M 20	M 24	M 30	M 36	M 42
Tightening torque	[Nm]	86	210	410	710	1450	2520	4050
Weight	[kg]	3.0	6.5	11.4	21.7	41	74.7	126
Part no.		**HCR-8.2403.1500**	**HCR-8.2404.1500**	**HCR-8.2405.1500**	**HCR-8.2406.1500**	**HCR-8.2407.1500**	**HCR-8.2408.1500**	**HCR-8.2409.1500**

Accessories

Drill bushings DIN 179	[mm]	12 x 12	17 x 16	21 x 20	26 x 20	32 x 25	38 x 30	44 x 30
Part no.		**CLR-3300-285**	**CLR-3300-287**	**CLR-3300-288**	**CLR-3300-289**	**HCR-3300-420**	**HCR-3300-430**	**HCR-3300-440**

* lubricating nipples of the version with a clamping force of 25 kN are offset by 9.5 mm and protrude by 5 mm

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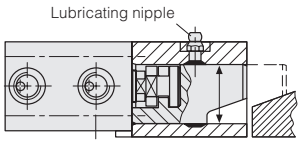
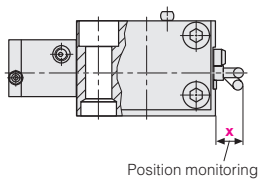
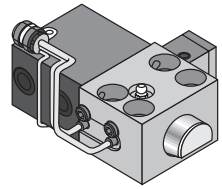
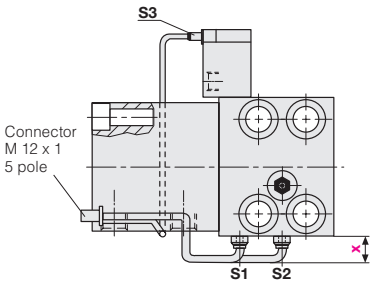
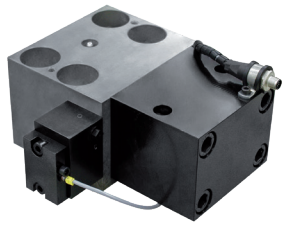
Wedge clamps for tapered clamping edge with locking bolt and position monitoring











Description

The proximity switches are installed in the guide housing. They are activated by means of the wedge bolt. The positions of the bolt in off-position or in clamping position are displayed.

S1: Clamping bolt in unclamping position
S2: Clamping bolt in clamping position
S2 is overrun: Clamping bolt in final position
(message for no mould/die available or mold/die not clamped)
S3: Position monitoring for the locking bolt, position unlocked

Special versions with signal up to final bolt position are available on request.

Technical data

Temperature resistance up to 100 °C

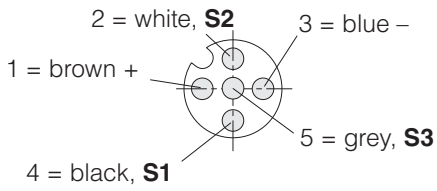
Clamping force max. [kN]	**25***	**50**	**100**	**160**	**250**	**400**	**630**
x Position monitoring [mm]	12	5	0	0	0	0	0
Part no.	**HCR-8.2403.3000**	**HCR-8.2404.3000**	**HCR-8.2405.3000**	**HCR-8.2406.3000**	**HCR-8.2407.3000**	**HCR-8.2408.3000**	**HCR-8.2409.3000**

* lubricating nipples of the version with a clamping force of 25 kN are offset by 9.5 mm and protrude by 5 mm

Accessories

Connecting cable with screw coupling
Cable length 5 m **Part no. HCR-5700-013**
Cable length 10 m **Part no. HCR-5700-014**

Pin assignment 5-pole



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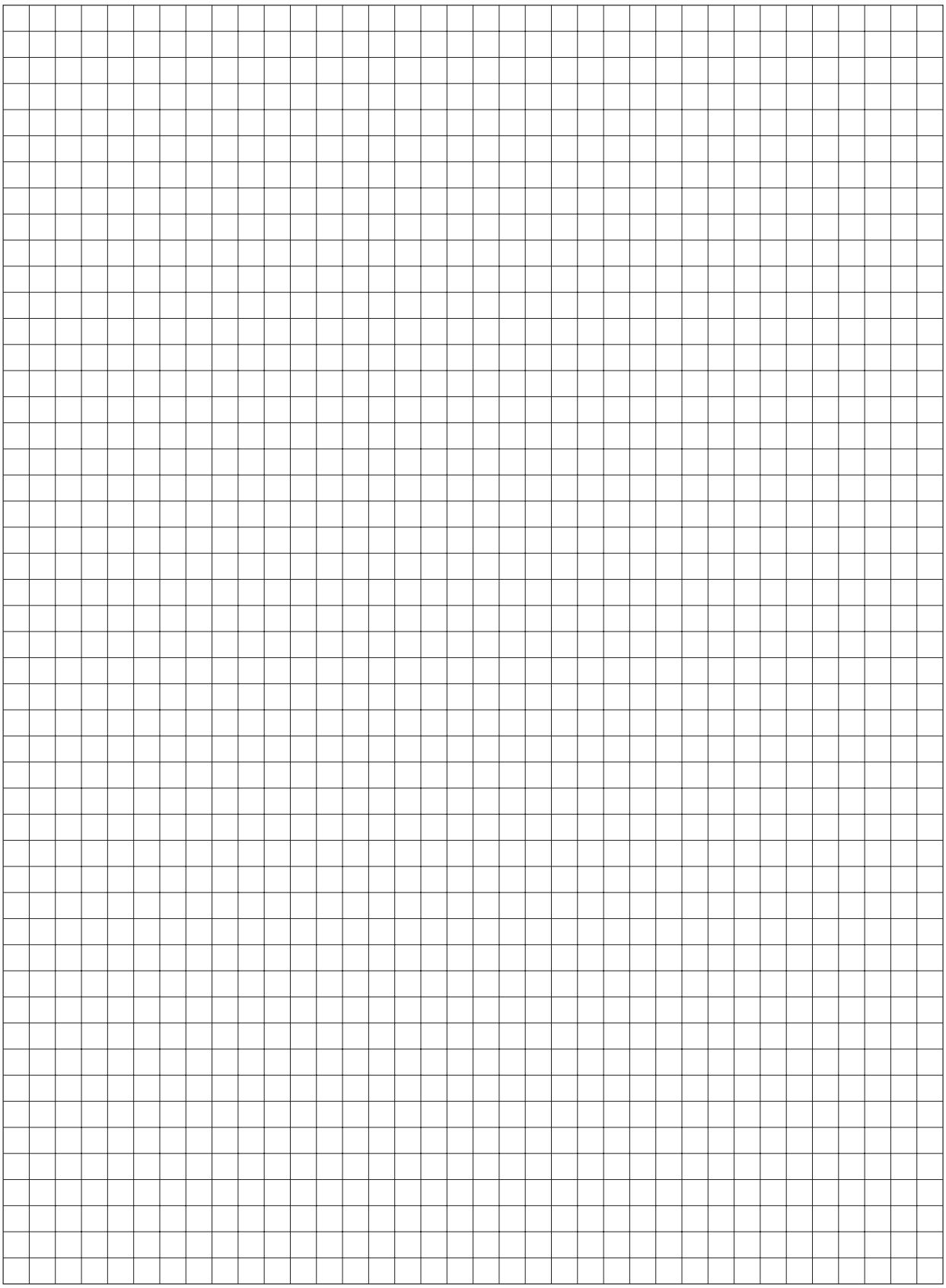

Wedge clamps for tapered clamping edge double acting, max. clamping force 25 to 630 kN, with sequence valve control for high temperature ranges

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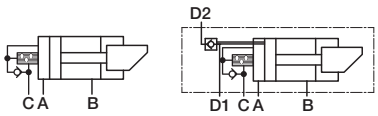


Application

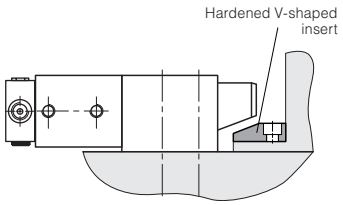
Double-acting wedge clamp with optional safety step at the clamping bolt for clamping molds or dies on a press bed or ram or in injection molding machines, machines and installations.

Description

The wedge clamp consists of a hydraulic block cylinder and a piston guided in a housing. The clamping bolt is provided with 20° bevel to clamp on the tapered clamping surface of the die.
Based on the internal design of the wedge clamp and the 20° bevel of the clamping bolt, the system is providing internal friction.
Wedge clamps with hydraulic position monitoring for high temperatures. An additional valve block on the standard wedge clamp enables hydraulic control of the clamping position.
Only after the last wedge clamp has been clamped, the machine control is released by a pressure switch on the pressure generator.

Retrofitting to wedge clamping

Wedge clamping of existing molds/dies is possible by retrofitting V-shaped inserts as shown below. Max. hardness 50 HRc



Advantages

- Optional safety step for the support of the upper die or mold half when the pressure drops
- Safe clamping of molds/dies with tapered clamping edge at high temperatures
- Very sturdy design
- High safety standard
- Hydraulic position monitoring, without electrics
- High operational safety by hydraulic position monitoring and automatic motion sequence of the clamping bolt

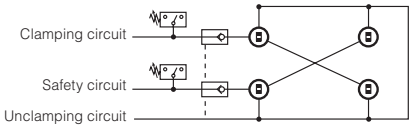
Optional safety step

The clamping bolt of this version has an additional support surface parallel to the clamping edge.
In the case of pressure drop (machine failure or down time) the upper mold/die can be lowered to the safety step and safely held.

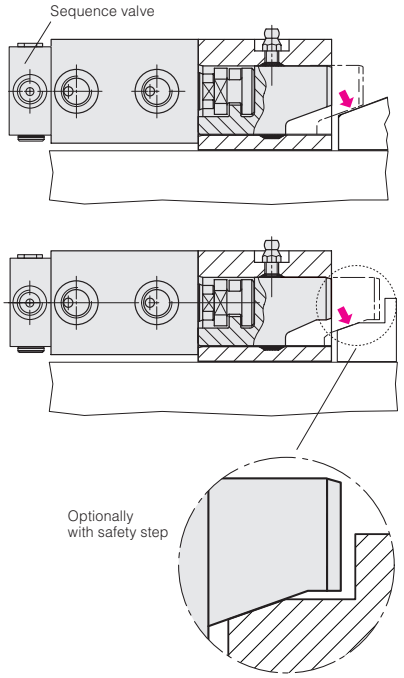
Important notes

The greasing intervals (high temperature grease) should be adapted to the existing operating conditions. Please note that greasing of the wedge bolt should only be made with the elements being retracted.
The clamping elements must be protected against dirt, scale, swarf, coolant, etc. by means of a suitable covering.
Molds or dies clamped by means of wedge clamps are subject to side loads that may be strong enough to displace them. Thus, positioning is required to absorb the side loads. Therefore, location pins or suitable limit stops should be provided to keep the molds and dies in their correct position.
When using wedge clamps on the press ram, it is recommended that multiple-circuit hydraulic supply of the clamping elements and pilot-controlled check valves are used for securing hydraulic clamping.

Circuit diagram



For safety reasons and in the sense of the machine tool guide lines ML 2006/42/EC the hydraulic pressure must be maintained.
When upper molds/dies are clamped by wedge clamps, they must be secured mechanically when maintenance work is carried out.



Versions

- with hydraulic position monitoring with sequence valve control to monitor the clamping position
  max. temperature: 160 °C
  (300 °C on request)

- with hydraulic position monitoring with double sequence valve control to monitor
  the clamping and unclamping position
  max. temperature: 160 °C
  (300 °C on request)

Clamping force

This is the force the clamping element applies to the mould or die. The mold or die is clamped on the fixture plate by means of this force.
The external forces acting on mold or die (e.g. ejecting force or die cushion force) shall not exceed the totality of the elements' clamping force.

Maximum admissible operating force

This is the force that can be absorbed by the clamping element and the fastener (screws).
It must be ensured that in cases of emergency, e.g. workpiece jammed in mold or die, the sum total of the elements' operating forces is not exceeded.

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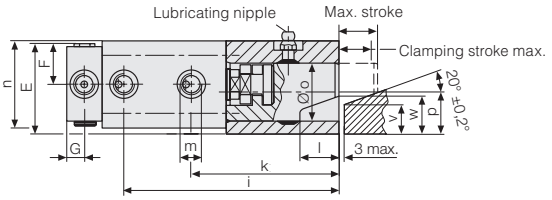
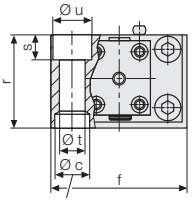
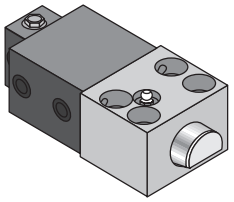
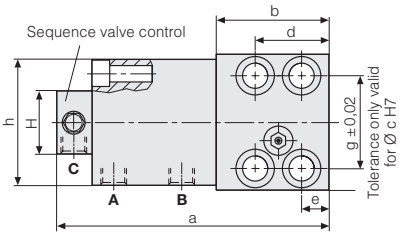
Wedge clamps for tapered clamping edge sequence valve control to monitor clamping position

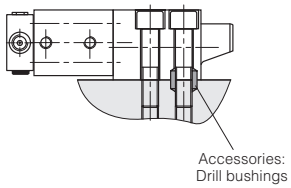


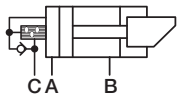






Installation of drill bushings to absorb side loads
The occurring side loads must be absorbed by drill bushings to be inserted into the fixture plate.





A = Hydraulic port clamping
B = Hydraulic port unclamping
C = Hydraulic port sequence valve

Technical data

Temperature resistance up to 160 °C

Clamping force max.	**[kN]**	**25***	**50**	**100**	**160**	**250**	**400**	**630**
Max. admissible operating force Screw DIN 912 8.8	[kN]	35	65	130	210	320	520	820
Max. operating pressure	**[bar]**	**350**	**275**	**350**	**350**	**350**	**350**	**350**
Cylinder Ø	[mm]	25	40	50	63	80	100	125
Max. stroke	[mm]	20	25	25	30	32	40	40
Clamping stroke (from/to)	[mm]	15 – 18	18 – 22	19 – 22	23 – 27	24 – 29	30 – 36	30 – 36
Max. oil consumption	[mm]	10	31	49	94	161	314	491
Sequence valve control	[mm]	12	14	14	17	17	22	22
a	[mm]	152	187	220	262	302	345	410
b	[mm]	58	78	100	125	150	180	225
Ø c H7 x depth	[mm]	18/7	26/9	30/11	35/11	48/13	55/16	62/16
d	[mm]	38	46	58	75	78	95	108
e	[mm]	14	16	20	25	26	32	38
f	[mm]	70	95	120	150	200	240	280
g	[mm]	48	65	85	106	140	180	210
h	[mm]	65	85	100	125	160	200	230
i	[mm]	111	146	177	210	246	285	344
k	[mm]	76	102	127	151	184	215	272
l	[mm]	20	25	26	32	40	45	50
m		G 1/4	G 1/4	G 1/4	G 1/2	G 1/2	G 1/2	G 1/2
n	[mm]	45	63	75	95	120	150	180
Ø o	[mm]	30	40	55	70	80	100	125
p	[mm]	21.5	28	37	49	55	75	85
r	[mm]	48	65	80	105	125	160	190
s	[mm]	13	18	20	26	32	38	44
Ø t	[mm]	13	17	21	26	33	39	45
Ø u	[mm]	20	26	32	40	48	57	66
v	[mm]	15	18	25	30	30	50	60
w	[mm]	19.5	23.5	30.5	37	38	60	70
E	[mm]	48	68	75	89	96.5	116.5	131.5
F	[mm]	22.5	31.5	37.5	47.5	60	75	90
G	[mm]	16	14	14	16	16	16	16
H	[mm]	64	48	48	90	90	90	90
Screw DIN 912-8.8 (4 off)		M 12	M 16	M 20	M 24	M 30	M 36	M 42
Tightening torque	[Nm]	86	210	410	710	1450	2520	4050
Weight	[kg]	3.0	6.5	11.4	21.7	41	74.7	126
Part no.		**HCR-8.2403.2500**	**HCR-8.2404.2500**	**HCR-8.2405.2500**	**HCR-8.2406.2500**	**HCR-8.2407.2500**	**HCR-8.2408.2500**	**HCR-8.2409.2500**
Accessories								
Drill bushings DIN 179	[mm]	12 x 12	17 x 16	21 x 20	26 x 20	32 x 25	38 x 30	44 x 30
Part no.		**CLR-3300-285**	**CLR-3300-287**	**CLR-3300-288**	**CLR-3300-289**	**HCR-3300-420**	**HCR-3300-430**	**HCR-3300-440**

* lubricating nipples of the version with a clamping force of 25 kN are offset by 9.5 mm and protrude by 5 mm

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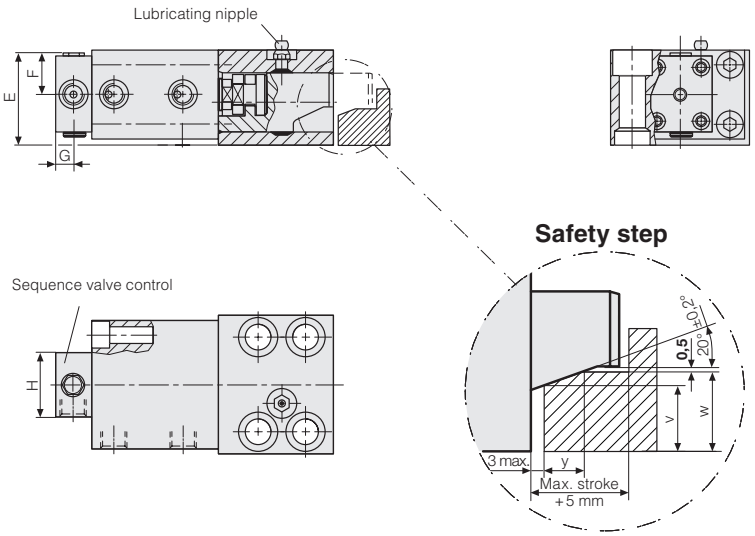
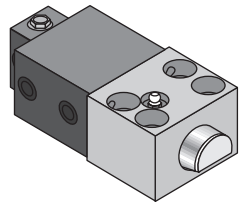
Wedge clamps, sequence valve control to monitor clamping position and safety step





Description

In addition to the sequence valve control, the clamping bolt of this version has an additional support surface parallel to the clamping edge. In the case of pressure drop (machine failure or down time) the upper mold/ die can be lowered to the safety step and safely held.

Technical data

Temperature resistance up to 160 °C

Clamping force max. [kN]	25*	50	100	160	250	400	630
w [mm]	17.5	21.2	28.2	34.7	35.3	57.3	67.3
y [mm]	7	9	10	14	14	20	21
Part no.	**HCR-8.2403.3500**	**HCR-8.2404.3500**	**HCR-8.2405.3500**	**HCR-8.2406.3500**	**HCR-8.2407.3500**	**HCR-8.2408.3500**	**HCR-8.2409.3500**

* lubricating nipples of the version with a clamping force of 25 kN are offset by 9.5 mm and protrude by 5 mm
** high temperatures up to 300 °C on request.

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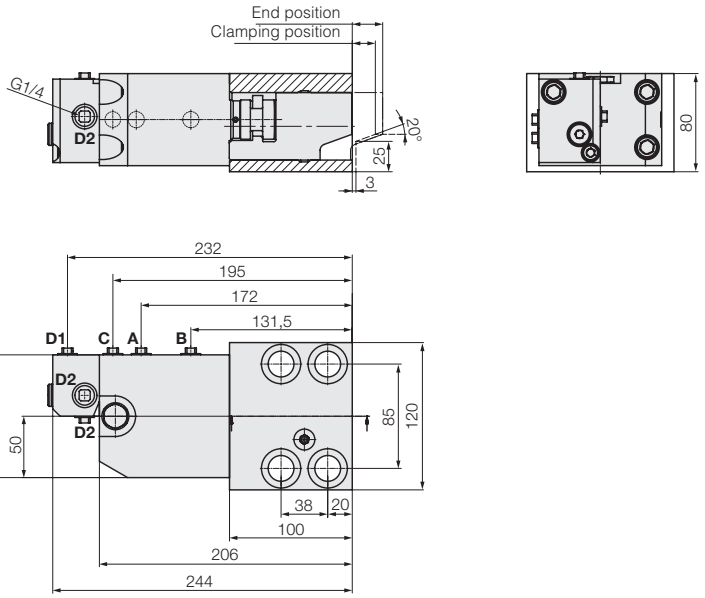
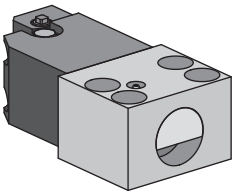
Wedge clamp double sequence valve control to monitor clamping and unclamping position





Technical data

Temperature resistance of up to 160°C (higher temperatures on request)

Clamping force max.	**[kN]**	**100***
Max. admissible operating force screws DIN 912 8.8	[kN]	130
Max. operating pressure	**[bar]**	**350**
Cylinder Ø	[mm]	50
Max. stroke	[mm]	25
Clamping stroke (from/to)	[mm]	19 – 22
Sequence valve control	[mm]	13
Screw DIN 912-8.8 (4 off)		M 20
Tightening torque	[Nm]	410
Weight	[kg]	12.5

* Other sizes on request

Description

The wedge clamp enables the hydraulic control of the clamping and unclamping position. Only after the last wedge clamp has been clamped, the machine control is released by a pressure switch on the pressure generator.

Version with safety step

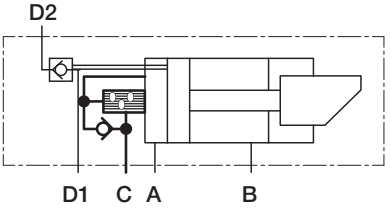
The version with double sequence valve control is also available with safety step at the clamping bolt on request (description see page 3 of this series).

Element in clamping position

Port A pressurized, bolt moves to the clamping position. The oil displaced by the piston movement escapes at port B. The sequence valve opens after approx. 50 % of the total stroke and oil escapes with full pressure at port C.

Element in unclamping position

Pressurise port D1, port D2 must remain free of oil. Pressurize port B.
The oil displaced by the piston movement escapes at port A and C. The second sequence valve will be opened maximally 2 mm before the end position of the bolt and oil escapes with full pressure at port D2.



A = Clamping
B = Unclamping
C = To the following element
D = Sequence released to the following element

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Wedge clamps for tapered clamping edge double acting, max. clamping force 100 to 630 kN, with single valve control for individual control

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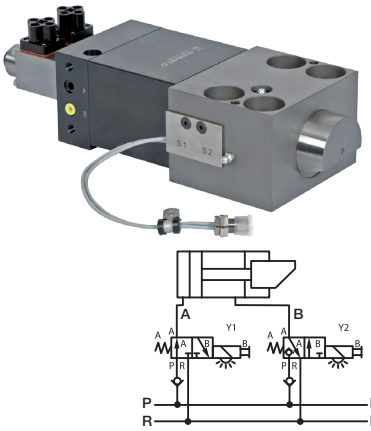
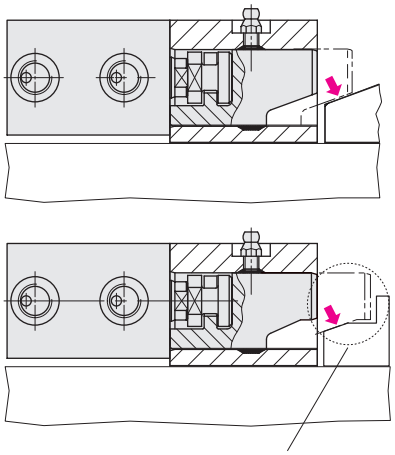
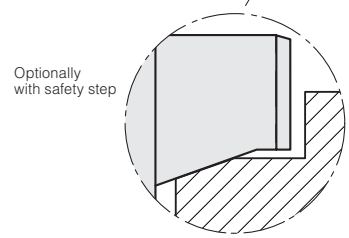


Advantages

- Safe clamping of molds/dies with tapered clamping edge
- Each element can be individually controlled
- Single molds/dies can be clamped
- High operational safety by position monitoring, check valves and automatic motion sequence
- Very sturdy design
- Long service life
- Little installation work as a result of a plug-type closed hydraulic circuit
- Suitable for BUS systems





Application

Double-acting wedge clamp with manifold-mounted directional control valves as control valves for the separate control of all clamping elements. For clamping molds or dies on a press bed or ram or in injection molding machines, machines and installations.

Technical data

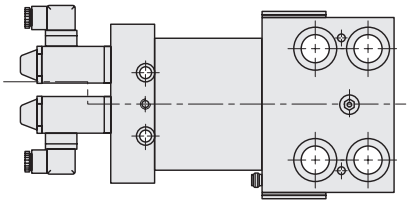
Temperature resistance	[°C]	max. 100
Clamping forces	[kN]	100 – 630
Operating pressure	[bar]	200 – 350
Valve voltage		24 V DC

Description

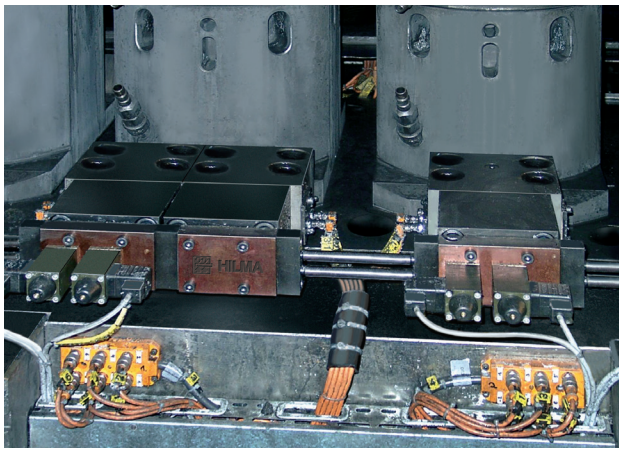
The wedge clamp consists of a hydraulic block cylinder and a piston guided in a housing. The clamping bolt is provided with 20° bevel to clamp on the tapered clamping surface of the mould/die.
Based on the internal design of the wedge clamp and the 20° bevel of the clamping bolt, the system is providing internal friction.

With safety step on request

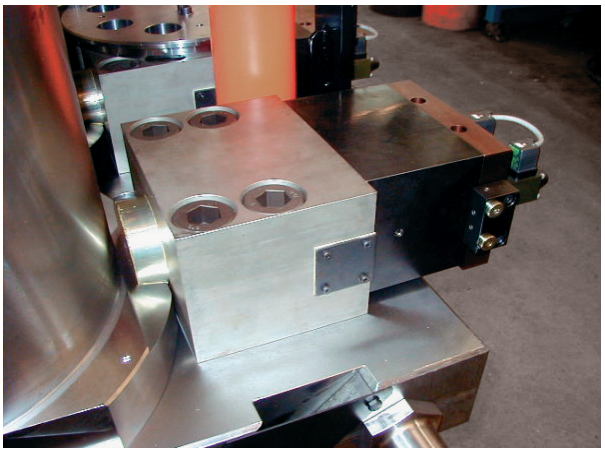
Dimensions, interfaces and further technical details in the course of the project.



Application examples



Wedge clamps with directly manifold-mounted directional control valves



Wedge clamps on a forging press

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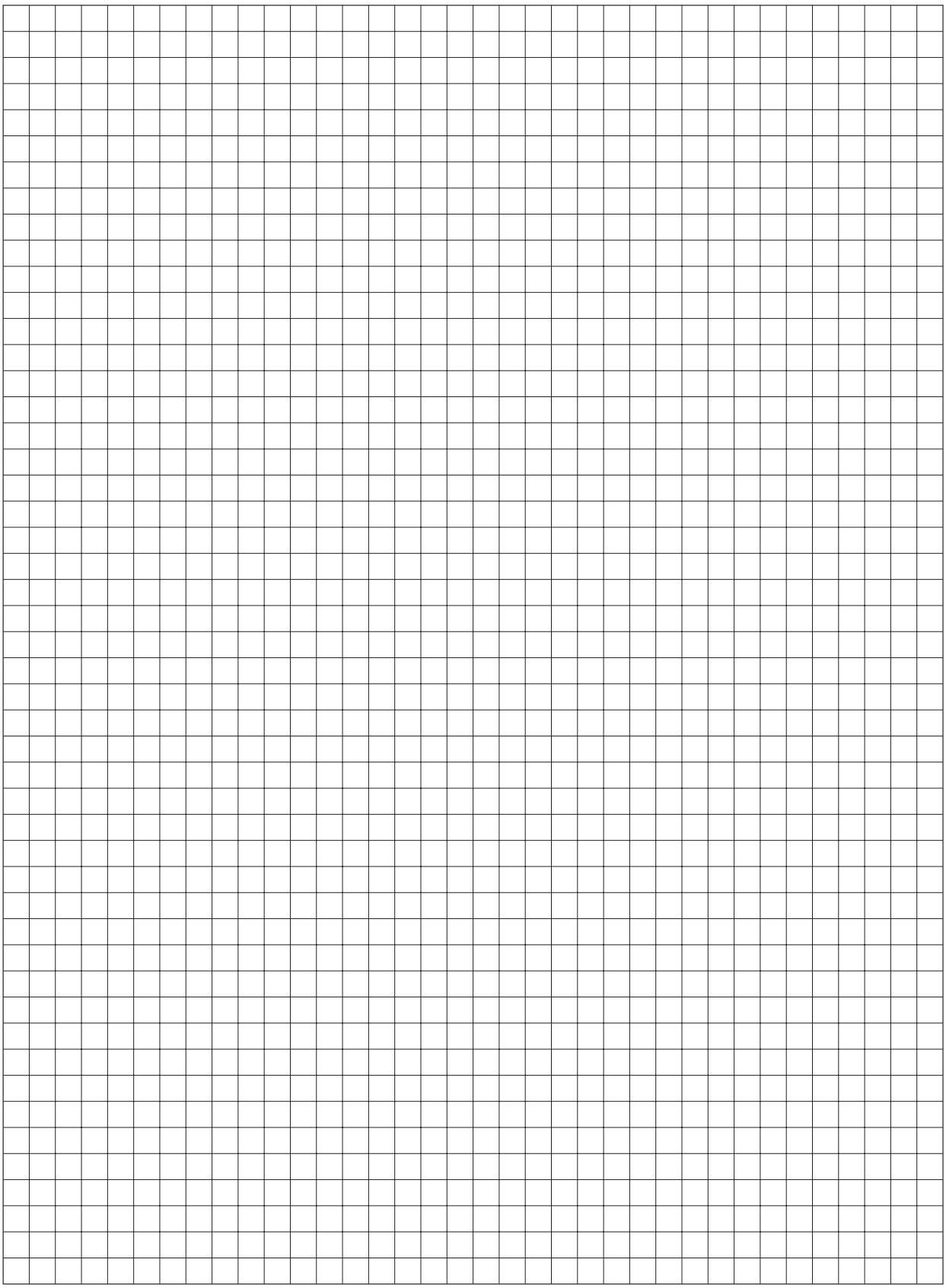

Wedge clamps for tapered clamping edge double acting, max. clamping force 100 to 630 kN, with cooling circuit for temperatures up to 250° C

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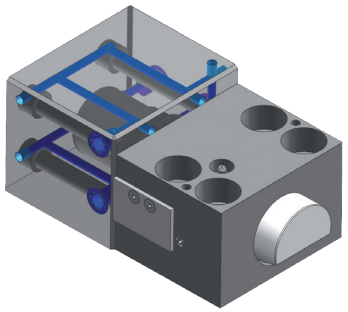
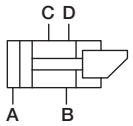




Application

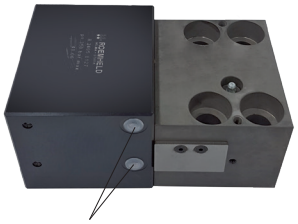
Double-acting wedge clamp for clamping molds and dies on a press bed or ram or in injection molding machines, machines and installations.

Description

The wedge clamp consists of a hydraulic block cylinder and a piston guided in a housing. The clamping bolt is provided with 20° bevel to clamp on the tapered clamping surface of the mould/die.
Based on the internal design of the wedge clamp and the 20° bevel of the clamping bolt, the system is providing internal friction.

Cooling circuit

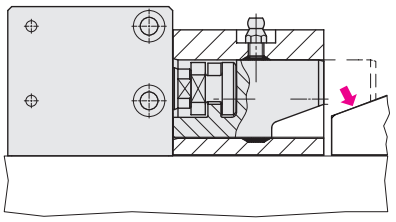
In addition, there is a cooling circuit for oil cooling in the block cylinder. This cooling circuit guarantees a steady temperature at the sealing surfaces of the hydraulic supply.
When dimensioning the cooling circuit, the occurring temperatures and the admissible temperature at the clamping element must be considered.



Cooling ports **C** and **D**

Advantages

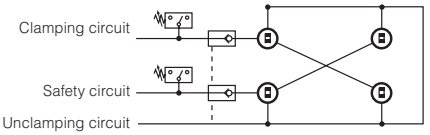
- Safe clamping of molds/dies with tapered clamping edge
- Temperatures up to 250°C with integrated cooling circuit
- High operational safety by automatic motion sequence
- Very sturdy design
- High safety standard
- Long service life
- Block cylinders can be retrofitted



Important notes

In case of incorrect operation of the wedge clamps, the clamping bolt may fully retract into the guide housing and thus cause the upper mold/die falling off the ram.
The greasing intervals (high temperature grease) should be adapted to the existing operating conditions. Please note that greasing of the wedge bolt should only be made with the elements being retracted.
The clamping elements must be protected against dirt, scale, swarf, coolant, etc. by means of a suitable covering.
Molds or dies clamped by means of wedge clamps are subject to side loads that may be strong enough to displace them. Thus, positioning is required to absorb the side loads. Therefore, location pins or suitable limit stops should be provided to keep the molds and dies in their correct position.
When using wedge clamps on the press ram, it is recommended that multiple-circuit hydraulic supply of the clamping elements and pilot-controlled check valves are used for securing hydraulic clamping.

Circuit diagram



For safety reasons and in the sense of the machine tool guide lines ML2006/42/EC the hydraulic pressure must be maintained.
When upper dies are clamped by wedge clamps, they must be secured mechanically when maintenance work is carried out.

Versions

- without position monitoring
  max. temperature: 250 °C

Technical data

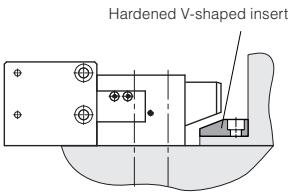
max. clamping force: 100 – 630 kN
max. operating pressure: 350 bar

Dimensions and part numbers

on request

Retrofitting to wedge clamping

Wedge clamping of existing molds/dies is possible by retrofitting V-shaped inserts as shown below. Max. hardness 50 HRc



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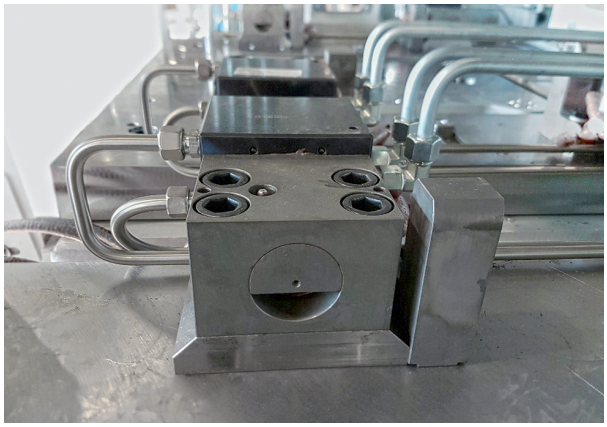
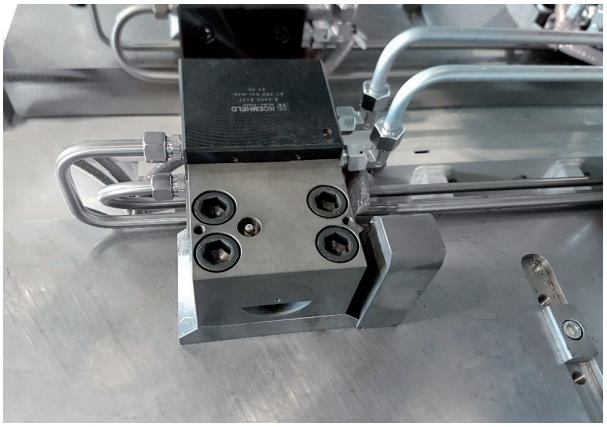
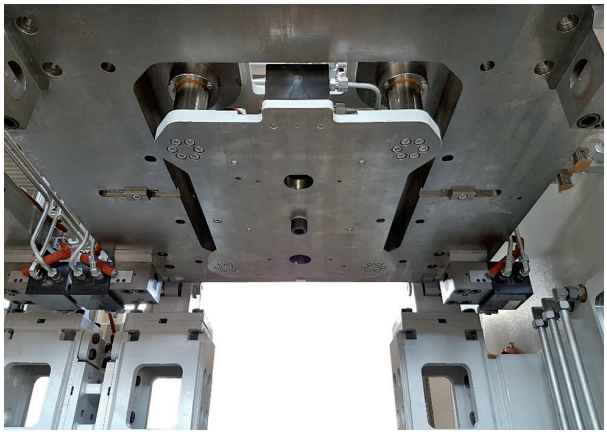
Application examples





Wedge clamp with hydraulic ports **A + B** at the right and an additional cooling circuit **C + D** at the opposite, left side



Wedge clamp on the press ram

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Wedge clamp, single-acting, spring force, hyd. unclamping, for dies with straight clamping edge

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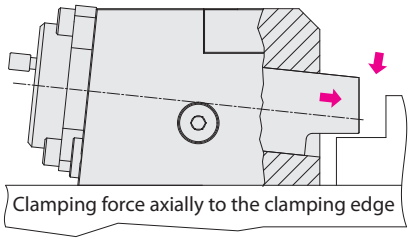


Advantages:

- safe clamping of dies with straight clamping edge
- high operating safety due to the clamping by spring force inductive and visual position monitoring
- position monitoring on the left or right side
- clamping element with self-locking
- dimensions in accordance with Euromap guideline
- no clamping edge bevels are required
- variable clamping edge heights (spacer plates)
- tolerance of clamping edge height ± 0.5 mm
- the pressure of the machine hydraulics of 160 bar is sufficient for unclamping
- very sturdy and compact design
- housing with stainless coating

Application:

The single acting wedge clamping elements are suitable for safe clamping of molds and dies with straight clamping edge in injection molding machines, punches and presses.

Description:

The wedge clamping elements consist of a guide housing with one-piece clamping bolt. Clamping cycle: the clamping bolt which is inclined by 6° performs an idle stroke and simultaneously a clamping stroke. The clamping bolt is lowered axially onto the clamping edge. The 6° angle, the spring force in the clamping bolt and the frictional engagement at the clamping point create a self-locking connection. The wedge clamping element should preferably be used with position monitoring.

Position monitoring:

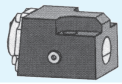
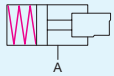
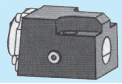
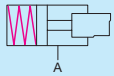
The integrated position monitoring is coupled to the clamping bolt in a space-saving way and signals:
1. Clamping bolt in the unclamping position
2. Clamping bolts in the clamping position
3. Error message when overrunning the clamping position

Important notes:

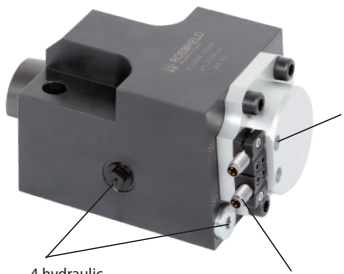
Please observe: in case of incorrect operation of the wedge clamping element, the clamping bolt may fully retract into the guide housing and thus cause a die halve falling off.

When using wedge clamping elements on the press ran or a vertical press, it is recommended that multiple-circuit hydraulic supply of the clamping elements and pilot-controlled check valves are used for securing hydraulic clamping.

Versions

		without position monitoring	up to 160° C
		with position monitoring	up to 80° C

*250 °C on request



Max. operating pressure	200 bar
Clamping pressure	with spring force
Unclamping pressure	160 bar
Retention forces	25 – 120 kN

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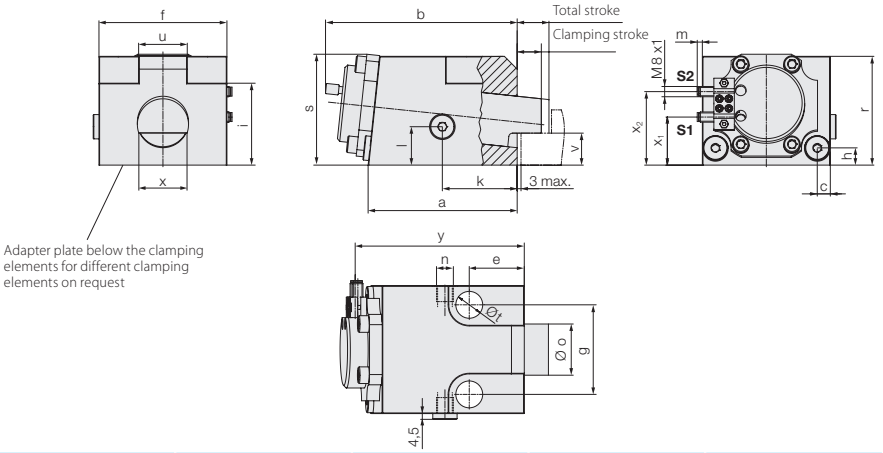
Wedge clamp, single acting, clamping with spring force and hydraulic unclamping

Wedge clamping elements
with position monitoring
Clamping bolt with a 6° bevel
Temperature resistance up to 80° C
(higher temperature on request)



Adm. operating force	[kN]	25	50	80	120	120
Clamping force by spring	[kN]	2,4	5	5	11	11
Unclamping pressure	[bar]	160	160	160	160	160
Max. operating pressure	[bar]	200	200	200	200	200
Cylinder-Ø	[mm]	35	60	60	85	85
Max. oil volume	[cm³]	14	39	39	90	90
Total stroke	[mm]	20	25	25	40	40
Clamping stroke	[mm]	14	19	19	15	15
a	[mm]	100	120	120	200	200
b	[mm]	131	153	153	245	245
c	[mm]	9	10	10	30	30
e min. / e max.	[mm]	10/37	12/45	15/43	15/77	18/74
f	[mm]	88	100	100	180	180
g (± 0.2 mm) mounting grid as per Euromap	[mm]	35/M12/12.9	70/M16/12.9	70/M20/12.9	140/M20/12.9	140/M24/8.8
Tightening torque	[Nm]	85	220	300	470	550
h	[mm]	13	13,5	13,5	30	30
i	[mm]	-	64	64	94	94
k	[mm]	55	62	62	115	115
l	[mm]	14	30	30	23	23
m	[mm]	-	4	4	-	-
n	[mm]	$G^1/_8$	$G^1/_4$	$G^1/_4$	$G^1/_4$	$G^1/_4$
Ø o	[mm]	18	40	40	65	65
r	[mm]	60	85	85	120	120
s	[mm]	62	87	87	120	120
Ø t	[mm]	13	17	21	21	26
u	[mm]	-	38	38	90	90
v** (± 0.15)	[mm]	20	25	25	40	40
x_1/x_2	[mm]	25/47	38/58	38/58	58/84	58/84
y	[mm]	114	132	132	212	212
Weight	[kg]	2,5	6,5	6,5	29	29
Part no. with position monitoring up to 80° C*		**HCR-8.2403.5510**	**HCR-8.2404.5510**	**HCR-8.2404.5520**	**HCR-8.2405.5510**	**HCR-8.2405.5520**
without position monitoring				**on request**		

* Higher temperatures up to 250° C on request
** Different operating forces, clamping edge heights, mounting grids or dimensions of the housing on request

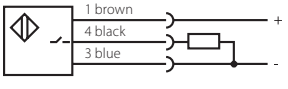
Technical data for inductive proximity switches

Operating voltage	10...30 V DC
Ripple	max. 15%
Switching function	interlock
Output	PNP
Housing material	steel, corrosion resistant
Code class (DIN 40050)	IP 67
Part no.	**HCR-6.3829.0980**

Connecting cable with plug

Environmental temperature TA	[°C]	-25...+80
Min. distance of the switching positions	[mm]	8
Type of connection		Plug
LED function display		in the plug
Constant current max.	[mA]	200
Rated operating distance	[mm]	1.5
Protected against short circuits		yes
Connecting cable with plug, 5 m Part no.		**CLR-3829-099**
Connecting cable with plug, 10 m Part no.		**HCR-3829-139**

Electric circuit diagram



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Wedge clamp, double-acting, type A for dies with flat clamping edge

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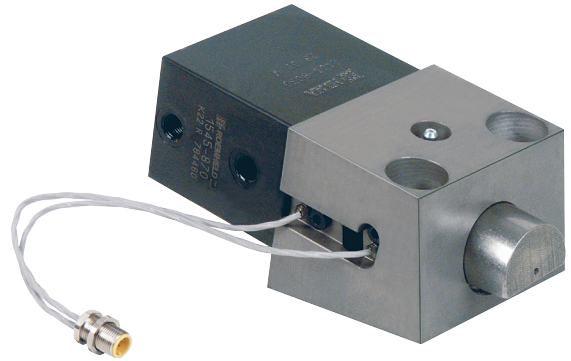
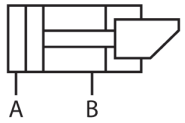
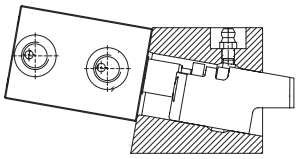
Type A - Clamping force axially applied to the clamping edge



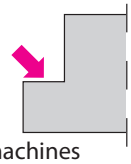




Clamping operation

Extending and simultaneous lowering/clamping

Application:



- safe clamping of dies with flat clamping edge
- for clamping of dies in injection molding machines
- for clamping of dies on press bed and slide

Design:

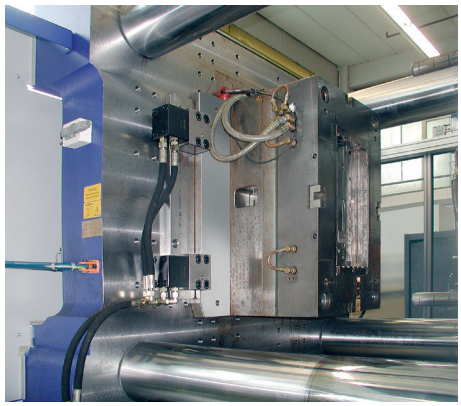
Double-acting wedge clamp for clamping dies on the press bed or slide or for clamping dies in injection molding machines according to Euromap standard.

The wedge clamp consists of a hydraulic block cylinder connected with a clamping bolt in a floating manner. Clamping cycle: the clamping bolt which is inclined by 5° performs an idle stroke and simultaneously a clamping stroke. The clamping bolt is lowered axially onto the clamping edge. The 5° angle of the housing has been determined so as to ensure that despite frictional engagement on the clamping edge the hydraulic pressure required for unclamping is sufficient.

Since the clamping force is vertically transmitted to the clamping point, only low transverse forces occur. The wedge clamp is available with or without position monitoring.

Special features:

- transverse forces are absorbed by drill bushings; high functional reliability is ensured by position monitoring and automatic cycle
- rugged and compact design
- well-proven clamping element with high degree of safety and long service life
- retracting clamping bolt ensures unrestricted die change
- clamping and unclamping pressures are different



Please note

In case of incorrect operation of the wedge clamping element, the clamping bolt may fully retract into the guide housing and thus cause the upper die to fall off the slide.

When using wedge clamping elements on press slides or vertical presses it is recommended that multiple-circuit hydraulic supply of the clamping elements and pilot-controlled check valves are used in the clamping lines for securing hydraulic clamping.

The greasing intervals (high-temperature grease) should be scheduled in accordance with the operating conditions (at least once a week). **Greasing of the clamping bolt should only be made with the elements being retracted.**

Position monitoring

The integrated position monitoring system is coupled to the clamping bolt and signals:

1. Clamping bolt in home position
2. Clamping bolt in extended position

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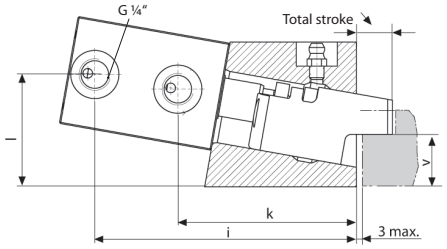
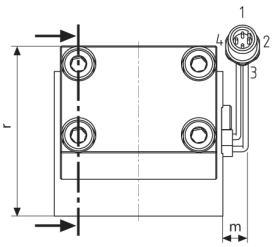
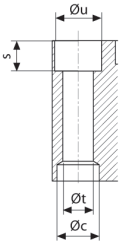
Wedge clamp, double-acting

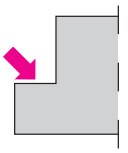
Type A - Clamping force axially applied to the clamping edge

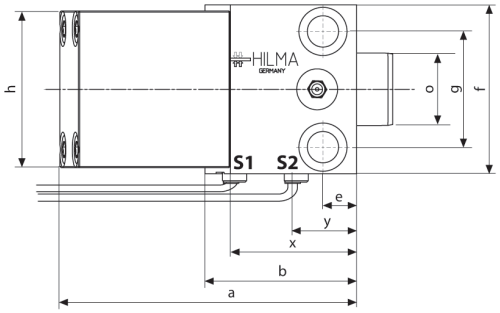




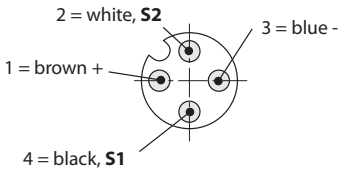


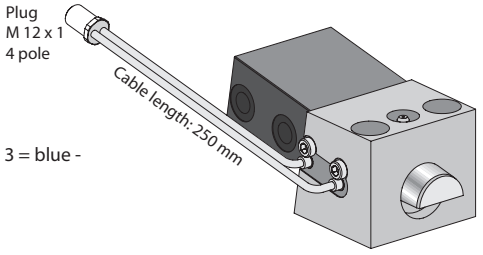
Drill bushing for absorbing transverse forces





Plug assignment





Standard mounting grid

(comparable to wedge clamp 2.2400)

Euromap mounting grid

(comparable to wedge clamp 2.2460)

Perm. retention force (kN) Screw property class 8.8	**35**	**60**	**120**	**35**	**60**	**120**
Max. clamping pressure (bar)	**50**	**50**	**50**	**50**	**50**	**50**
Max. unclamping pressure (bar)	**350**	**350**	**350**	**350**	**350**	**350**
Cylinder-Ø (mm)	25	40	50	25	40	50
Total stroke (mm)	20	25	25	20	25	25
Max. oil consumption (cm^3)	10	32	50	10	32	50
Clamping stroke (mm)	12	16	17	12	16	17
a (mm)	123	160	197	123	176	197
Ø c H7 x depth (mm)	18H7 x 7	26H7 x 9	30H7 x 11	18H7 x 7	26H7 x 9	30H7 x 11
b (mm)	60	78	109	60	95	109
e (mm)	14	16	20	15	33	32
f (mm)	70	95	120	95	100	140
g (± 0,2 mm)	48	65	85	70	70	105
h (mm)	65	85	100	65	85	100
i (mm)	109	142	180	109	158	180
k (mm)	75	99	131	75	115	131
l (mm)	36	50	65	36	50	65
m (mm)	12	5	0	0	0	0
Ø o (mm)	30	40	55	30	40	55
r (mm)	60	81	103	60	81	103
s (mm)	13	17	20	13	17	20
Ø t (mm)	13	17	21	13	17	21
Ø u (mm)	20	26	32	20	26	32
v** (± 0,1) (mm)	22	25	35	22	25	35
x (mm)	52	68	100	52	85	100
y (mm)	27	29	75	27	45	75
Weight (kg)	2,5	6,0	11,0	2,5	6,0	11,0
with position monitoring Part no. up to 100°C*	**HCR-8.2403.5120**	**HCR-8.2404.5120**	**HCR-8.2405.5120**	**HCR-8.2403.5130**	**HCR-8.2404.5130**	**HCR-8.2405.5130**
without position monitoring Part no. up to 160°C*	**HCR-8.2403.5020**	**HCR-8.2404.5020**	**HCR-8.2405.5020**	**HCR-8.2403.5030**	**HCR-8.2404.5030**	**HCR-8.2405.5030**
Accessories Drill bushes DIN 179	12 x 12	17 x 16	21 x 20	12 x 12	17 x 16	21 x 20
Part no.	**CLR-3300-285**	**CLR-3300-287**	**CLR-3300-288**	**CLR-3300-285**	**CLR-3300-287**	**CLR-3300-288**

* Temperatures up to 250°C on request ** Clamping edge height: on request to Euromap standard, tolerance ± 0.1 mm

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Wedge clamp, double-acting, type V for dies with flat clamping edge

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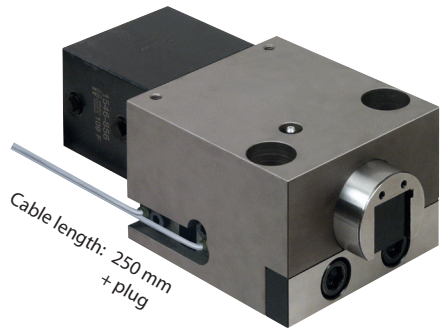
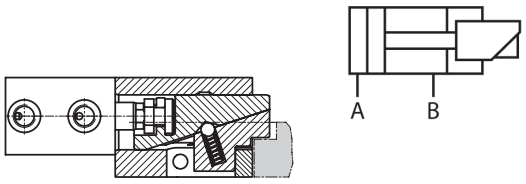
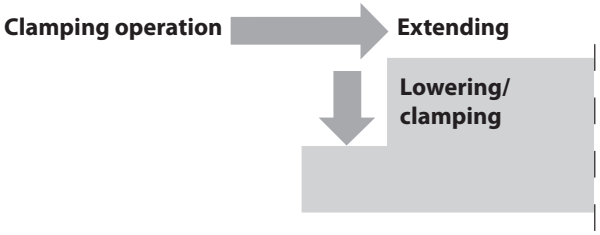
Type V - Clamping force vertically applied to the clamping edge







Please note:
In case of incorrect operation of the wedge clamping element, the clamping bolt may fully retract into the guide housing and thus cause the upper die falling off the slide.

When using wedge clamping elements on the press slide, it is recommended that multiple-circuit hydraulic supply of the clamping elements and pilot-controlled check valves are used for securing hydraulic clamping.

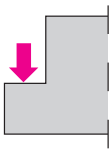
The greasing intervals (high-temperature grease) should be scheduled in accordance with the operating conditions (at least once a week). **Greasing of the clamping bolt should only be made with the elements being retracted.**

Clamping elements with a wedge clamping bolt must be protected against dirt, scale, swarf, coolant, etc. by means of a suitable covering. If penetration of such foreign matters cannot be prevented, this type of element should not be used.

Position monitoring
The integrated position monitoring is coupled to the clamping bolt and the contact bolt and signals:

1. **Clamping bolt in unclamping position**
2. **Clamping bolt in clamping position**
3. **Error message when overrunning the clamping position**

Application:



- safe clamping of dies with flat clamping edge, even in case of pressure loss
- for clamping of dies in injection molding machines
- for clamping of dies on press bed and slide

Design:

Double-acting wedge clamp for clamping dies on the press bed or slide or for clamping dies in injection molding machines.

The wedge clamp consists of a hydraulic block cylinder and a two-piece thrust pad.

Clamping cycle: the bolt with the thrust pad first performs a defined idle stroke. When the inner stop is reached, the thrust pad is lowered onto the clamping edge.

The angle of the thrust pad has been determined to ensure that despite self-locking the oil pressure required for unclamping is not higher than that required for clamping.

Since the clamping force is vertically transmitted to the clamping point, no transverse forces occur.

The wedge clamp is available with or without position monitoring.

Special features:

- the clamping piston does not retract in the case of pressure drop
- available in sizes of 25 kN, 50 kN and 100 kN
- high functional reliability ensured by position monitoring and automatic cycle
- rugged and compact design
- special versions available on request
- well-proven clamping element with high degree of safety and long service life
- retracting clamping bolt ensures unrestricted die change

Versions

- without position monitoring
  max. temperature: 160 °C
  (300 °C on request)

- with position monitoring at the side
  max. temperature: 100 °C

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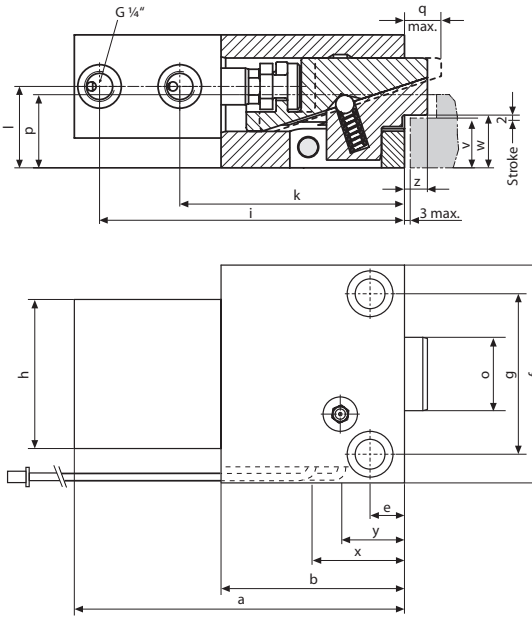
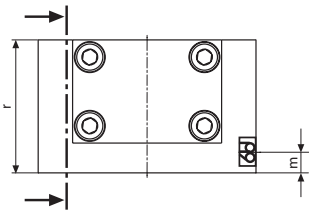
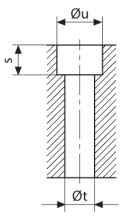
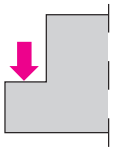
Wedge clamp, double-acting

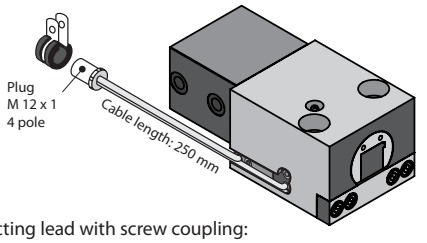
Type V - Clamping force vertically applied to the clamping edge











Connecting lead with screw coupling:
cable length 5 m **part no. HCR-5700-013**
cable length 10 m **part no. HCR-5700-014**

Proximity switch (Twin Set):
part no. HCR-2.5012.0073 (spare part)

Max. clamping force (kN)	**25**	**50**	**100**
Perm. retention force (kN)			
Schraube DIN 912 8.8	35	65	130
Screw DIN 912 12.9	45	75	145
Max. operating pressure (bar)	**250**	**250**	**250**
Cylinder-Ø (mm)	25	40	50
Max. stroke	2	2	2
Max. oil consumption (cm³)	10	31	49
Clamping stroke (mm)	1	1	1
a (mm)	144	196	240
b (mm)	80	117	150
e (mm)	15	33	32
f (mm)	95	100	140
g (± 0,2 mm)	70	70	105
h (mm)	65	85	100
i (mm)	133	185	227
k (mm)	98	141	177
l (mm)	35,5	48,5	62,5
m (mm)	9	9	17
Ø o (mm)	32	50	60
p (mm)	32	43	56
q max. (mm)	17	24	24
r (mm)	58	80	100
s (mm)	13	16	22
Ø t (mm)	13	17	21
Ø u (mm)	20	26	32
v** (± 0,3) (mm)	22	25	35
w (mm)	23	26	36
x (mm)	39	65	85
y (mm)	26	47	50
z (mm)	10	17	17
Weight (kg)	4,28	9,55	15,20
with position monitoring up to 100°C **Part no.**	**HCR-8.2403.6601**	**HCR-8.2404.6611**	**HCR-8.2405.6621**
without position monitoring up to 160°C **Part no.**	**HCR-8.2403.6800**	**HCR-8.2404.6810**	**HCR-8.2405.6820**

**Clamping edge height: on request to Euromap standard, tolerance ±0.3 mm

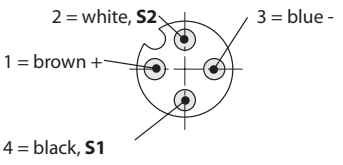
Technical data - Position monitoring

Tripping function	N/O contact
Type	PNP
Nom. tripping cycle Sn	1 mm
Ambient temperature T_A	-25°C ... + 100°C * Ambient temperature 120° for 1000 working hours.
Operating voltage U_B	10 ... 30 V DC
Residual ripple/supply frequency	≤ 15% (SS)
Max. constant current	100 mA
Unit power consumption	≤ 10 mA
Voltage drop U_D at I max.	≤ 1,5 V
Output resistance R_A	4,7 kΩ
Material of housing	corrosion-proof steel
Type of connection *2	plug on the right side
Protective system acc. to DIN 40050	IP 67

Cable length: 250 mm

*** A design to withstand higher temperatures is available on request**

Pin assignment:



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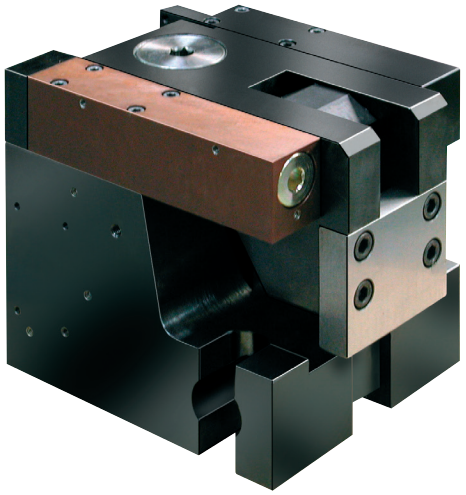
Extending clamp
double-acting, with mechanical lock



Applications:

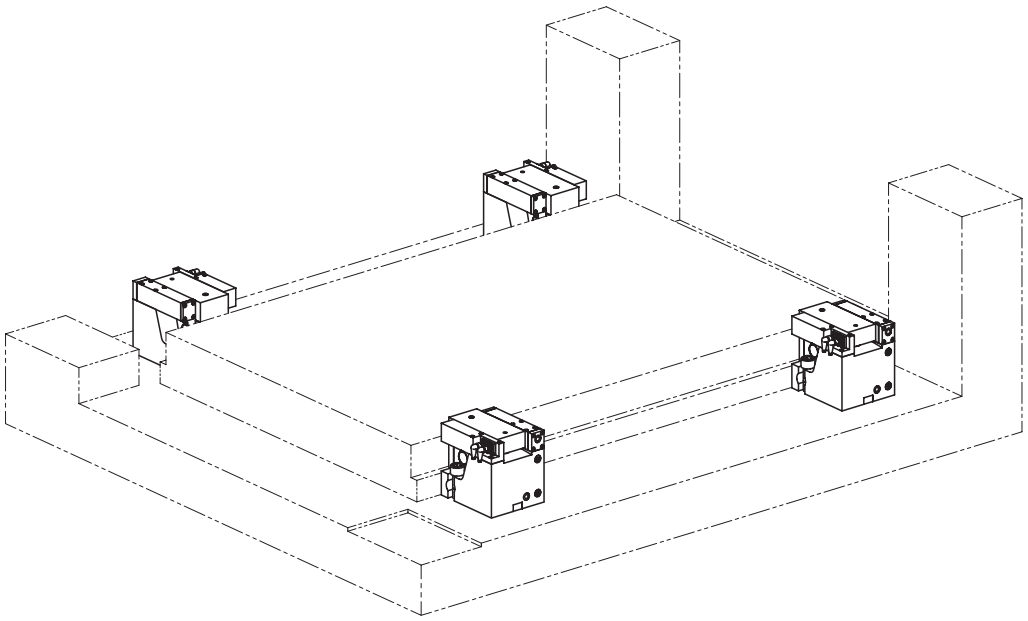
- preferably on press beds
- for clamping and locking dies and moving bolsters in presses

Clamping:
For clamping, the cylinder piston pushes the clamping lever into the clamping position. Released by the hydraulic sequence control, pressure is then applied to the clamping and locking mechanism.
Once the clamping force is built up, the clamping element is self-locking. This *mechanical lock* prevents unintentional unclamping of the die even if there is a loss of pressure.

Unclamping:
For unclamping, the clamping and locking mechanism is hydraulically unlocked.
Released by the hydraulic sequence control, pressure is applied to the cylinder piston which pushes the clamping lever into the unclamping position.
Unclamping and clamping positions are monitored by inductive proximity switches.

Special features:

- compact housing and high power density
- high functional reliability ensured by position monitoring and automatic cycle
- self-locking by mechanical lock
- low operating pressure of 100 bar
- easy installation



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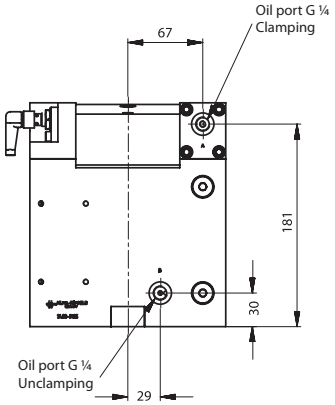
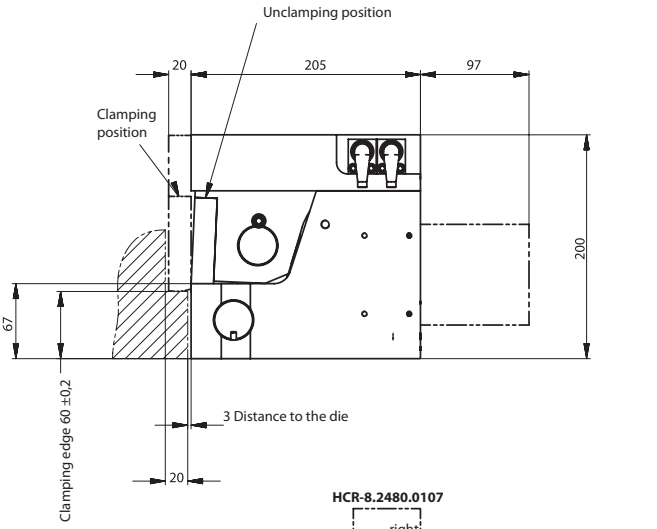
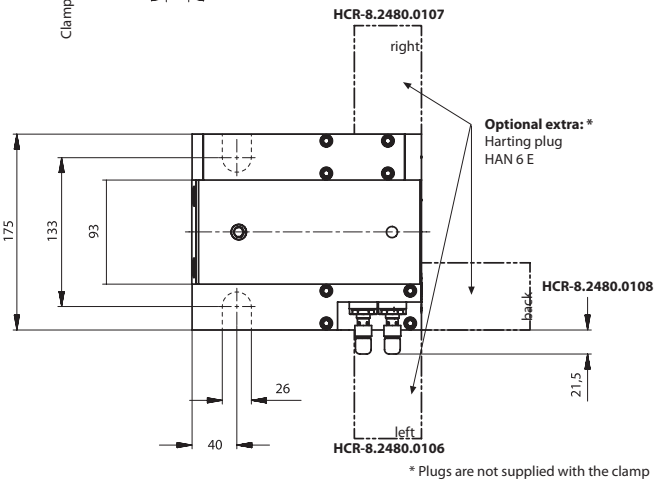
Extending clamp
double-acting, with mechanical lock







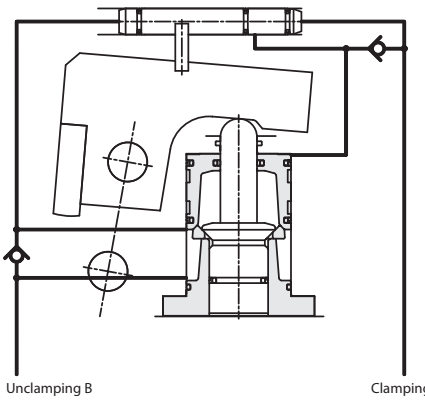
* Plugs are not supplied with the clamp

Clamping force at 100 bar (kN)	**200**
Perm. retaining power (kN)	250
Working pressure (bar)	100
Oil consumption clamping (cm^3)	204
Oil consumption unclamp.(cm^3)	188
Pump delivery (l/min)	1,6 – 2,5
Operating temperature (°C)	70
Screws DIN 912-8.8	M 24
Required torque (Nm)	660
Weight (kg)	46
Part no.	**HCR-8.2480.0105**

Special designs are available at request.

- Design and position of plug-in connection for proximity switches
- Proximity switches for temperatures of up to 120°C
- Cover plate for protection in extremely dirty environments
- Clamping edge height larger than 60 mm

Hydraulic diagram



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adjustable
adjustable
adjustable
adjustable
adjustable
adjustable

hydraulic

Hydraulic clamping elements
adjustable

adjustable
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3

Contents
Product group 3

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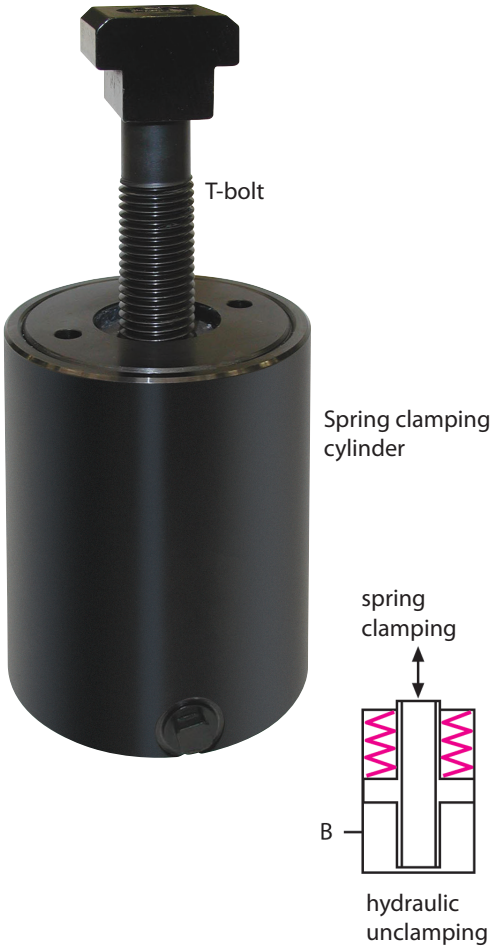
Hollow piston cylinder, single-acting

• spring clamping • hydraulic unclamping



Applications:

- un-pressurized long-term clamping of dies or fixtures on press beds and rams
- when the space available is limited

Function:

Manual positioning of the cylinder on the die clamping edge.

Unclamping is carried out by applying hydraulic pressure to the piston, clamping takes place by spring power.

By means of the T-bolt the die is clamped against the clamping surface of the press ram or bed.

Special features:

- hydraulic supply is only required for unclamping, i.e. for a short time
- ideal power transmission
- convenient and compact design with gripping surface
- no colliding edges, smooth die positioning
- suitable for retrofit
- easy fastening

For suitable power units
please refer to product group 7

For accessories
please refer to product group 11

Recommended accessory:
Angular rotary coupling
part no. HCR-9208-043

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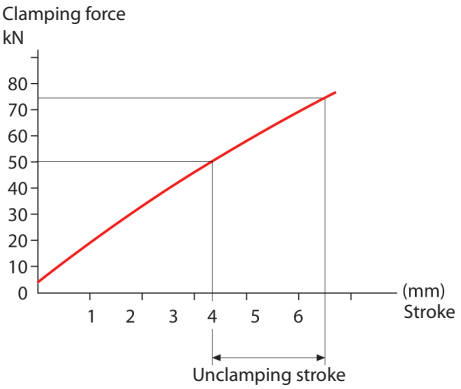
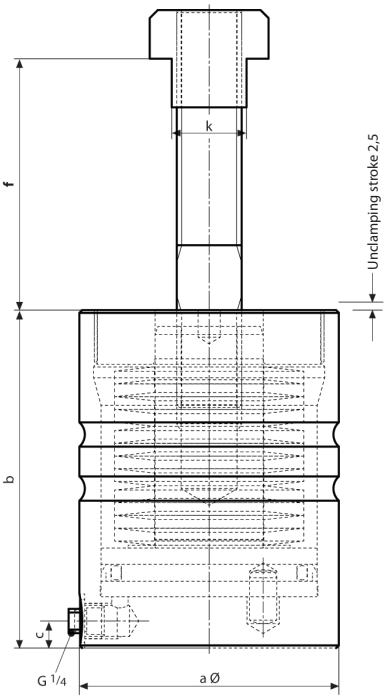
Hollow piston cylinder, single-acting
• spring clamping • hydraulic unclamping

Spring clamping cylinder, complete with adjusted and pinned T-bolt, Dimension 'f' to be quoted in the order

For T-slot (mm)	22	28
Clamping force (kN)	**50**	**50**
Unclamping pressure (bar)	175	175
Unclamping stroke (mm)	2,5	2,5
Oil consumption/1 mm of stroke (cm^3)	5	5
a (mm)	96	96
b (mm)	125	125
c (mm)	10	10
k (mm)	22	28
Weight (kg)	6,8	7,0
Part no.	**HCR-8.1403.2200**	**HCR-8.1403.2800**



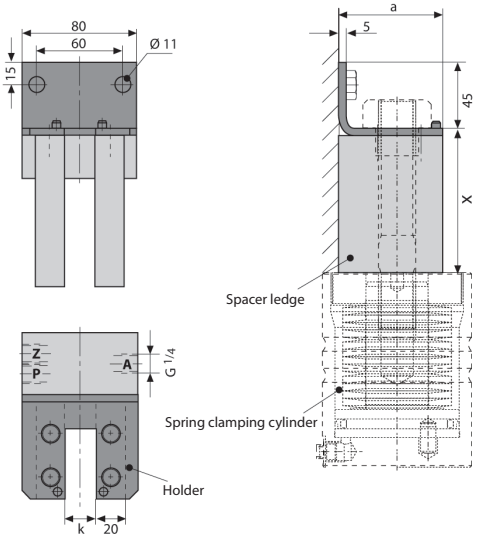


Dimension 'f' =
die clamping edge
+ web height + unclamping stroke

Parking station during die change

Holder with spacer ledges fastened (without a connector block) Part no.	HCR-8.2753.2230	HCR-8.2753.2830
Width of T-slot k (mm)	22	28
a (mm)	72	85
Separate holder Part no.	**HCR-2753-220**	**HCR-2753-280**

Special versions are available on request



Distance 'x':
x = dimension '**f**' - 4 mm
(to be quoted in the order)

Carr Lane Roemheld Mfg Co.
927 Horan Drive, Fenton, MO 63026
Phone 800-827-2526 Fax 636-386-8034 www.roemheld-usa.com

Hollow piston clamp, single acting

• hydraulic clamping • spring unclamping

ROEMHELD
HILMA ▪ STARK

Applications:

- on press beds and rams
- on machines and equipment for clamping and locking
- when the available space is limited
- when temperatures may reach 120° C (248°F)

Function:

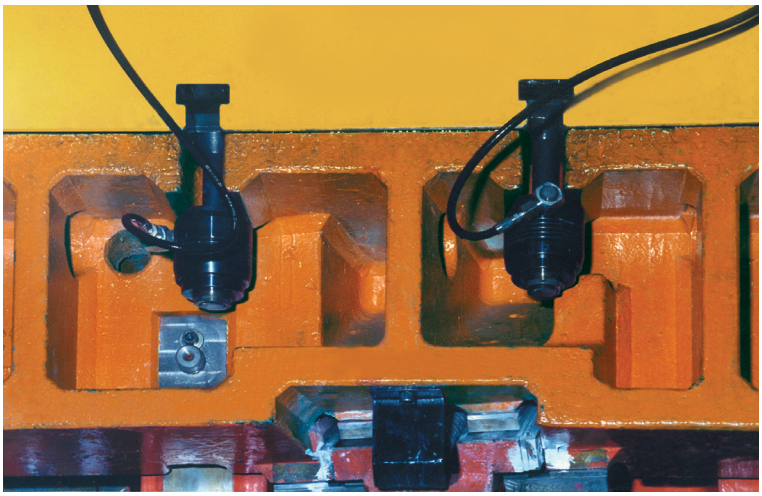
The sliding clamp is manually placed on the clamping edge of the die. The die is clamped by applying hydraulic pressure to the piston and mechanically unclamped by spring return.

The T-bolt clamps the die on the clamping surface of the press ram or bed.

Special features:

- optional spherical disk for optimum adaptation to the clamping surface
- T-bolt, pinned to maintain clamping dimension
- convenient and compact design with gripping surface
- clamping force of between 60 and 104 kN
- large clamping stroke
- no colliding edges, smooth die positioning
- suitable for retrofit
- hardened and ground piston
- easy fastening
- fully utilizable stroke

For power units
please refer to product group 7



Hollow piston cylinders fastened to the press ram

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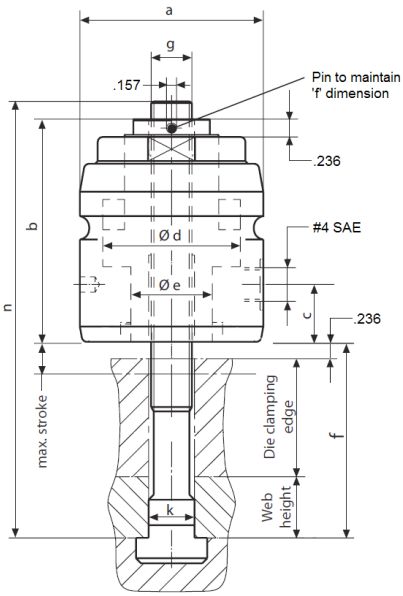
Hollow piston clamp, single acting

• for ANSI T-slot • without spherical washer

Hollow piston cylinder complete with T-bolt , adjusted and pinned
Dimension 'f' to be quoted in the order

for T-slot (in)	11/16	13/16	1-1/16	1-5/16
Clamping force at 5,800 psi (lbf)	**13,500**	**13,500**	**23,400**	**23,400**
Spring return force min. (lbf)	72	72	128	128
Piston-Ø d (in)	2.126	2.126	2.755	2.755
Stroke (in)	0.472	0.472	0.472	0.472
Total oil consumption (in³)	1.1	1.1	1.9	1.9
a (in)	2.834	2.834	3.543	3.543
b (in)	3.641	3.641	4.094	4.094
c (in)	1.102	1.102	0.944	0.944
g (in)	5/8-11	3/4-10	1-8	1-1/4 - 7
k (in)	11/16	13/16	1-1/16	1-5/16
Weight (lbm)	5.3	5.6	9.7	11
Part no.	**HCR-2134-611**	**HCR-2134-613**	**HCR-2135-617**	**HCR-2135-621**

36,000 lbf clamping force at 5,800 psi upon request



Example of ordering: HCR-2135-617-1234

Hollow piston cylinder
Clamping force: 23,400 lbf

T-slot
1-1/16

Functional dimension
'f' = 1.234 inch

Hollow piston cylinder without a T-bolt

Part no.	HCR-2134-213	HCR-2134-313	HCR-2135-213	HCR-2135-313
Weight (lbm)	4.6	4.5	7.8	7.3

Dimension 'f' =
die clamping edge
+ web height + ½ stroke

T-bolt, detached

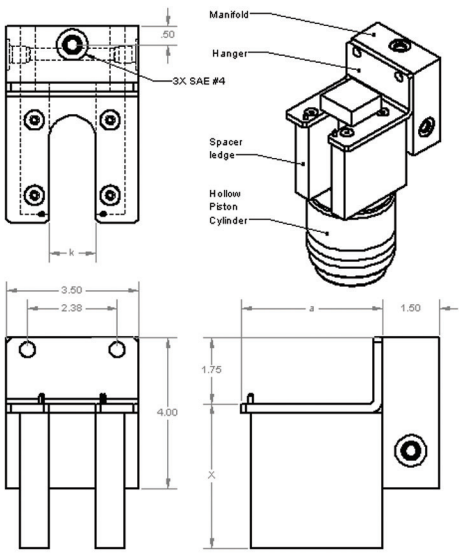
for T-slot (in)	11/16	13/16	1-1/16	1-5/16
Length n (in)	7	7	8	8
Strength	grade 8	grade 8	grade 8	grade 8
Weight (lbm)	0.7	1.1	2.1	3.7
Part no.	**HCR-HM-TB062-0700**	**HCR-HM-TB075-0700**	**HCR-HM-TB100-0800**	**HCR-HM-TB125-0800**

If hollow piston cylinder and T-bolt are supplied separately, adjust them to suit dimension 'f' and secure them.

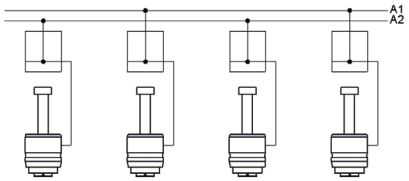
Clamp holders and hangars for clamps not in use

① ② ③ **Complete holder (holder, spacer ledge and manifold block) Part no.**	**Available on request**	**HCR-2753-705-XXXX**	**HCR-2753-775-XXXX**	**Available on request**
① ② **Holder with spacer ledges fastened (without a manifold block) Part no.**	**Available on request**	**HCR-2753-700-XXXX**	**HCR-2753-770-XXXX**	**Available on request**
③ **Hangar (without spacer ledge, with manifold block) Part no.**	**Available on request**	**HCR-2753-275**	**HCR-2753-285**	**Available on request**
① **Hangar for hollow piston cylinder**	**2134**	**2134**	**2135**	**2135**
Width of T-slot k (in)	11/16	13/16	1-1/16	1-5/16
a (in)	3.75	3.75	3.75	3.75
Part no.	**Available on request**	**HCR-2753-270**	**HCR-2753-280**	**Available on request**

Special versions are available on request.



Application with manifold blocks for dual parallel safety circuit



Distance 'x':
x = dimension '**f**' - ½ stroke
(to be quoted in the order)

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Hollow piston clamp, single acting

• for ANSI T-slot • with spherical washer

ROEMHELD
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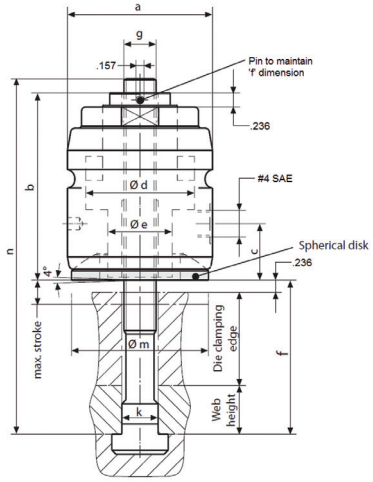
Hollow piston cylinder complete with T-bolt , adjusted and pinned
Dimension 'f' to be quoted in the order

for T-slot (in)	11/16	13/16	1-1/16	1-5/16
Clamping force at 5,800 psi (lbf)	**13,500**	**13,500**	**23,400**	**23,400**
Spring return force min. (lbf)	72	72	128	128
Piston-Ø d (in)	2.126	2.126	2.755	2.755
Stroke (in)	0.472	0.472	0.472	0.472
Total oil consumption (in³)	1.1	1.1	1.9	1.9
a (in)	2.834	2.834	3.543	3.543
b (in)	3.661	3.661	4.133	4.133
c (in)	1.102	1.102	0.944	0.944
g (in)	5/8-11	3/4-10	1-8	1-1/4 - 7
k (in)	11/16	13/16	1-1/16	1-5/16
m (in)	2.677	2.677	3.071	3.071
Weight (lbm)	5.3	5.6	9.7	11
Part no.	**HCR-2134-711**	**HCR-2134-713**	**HCR-2135-717**	**HCR-2135-721**

36,000 lbf clamping force at 5,800 psi upon request



Example of ordering: HCR-2135-717-1234

Hollow piston cylinder
Clamping force: 23,400 lbf

T-slot
1-1/16

Functional dimension
'**f**' = 1.234 inch

Hollow piston cylinder without a T-bolt

Part no.	HCR-2134-210	HCR-2134-310	HCR-2135-210	HCR-2135-310
Weight (lbm)	4.6	4.5	7.8	7.3

T-bolt, detached

for T-slot (in)	11/16	13/16	1-1/16	1-5/16
Length n (in)	7	7	8	8
Strength	grade 8	grade 8	grade 8	grade 8
Weight (lbm)	0.7	1.1	2.1	3.7
Part no.	**HCR-HM-TB062-0700**	**HCR-HM-TB075-0700**	**HCR-HM-TB100-0800**	**HCR-HM-TB125-0800**

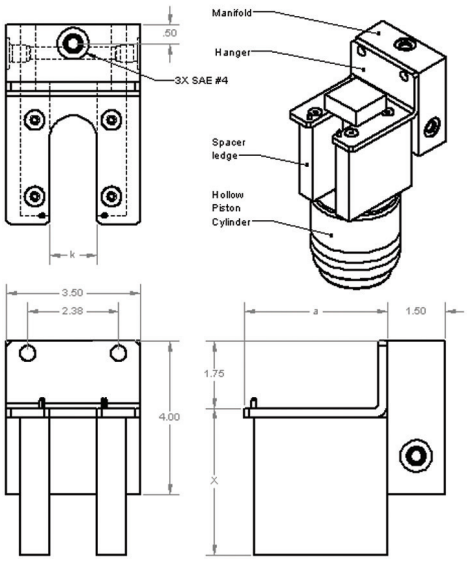
If hollow piston cylinder and T-bolt are supplied separately, adjust them to suit dimension 'f' and secure them.

Dimension 'f' =
die clamping edge
+ web height + ½ stroke

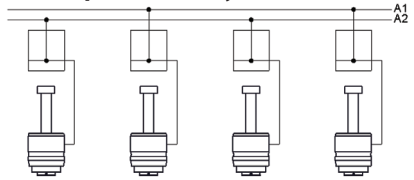
Clamp holders and hangars for clamps not in use

① ② ③ **Complete holder (holder, spacer ledge and manifold block) Part no.**	**Available on request**	**HCR-2753-705-XXXX**	**HCR-2753-775-XXXX**	**Available on request**
① ② **Holder with spacer ledges fastened (without a manifold block) Part no.**	**Available on request**	**HCR-2753-700-XXXX**	**HCR-2753-770-XXXX**	**Available on request**
③ **Hangar (without spacer ledge, with manifold block) Part no.**	**Available on request**	**HCR-2753-275**	**HCR-2753-285**	**Available on request**
① **Hangar for hollow piston cylinder**	**2134**	**2134**	**2135**	**2135**
Width of T-slot k (in)	11/16	13/16	1-1/16	1-5/16
a (in)	3.75	3.75	3.75	3.75
Part no.	**Available on request**	**HCR-2753-270**	**HCR-2753-280**	**Available on request**

Special versions are available on request.



Application with manifold blocks for dual parallel safety circuit



Distance 'x':
x = dimension'**f**' - ½ stroke
(to be quoted in the order)

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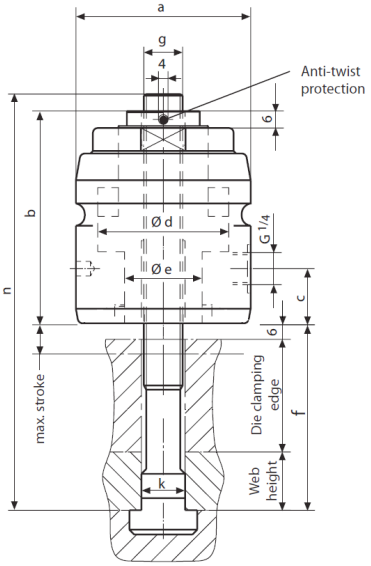
Hollow piston clamp, single acting

• for metric T-slot • without spherical washer

Hollow piston cylinder complete with T-bolt , adjusted and pinned
Dimension 'f' to be quoted in the order

for T-slot (mm)	18	22	28	36
Clamping force at 400 bar (kN)	**60**	**60**	**104***	**104***
Spring return force min. (N)	320	320	570	570
Piston-Ø d (mm)	54	54	70	70
Stroke (mm)	12	12	12	12
Total oil consumption (cm^3)	18	18	32	32
a (mm)	72	72	90	90
b (mm)	92.5	92.5	104	104
c (mm)	28	28	24	24
g (mm)	M 16	M 20	M 24	M 30
k (mm)	18	22	28	36
Weight (kg)	2.49	2.74	4.85	5.38
Part no.	**HCR-8.2134.1832**	**HCR-8.2134.2232**	**HCR-8.2135.2832**	**HCR-8.2135.3632**

kN lbf clamping force at 400 bar upon request



Example of ordering: HCR-8.2134.1832.F110

Hollow piston cylinder
Clamping force: 60kN

T-slot
18mm

Functional dimension
'**f**' = 110 mm

Hollow piston cylinder without a T-bolt

Part no.	HCR-8.2134.0132	HCR-8.2134.1132	HCR-8.2135.0132	HCR-8.2135.1132
Weight (kg)	2.2	2.16	3.75	3.58

Dimension 'f' =
die clamping edge
+ web height + ½ stroke

T-bolt, detached

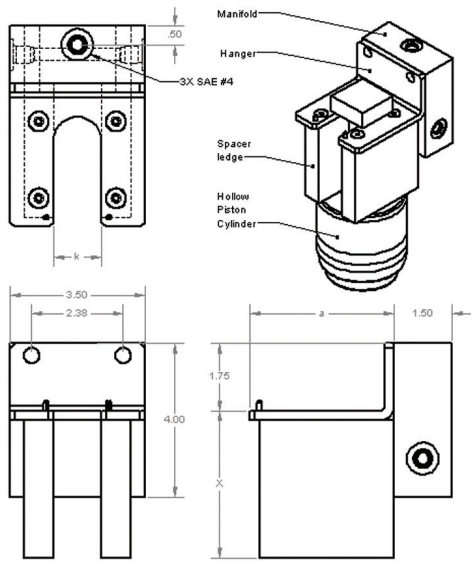
for T-slot (mm)	18	22	28	36
Length n (mm)	160	200	250	250
Strength	8.8	8.8	8.8	8.8
Weight (kg)	0.29	0.58	1.1	1.8
Part no.	**HCR-5700-022**	**HCR-5700-023**	**HCR-5700-024**	**HCR-5700-048**

If hollow piston cylinder and T-bolt are supplied separately, adjust them to suit dimension 'f' and secure them.

Clamp holders and hangars for clamps not in use

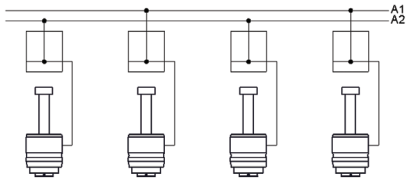
① ② ③ **Complete holder (holder, spacer ledge and manifold block) Part no.**	**HCR-2753-755-XXXX**	**HCR-2753-765-XXXX**	**HCR-2753-775-XXXX**	**HCR-2753-795-XXXX**
① ② **Holder with spacer ledges fastened (without a manifold block) Part no.**	**HCR-8.2753.1830.XXXX**	**HCR-8.2753.2230.XXXX**	**HCR-2753-770-XXXX**	**HCR-8.2753.3630.XXXX**
③ **Hangar (without spacer ledge, with manifold block) Part no.**	**HCR-2753-255**	**HCR-2753-265**	**HCR-2753-285**	**HCR-2753-295**
① **Hangar for hollow piston cylinder**	**2134**	**2134**	**2135**	**2135**
Width of T-slot k (mm)	18	22	28	36
a (mm)	72	72	95	90
Part no.	**HCR-2753-180**	**HCR-2753-220**	**HCR-2753-280**	**HCR-2753-360**

Special versions are available on request.



Distance 'x':
x = dimension'**f**' - ½ stroke
(to be quoted in the order)

Application with manifold blocks for dual parallel safety circuit



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Hollow piston clamp, single acting

• for metric T-slot • with spherical washer

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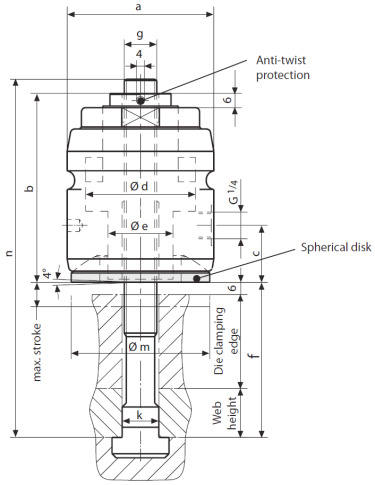
Hollow piston cylinder complete with T-bolt , adjusted and pinned
Dimension 'f' to be quoted in the order

for T-slot (mm)	18	22	28	36
Clamping force at 400 bar (kN)	**60**	**60**	**104***	**104***
Spring return force min. (N)	320	320	570	570
Piston-Ø d (mm)	54	54	70	70
Stroke (mm)	12	12	12	12
Total oil consumption (cm^3)	18	18	32	32
a (mm)	72	72	90	90
b (mm)	93	93	105	105
c (mm)	28	28	24	24
g (mm)	M 16	M 20	M 24	M 30
k (mm)	18	22	28	36
m (mm)	68	68	78	78
Weight (kg)	2,39	2,67	4,77	5,29
Part no.	**HCR-8.2134.1802**	**HCR-8.2134.2202**	**HCR-8.2135.2802**	**HCR-8.2135.3602**

160 kN clamping force at 400 bar upon request



Example of ordering: HCR-8.2134.1802.F110

- HCR-8.2134 — Hollow piston cylinder, Clamping force: 60kN
- 1802 — T-slot 18mm
- F110 — Functional dimension 'f' = 110 mm

Hollow piston cylinder without a T-bolt

Part no.	HCR-8.2134.0102	HCR-8.2134.1102	HCR-8.2135.0102	HCR-8.2135.1102
Weight (kg)	2.1	2.09	3.67	3.49

Dimension 'f' =
die clamping edge
+ web height + ½ stroke

T-bolt, detached

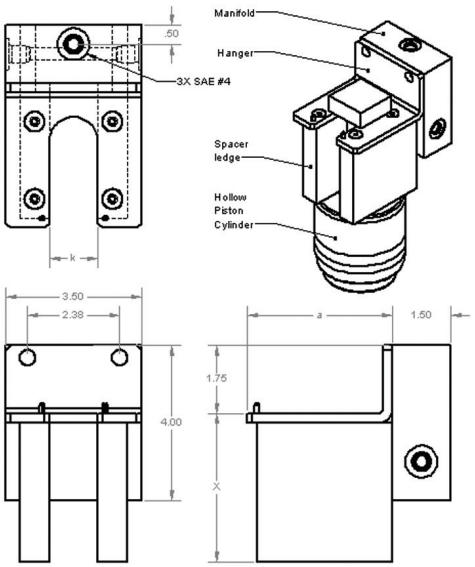
for T-slot (mm)	18	22	28	36
Length n (mm)	160	200	250	250
Strength	8.8	8.8	8.8	8.8
Weight (kg)	0.29	0.58	1.1	1.8
Part no.	**HCR-5700-022**	**HCR-5700-023**	**HCR-5700-024**	**HCR-5700-048**

If hollow piston cylinder and T-bolt are supplied separately, adjust them to suit dimension 'f' and secure them.

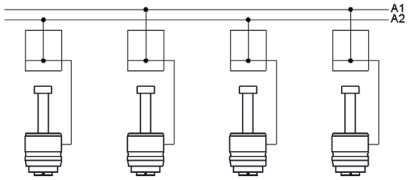
Clamp holders and hangars for clamps not in use

① ② ③ **Complete holder (holder, spacer ledge and manifold block) Part no.**	**HCR-2753-755-XXXX**	**HCR-2753-765-XXXX**	**HCR-2753-775-XXXX**	**HCR-2753-795-XXXX**
① ② **Holder with spacer ledges fastened (without a manifold block) Part no.**	**HCR-8.2753.1830.XXXX**	**HCR-8.2753.2230.XXXX**	**HCR-2753-770-XXXX**	**HCR-8.2753.3630.XXXX**
③ **Hangar (without spacer ledge, with manifold block) Part no.**	**HCR-2753-255**	**HCR-2753-265**	**HCR-2753-285**	**HCR-2753-295**
① **Hangar for hollow piston cylinder**	**2134**	**2134**	**2135**	**2135**
Width of T-slot k (mm)	18	22	28	36
a (mm)	72	72	95	90
Part no.	**HCR-2753-180**	**HCR-2753-220**	**HCR-2753-280**	**HCR-2753-360**

Special versions are available on request.



Application with manifold blocks for dual parallel safety circuit



Distance 'x':
x = dimension'**f**' - ½ stroke
(to be quoted in the order)

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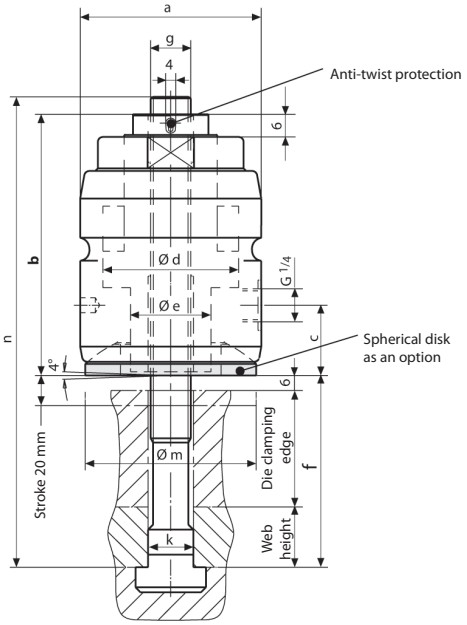
Hollow piston clamp, single acting
• special versions

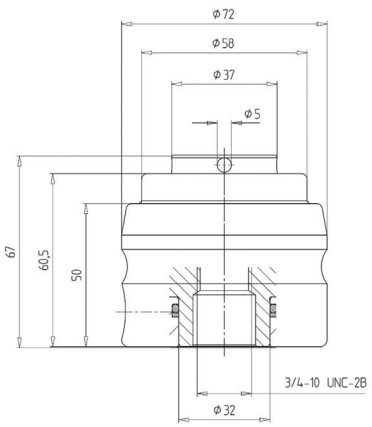


Version with variable clamping dimension

Freely adjustable and flexible adaptation to suit varying heights of clamping edges by rapid and easy adjustment of the tie rod using a counter nut. The tie rod is inserted through the hollow piston cylinder and adjusted to the correct dimension by means of the counter nut.

In this version, the cylinder has a through-hole instead of a thread.

Technical design, clamping forces and dimensions are as shown on catalog sheet 3.2130 for the standard design.

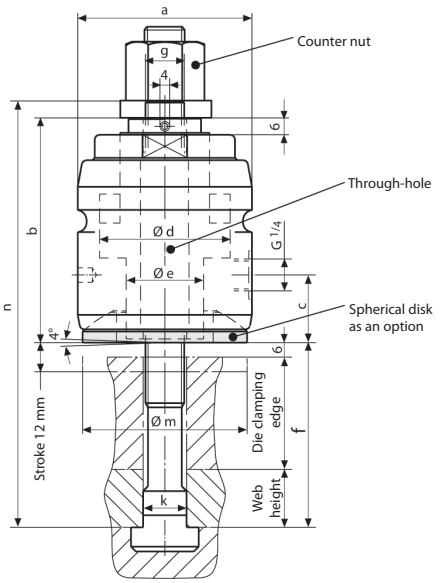


Version with a total stroke of 20 mm

Optimum adaptation to varying heights of the clamping edges of dies by an increased total stroke of 20 mm (higher total stroke on request).

Technical design, clamping forces and dimensions correspond to the standard in catalog sheet 3.2130. Due to the increased total stroke, dimension ‘b‘ is greater than indicated in catalog sheet 3.2130.

Total stroke 20 mm:
Dimension ‘b‘ with a clamping force of 60 kN: 120 mm
Dimension ‘b‘ with a clamping force of 104 kN: 132 mm



Version with compact size

Compact 2134 hollow piston clamp for use in small spaces. Reduced total height, reduced stroke and without spherical washer to make the clamp as small as possible. Available with metric thread up to M20 and inch thread up to 3/4 inch.

Safety information
Increased risk of injury in the case of an incorrect adjustment of the version with higher total stroke or variable clamping dimension. The clamping stroke must be less than 6 mm.

Carr Lane Roemheld Mfg Co.
927 Horan Drive, Fenton, MO 63026
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Sliding clamp, compact
single acting with spring return

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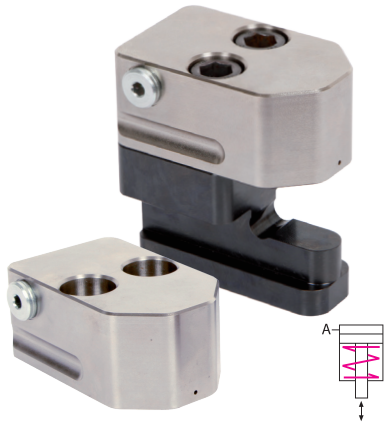

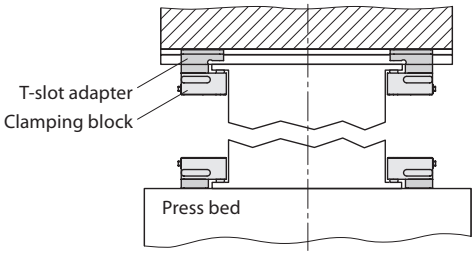

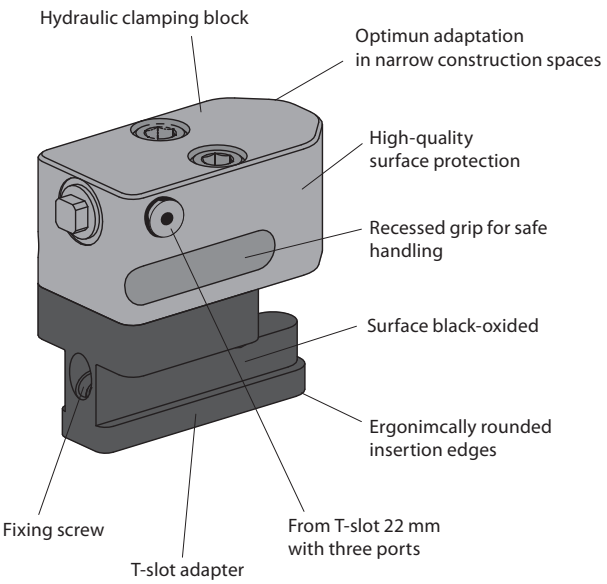

Applications:

- the "compact" sliding clamp is a hydraulic clamping element, used with minimum space requirements for clamping and looking on machines and plants, on press bed and ram.
- due to the manageable and rounded design, "compact" sliding clamps are especially suitable where space is limited as, for example, on high-speed punching presses. The use is possible at ambient temperatures up to a maximum of 120˚C.

Function

Manual positioning of the sliding clamp in the T-slots of the press ram or bed. Clamping on the die clamping edge by the application of hydraulic pressure to the piston and unclamping by spring force.

The "compact" sliding clamp consists of a hydraulic clamping block which will be fixed with two screws to a T-slot adapter.

The clamping block can also be directly screwed without T-slot adapter and can be ordered separately.

Advantages

- high clamping force in combination with small size and low weight
- ergonomic T-slot adapter for easy insertion
- high-quality surface protection on the clamping block
- clamping block rounded and thus optimum adaptation in narrow construction spaces
- safe handling by special recessed grip
- T-slot 14, 18, 22 and 28 mm are available
- total stroke 8 and 12 mm
- die standardization with regard to the width and depth in not required
- easy to retrofit

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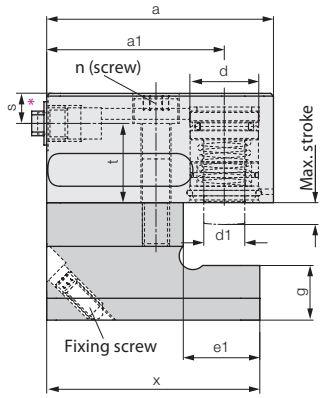
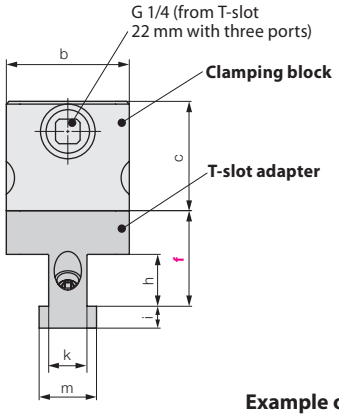
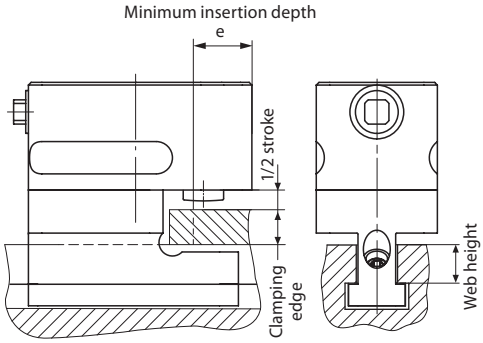
Sliding clamp, compact
single acting with spring return

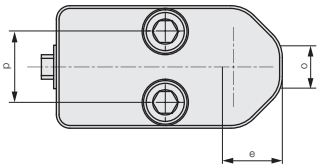
Hydraulic sliding clamp complete, with T-slot adapter







* From T-slot 22 mm with hydraulic port at the rear and at the side



Example of ordering

Functional dimension "f":
= 1/2 stroke
+ die clamping height
+ web height of the T-slot
Please specify when ordering.

HCR-8.2202.1855.F60

Sliding clamp
Clamping force: 19.6 kN

T-slot
18 mm

Functional dimension "f" [mm]
Please specify when ordering

T-slot as per DIN 650	**[mm]**	**14**	**18**	**22**	**22**	**28**	**28**
Clamping force at 400 bar	**[kN]**	**19.6**	**19.6**	**32**	**50**	**50**	**78**
Stroke	[mm]	8	8	8	8	8	12
Oil volume	[cm³]	4	4	7	10	10	24
Dimension "f" min.	**[mm]**	**30**	**41**	**50**	**50**	**55**	**60**
Dimension "f" max.	**[mm]**	**75**	**90**	**106**	**106**	**112**	**117**
a	[mm]	83	83	104	111	111	132
a1	[mm]	65	65	81	85	85	99
b	[mm]	45	45	65	65	65	80
c	[mm]	40	40	47	50	50	75
d	[mm]	25	25	32	40	40	50
d1	[mm]	15	15	15	20	20	25
e (min. insertion depth)	[mm]	22	22	28	31	31	38
e1	[mm]	28	33	41	48	48	60
g	[mm]	20	24	32	32	42	42
h	[mm]	19	25	30	30	37	37
i	[mm]	8	10	14	14	18	18
k	[mm]	14	18	22	22	28	28
m	[mm]	21	28	35	35	44	44
n (screw DIN 912, 10.9)		M 10	M 10	M 16	M 16	M 16	M 20
o	[mm]	18	18	20	20	20	28
p	[mm]	26	26	36	36	36	43
r	[mm]	40	40	50	50	50	57
s	[mm]	11	11	12	12	12	17.5
t	[mm]	29	29	29	32	32	53
x	[mm]	78	83	104	104	104	132
Clamping block with T-slot adapter							
Weight	[kg]	1.5	2.9	3.6	3.9	4.5	7.5
Part no.		**HCR-8.2202.1455**	**HCR-8.2202.1855**	**HCR-8.2203.2255**	**HCR-8.2204.2255**	**HCR-8.2204.2855**	**HCR-8.2205.2855**
Clamping block, separate							
Weight	[kg]	0.7	0.7	2.0	2.3	2.3	4.9
Part no.		**HCR-8.2202.1305**	**HCR-8.2202.1305**	**HCR-8.2203.1305**	**HCR-8.2204.1305**	**HCR-8.2204.1305**	**HCR-8.2205.1305**

Please consult us if aggressive spray is used.
Max. operating pressure 400 bar, max. operating temperature 120° C.
Further sizes and special versions are available on request.

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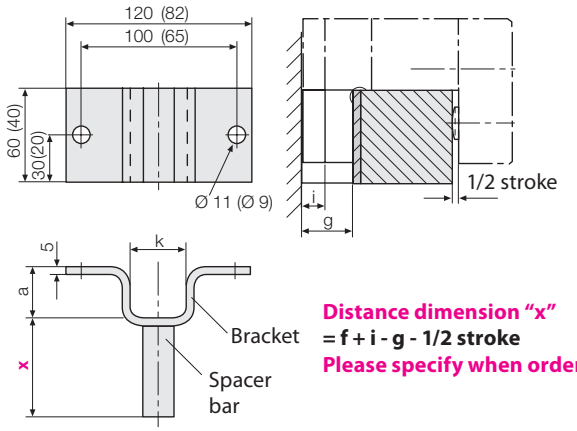
Sliding clamp, compact
single acting with spring return

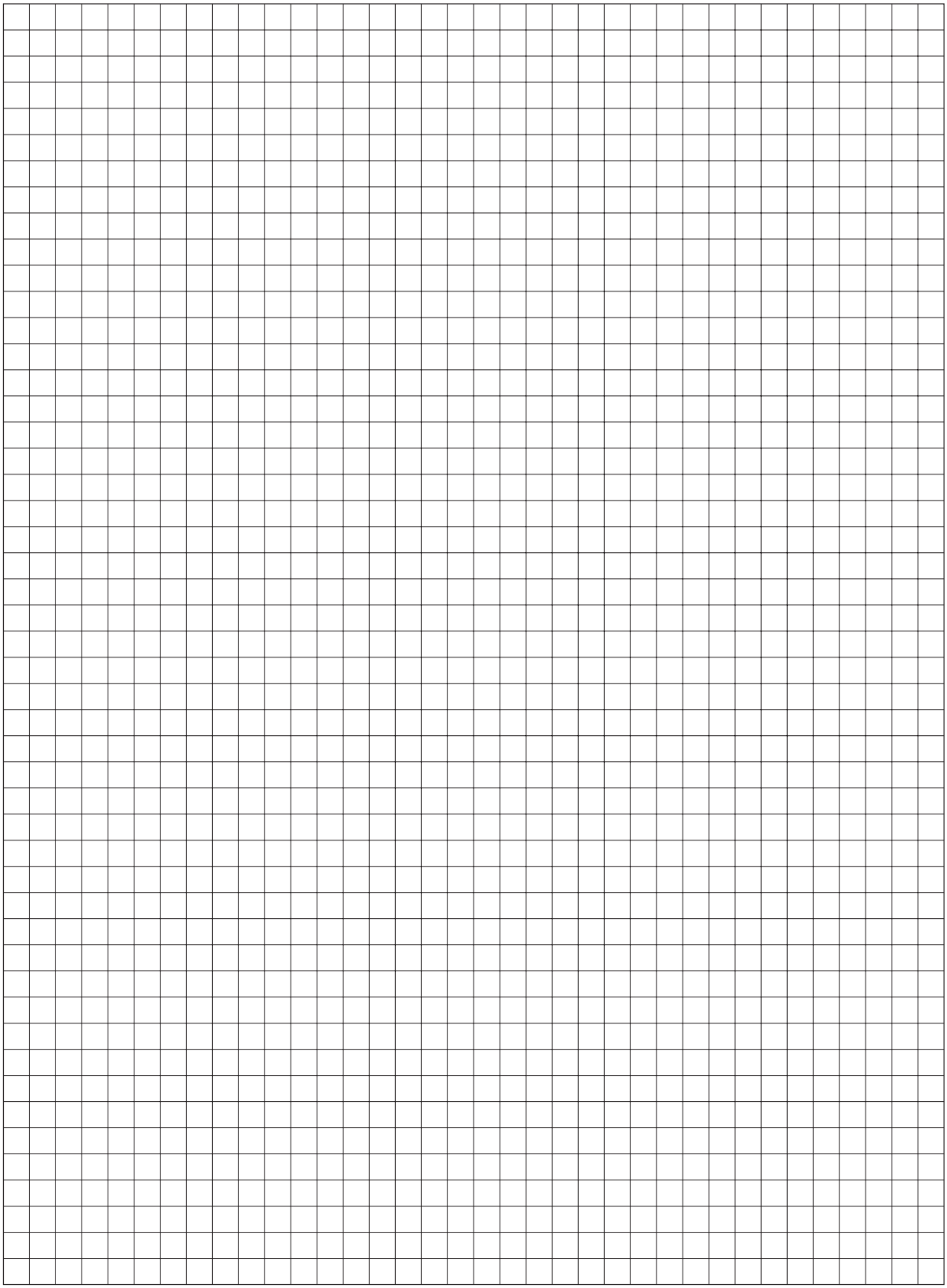
Values in brackets for 14mm T-slots



Distance dimension "x"
= f + i - g - 1/2 stroke
Please specify when ordering

Parking station
accommodates the sliding clamp during die change

T-slot as per DIN 650	**[mm]**	**14**	**18**	**22**	**28**
a	[mm]	21	25	33	43
k	[mm]	23	30	37	46
l	[mm]	8	10	14	18
g	[mm]	20	24	32	42
Parking station complete (with bracket and spacer bar)					
Part no.		**HCR.8.2754.1450**	**HCR.8.2754.1850**	**HCR.8.2754.2250**	**HCR.8.2754.2850**
Bracket Part no.		**HCR.8.2754.1400**	**HCR-2754-180**	**HCR-2754-220**	**HCR-2754-280**



Sliding clamp, classic
single acting, with spring return

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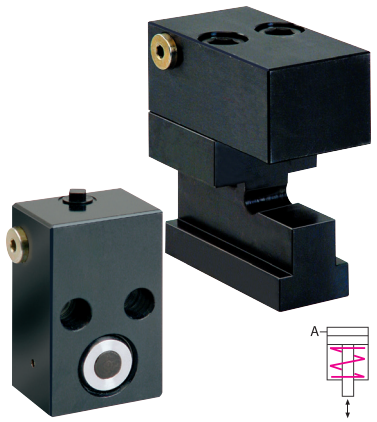
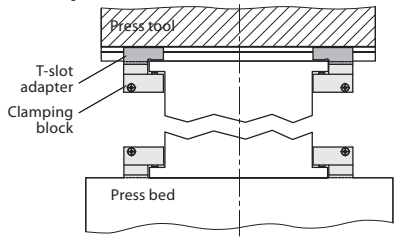
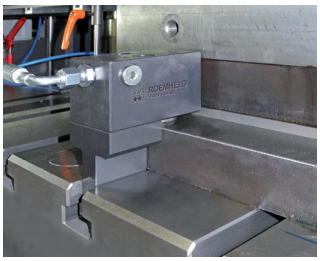


Installation option





Applications:

- the “classic“ sliding clamp is a very sturdy hydraulic clamping element, used with low space requirements for clamping and locking on machines and plants, on press bed and ram.
- the use is possible at ambient temperatures up to a maximum of 120˚C.

Function:

Manual positioning of the sliding clamp in the T-slots of the press ram or bed. Clamping on the die clamping edge by the application of hydraulic pressure to the piston and unclamping by spring force.

The “classic” sliding clamp consists of a hydraulic clamping block which will be fixed with two screws to a T-slot adapter.

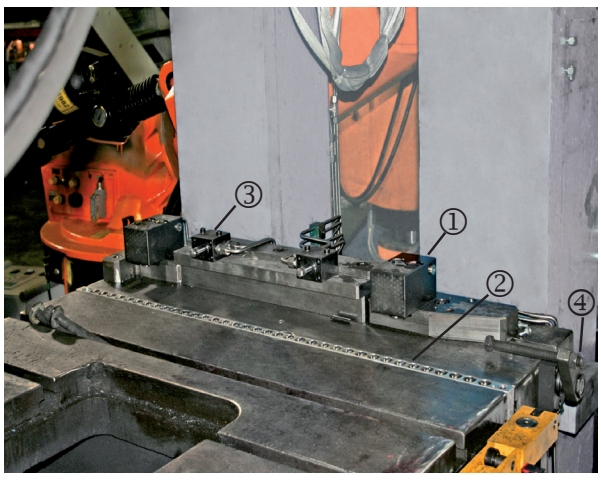
The clamping block can also be directly screwed without T-slot adapter and can be ordered separately.

Advantages:

- optimum force transmission
- clamping force from 19 kN up to 78 kN
- easy mounting
- suitable for large clamping edge tolerances
- no colliding edges when inserting the dies
- T-slot 18, 22, 28 and 36 mm are available
- total stroke 8 and 12 mm
- die standardization with regard to the width and depth is not required
- easy to retrofit

Application examples

Sliding clamp with T-slot adapter in press bed and ram, roller bars and carrying consoles for tool insertion.



Clamping block ① separately mounted on bars, ball bars ② in the press bed, carrying consoles in front. Block cylinders ③ and swing clamps ④ for positioning.

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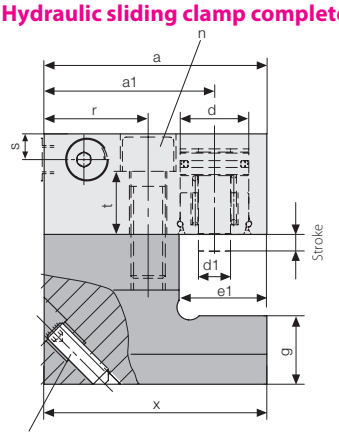
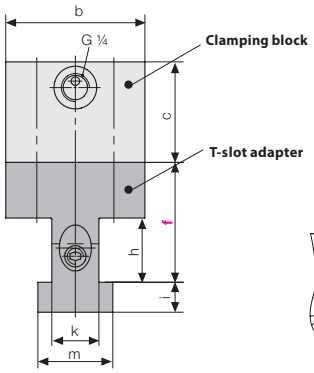
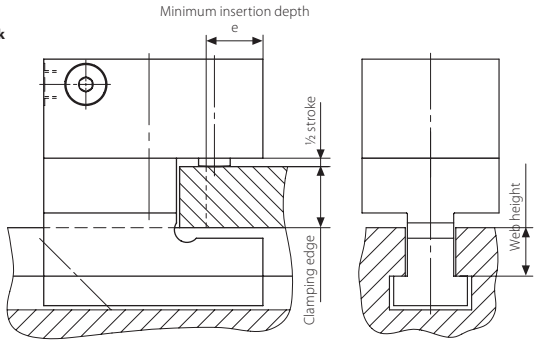
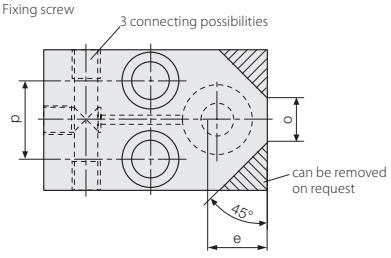
Sliding clamp, classic
single acting, with spring return

Hydraulic sliding clamp complete, with T-slot adapter









Functional dimension "f":
= ½ stroke
+ die clamping height
+ web height of the T-slot

Please specify when ordering.

Example of ordering

HCR-8.2202.1850.F60

Sliding clamp
Clamping force: 19.6 kN

T-slot
18 mm

Functional dimension "f" [mm]
Please specify when ordering

T-slot as per DIN 650 [mm]	**18**	**22**	**22**	**22**	**28**	**28**	**28**
Clamping force at 400 bar [kN]	**19.6**	**19.6**	**32**	**50**	**32**	**50**	**78**
Stroke [mm]	8	8	8	8	8	8	12
Oil volume [cm³]	4	4	7	10	7	10	24
Dimension "f" min.[mm]	**42**	**50**	**50**	**50**	**55**	**55**	**60**
Dimension "f" max.[mm]	**90**	**106**	**106**	**106**	**112**	**112**	**117**
a [mm]	95	95	104	111	104	111	132
a1 [mm]	77	77	81	85	81	85	99
b [mm]	65	65	65	65	65	65	80
c [mm]	40	40	47	50	47	50	75
d [mm]	25	25	32	40	32	40	50
d1 [mm]	15	15	15	20	15	20	25
e (min. insertion depth) [mm]	23	23	28	31	28	31	38
e1 [mm]	32	32	41	48	41	48	60
g [mm]	24	32	32	32	42	42	42
h [mm]	25	30	30	30	37	37	37
i [mm]	10	14	14	14	18	18	18
k [mm]	18	22	22	22	28	28	28
m [mm]	28	35	35	35	44	44	44
n (screw DIN 912, 10.9)	M 16	M 16	M 16	M 16	M 16	M 16	M 20
o [mm]	18	18	20	20	20	20	28
p [mm]	36	36	36	36	36	36	43
r [mm]	50	50	50	50	50	50	57
s [mm]	12	12	12	12	12	12	17.5
t [mm]	24	24	29	32	29	32	53
x [mm]	95	104	104	104	104	104	132
Clamping block with T-slot adapter							
Weight [kg]	2.9	3.2	4.0	4.3	4.5	4.7	9.3
Part no.	**HCR-8.2202.1850**	**HCR-8.2202.2250**	**HCR-8.2203.2250**	**HCR-8.2204.2250**	**HCR-8.2203.2850**	**HCR-8.2204.2850**	**HCR-8.2205.2850**
Clamping block, separate							
Weight [kg]	1.6	1.6	2.0	2.3	2.0	2.3	4.9
Part no.	**HCR-8.2202.1301**	**HCR-8.2202.1301**	**HCR-8.2203.1301**	**HCR-8.2204.1301**	**HCR-8.2203.1301**	**HCR-8.2204.1301**	**HCR-8.2205.1301**

(supplied without fixing screws)

Please consult us if aggressive spray is used.
Max. operating pressure 400 bar, max. operating temperature 120°C.
Further sizes and special versions are available on request.

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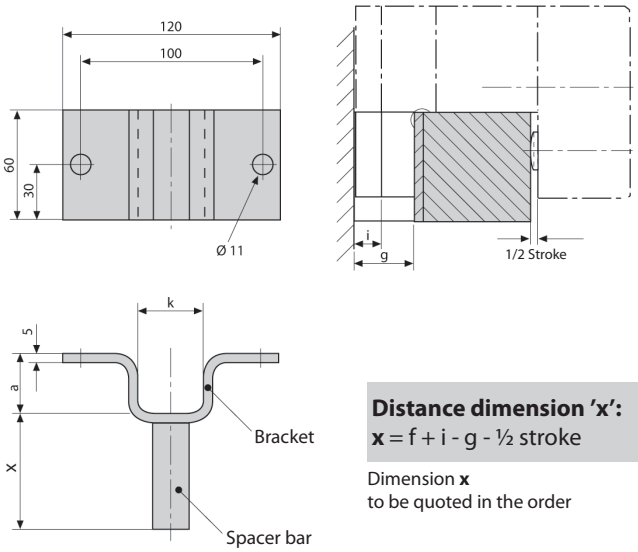
Sliding clamp, classic
single acting, with spring return



Distance dimension 'x':
x = f + i - g - ½ stroke

Dimension **x**
to be quoted in the order

Parking station
accommodates the sliding clamp during die change

T-slot as per DIN 650 (mm)	18	22	28
a (mm)	25	33	43
k (mm)	30	37	46
i (mm)	10	14	18
g (mm)	24	32	42
Parking station complete with bracket and spacer bar Part no.	**HCR-8.2754.1850**	**HCR-8.2754.2250**	**HCR-8.2754.2850**
Part no. Bracket	**HCR-2754-180**	**HCR-2754-220**	**HCR-2754-280**

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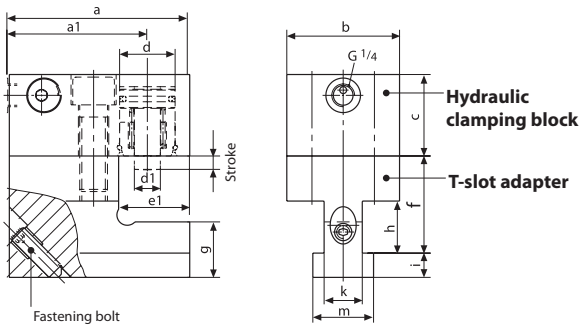
Sliding clamp, classic single acting, inch/ASA T-slot

Sliding clamp complete

T-slot (inch)	Clamping force (lbs)	Part no.
13/16	4,300	HCR-8.2202.1350
13/16	7,200	HCR-8.2203.1350
13/16	11,300	HCR-8.2204.1350
1 1/16	7,200	HCR-8.2203.1750
1 1/16	11,300	HCR-8.2204.1750
1 1/16	17,600	HCR-8.2205.1750



Example of ordering: HCR-8.2202.1350/ F3125

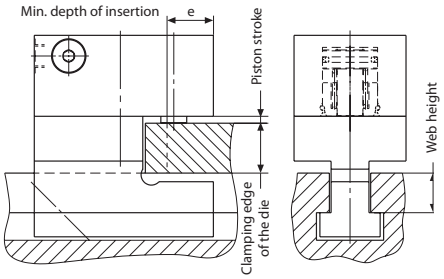
Sliding clamp
Clamping force 4,300 lbs

T-slot
13/16 inch

Functional dimension '**f**' (inch) to be quoted in the order

Functional dimension 'f':
½ stroke
+ height of die clamping edge
+ web height of T-slot
= dimension '**f**'

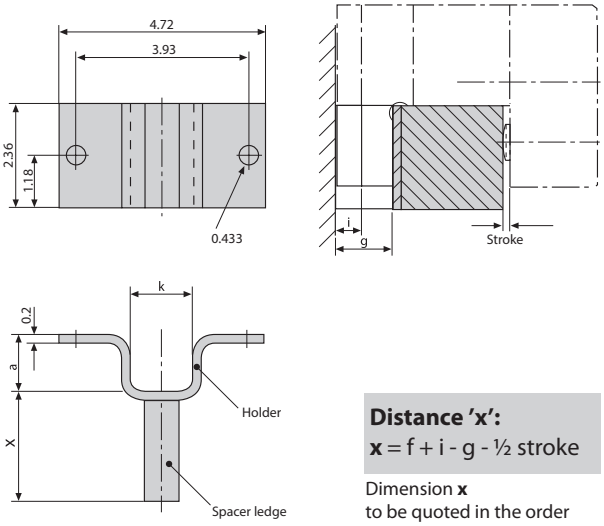
T-slot as per ASA (inch)	13/16	13/16	13/16	1 1/16	1 1/16	1 1/16
Clamping forceat 5,800 psi (lbs)	**4,300**	**7,200**	**11,300**	**7,200**	**11,300**	**17,600**
Stroke (inch)	0.315	0.315	0.315	0.315	0.315	0.472
Oil consumption (in³)	0.250	0.430	0.610	0.430	0.610	1.460
a (inch)	3.740	4.095	4.370	4.095	4.370	5.196
a1 (inch)	3.031	3.189	3.346	3.189	3.346	3.897
b (inch)	2.559	2.559	2.559	2.559	2.559	3.149
c (inch)	1.574	1.850	1.968	1.850	1.968	2.952
d (inch)	0.984	1.259	1.574	1.259	1.574	1.968
d1 (inch)	0.590	0.590	0.787	0.590	0.787	0.984
e (inch)	0.926	1.103	1.221	1.103	1.221	1.497
e1 (inch)	1.890	1.890	1.890	1.890	1.890	2.361
g (inch)	1.024	1.024	1.024	1.378	1.378	1.378
h (inch)	1.173	1.173	1.173	1.375	1.375	1.375
i (inch)	0.515	0.515	0.515	0.703	0.703	0.703
k (inch)	0.783	0.783	0.783	1.033	1.033	1.033
m (inch)	1.299	1.299	1.299	1.654	1.654	1.654
Weight (lb)	7.9	8.8	9.5	11.3	12	17.7



max. operating pressure 5,800 psi
Please consult us if aggressive spray is used

Parking station accommodates the clamping element during die change

T-slot as per ASA (inch)	13/16	1 1/16
a (inch)	1.299	1.693
k (inch)	1.456	1.811
i (inch)	0.515	0.703
g (inch)	1.024	1.378
Parking station complete with holder and ledge Part no.	**HCR-2754-220-XXXX**	**HCR-2754-280-XXXX**
Holder Part no.	**HCR-2754-220**	**HCR-2754-280**
Spacer ledge Part no.	**HCR-2754-220-XXXX-SP**	**HCR-2754-280-XXXX-SP**



Distance 'x':
x = f + i - g - ½ stroke

Dimension **x**
to be quoted in the order

For suitable **power units** please refer to product group 7
For **hydraulic hoses** please refer to product group 11

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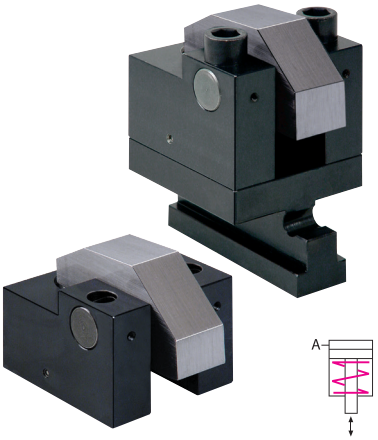
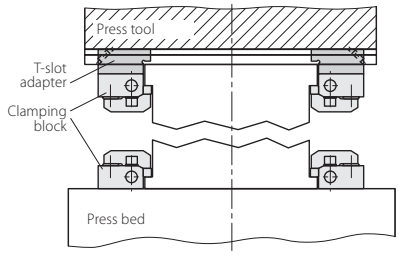
Angular clamp, hydraulic single acting, with spring return



Installation option



Applications:

- angular clamps are used for clamping and locking on machines and plants, on press bed and ram.
- due to the manageable and rounded design, angular clamps are especially suitable where space is limited and with small clamping edges.
- the use is possible at ambient temperatures up to a maximum of 120°C.

Function:

The angular clamp is manually placed in the T-slots provided in press ram or bed.

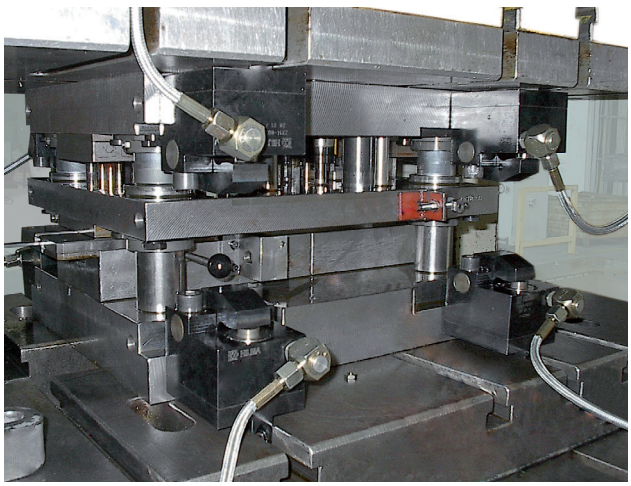
Clamping on the die clamping edge by the application of hydraulic pressure to the piston and unclamping by spring force.

The clamping block can also be directly screwed without T-slot adapter and can be ordered separately.

Advantages:

- optimum force transmission
- compact design
- easy mounting
- suitable for minimum clamping edges
- T-slot 18, 22, 28 and 36 mm are available
- total stroke 5.5 – 6 mm
- die standardization with regard to the width and depth is not required
- easy to retrofit

Application example



Angular clamp with T-slot adaptor in a high-speed punching press, the clamping force per clamping point is 66 kN

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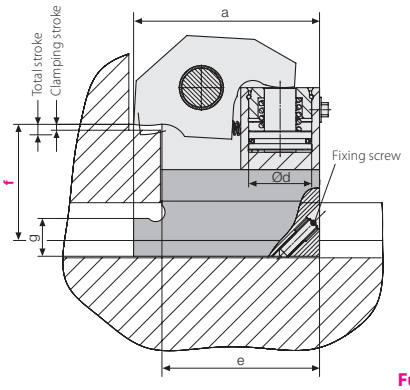
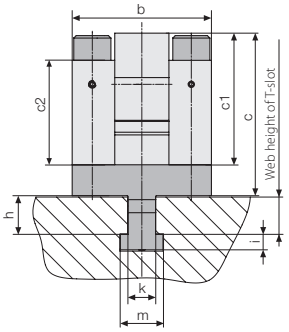
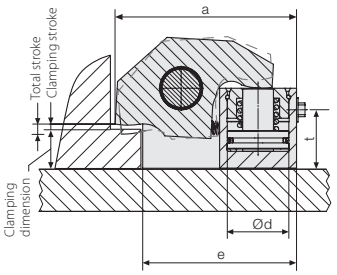
Angular clamp, hydraulic single acting, with spring return

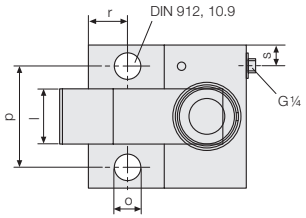
Angular clamp complete, with T-slot adapter

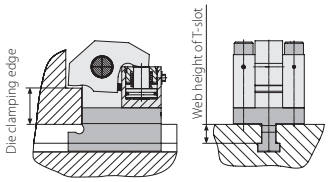




Clamping block separate, without T-slot adapter







Functional dimension "f":
= clamping stroke
+ die clamping edge
+ web height of T-slot
Please specify when ordering

Example of ordering

HCR-8.2314.2211 . F110

Angular clamp
Clamping force: 66 kN

T-slot
22 mm

Functional dimension "f" [mm]
Please specify when ordering

T-slot as per DIN 650	**[mm]**	**18**	**22**	**22**	**28**	**28**	**36**
Clamping force at 400 bar	**[kN]**	**40**	**40**	**66**	**66**	**110**	**110**
Clamping force at 100 bar	**[kN]**	**10**	**10**	**16.5**	**16.5**	**27.5**	**27.5**
Total stroke	[mm]	5.5	5.5	6	6	6	6
Clamping stroke	[mm]	2.5	2.5	3	3	3	3
Clamping dimension	[mm]	±1	±1	±1.5	±1.5	±1.5	±1.5
Oil volume	[cm³]	6.5	6.5	10	10	16	16
Dimension "f" min.	**[mm]**	**61**	**66**	**76**	**83**	**97**	**107**
Dimension "f" max.	**[mm]**	**90**	**95**	**96**	**103**	**157**	**167**
a	[mm]	101	101	118	118	147	147
b	[mm]	75	75	90	90	120	120
c max. (at "f" min.)	[mm]	93	93	106	106	133	133
c1	[mm]	80	80	88	88	108	108
c2	[mm]	62.5	62.5	67.5	67.5	85.0	85.0
d	[mm]	32	32	40	40	50	50
e	[mm]	85	85	100	100	125	125
g	[mm]	24	32	32	42	41	53
h	[mm]	25	30	30	37	37	47
i	[mm]	10	14	14	18	18	23
k	[mm]	18	22	22	28	28	36
l	[mm]	25	25	35	35	55	55
m	[mm]	28	35	35	44	44	54
o	[mm]	12.5	12.5	16.5	16.5	22.0	22.0
p	[mm]	50	50	64	64	90	90
r	[mm]	20	20	25	25	30	30
s	[mm]	13	13	13	13	20	20
t	[mm]	32	32	38	38	45	45
Clamping block with T-slot adapter	**Part no.**	**HCR-8.2312.1802**	**HCR-8.2312.2202**	**HCR-8.2314.2211**	**HCR-8.2314.2811**	**HCR-8.2315.2811**	**HCR-8.2315.3611**
Weight	[kg]	4.0	4.4	6.7	7.4	14.2	15.5
Clamping block, separate	**Part no.**	**HCR-8.2312.0101**	**HCR-8.2312.0101**	**HCR-8.2314.0501**	**HCR-8.2314.0501**	**HCR-8.2315.0501**	**HCR-8.2315.0501**
Clamping dimension	[mm]	20.5 ± 1	20.5 ± 1	25 ± 1.5	25 ± 1.5	32 ± 1.5	32 ± 1.5
Weight	[kg]	2.6	2.6	4.0	4.0	8.6	8.6
Clamping block, separate with position monitoring	**Part no.**	**HCR-8.2312.0104**		**HCR-8.2314.0504**			

Please consult us if aggressive spray is used. Max. operating pressure 400 bar, max. operating temperature 120 °C.
Further sizes and special versions are available on request.

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Angular clamp
single-acting, inch/ASA T-slot

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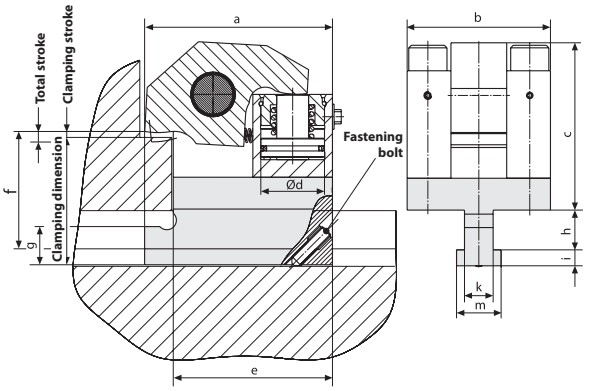
Angular clamp complete with T-slot adapter

T-slot (inch)	Clamping force (lbs)	Part no.
13/16	9,000	HCR-8.2312.1302
13/16	14,850	HCR-8.2314.1311
1 1/16	9,000	HCR-8.2312.1702
1 1/16	14,850	HCR-8.2314.1711
1 1/16	24,750	HCR-8.2315.1711



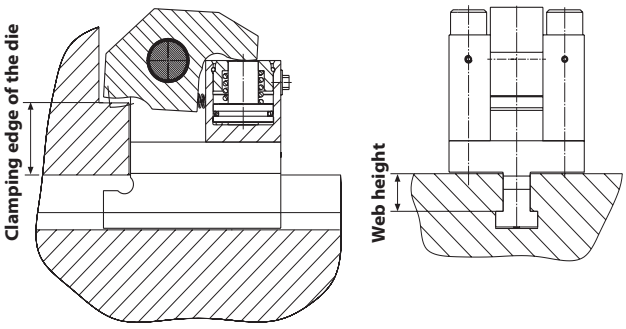
Example of ordering: HCR-8.2314.1311.F3125

- HCR-8.2314.1311.F3125 — Angular clamp, Clamping force 14,850 lbs
- 1311 — T-slot: 13/16 inch
- F3125 — Functional dimension '**f**' (inch) to be quoted in the order

T-slot as per ASA (inch)	13/16	13/16	1 1/16	1 1/16	1 1/16
Clamping force at 5,800 psi (lbs)	**9,000**	**14,850**	**9,000**	**14,850**	**24,750**
Clamping force at 1,450 psi (lbs)	2,250	3,700	2,250	3,700	6,200
Total stroke (inch)	0.217	0.236	0.217	0.236	0.236
Clamping stroke (inch)	0.098	0.118	0.098	0.118	0.118
Clamping dimension (inch)	0.807	0.984	0.807	0.984	1.260
Oil consumption (in^3)	0.397	0.610	0.397	0.610	0.976
a (inch)	3.976	4.646	3.976	4.646	5.787
b	2.953	3.543	2.953	3.543	4.724
c max. [for 'f' min] (inch)	3.661	3.661	4.173	4.173	5.236
d	1.260	1.575	1.260	1.575	1.969
e	3.346	3.937	3.346	3.937	4.921
g	0.944	0.944	1.654	1.654	1.654
h	1.173	1.173	1.375	1.375	1.375
i	0.515	0.515	0.703	0.703	0.703
k	0.783	0.783	1.033	1.033	1.033
m	1.299	1.299	1.654	1.654	1.654
Weight (lb)	10.1	13.2	12.6	15.7	25.9

max. operating pressure 5,800 psi
Please consult us if aggressive spray is used

Functional dimension 'f':
clamping stroke
+ height of die clamping edge
+ web height of T-slot
= dimension '**f**'



Please note:
Further dimensions with other clamping forces and T-slots are available on request.
The angular clamp may also be fastened directly, without a T-slot adapter. Position monitoring using laterally installed proximity switches on request.

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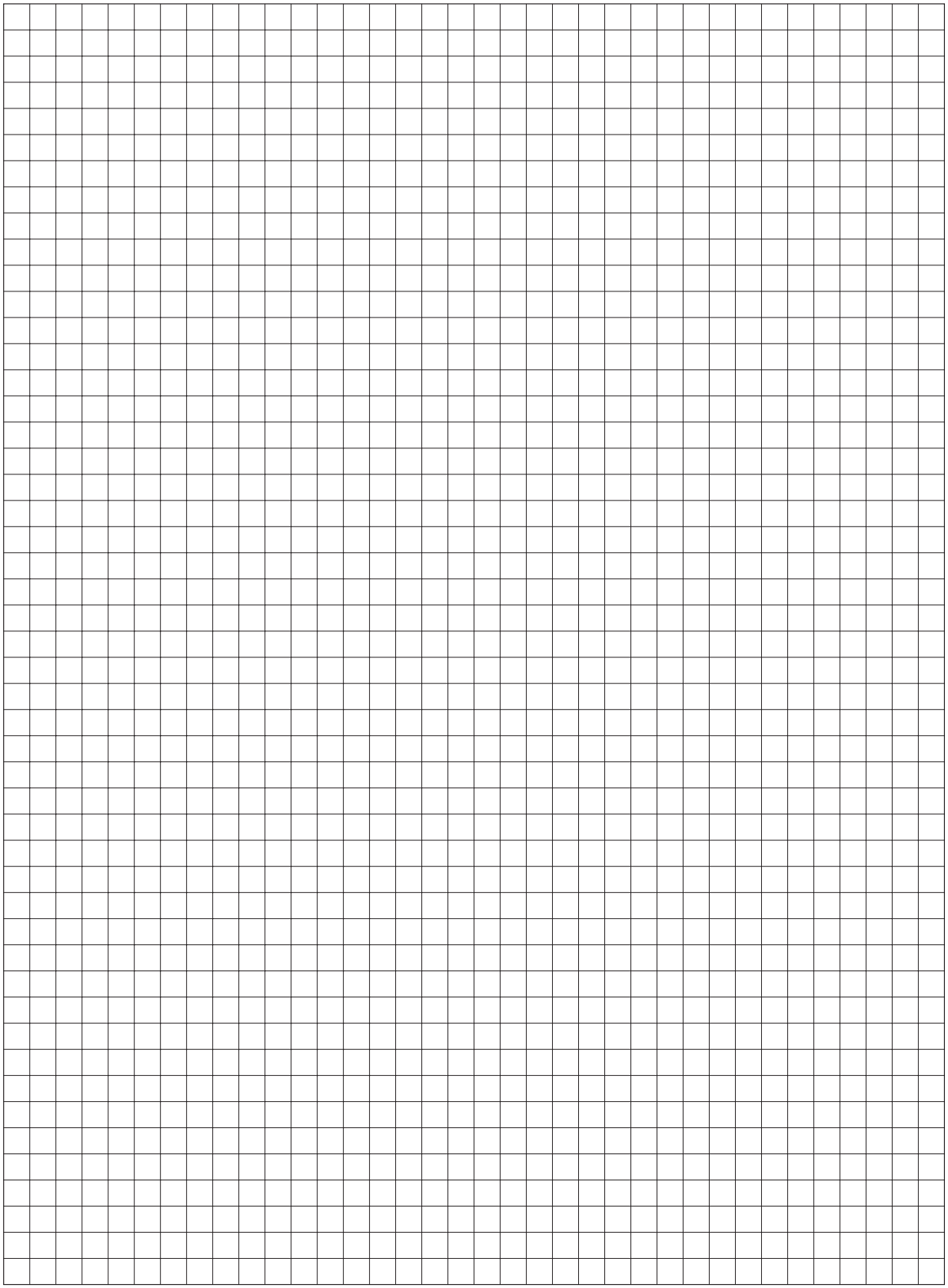

Flexline rapid clamping systems with drive chain clamping element, T-slot and adjustment track

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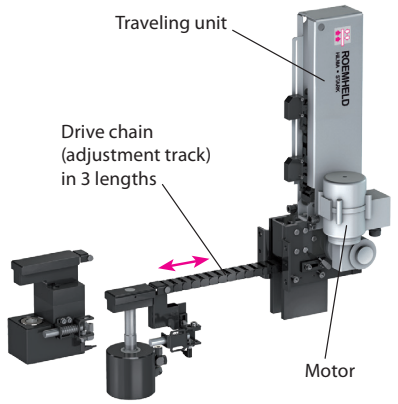

Clamping elements
in various designs

Advantages

- 8 different clamping elements
- 4 different T-slots
- 3 different adjustment tracks
- drive motor and "die position" monitor attachable on left or right
- easy to service, easily exchangeable modular assemblies ensure high availability of parts
- technical arrangement and finished drawing in just a few minutes
- highly flexible. low-maintenance hydraulic lines with high burst pressure

Applications:

- rapid clamping systems are used for the automatic clamping of dies of varying sizes on the press ram.

Function

The electro-mechanical drive chain moves the clamping element attached to the rapid clamping system automatically from the parking position to the clamping position at the clamping edge and then back to the parking position.

The T-slot of the machine serves as the guide for the drive chain and clamping element. The drive chain also serves as the energy chain for accommodating the hydraulic and electric lines of the clamping element.

Versions:

Flexline rapid clamping systems can be supplied in the following variants:

- Clamping elements
  Hollow piston cylinders, clamping cylinders with locking mechanism, spring clamping cylinders or sliding clamps
- T-slots 28, 32 or 36 mm or 1-1/16"
- Adjustment tracks (tracks of the clamping element) 660, 820 or 1100 mm
- Drive motor attached on left or right
- Optional position monitoring (configurable) micro switch for "end position" and "intermediate position"
- "Die position" monitoring attached on left or right
- Chain case in galvanized design or painted individually at customer's request
- Option: Arrangement with UL-compliant parts
- Various Harting connectors to choose from for motor current and monitoring signals
- Option: Socket housing for assembly to machine

Technical data

T-slot	**28 mm and 36 mm (DIN 650) / 32 mm (similar to DIN 650) and 1-1/16"**
Adjustment speed	150 mm/s
Multi-frequency motor	400 V 50 Hz and 480 V 60 Hz / 3~ AC
Motor current	0,18 A
Motor power	45 W
Motor connection	Harting connector with 500 mm cable length
Monitoring connection	Harting connector with 500 mm cable length
Monitoring: 1. Parking position 2. Die position Option: 3. "End position" (end of chain) 4. "Intermediate position"	 inductive sensor 24 (10-30) V DC inductive sensor 24 (10-30) V DC micro switch micro switch
Hydraulic connection	8 mm pipe nozzle with M 16 x 1.5 union nut (500 mm pipe length)
Operating temperature	max. 70°C
Part No.	**HCR-8228X** (standard version)

Application example

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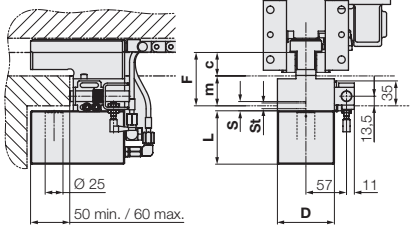
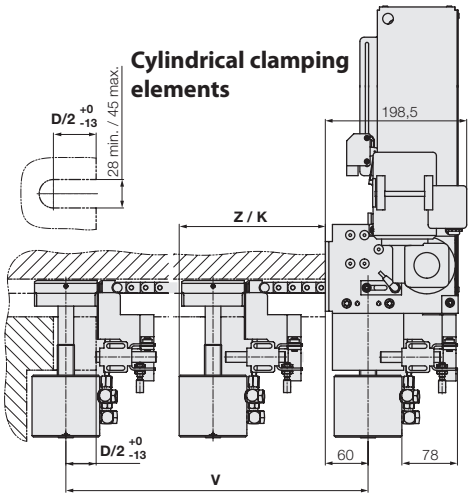
Flexline rapid clamping systems with drive chain clamping element, T-slot and adjustment track

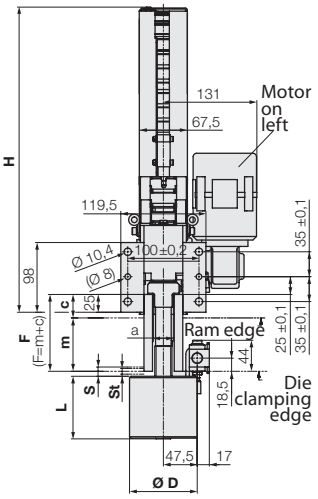
Dimensions

Sliding clamping elements



Cylindrical clamping elements





Selection scheme

You can configure the desired product variant yourself. You are provided with a dimension drawing for the selected configuration and can send us your chosen configuration directly for an offer to be prepared.

Clamping element		Dimension D x L	Clamping force	Operating pressure	Total stroke S	Clamping stroke St	Oil requirement Clamping/releasing
o	Hollow piston cylinder, double acting	Ø 95 x 88	104 kN	400 bar	12 mm	8 mm	2,6/2,6 cm³ / mm
o	Hollow piston cylinder, single acting	Ø 90 x 105	104 kN	400 bar	12 mm	8 mm	2,6/ – cm³ / mm
o	Hollow piston cylinder, double acting	Ø 105 x 88	100 kN	245 bar	12 mm	8 mm	4,1/4,1 cm³ / mm
o	Hollow piston cylinder, single acting	Ø 100 x 112	100 kN	245 bar	12 mm	8 mm	4,1/ – cm³ / mm
o	Clamping cylinder with mechanical lock, double acting	Ø 100 x 128	100 kN	80 bar	8 mm	4 mm	31/31 cm³ / mm (22 cm3 for adjustment stroke 0-3 mm)
o	Spring clamping cylinder, single-acting	Ø 120 x 134	100 kN	260 bar	7 mm	1 mm	-/7,9 cm³ / mm
o	Sliding clamp, double acting	80 x 75	78 kN	400 bar	12 mm	8 mm	2/1,5 cm³ / mm
o	Sliding clamp, single acting	80 x 75	78 kN	400 bar	12 mm	8 mm	2 cm³ / mm

Slot width a	Max. displacement path of clamping element V
o 28 mm (DIN 650)	o 660 mm (H = 654 mm)
o 32 mm	o 820 mm (H = 574 mm)
o 36 mm (DIN 650)	o 1100 mm (H = 794 mm)
o 1-1/16“ (27 mm)	

F min. 70 mm, mac. 128 for hollow piston cylinder
F min. 70 mm, max. 112 mm for spring clamping cylinder and clamping cylinder with locking mechanism
F min. 72 mm, max. 128 mm for sliding clamp + T-slot 28 + 1-1/16”
F min. 77 mm, max. 128 mm for sliding clamp + T-slot 32
F min. 82 mm, max. 128 mm for sliding clamp + T-slot 36

Motor o left o right

- o 400 V ± 10%, 50 Hz, 3~AC/480 V ± 10%, 60 Hz, 3~AC
- o 400 V ± 10%, 50 Hz, 3~AC/480 V ± 10%, 60 Hz, 3~AC (UL certified)

Position query	Chain case position query
o Die position S2 - left	o galvanized, unpainted
o Die position S2 - right	o painted RAL XXXX
o End position S3 + spec. of dimension K	
o Int. position S4 + spec. of dimension K	

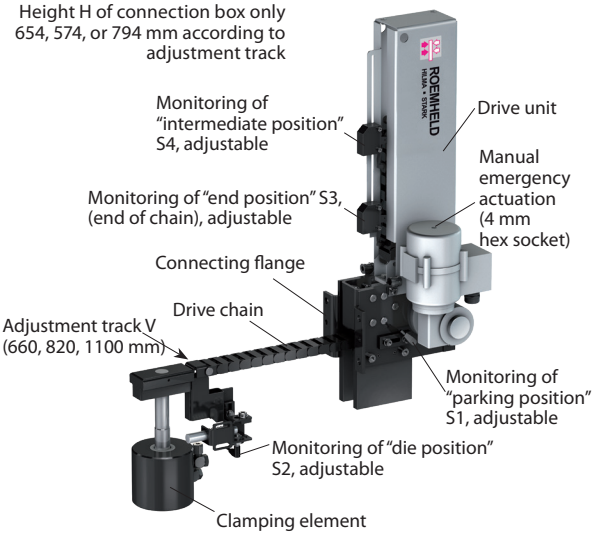
Harting plug for motor and position queries

o Harting HAN modular 3x5 ES	Pin assignment type 2290
o Harting HAN 3 HvE/HAN 10 E	o Harting HAN 3 HvE/HAN 10 E “2290”
o Harting HAN 6 HvE/HAN 10 ES	o Harting HAN 6 HvE/HAN 10 ES “2290”

- o Counterparts included in delivery (selectable option: yes/no)

Clamping dimension Specification of clamping dimension F (±St/2) in [mm]

F = mm — F = c + m (m = die clamping edge, c = web height of T-slot)



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Flexline rapid clamping systems with drive chain clamping element, T-slot and adjustment track

Electric interfaces:

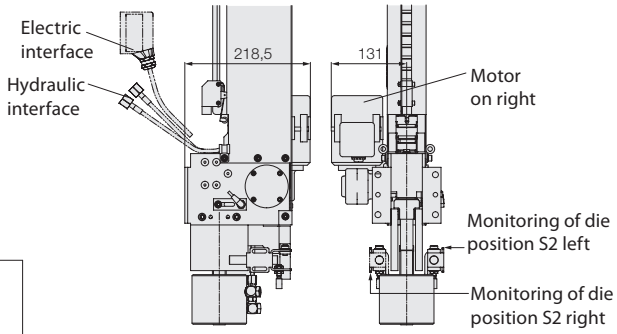
Harting connector for motor + position monitoring. See circuit diagram for pin assignment and connector design. (available as special variant or without connector on request)

Hydraulic interfaces:

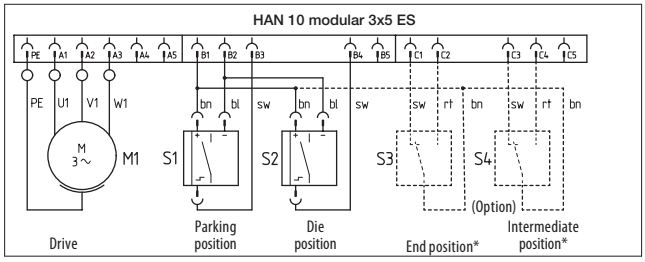
Connection A for clamping

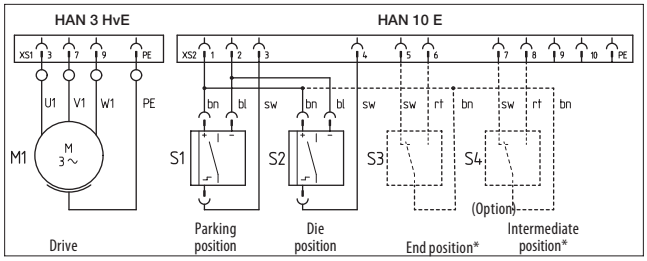
Connection B for releasing

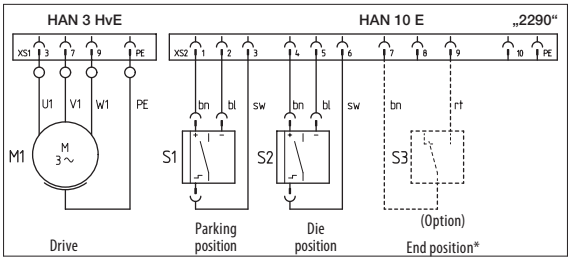
Standard: M16 x 1.5 union nut, pipe connection 8 diam.

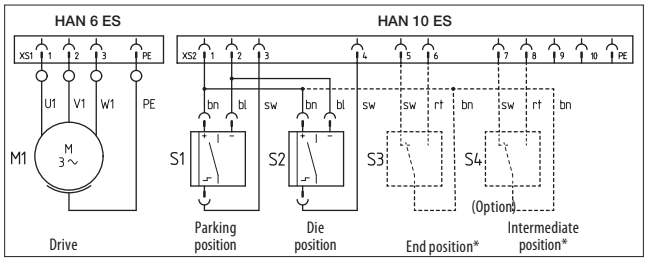


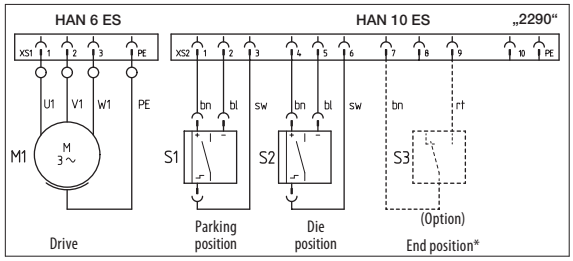
Pin assignment of Harting connectors









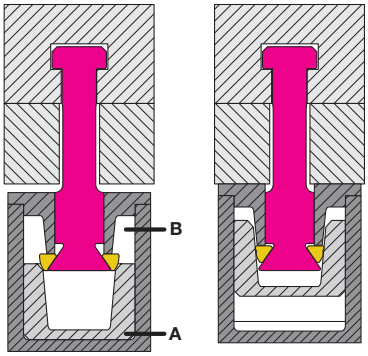


* unactuated in *-position!

Clamping cylinder double-acting with mechanical lock

Clamping element unclamped

Clamping element clamped



Mode of operation

To clamp, apply pressure to connection A.

The clamping element is moved by means of the integrated wedge mechanics to the edge of the die in a rapid adjustment stroke.

After generating clamping force of 100 kN with only 80 bar operating pressure, the clamping position is them mechanically secured in a self-locking manner, so that the clamping force is retained completely, even in the event of pressure loss.

For safety reasons it is recommended to maintain the hydraulic pressure.

To release, depressurize connection A and apply pressure to connection B.

The mechanical lock is released and the clamping element moves to the release position.

Special versions

Please contact us if your individual clamping task is not covered by the options available with "Flexline." In many cases, we will be able to fulfill your requirements with a customized special version which deviates only slightly from the standard design.

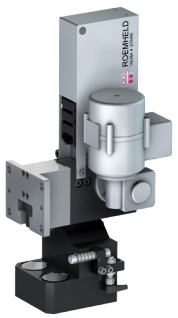
Possible special versions:

- Clamping solutions for tight spaces
- Special mounting hole pattern
- Different T-slot dimension (e.g. T-slot 22)
- Modified adjustment track V (e.g. > 1100 mm)
- Clamping elements with, for example
  -special clamping force
  -specific operating pressure
  -modified clamping stroke St
  -modified clamping dimension F
  -modified shape
  -different mode of operation
- different motor voltage (e.g. 24 V DC) or different drive principle (e.g. pneumatic)
- special options for electric or hydraulic connections
- Parts of certain manufacturers or specification
- Additional requests and customer-specific requirements...

Examples of special versions

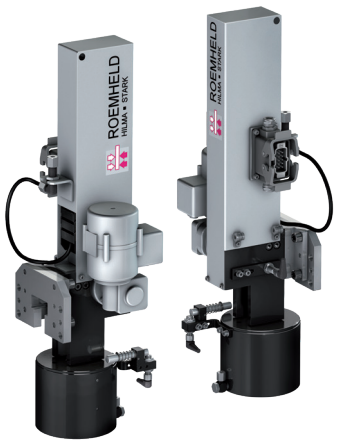
Special sliding clamping element with two clamping pistons

- **Short track**



Adapter plate with special mounting hole pattern

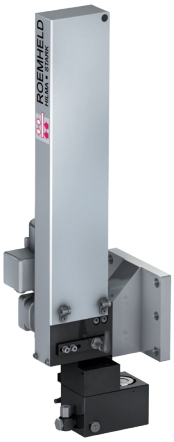
- **special electric conncection and hydraulic connection**



Long track with special low profile chain case

- **additional position monitoring**

Specific flange plate with special mounting hole pattern



Additional extension bracket with new parking position to overcome major obstruction on the press

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Rapid clamping system with pneumatic cylinder ‘Pneumatic travelling clamp‘

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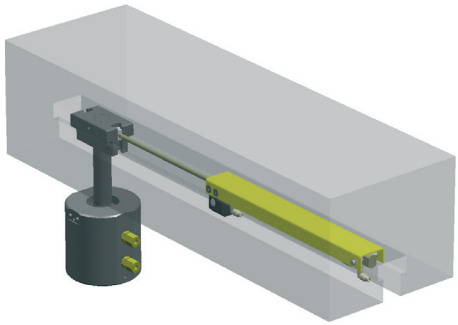
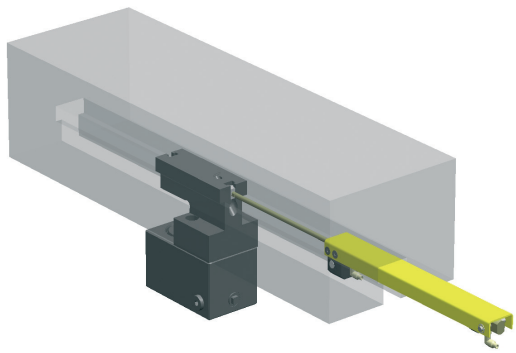
Possible clamping elements:

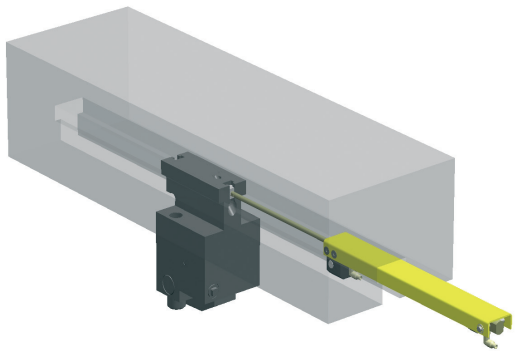
- Hollow piston cylinder double-acting with a max. clamping force of 115 kN
- Hollow piston cylinder single-acting with a max. clamping force of 104 kN
- Locking cylinder double-acting with a max. clamping force of 100 kN
- Spring clamping cylinder single-acting with a max. clamping force of 100 kN



Sliding clamp single-acting
with a max. clamping force of 78 kN



Angular clamping element single-acting
with a max. clamping force of 66 kN



Application and special features:

Low-cost rapid clamping system for short distances of travel. In this version, standard clamping elements are moved by means of a pneumatic cylinder. The pneumatic positioning drive fits completely into a T-slot as per DIN 650 with a slot width of 28 mm, therefore the positioning cylinder can be positioned upstream or downstream of the clamping element. The positioning drive is fastened in the T-slot using a wedge lock without the need to modify the press ram. Interrogation of the unclamping and clamping positions is carried out using inductive magnetic sensors on the pneumatic cylinder.

- robust and cost-effective system for short distances of travel
- easy installation using standard clamping elements
- for fastening, no modification to the press ram is required
- rapid adaptation to various die sizes

Scope of supply:

Pneumatic positioning drive unit including screw fittings for pneumatic connection and position interrogation on the cylinder.

Clamping element

High-pressure hose and screw fittings for hydraulic connections on the clamping element

Optional extras:

- parking station (for the unclamping position outside of the press ram)
- traveling distance up to 400mm
- reed contacts instead of inductive magnetic sensors
- pneumatic one-way restrictors for adjusting the positioning speed

Other optional extras including adaptation are available upon request

Technical data:

Operating pressure, pneumatic:	min. 6 bar (max. 10 bar)
Weight of the clamping element:	max. 8,5 kg (for 6 bar) 14 kg (for 10 bar)
Travel:	200 mm
Temperature range:	max. 70°C

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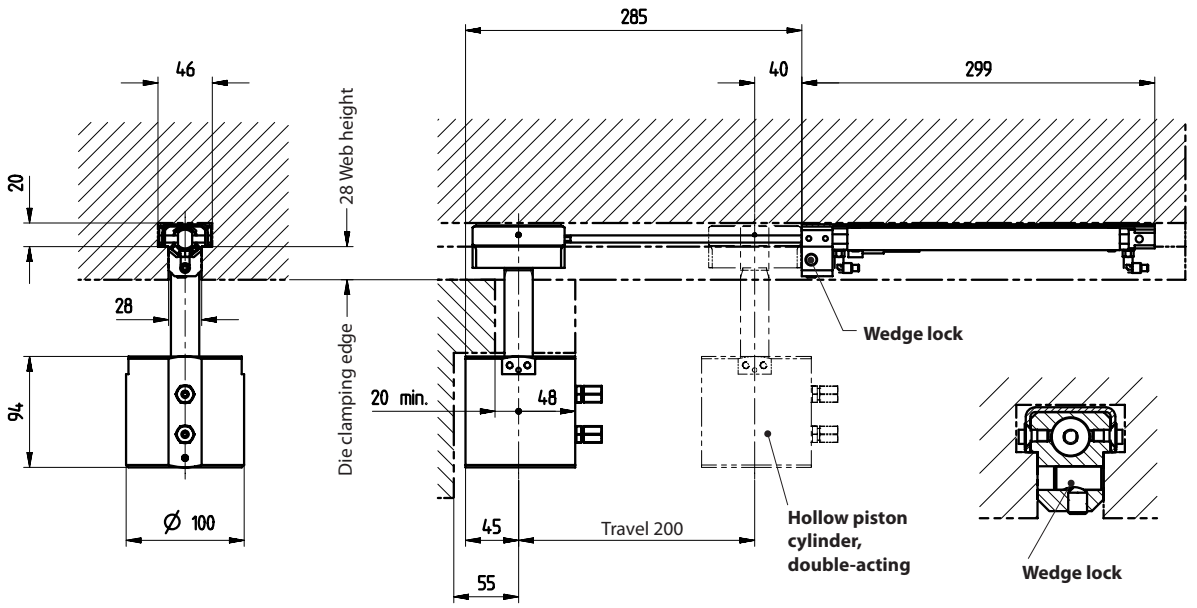
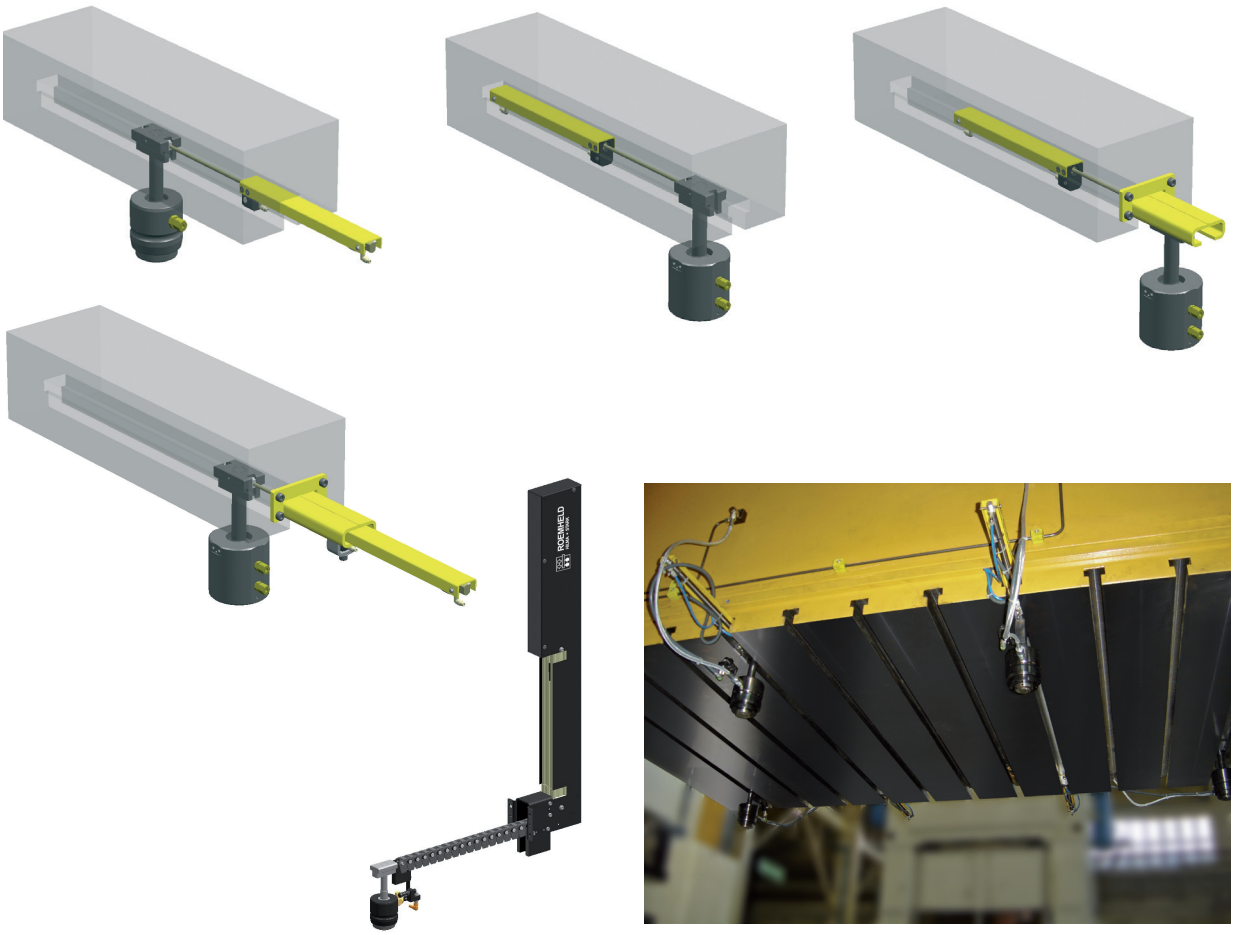
Rapid clamping system with pneumatic cylinder ‘Pneumatic travelling clamp‘



Optional extras and versions of installation



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integrated
integrated
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integrated
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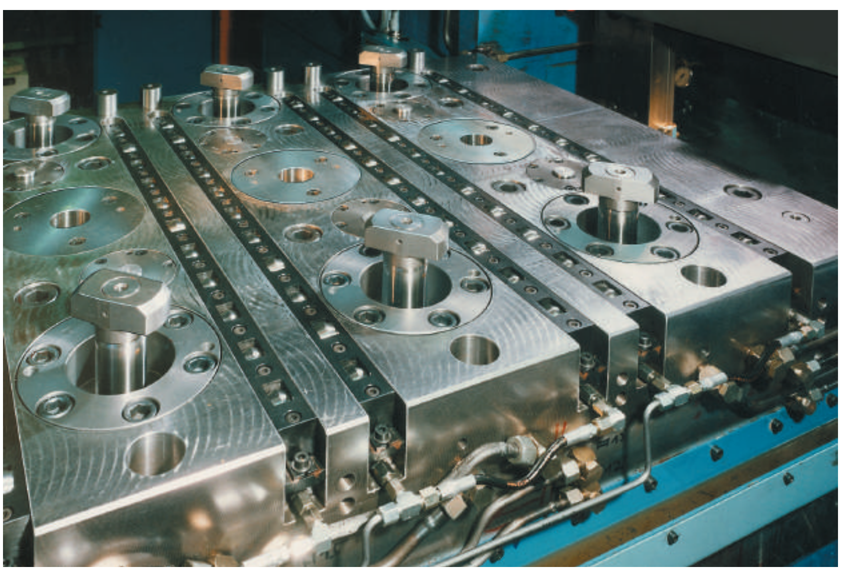
integrated

hydraulic

Hydraulic clamping elements
integrated



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Products | for | productivity

Contents
Product group 4

Built-in piston, single-acting with spring return

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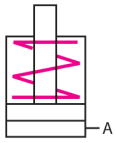
Original size



Applications:

- in clamping bars and blocks
- for workpiece and die clamping and locking
- when the available space is narrow and shallow

Function:

Plunger piston single-acting with integral pull-back spring, stroke limitation and fastening screw as a subassembly which cannot be dismantled.
Sealing ring made from PTFE, O-ring as static seal.
The piston is hardened and ground. On request, a wiper ring is supplied for installation in the housing.
Special seals are available on request.

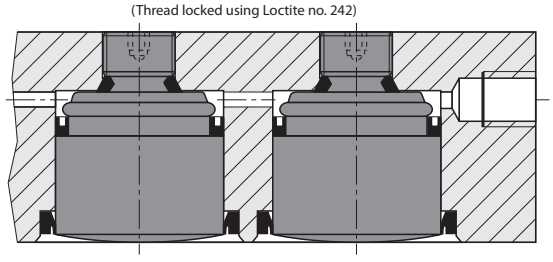
Advantages:

- low installation height
- very compact design
- extremely low overall height, despite pull-back spring and fully utilizable stroke
- easily replaceable
- high power density

For power units
please see product group 7

For accessories
please see product group 11

Example of application
Built-in piston integrated in a clamping bar



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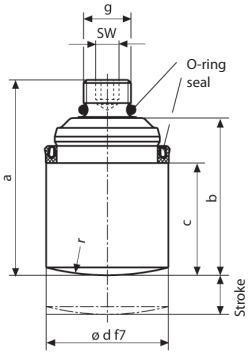
Built-in piston, single-acting with spring return

Clamping force at 250 bar (kN)	12,25	20	31,25	48,75
Clamping force at 100 bar (kN)	4,9	8	12,5	19,5
Min. spring return force (N)	130	200	230	400
Piston Ø d (mm)	25	32	40	50
Stroke (mm)	8	8	8	12
Total oil consumption (cm³)	4	7	10	24
a (mm)	40	47	50	75
b (mm)	32,5	34,5	36	56
c (mm)	23,5	25	26	43
e (mm)	11,5	14	19,5	24
f (mm)	32	42	47	58
g (mm)	G ⅛	G ¼	G ⅜	G ½
r (mm)	50	100	150	200
SW (mm)	4	6	6	8
Tightening torque (Nm)	10	20	25	30
Weight (kg)	0,10	0,17	0,28	0,59
Part no.	**HCR-1072-010-TB**	**HCR-1073-010-TB**	**HCR-1074-010-TB**	**HCR-1075-020-TB**

Wiper ring Part no.	**CLR-5700-001**	**CLR-5700-002**	**CLR-5700-003**	**CLR-5700-004**
Set of seals Part no.	**CLR-5700-005**	**CLR-5700-006**	**CLR-5700-007**	**CLR-5700-008**
Mounting sleeve Part no.	**CLR-5700-009**	**CLR-5700-010**	**CLR-5700-011**	**CLR-5700-012**

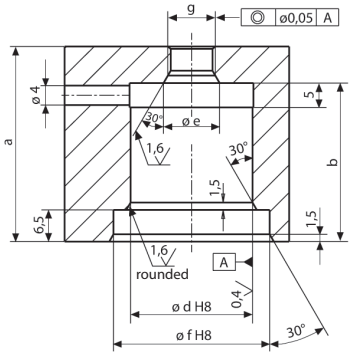
max. operating pressure 250 bar

Built-in piston



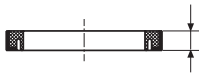
Drilled location hole

Hydraulic oil supply through holes drilled in the base.
Only one oil port is required.

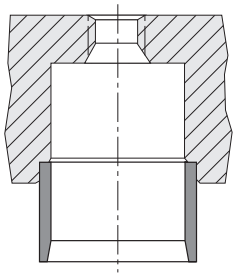


Please note
Lateral forces should be less than 5% of clamping forces.
To ensure perfect operation, the installation dimensions and surface qualities must be strictly observed.
Use an Allan key for assembly and dismantling.
Replace the O-ring after dismantling.
The max. service temperature is 80°C.
Lock the thread using Loctite no. 242.

Wiper ring



Mounting sleeve for built-in piston and wiper ring



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Swing sink clamping element double-acting

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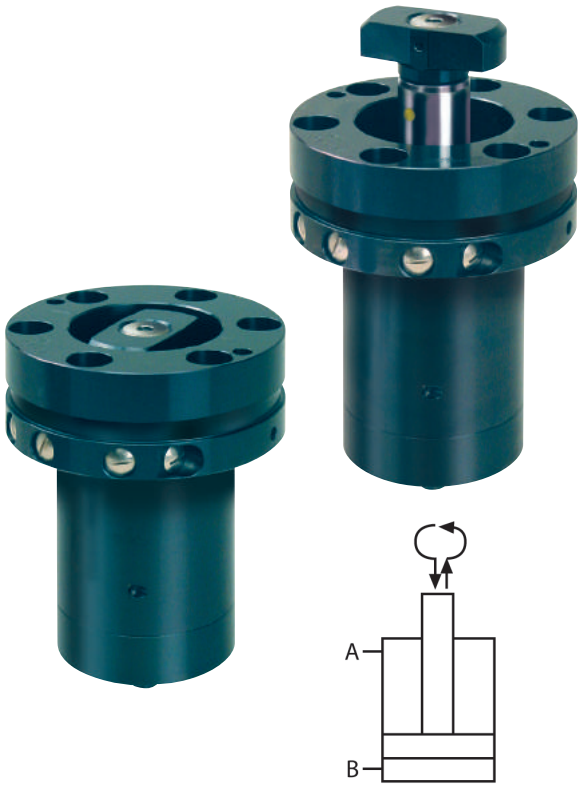


Applications:

- integrated in press rams
- integrated in press beds
- in machine tools and equipment
- when the available space is limited
- when temperatures may reach 70° C

Design:

Double-acting swing sink clamp with 90° swing angle. The piston is guided by a guide pin in such a manner that during part of the stroke a 45° rotation is carried out. Unclamping, change-over and clamping are monitored by inductive proximity switches.

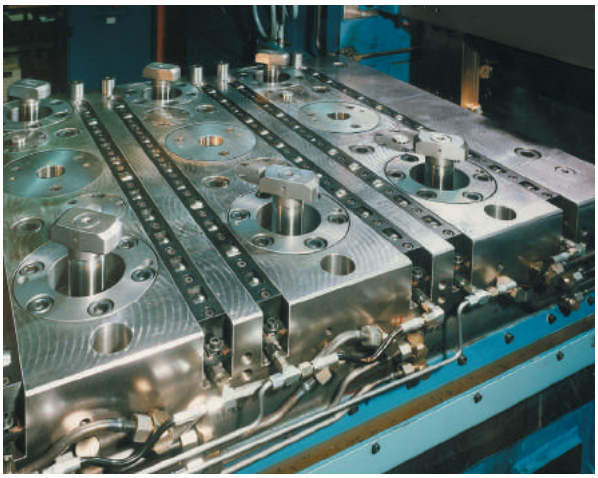
The swing mechanism is protected by a spring-loaded overload protection and equipped with emergency hand operation. The tie rod, piston and swing mechanism are hardened.

Advantages:

- ideal power transmission
- compact design
- clamping force of between 60 and 164 kN
- position monitoring, emergency hand operation and overload protection combine to ensure high functional safety
- compensates for large clamping edge tolerances (± 1.5 mm)
- no colliding edges, smooth die positioning
- optimum use of ram and bed surfaces
- die clamping in barely accessible positions

For power units
please see product group 7

For accessories
please see product group 11



Swing sink clamps fastened
in a double column press.
The tie rod is extended (swing position).
Easy feeding of dies by hydraulic roller bars
installed in the T-slots and lateral stops

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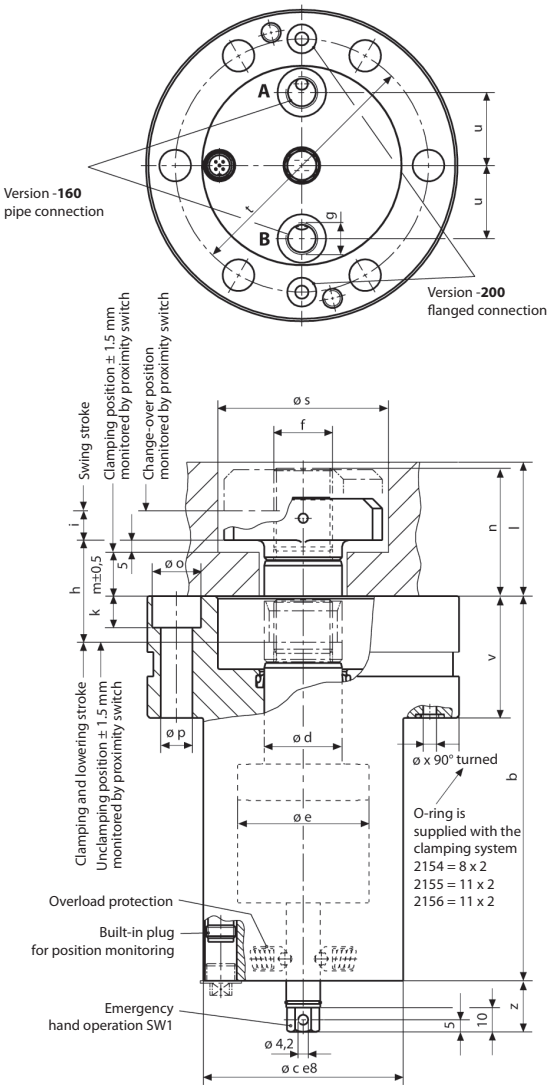
Swing sink clamping element double-acting

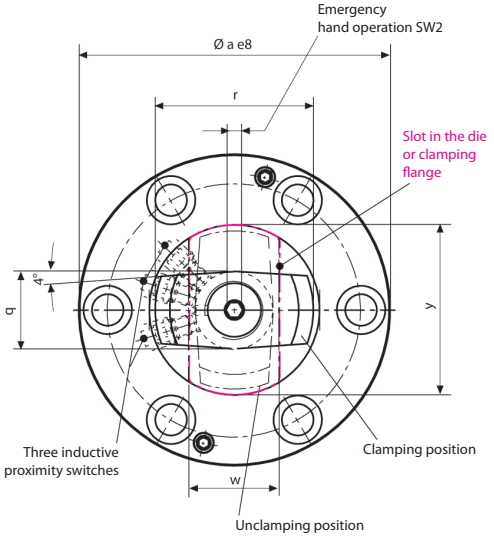
Clamping force at 400 bar (kN)	60	104	164
Clamping force at 100 bar (kN)	15	26	41
Piston Ø e (mm)	54	70	88
Piston rod Ø d (mm)	32	40	50
Swing stroke i (mm)	12	15	21
Clamping+lowering stroke h (mm)	42	54	65
Oil consumption clamping (cm³)	150	318	630
Oil consumption unclamping (cm³)	120	256	512
Max. volume flow (cm³/s)	15	32	63
a (mm)	128	160	192
b (mm)	158	197	242
c (mm)	82	104	126
f (mm)	M 24 x 1,5	M 30 x 1,5	M 36 x 1,5
g BSPP port	G ¼	G ⅜	G ⅜
g SAE port	7/16 20	9/16 18	¾ 16
k (mm)	13	17	21
l (mm)	55	70	87
m (clamping edge) (mm)	18	23	28
n (mm)	53	68	85
o (mm)	20	26	33
p (mm)	13	18	22
q (mm)	34	42	52
r (mm)	65	80	95
s (mm)	70	86	103
t (mm)	104	130	156
u (mm)	30	38	45
v (mm)	50	61	72
w (mm)	38	47	59
x (mm)	5,5	8	8
y (mm)	70	86	103
z (mm)	21	24	29
(Emergency hand operation) SW1 (mm)	12	14	19
(Emergency hand operation) SW2 (mm)	6	8	10
Weight (kg)	7,4	14,7	25
with pipe connection, BSPP port Part no.	**HCR-2154-160**	**HCR-2155-160**	**HCR-2156-160**
with pipe connection, SAE port Part no.	**HCR-2154-170**	**HCR-2155-170**	**HCR-2156-170**
with flange connection Part no.	**HCR-2154-200**	**HCR-2155-200**	**HCR-2156-200**

max. operating pressure 400 bar.
*Adaptor fittings available on request.
Other sizes and special versions are available on request.



Swing sink clamping element for clamping edge m = 50 mm

m (mm)	50	50	50
h (mm)	74	81	87
b (mm)	190	224	264
n (mm)	85	95	107
l (mm)	87	97	109
Oil consumption clamping (cm³)	222	420	764
Oil consumption unclamping (cm³)	174	342	601
with pipe connection Part no.	**HCR-8.2154.8059**	**HCR-8.2155.8047**	**HCR-8.2156.8023**
with flanged connection Part no.	**HCR-8.2154.8082**	**HCR-8.2155.8050**	**HCR-8.2156.8027**



Please note!
Access to one of the two emergency hand controls SW1 or SW 2 is essential.

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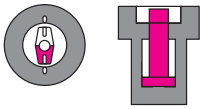
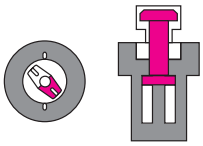
Function

The piston is guided by a guide pin in such a manner that during part of the stroke a 45° rotation is carried out just before reaching and just after leaving the piston upper end position.
The rotation is always anti-clockwise, no matter whether the piston extends or retracts.

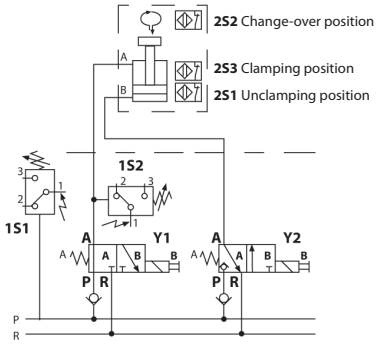


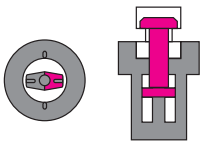
1. Unclamping position
The piston is completely retracted. This permits an easy die change, as no parts project over the bed level. Proximity switch 2S1 monitors this position.



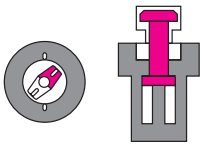
2. Change-over position for clamping
Valves Y1 and Y2 are energized, and pressure is applied to piston side B.
The tie rod passes through the slot of the clamping point and is then rotated by 45°. Proximity switch 2S2 monitors this position.

Hydraulic schematics

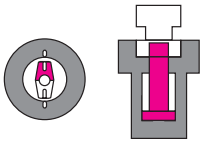




3. Clamping position
Valves Y1 and Y2 are de-energized, and pressure is applied to piston rod side A. The tie rod makes a further 45° rotation and is now transversely above the clamping point.
The die is clamped. Proximity switch 2S3 monitors this position.
Once the clamping pressure has been reached the power unit will be switched off by pressure switch 1S2.
In the event of a fall in pressure, the power unit is switched on by the pressure switch and builds up to the required clamping pressure.

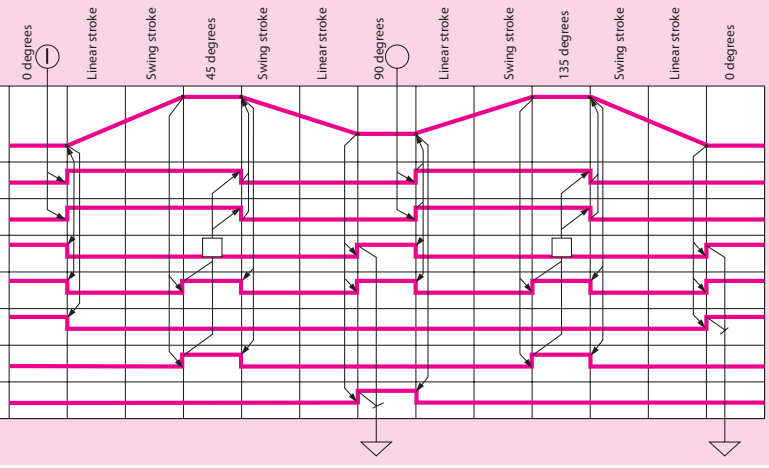


4. Change-over position for unclamping
Valves Y1 and Y2 are energized, and pressure is applied to piston side B. The tie rod is extended and then again rotated by 45°. Proximity switch 2S2 monitors this position.



5. Unclamping position
Valves Y1 and Y2 are de-energized, and pressure is applied to piston rod side A. The tie rod makes a further 45° rotation and passes through the slot of the clamping point as far as the end position.
Proximity switch 2S1 monitors this position.
The die is unclamped.

Functional diagram



Swing sink clamp without a pilot controlled check valve	Change-over position Rotation Clamping position Unclamping position	
3/2 way valve	Y1	energized idle
3/2 way valve	Y2	energized idle
Pressure switch, clamping position	1S2	energized free
Pressure switch, change-over position	1S1	energized free
Limit switch, unclamping position	2S1	1 0
Limit switch, change-over position	2S2	1 0
Limit switch, clamping position	2S3	1 0

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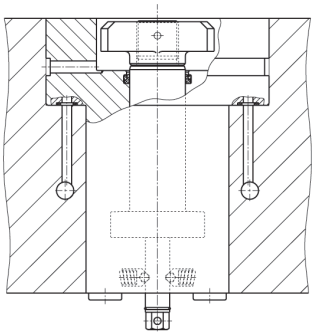
Swing sink clamping element double-acting

Recommended installation

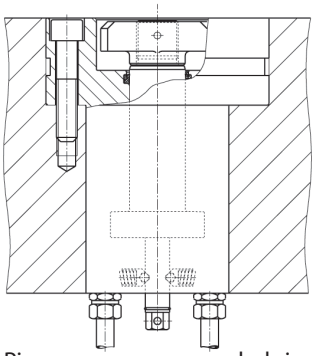
In order to ensure ease of servicing, two alternatives are offered for connecting the swing sink clamps.

Flanged connection



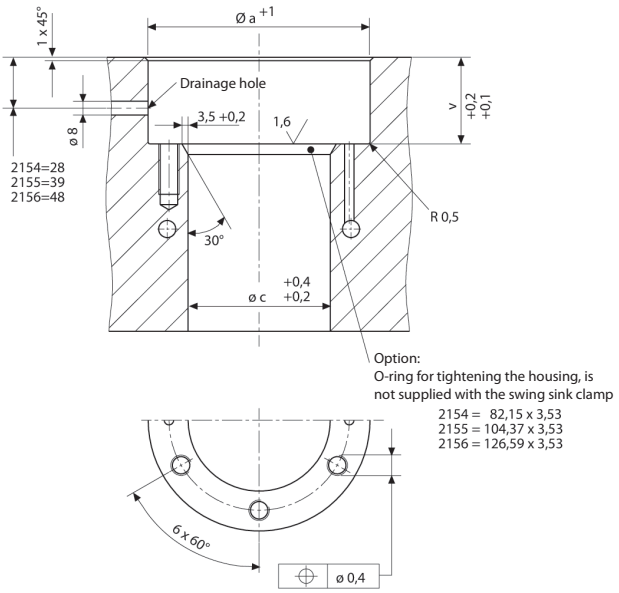
Hydraulic oil is fed through the drilled holes in the bed and in the ram. There are no exposed conduits or screw fittings. O-rings supplied with the clamping element provide for tight fitting. Easy installation, ease of servicing.

Pipe connection



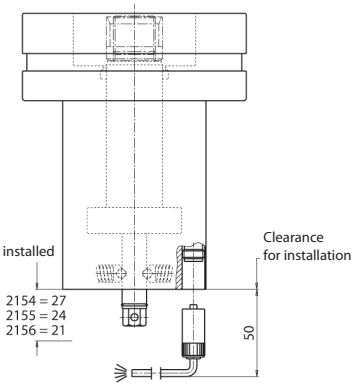
Pipes are recommended in applications where screw fittings are easily accessible and where pipes do not impede installation and dismantling of the swing sink clamps.

Drilled hole for flanged or pipe connection



Flanged connection requires a plain and neat surface. The drainage hole may be drilled in any position provided that spray and separating agent can drain off freely.

Connection of the monitoring system for clamping and unclamping position



The three proximity switches are connected to the base of the swing sink clamp through a connecting lead with a screw coupling [IP 67].The connecting lead is not supplied with the swing sink clamp and it has a separate part number, see page 6 in this series. Further installation may be carried out using a distribution block with an LED display.

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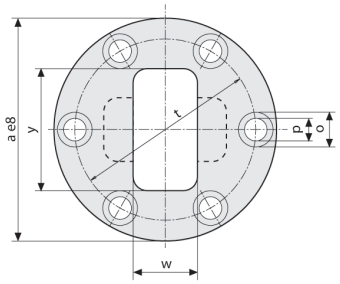
Accessories Flange

as a clamping point for installation in press dies

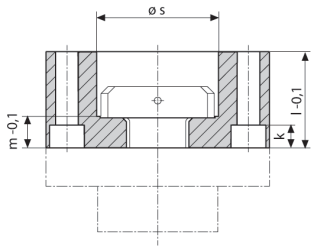
for clamping element type	2154-160 2154-200	2155-160 2155-200	2156-160 2156-200
a (mm)	128	160	192
k (mm)	13	17	21
l (mm)	55	70	87
m (mm)	18	23	28
o (mm)	20	26	33
p (mm)	13	18	22
s (mm)	70	86	103
t (mm)	104	130	156
w (mm)	38	47	59
y (mm)	70	86	103
Part no.	**HCR-5700-016**	**HCR-5700-017**	**HCR-5700-018**

for clamping element type	2154-160 2154-200	2155-160 2155-200	2156-160 2156-200
a (mm)	128	160	192
k (mm)	13	17	21
l (mm)	55	70	87
m (mm)	18	23	28
o (mm)	20	26	33
p (mm)	13	18	22
s (mm)	70	86	103
t (mm)	104	130	156
w (mm)	38	47	59
y (mm)	70	86	103
Part no.	**HCR-5700-019**	**HCR-5700-020**	**HCR-5700-021**

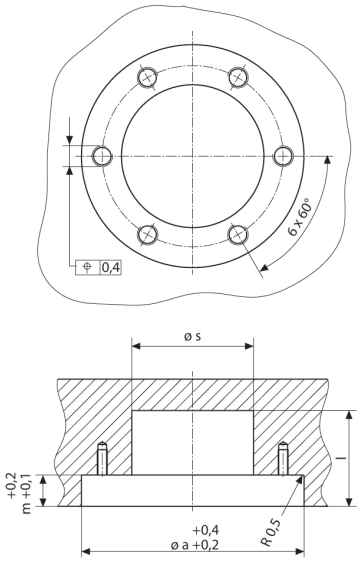
Flange



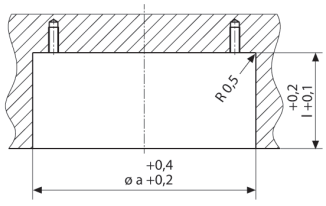
Flange



Location hole



Location hole



For more accessories, please see product group 11.

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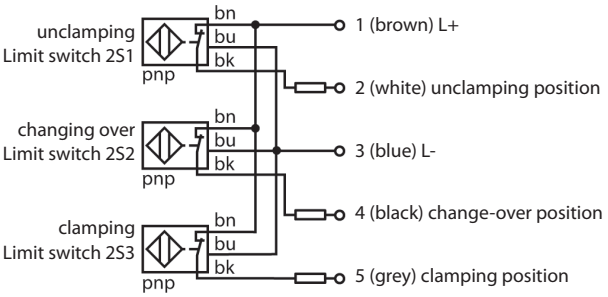
Swing sink clamping element double-acting

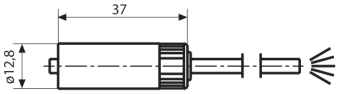
Electrical installation

Pin assignment for three-wire proximity switches

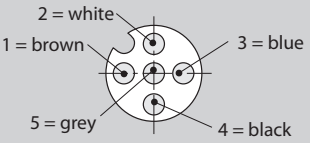


Supply voltage: 10-30 V DC
Constant current: ≤ 100 mA
Type: inductive, NC pnp

5-pole connecting lead with screw coupling



Cable length 5 m	**Part no.**	**HCR-5700-013**
Cable length 10 m	**Part no.**	**HCR-5700-014**

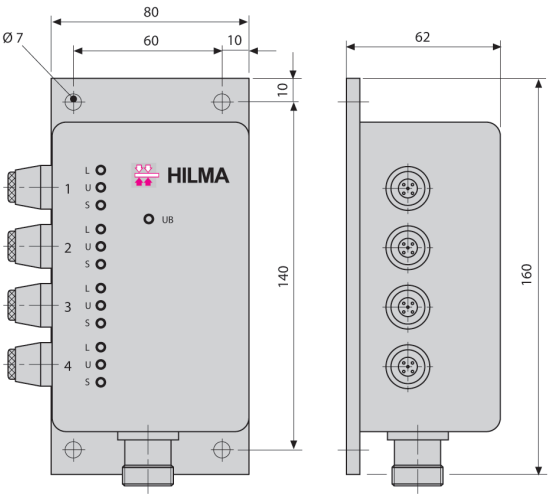


Distribution block with LED display

for connecting 4 clamping elements

Easy installation.
LED display of the unclamping, change-over and clamping position of each clamping element.

Scope of delivery: 1 distribution block
4 coupler plugs, 5 poles
1 coupler plug, 16 poles



Part no.	**HCR-5700-015**

Wiring of output plug:

Pin 1 = L+
Pin 2 = L
Pin 3 = 1L
Pin 4 = 1U
Pin 5 = 1S
Pin 6 = 2L
Pin 7 = 2U
Pin 8 = 2S
Pin 9 = 3L
Pin 10 = 3U
Pin 11 = 3S
Pin 12 = 4L
Pin 13 = 4U
Pin 14 = 4S
Pin 15 = free
Pin 16 = free

L = Unclamping position
U = Change-over position
S = Clamping position

Hydraulic installation

Read the operating instructions before commissioning the system.
Adjust the displacement of the power unit so that clamping and unclamping cycles between 10 and 30 seconds are obtained. In order to prevent the swing mechanism from premature wear, the dynamic pressure at port B should not exceed 50 bar while the tie rods retract through the slot.
Swing sink clamps which are grouped together should be connected to distribution blocks, in order to avoid series connection. Use pipes with larger diameter for connection to the power unit.

If in doubt, please send the installation plan to be reviewed.
Provide a pressure gauge connection in every hydraulic circuit for adjustment and to check operational data.
Other parameters and recommendations for hydraulic installation of die clamping systems are given in chapter no. 1 “General information”.

Please note

The full stroke of the piston must be realized, otherwise the swing mechanism may be damaged.

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Swing clamping element double-acting

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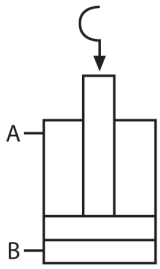

For power units
please see product group 7

For accessories
please see product group 11

Applications:

- integrated in press rams
- in machine tools and equipment
- when the available space is limited
- when temperatures may reach 70° C

Design:

Double-acting swing clamp with 90° swing angle. Unclamping and clamping are monitored by inductive proximity switches. The swing mechanism is protected by a spring-loaded overload protection and is equipped with emergency hand operation. The tie rod, piston and swing mechanism are hardened. The hydraulic system is protected by a wiper ring.

Advantages:

- ideal power transmission
- compact design
- clamping force of between 60 and 164 kN
- position monitoring, emergency hand operation and overload protection combine to ensure high functional safety
- compensates for large clamping edge tolerances (± 1.5 mm)
- optimum use of ram surface
- die clamping in barely accessible positions

The swing clamps are fastened in the press ram.
The ram is in the upper position and the swing clamps are extended (die change position).

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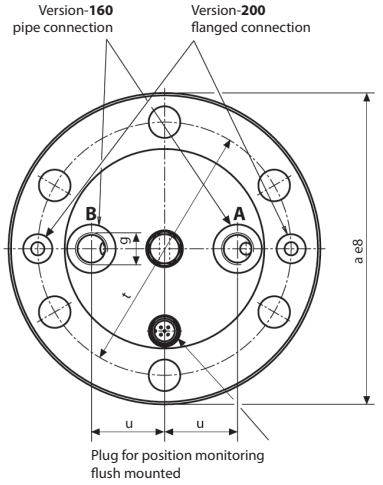
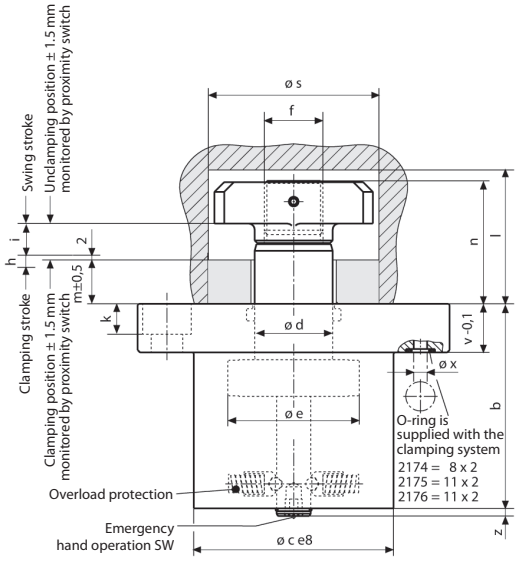
Swing clamping element double acting

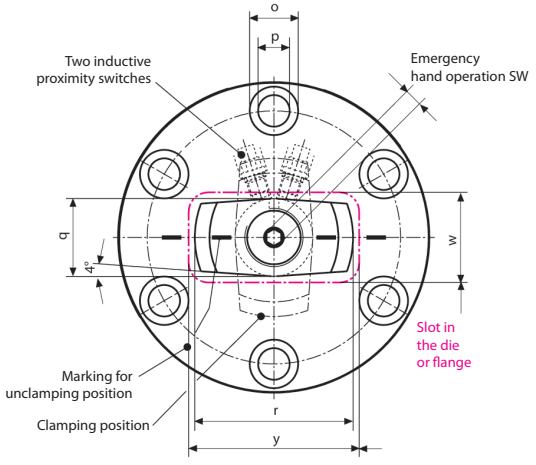
Clamping force at 400 bar (kN)	60	104	164
Clamping force at 100 bar (kN)	15	26	41
Piston Ø e (mm)	54	70	88
Piston rod Ø d (mm)	32	40	50
Swing stroke i (mm)	13	18	24
Clamping and lowering stroke h (mm)	5	6	6
Oil consumption clamping (cm^3)	22	52	107
Oil consumption unclamping (cm^3)	34	77	158
Max. volume flow (cm^3/s)	10	16	25
a (mm)	128	160	192
b (mm)	84	104	122
c (mm)	82	104	126
f (mm)	M 24 x 1,5	M 30 x 1,5	M 36 x 1,5
g BSPP port	G ¼	G ⅜	G ⅜
g SAE port	7/16 20	9/16 18	¾ 16
k (mm)	13	17	21
l (mm)	55	70	87
m (mm)	18	23	28
n (mm)	51	68	85
o (mm)	20	26	33
p (mm)	13	18	22
q (mm)	34	42	52
r (mm)	65	80	95
s (mm)	70	86	103
t (mm)	104	130	156
u (mm)	30	38	45
v (mm)	20	28	35
w (mm)	38	47	59
x (mm)	5,5	8	8
y (mm)	70	86	103
z (mm)	4	5	6
Emergency hand operation SW (mm)	6	8	10
Weight (kg)	4,2	8,6	15
with pipe connection, BSPP port Part no.	**HCR-2174-160**	**HCR-2175-160**	**HCR-2176-160**
with pipe connection, SAE port Part no.	**HCR-2174-170**	**HCR-2175-170**	**HCR-2176-170**
with flanged connection Part no.	**HCR-2174-200**	**HCR-2175-200**	**HCR-2176-200**

max. operating pressure 400 bar.
*Adaptor fittings available on request.
Other sizes and special versions are available on request.





Please note!
Access to one of the two emergency hand controls is essential.



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Swing clamping element double-acting

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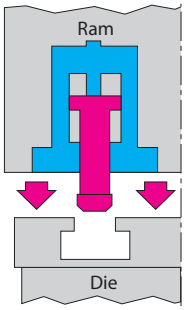
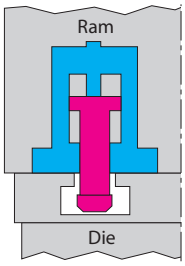


Function

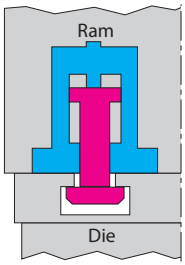
Clamping

1. Push the die into the press with the swing clamping elements in the rest position.

2. Lower the press ram onto the upper part of the die. The tie rods of the swing clamping elements will pass through the clamping slots of the upper die.



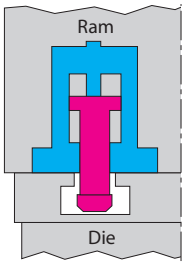
3. The swing clamping elements are operated by means of a power unit. The tie rod rotates by 90° and is then in a transverse position to the clamping point. The upper die is hydraulically clamped. Once the clamping pressure has been reached the power unit will be switched off through pressure switch 1S2. In the event of a fall in pressure, the power unit is switched on by means of the pressure switch and builds up to the required clamping pressure.



Unclamping

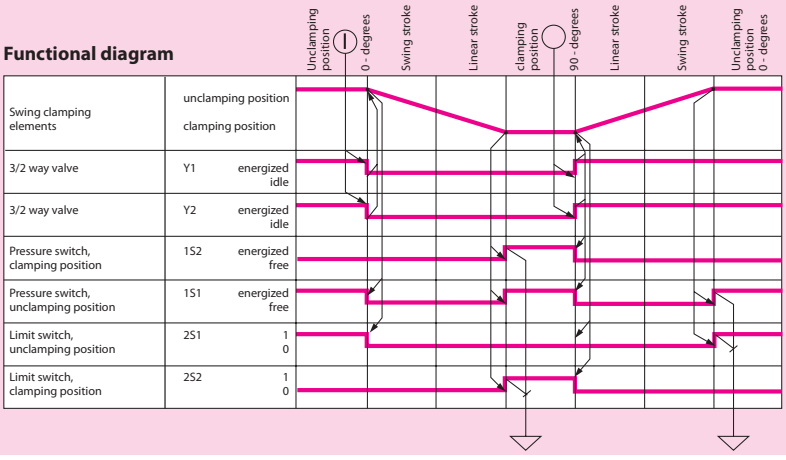
1. Move the dies together and return the swing clamping elements into the unclamping position by means of energizing valves Y1 and Y2. The tie rod rotates by 90° and can then pass through the clamping slots of the upper die.

2. Move the press ram upwards and take the die out.

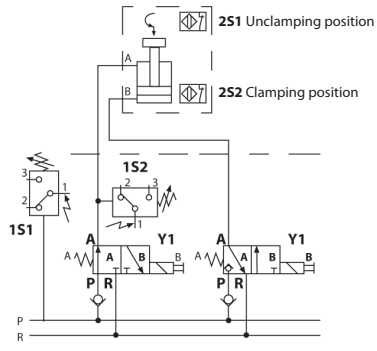


The clamping and unclamping positions are monitored by inductive proximity switches.

Functional diagram



Hydraulic schematics

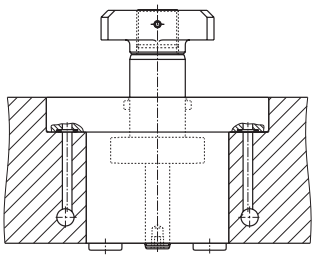


Swing clamping element double-acting

Recommended installation

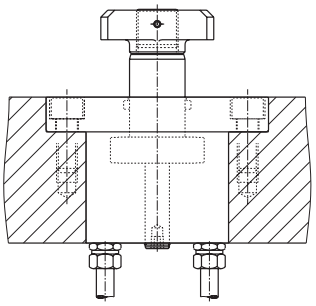
In order to ensure ease of servicing, two alternatives are offered for connecting the swing clamps.

Flanged connection



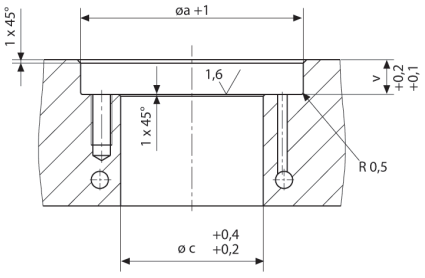
Hydraulic oil is fed through the drilled holes in the bed and in the ram. There are no exposed conduits or screw fittings. O-rings supplied with the clamping element provide for tight fitting. Easy installation, ease of servicing.

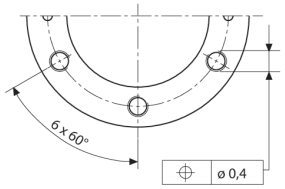
Pipe connection



Pipes are recommended in applications where screw fittings are easily accessible and where pipes do not impede installation and dismantling of the swing clamps.

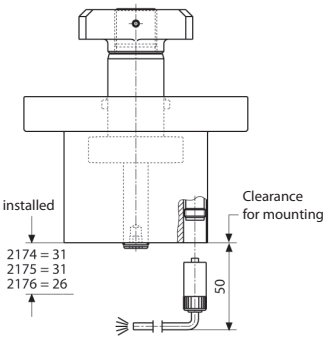
Drilled hole for flange or pipe connection





Flanged connection requires a plain and neat surface.

Connection of the monitoring system for clamping and unclamping position



Both proximity switches are connected to the base of the swing clamp through a connecting lead with a screw coupling [IP 67]. The connecting lead must be ordered separately. Further installation may be carried out using a distribution block with an LED display, see page 6 in this series.

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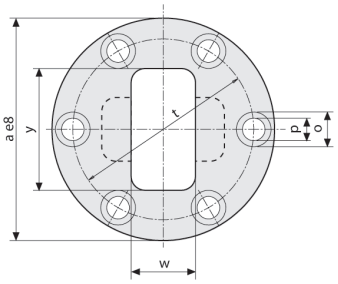
Accessory: Flange

as a clamping point for installation in press dies

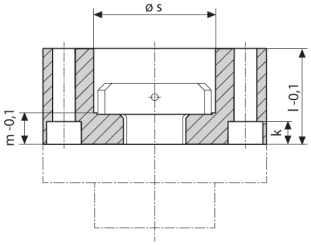
for clamping element type	2174-160 2174-200	2175-160 2175-200	2176-160 2176-200
a (mm)	128	160	192
k (mm)	13	17	21
l (mm)	55	70	87
m (mm)	18	23	28
o (mm)	20	26	33
p (mm)	13	18	22
s (mm)	70	86	103
t (mm)	104	130	156
w (mm)	38	47	59
y (mm)	70	86	103
Part no.	**HCR-5700-016**	**HCR-5700-017**	**HCR-5700-018**

for clamping element type	2174-160 2174-200	2175-160 2175-200	2176-160 2176-200
a (mm)	128	160	192
k (mm)	13	17	21
l (mm)	55	70	87
m (mm)	18	23	28
o (mm)	20	26	33
p (mm)	13	18	22
s (mm)	70	86	103
t (mm)	104	130	156
w (mm)	38	47	59
y (mm)	70	86	103
Part no.	**HCR-5700-019**	**HCR-5700-020**	**HCR-5700-021**

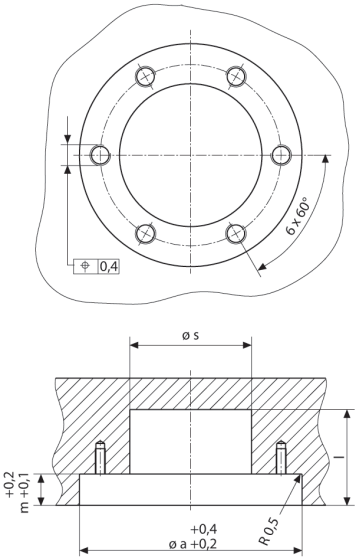
Flange



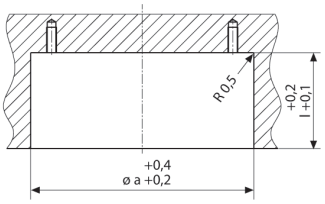
Flange



Location hole



Location hole



For more accessories, please see product group 11.

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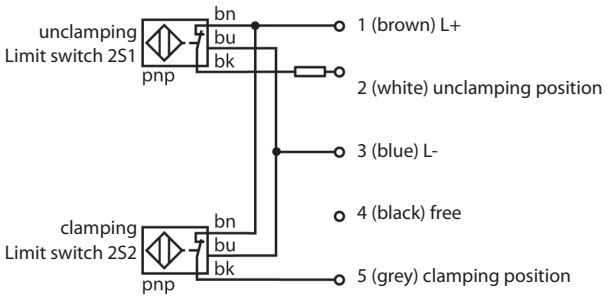
Swing clamping element double-acting

Electrical installation

Pin assignment for three-wire proximity switches



Supply voltage: 10-30 V DC
Constant current: ≤ 100 mA
Type: inductive, NC pnp

Distribution block with LED display

for connecting 4 clamping elements

Easy installation.
LED display of the unclamping, change-over and clamping position of each clamping element.

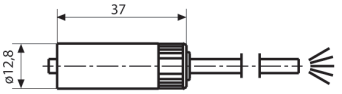
Scope of delivery: 1 distribution block
4 coupler plugs, 5 poles
1 coupler plug, 16 poles

Wiring of output plug:

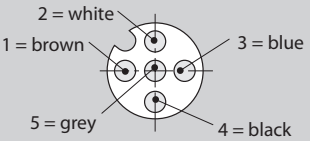
Pin 1 = L+
Pin 2 = L
Pin 3 = 1L
Pin 4 = do not use
Pin 5 = 1S
Pin 6 = 2L
Pin 7 = do not use
Pin 8 = 2S
Pin 9 = 3L
Pin 10 = do not use
Pin 11 = 3S
Pin 12 = 4L
Pin 13 = do not use
Pin 14 = 4S
Pin 15 = free
Pin 16 = free

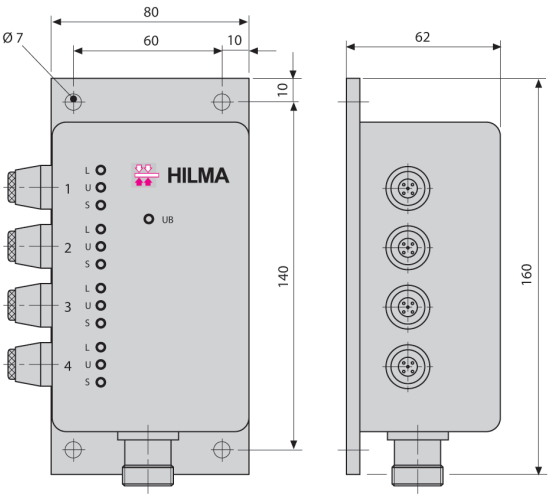
L = Unclamping position
U = Not assigned
S = Clamping position

5-pole connecting lead with screw coupling



Cable length 5 m	**Part no.**	**HCR-5700-013**
Cable length 10 m	**Part no.**	**HCR-5700-014**





Part no.	**HCR-5700-015**

Hydraulic installation

Read the operating instructions before commissioning the system.
Adjust the displacement of the power unit so that clamping and unclamping cycles between 10 and 30 seconds are obtained. In order to prevent the swing mechanism from premature wear, the dynamic pressure at port B should not exceed 50 bar while the tie rods retract through the slot.
Swing sink clamps which are grouped together should be connected to distribution blocks, in order to avoid series connection. Use pipes with larger diameter for connection to the power unit.

If in doubt, please send the installation plan to be reviewed.
Provide a pressure gauge connection in every hydraulic circuit for adjustment and to check operational data.
Other parameters and recommendations for hydraulic installation of die clamping systems, are given in chapter no. 1 “General information”.

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Pull clamping element double-acting

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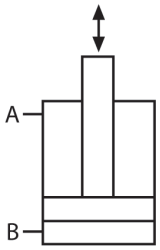


For power units
please see product group 7.

For accessories
please see product group 11.

Applications:

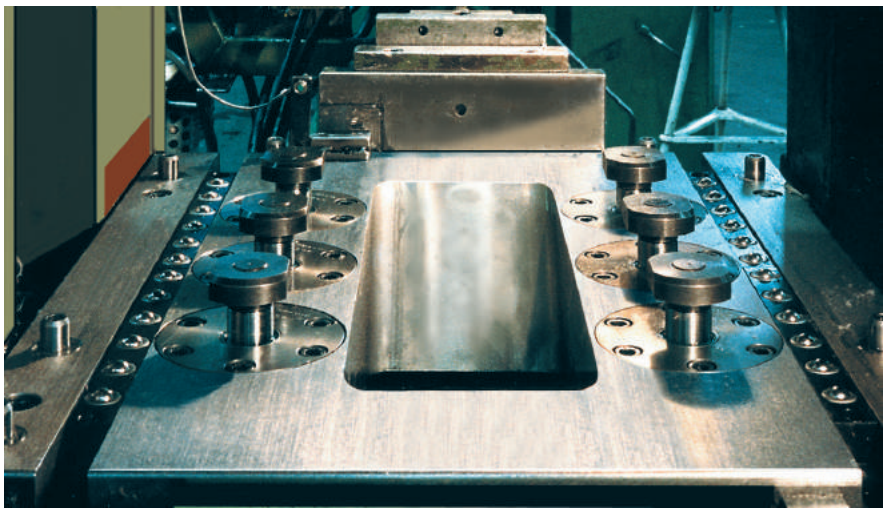
- integrated in press rams
- integrated in press beds
- in machine tools and equipment
- when the available space is limited

Function:

Double-acting pull clamping element for clamping dies on a press bed or press ram. The die must be provided with T-slots for the tie rod. It is important that the die is correctly pushed into the press, and is parallel with the clamping elements. The clamping and unclamping positions are monitored by inductive proximity switches. The tie rod and the piston are hardened and ground, and the hydraulic system is protected against dirt by wiper rings.

Advantages:

- position monitoring ensures high functional safety
- ideal power transmission with centrally arranged clamping elements
- compact design
- clamping force of between 60 and 104 kN
- optimum use of bed and ram surfaces
- die clamping in barely accessible positions
- compensates for large clamping edge tolerances (± 1.5 mm)



Pull clamping elements in the press bed of a double column press. Feeding of dies is ensured by ball bars in the T-slots of the press bed.

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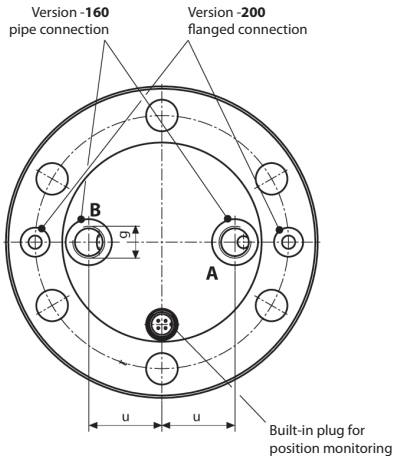
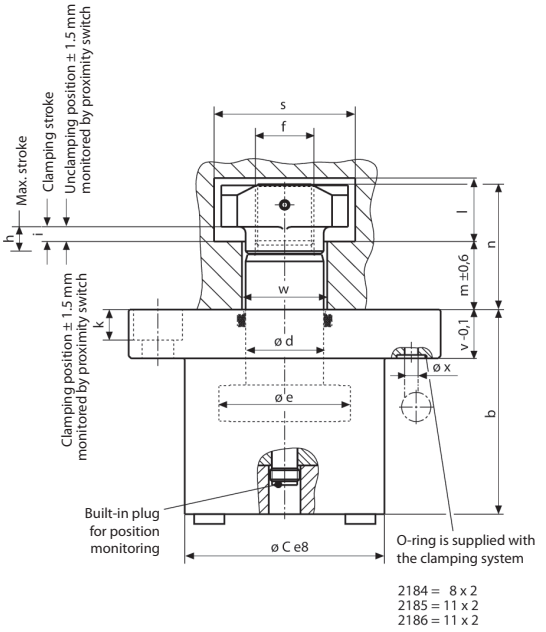
Pull clamping element double-acting

Pulling force at 400 bar (kN)	60	104	164
Pulling force at 100 bar (kN)	15	26	41
Piston Ø e (mm)	54	70	88
Piston rod Ø d (mm)	32	40	50
Max. stroke h (mm)	10	10	10
Oil consumption clamping (cm³)	10	16	25
Oil consumption unclamping (cm³)	15	23	37
a (mm)	128	160	192
b (mm)	84	104	122
c (mm)	82	104	126
f (mm)	M 24 x 1,5	M 30 x 1,5	M36 x 1,5
g BSPP port	G ¼	G ⅜	G ⅜
g SAE port	7/16 20	9/16 18	¾ 16
i (mm)	6	6	6
k (mm)	13	17	21
l (mm)	26	35	41
m (mm)	28	37	48
n (mm)	51	68	85
o (mm)	20	26	33
p (mm)	13	18	22
q (mm)	Ø 52	Ø 74	Ø 84
r (mm)	65	74	95
s (mm)	58	82	92
t (mm)	104	130	156
u (mm)	30	38	45
v (mm)	20	28	35
w (mm)	38	48	58
x (mm)	5,5	7	7
Weight (kg)	4,4	9	15
with pipe connection, BSPP port Part no.	**HCR-2184-160**	**HCR-2185-160**	**HCR-2186-160**
with pipe connection, SAE port Part no.	**HCR-2184-170**	**HCR-2185-170**	**HCR-2186-170**
with flanged connection Part no.	**HCR-2184-200**	**HCR-2185-200**	**HCR-2186-200**

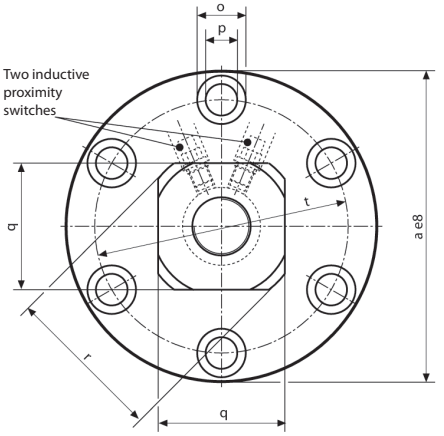
max. operating pressure 400 bar.
*Adaptor fittings available on request.
Other sizes and special versions are available on request.





Please note!
The piston rod is made from tempered steel.
In the case of aggressive ambient conditions,
a special material will be required.


Clamping of a complete die changing table with pull clamping elements.



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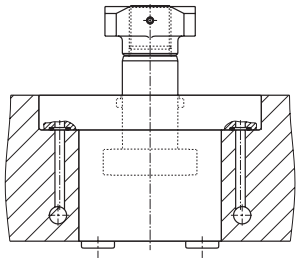
Recommended installation

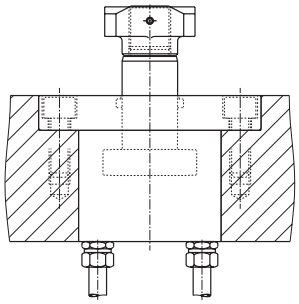
In order to ensure ease of servicing, two alternatives are offered for connecting the pull clamps.

Flanged connection



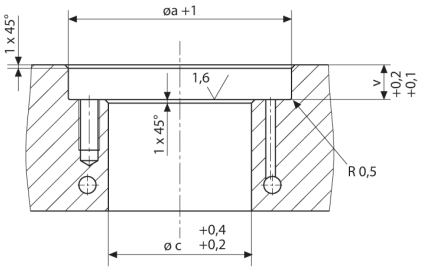
Hydraulic oil is fed through the drilled holes in the bed and in the ram. There are no exposed conduits or screw fittings. O-rings supplied with the clamping element provide for tight fitting. Easy installation, ease of servicing.

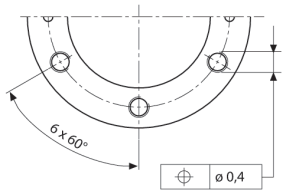
Pipe connection



Pipes are recommended in applications where screw fittings are easily accessible and where pipes do not impede installation and dismantling of the pull clamping elements.

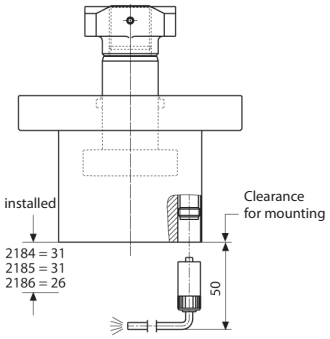
Drilled hole for flanged or pipe connection





Flanged connection requires a plain and neat surface.

Connection of the monitoring system for clamping and unclamping position



Both proximity switches are connected to the base of the pull clamp through a connecting lead with a screw coupling [IP 67]. The connecting lead must be ordered separately. Further installation may be carried out using a distribution block with an LED display, see page 4 of this series.

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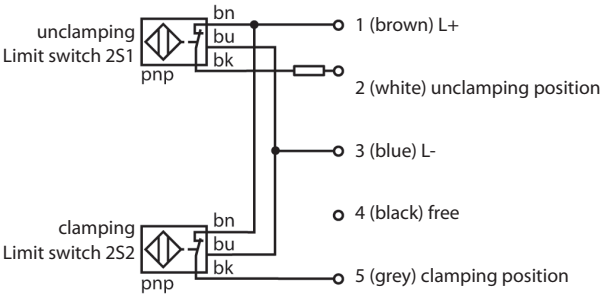
Pull clamping element double-acting

Electrical installation

Pin assignment for three-wire proximity switches



Supply voltage: 10-30 V DC
Constant current: ≤ 100 mA
Type: inductive, NC pnp

Distribution block with LED display

for connecting 4 clamping elements

Easy installation!
LED display of the unclamping, change-over and clamping position of each clamping element.

Scope of delivery: 1 distribution block
4 coupler plugs, 5 poles
1 coupler plug, 16 poles

Wiring of output plug:

Pin 1 = L+
Pin 2 = L
Pin 3 = 1L
Pin 4 = do not use
Pin 5 = 1S
Pin 6 = 2L
Pin 7 = do not use
Pin 8 = 2S
Pin 9 = 3L
Pin 10 = do not use
Pin 11 = 3S
Pin 12 = 4L
Pin 13 = do not use
Pin 14 = 4S
Pin 15 = free
Pin 16 = free

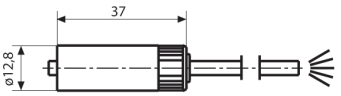
L = Unclamping position
U = not assigned
S = Clamping position

Hydraulic installation

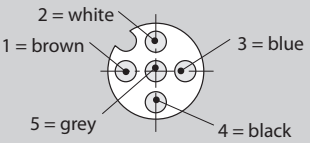
Read the operating instructions before commissioning the system.

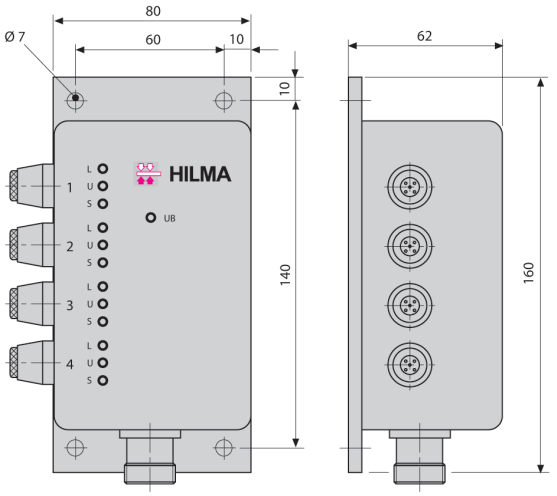
Other parameters and recommendations are given in chapter no. 1 "General information".

5-pole connecting lead with screw coupling



Cable length 5 m	**Part no.**	**HCR-5700-013**
Cable length 10 m	**Part no.**	**HCR-5700-014**





Part no.	**HCR-5700-015**

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Pull clamping element with T-slot double-acting

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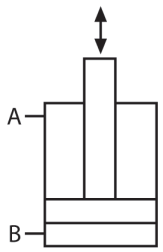


Applications:

- installation in press rams
- installation in press beds
- integrated in a spacer plate
- when the available space is limited

Function:

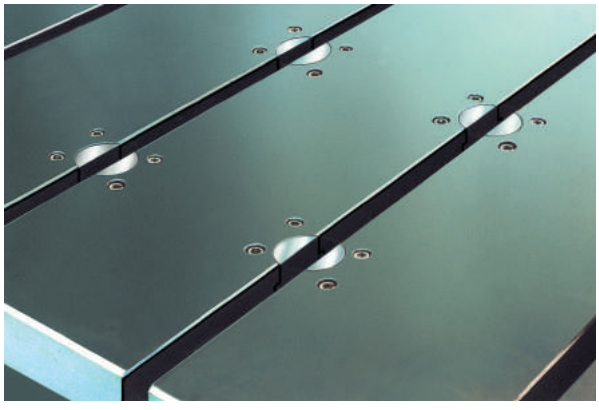
The pull clamping element with a T-slot facilitates the standardization of dies using T-slot bars or T-nuts which are fastened to the die. The hydraulic oil is fed either through the drilled holes in the bed and the ram or through pipes.

The tie rod and the piston are hardened and ground, and the hydraulic system is protected against dirt by wiper rings.

Advantages:

- compact design
- the bed and ram can also be used for manual clamping
- ideal power transmission with centrally arranged clamping elements
- optimum use of bed and ram surfaces

For power units
please see product group 7



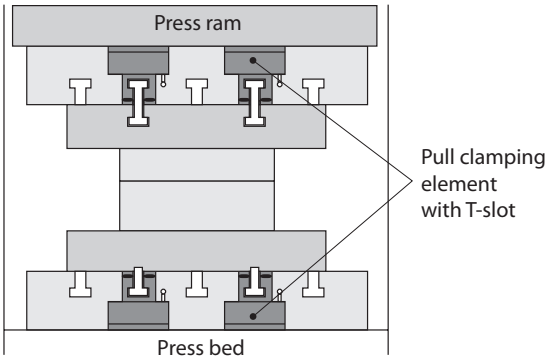
Pull clamping elements with T-slot installed in a press bed

Example of application:

Die clamping in a press

Ram: Clamping of the upper die using double T-slot bars

Bed: Clamping of the lower die using firmly mounted T-slot bars



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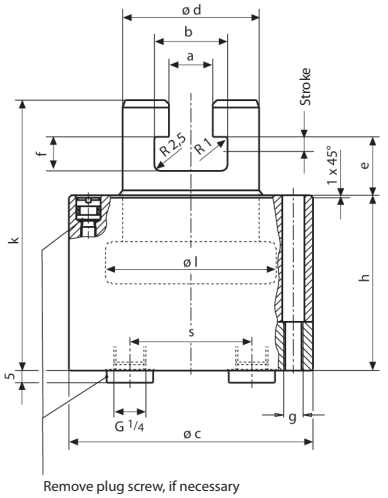
Pull clamping element with T-slot double-acting

For T-slot to DIN 650	18	22	28
Clamping force at 400 bar (kN)	**55,2**	**76**	**144**
Clamping force at 100 bar (kN)	13,8	19	36
Piston Ø l (mm)	70	80	105
Piston rod Ø d H7/f7 (mm)	56	63	80
Stroke (mm)	6	6	6
Oil consumption clamping (cm³)	9	12	22
Oil consumption unclamping (cm³)	23	30	52
a (mm)	18	22	28
b (mm)	30	37	46
c (mm)	100	115	150
e (mm)	24	28	32
f (mm)	14	18	22
g (mm)	M8	M10	M12
h (mm)	72	78	78
k (mm)	111	125	135
n (mm)	15,5	19,5	25,5
o ± 0,05 (mm)	42	47,5	62,5
p (mm)	29,7	33,6	44,2
s (mm)	50	56	70
Weight (kg)	4,1	5,8	10
Part no.	**HCR-2354-050**	**HCR-2355-050**	**HCR-2356-050**

Max. operating pressure 400 bar
Other sizes and special versions are available on request.

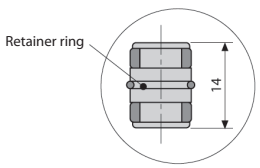
Pull clamping element



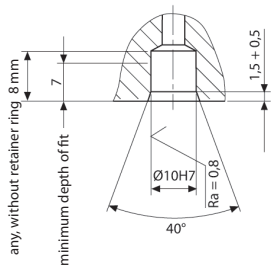
Remove plug screw, if necessary
(depends on the connection selected)

Accessories (for ordering with the clamping element)
Plug-in connector for flanged connection
Part no. CLR-9210-132

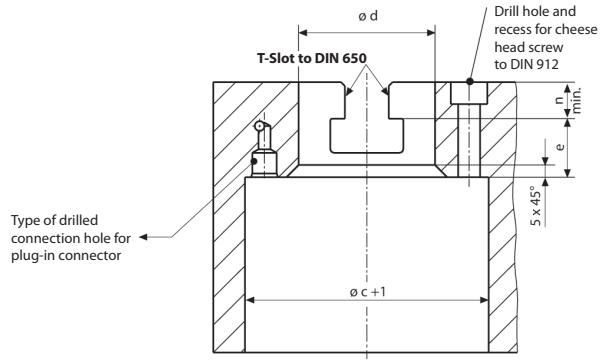
Plug-in connector

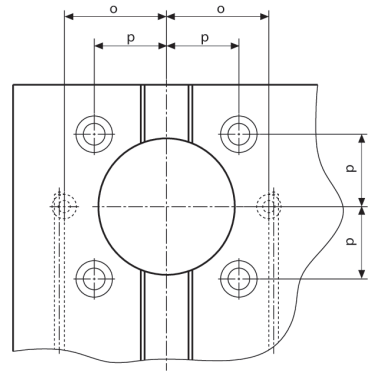


Accommodation space



Drilled location hole





Important information
Make sure that the T-slot of the clamping piston is subject to an axial load only. The T-nut must be in contact over its complete surface. Transverse loads must be avoided.

In view of the surface ratio of the pull clamping elements, only check valves having a minimum ratio of 3.5 : 1 may be used for maintaining the clamping force.

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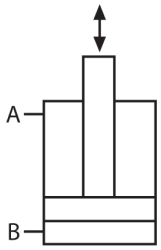
Pull clamping element with T-slot double-acting



For power units
please see product group 7

Applications:

- installation in press rams
- installation in press bed
- integrated in spacer plate
- when the available space is limited

Function:

The pull clamping element with a T-slot facilitates significantly the standardization of dies using T-slot bars or T-nuts which are fastened to the die.

The hydraulic oil is fed either through the drilled holes in the bed and the ram or through pipes.

The tie rod and the piston are hardened and ground, and the hydraulic system is protected against dirt by wiper rings.

Advantages:

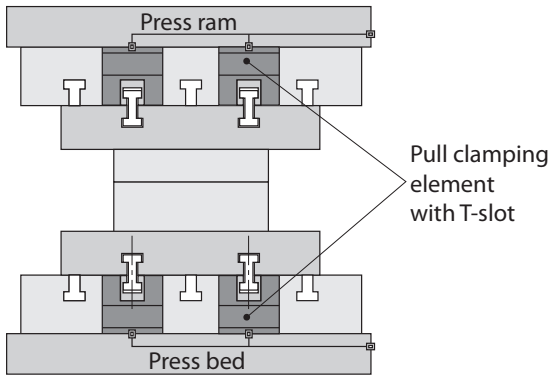
- installation directly in the bed or in the ram
- compact design
- dies are easily adaptable
- the bed and ram can also be used for manual clamping
- ideal power transmission with centrally arranged clamping elements
- optimum use of bed and ram surfaces

Example of application:

Die clamping in a press

Ram: Clamping of the upper die using double T-slot bars

Bed: Clamping of the lower die using firmly mounted T-slot bars



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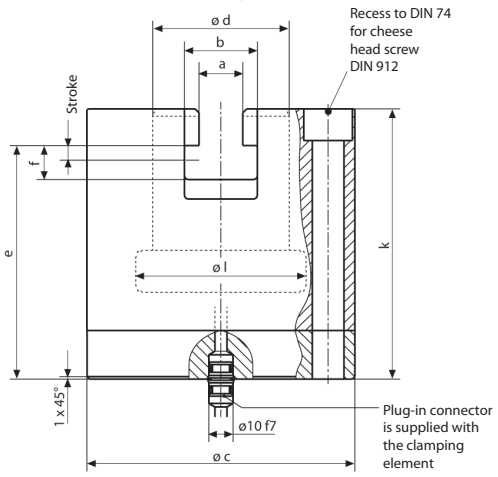
Pull clamping element with T-slot double-acting

For T-slot to DIN 650	18	22	28
Clamping force at 400 bar (kN)	**55,2**	**76**	**144**
Clamping force at 100 bar (kN)	13,8	19	36
Piston Ø l (mm)	70	80	105
Piston rod Ø d H7/f7 (mm)	56	63	80
Stroke (mm)	6	6	6
Oil consumption camping (cm^3)	9	12	22
Oil consumption unclamping (cm^3)	23	30	52
a (mm)	18	22	28
b (mm)	30	37	46
c e 8 (mm)	110	130	166
e (mm)	96	106	110
f (mm)	14	18	22
g (mm)	M12	M16	M20
h (mm)	21	23	27
k (mm)	111	125	135
n (mm)	15,5	19,5	25,5
o (mm)	31,1	36,2	46,7
p ± 0,05 (mm)	15	15	15
Weight (kg)	6,1	9,5	16,6
Connection lengthways to the T-slot Part no.	**HCR-2354-060**	**HCR-2355-060**	**HCR-2356-060**
Connection crosswise to the T-slot Part no.	**HCR-2354-065**	**HCR-2355-065**	**HCR-2356-065**

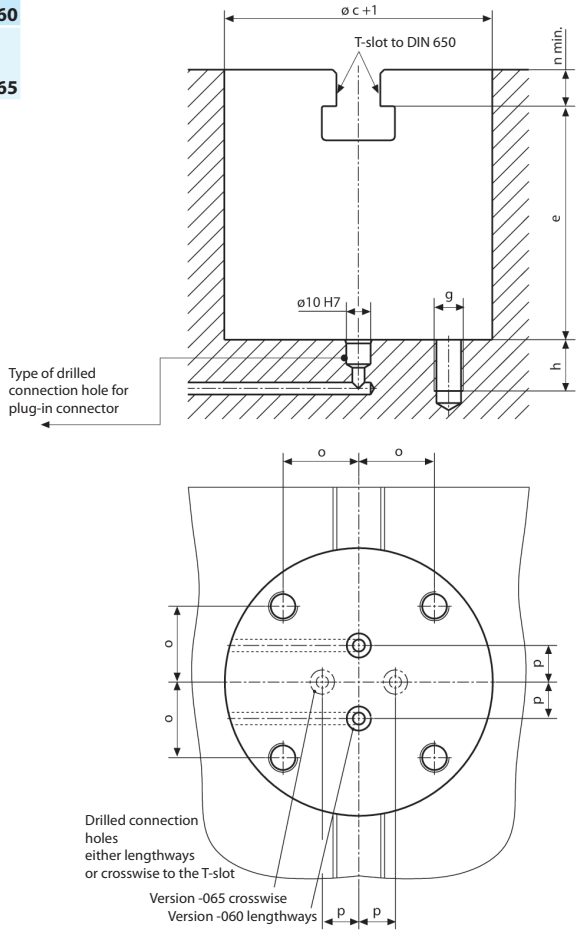
max. operating pressure 400 bar
Other sizes and special versions are available on request.

Plug-in connector for flanged connection
Part no. CLR-9210-132
(is supplied with the clamping element)

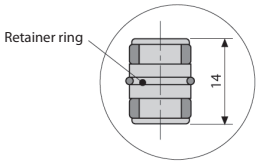
Pull clamping element



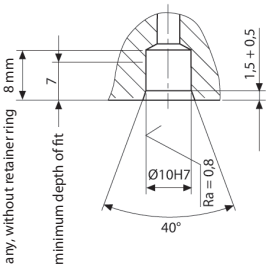
Drilled location hole



Plug-in connector



Accommodation space



Important information
Make sure that the T-slot of the clamping piston is subject to an axial load only. The T-nut must be in contact over its complete surface. Transverse loads must be avoided.

In view of the surface ratio of the pull clamping elements, only check valves having a minimum ratio of 3.5 : 1 may be used for maintaining the clamping force.

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Grip rail coupling

Rapid action clamping system for transfer presses

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Active part of the coupling
The active part of the grip rail coupling is of a mechanical, hydraulic or electromechanical design, depending on the required degree of automation.

Passive part of the coupling
The passive part is identical for all sizes.

hydraulic

mechanical

electromechanical

Applications:

- Automatic centering, coupling and clamping of grip rails on transfer presses
- The coupling is used whenever the maximum clamping force with high dynamic strength in the smallest space is required.

Function:

In contrast to conventional systems, the new coupling design is such that all components for positioning, centering, clamping force build-up and position monitoring are integrated into the active part of the coupling which is firmly connected to the press. The passive part does not have any moving parts.

In order to keep the weight of the coupling low, the housings of both the active and the passive parts are made from hard-coated, high-strength aluminium.

When moving the two halves of the coupling into position (insertion of grip rail), these are precentered using guide elements. Positioning pins on the active part locate into drilled holes in the passive part, thereby centering the coupling and ensuring a high degree of reproducibility.

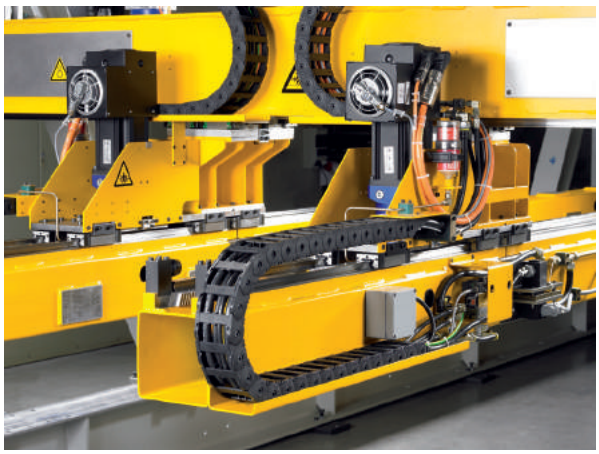
The clamping force is built up using a tie rod and maintained in a self-locking manner.

A compact position monitoring system installed in the element is easily adaptable to a bus system and this ensures exact positioning and clamping.

As an option, rapid action couplings for electrical power, compressed air and hydraulic fluid as per customer's specification can be fitted.

Advantages:

- safe coupling and uncoupling in a matter of a few seconds
- die positions are reproducible in a very short time
- high positioning accuracy of ± 0.02 mm
- easy retrofit
- no moving parts in the passive part of the coupling, thus making the coupling maintenance-free and affordable
- self-locking
- high dynamic strength
- flexible design of the couplings for electrical power, compressed air and hydraulic fluid as per customer's specification



Example of an application: 3-axis transfer system with hydraulic grip rail coupling (transfer rail coupling)

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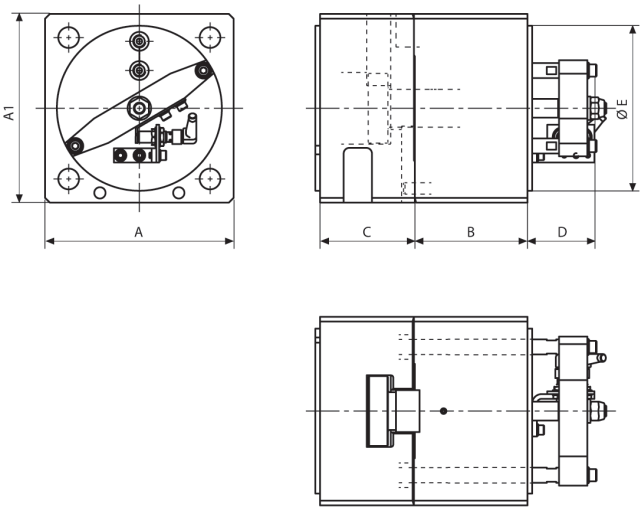
GSH version:
Grip rail coupling, hydraulic

Size	GSH 60	GSH 100
Clamping force (kN)	**60**	**100**
Operating pressure (bar)	60	60
A (mm)	115	200
A1 (mm)	160	200
B (mm)	100	120
C (mm)	80	100
D (mm)	95	84
E (mm)	—	175
Weight (kg)	10,5	27
Centering reproducibility (mm)	± 0,02	± 0,02
Perm. horizontal positioning accuracy (mm)	-1/+3	-1/+3
Perm. axis offset (mm)	± 2	± 2

Further technical details on request or determined in the course of the project.



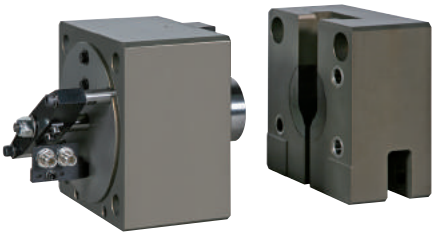
Fastening dimensions on request or according to customer's requirements

Function: hydraulic

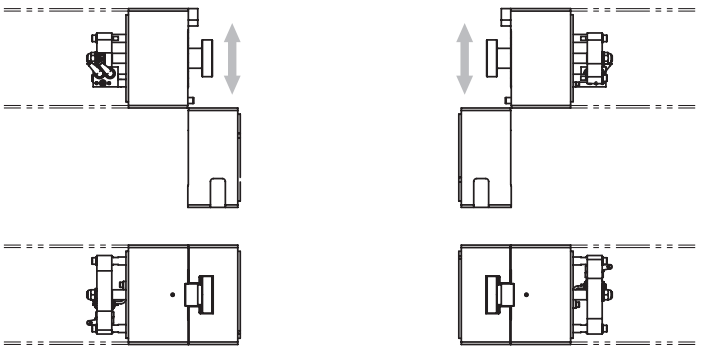
After applying hydraulic pressure, the coupling halves are centered, clamping force is built up and the tie rod is mechanically locked.

Even in the event of a pressure drop the clamping force is fully maintained by mechanical self-locking.

For reasons of safety we recommend that the hydraulic pressure is maintained.



Possibilities of positioning and changing



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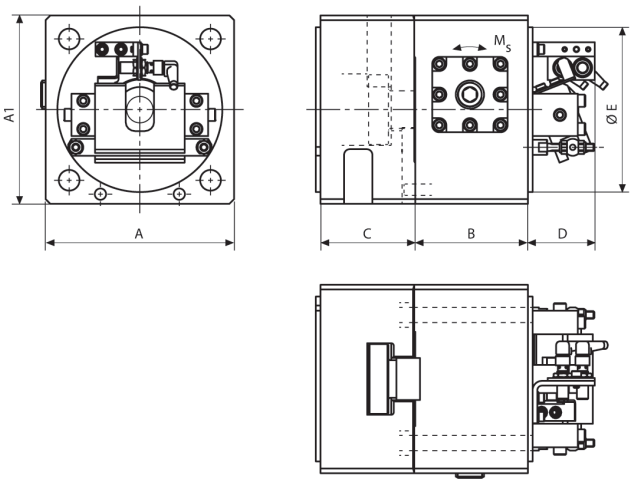
Grip rail coupling
Rapid action clamping system for transfer presses

GSM version:
Grip rail coupling, mechanical

Size	GSM 60	GSM 100
Clamping force (kN)	**60**	**100**
M_s (Nm)	**180**	**300**
A (mm)	115	200
A1 (mm)	160	200
B (mm)	100	120
C (mm)	80	100
D (mm)	65	71
E (mm)	—	175
Weight (kg)	12,5	29
Centering reproducibility (mm)	± 0,02	± 0,02
Perm. horizontal positioning accuracy (mm)	-1/+3	-1/+3
Perm. axis offset (mm)	± 2	± 2

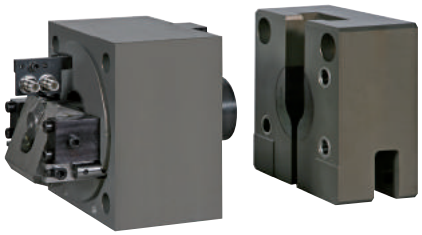
Further technical details on request or determined in the course of the project.



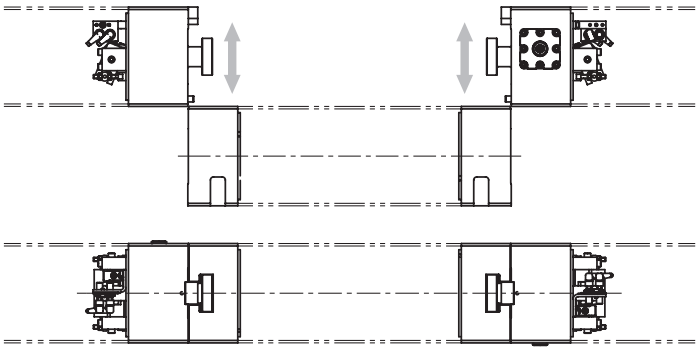
Fastening dimensions on request or according to customer's requirements.

Function: mechanical

By turning the hexagon socket the positioning pins are extended using a wedge system for centering the coupling halves, and the clamping force is built up. The self-locking wedge system, the high clamping forces and the high dynamic strength are the outstanding features of this clamping element.



Possibilities of positioning and changing



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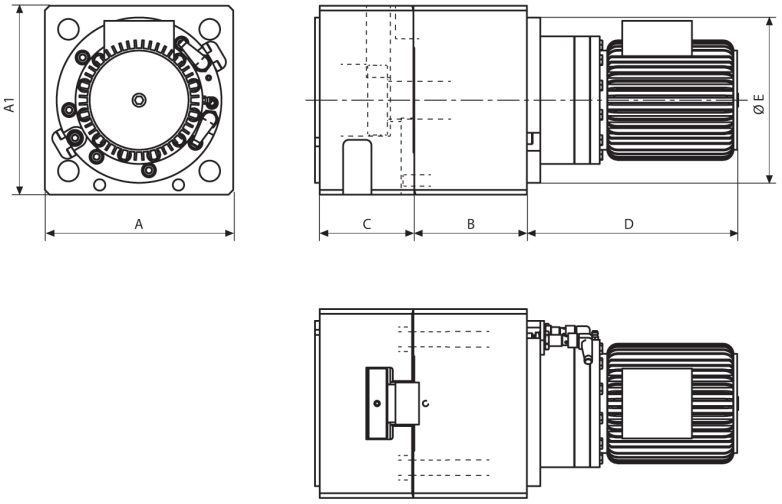
GSE version:
Grip rail coupling, electromechanical

Size	GSE 100
Clamping force (kN)	**100**
Motor output (kW)	0,25
A (mm)	200
A1 (mm)	200
B (mm)	120
C (mm)	100
D (mm)	225
E (mm)	175
Weight (kg)	39
Centering reproducibility (mm)	± 0,02
Perm. horizontal positioning accuracy (mm)	–1/+3
Perm. axis offset (mm)	± 2

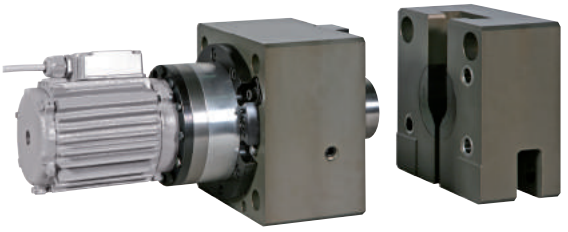
Further technical details on request or determined in the course of the project.



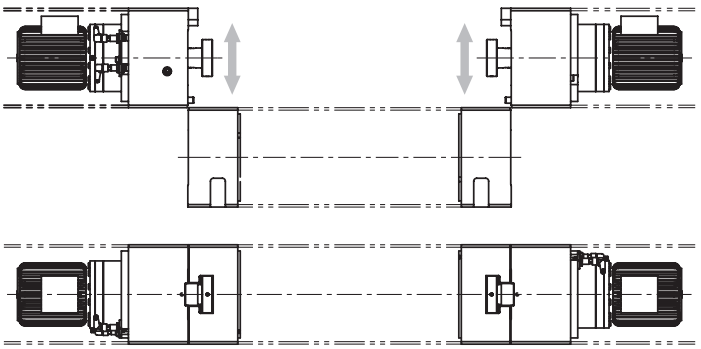
Fastening dimensions on request or according to customer's requirements

Function: electromechanical

The rotary movement of the drive motor is transmitted to the tie rod and the positioning pins using a flex-spline gear and a spindle drive. The operating principle and the arrangement of the gear, position monitoring and automatic sequence of movement ensure high operational reliability.



Possibilities of positioning and changing



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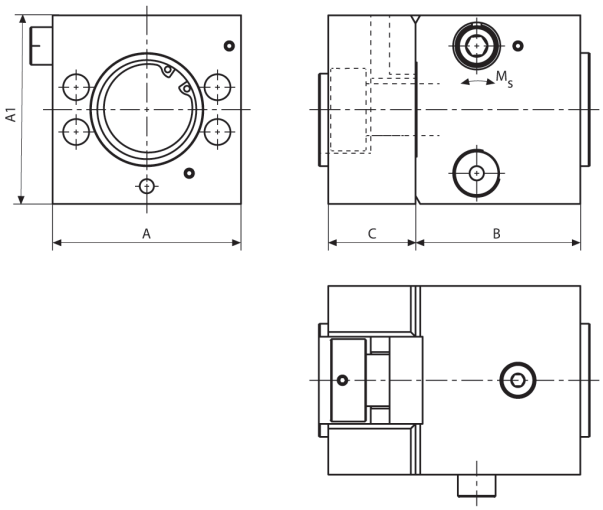
Grip rail coupling
Rapid action clamping system for transfer presses

GSHM version: hydro-mechanical
- with visual clamping force control
- without precision centering and position monitoring

Grip rail coupling, hydro-mechanical

Size	GSHM 45
Clamping force (kN)	**45**
M_s (Nm)	15
A (mm)	80
A1 (mm)	80
B (mm)	70
C (mm)	37
Weight (kg)	2
Centering reproducibility (mm)	± 0,15
Perm. horizontal positioning accuracy (mm)	–1/+2
Perm. axis offset (mm)	± 2

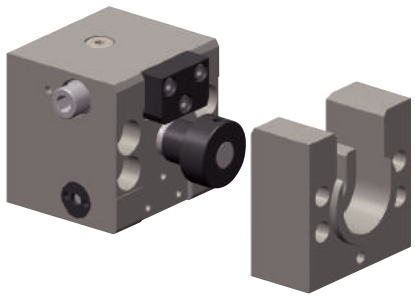
Further technical details on request or determined in the course of the project.



Fastening dimensions on request or according to customer's requirements

Function: hydro-mechanical

By turning the hexagon socket the integral hydraulic pad is preloaded and transforms a low torque into a high clamping force. An indicator pin indicates that the clamping force has been reached.



QUICK DIE CHANGE
Automatic or Manual

Manual Clamping Nut
See Section 6

Hilma has been safely clamping dies for more than 50 years. We work with you to develop an automatic or manual die change system to suit your needs.

We provide the products and support to keep you competitive in today's manufacturing environment.

New Automatic Flexline Traveling Clamp
See Section 3

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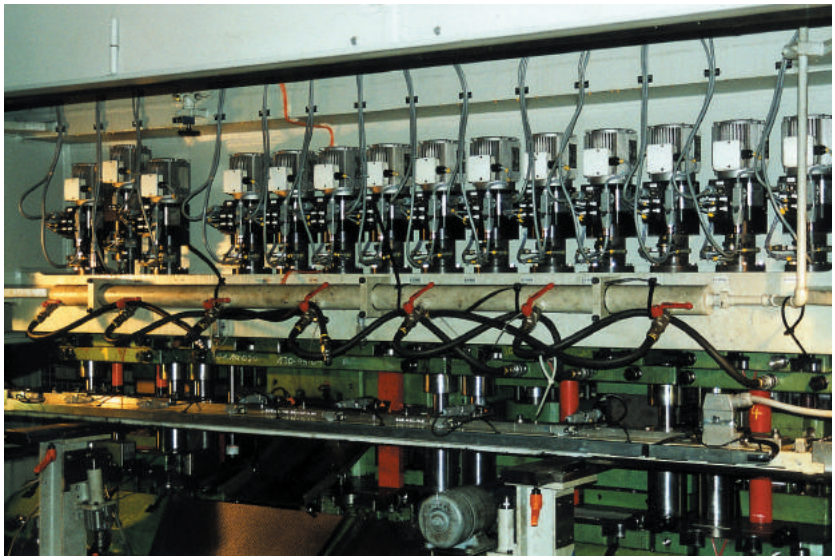
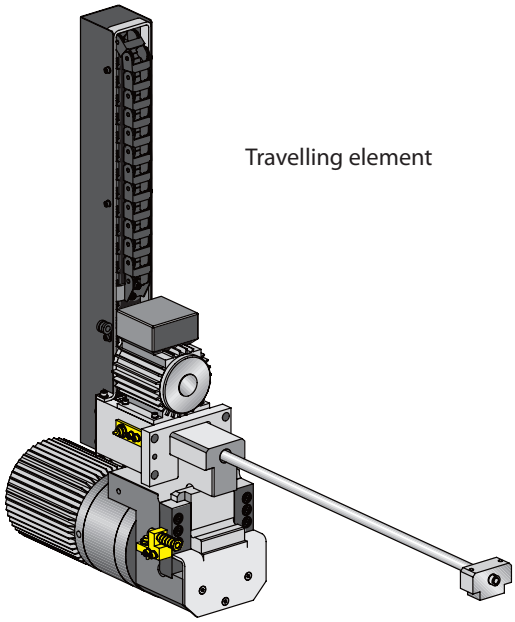
5

Electromechanical clamping elements

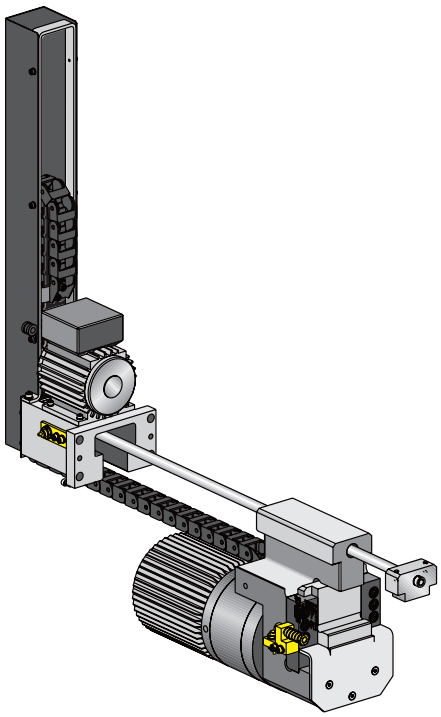


Contents
Product group 5

Angular clamp, electromechanical with lead screw



Angular clamping element in unclamping position



Angular clamping element in clamping position

Applications:

Automatic clamping of dies

- on press rams
- on hold-down devices
- at max. ambient temperatures of 70°C

Function:

The angular clamping element driven by an electric motor is automatically moved to the clamping edge of the die by an electrically driven lead screw. The clamping element is guided in the T-slot of the press.

Power transmission from the clamping element to the clamping edge of the die is ensured by the rotation of the motor, by a flexspine gear and a wedge system.

Advance movement: → Driven by an electric motor, the angular clamping element is moved to the clamping point.

Clamping movement: The clamping force is transmitted to the clamping point in the axial direction of the angular lever

The clamping force and the clamping and unclamping positions are monitored by inductive proximity switches. The clamping force is maintained by mechanical self-locking, even in the event of power failure.

Special features:

- clamping stroke 6 mm, which means high adaptability to varying heights of clamping edges
- clamping in any position of the travelling path
- position monitoring and an automatic cycle ensure high operational reliability
- central operation of all clamping elements
- mechanical self-locking provides additional safety
- resistant to high mechanical loads
- shock-resistant up to a max. ram acceleration of 12 *g*
- suitable for retrofit and for installation in original equipment

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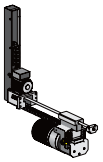
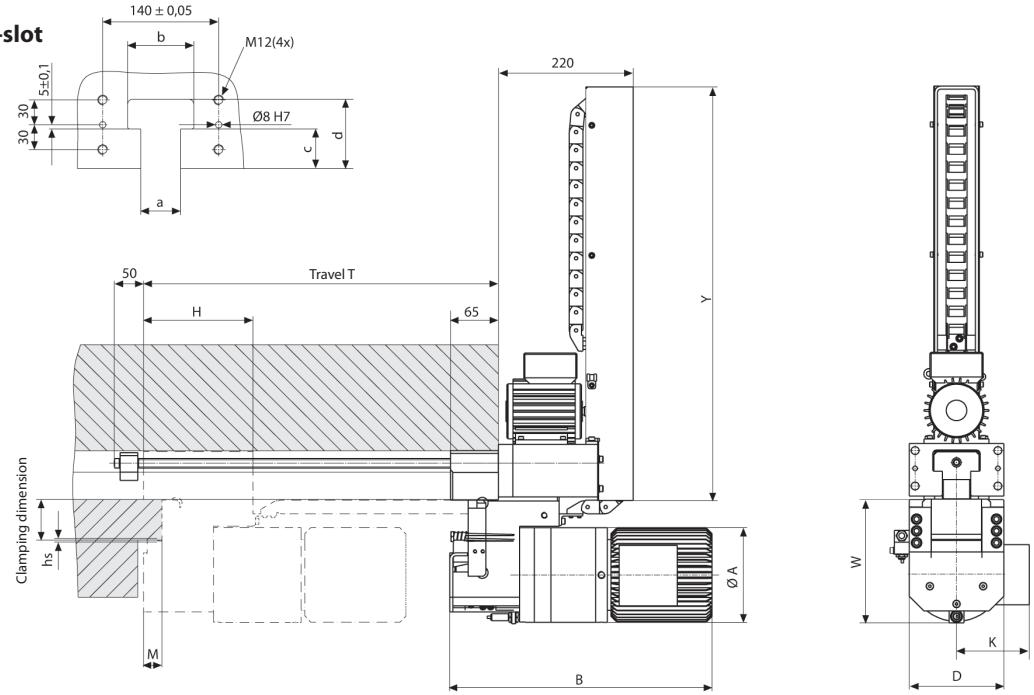


Angular clamp, electromechanical with lead screw

Geometry of the T-slot



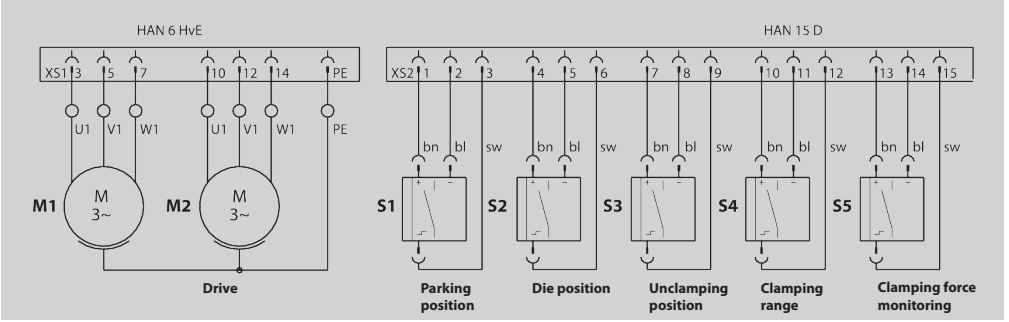
Technical data

Type	HCR-8.2615.0101	HCR-8.2616.0101
Clamping force (kN)	**120**	**160**
Max. static force (kN)	300	300
Traveling speed (mm/s)	64,0	64,0
Clamping speed (mm/s)	1,0	1,0
Connected motor voltage (V/Hz)	400/50	400/50
a (mm)	48	48
b (mm)	80	80
c (mm)	48	48
d (mm)	84	84
A (mm)	160	160
B (mm)	409	409
D (mm)	160	160
H (mm)	185	185
Total stroke hs (mm)	6	6
Clamping stroke (mm)	2	2
K (mm)	123	123
M (mm)	31	31
T (mm)	1000	1000
W (mm)	208	208
Y (mm)	870	870

Clamping dimension to be quoted in the order

Other T-slots, clamping dimensions, clamping forces and motor voltages are available on request

Terminal connections



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Tenon-type clamping element electromechanical

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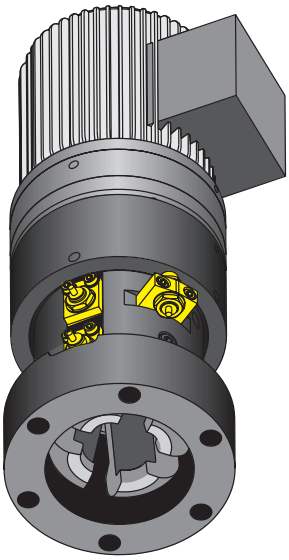

Applications:

Automatic clamping of dies

- on press rams
- on hold-down devices
- at max. ambient temperatures of 70°C

Function:

The rotation of the motor is converted into a grip and pull movement of the clamping claws by the flexspine gear and the lead screw.

For clamping, the claws grip the tenon of the clamping point and pull it towards the clamping element.

The clamping force and the clamping and unclamping positions are monitored by inductive proximity switches. The clamping force is maintained by self-locking.

Special features:

- position monitoring and an automatic cycle ensure high operational reliability
- central operation of all clamping elements
- compact design, rugged construction
- resistant to high mechanical loads
- shock-resistant up to a max. ram acceleration of 12 *g*
- suitable for retrofit and for installation in original equipment
- no colliding edges, smooth die positioning

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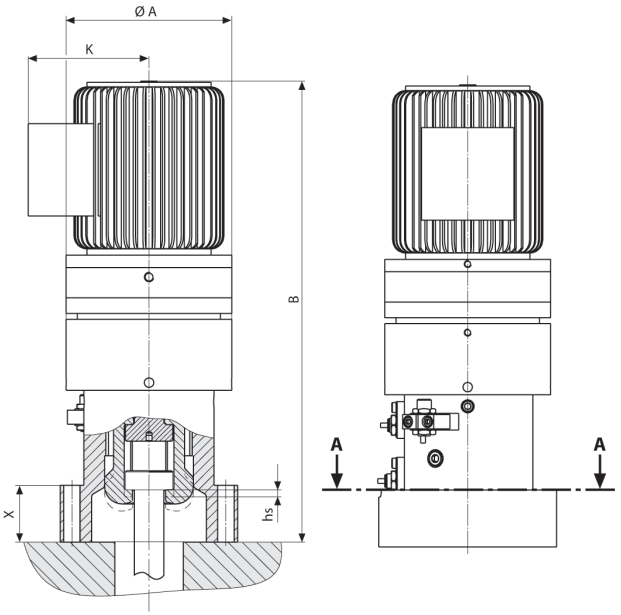
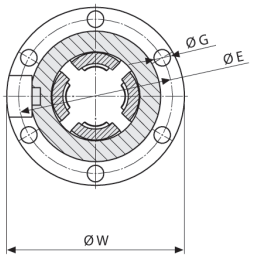
Tenon-type clamping element electromechanical

Technical data

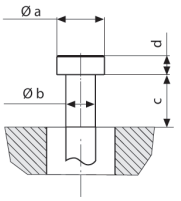
Type	HCR-8.2623.0101	HCR-8.2625.0101	HCR-8.2626.0101
Clamping force (kN)	**70**	**120**	**160**
Max. static force (kN)	110	200	300
Clamping speed (mm/s)	3,8	5,7	4,1
Connected motor voltage V/Hz)	400/50	400/50	400/50
Motor rating (kW)	0,55	1,1	1,1
Rated motor current (A)	2,1	3,55	3,55
a (mm)	40	50	60
b (mm)	25	32	40
c (mm)	44	48	48
d (mm)	16	20	25
A (mm)	140	160	195
B (mm)	390	470	516
E (mm)	130	150	170
G (mm)	14	14	14
Clamping stroke hs (mm)	5	5	5
K (mm)	102,0	112,5	112,5
W (mm)	150	172	200
X (mm)	48	55	65



Section A-A

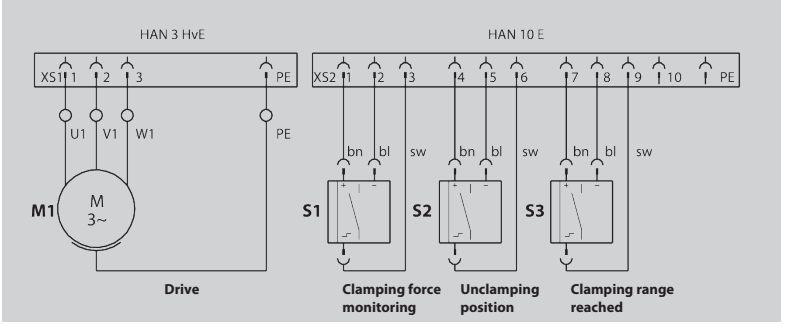


Geometry of the tenon



Other clamping dimensions, clamping forces and motor voltages are available on request

Terminal connections



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Swivel and pull clamping element electromechanical

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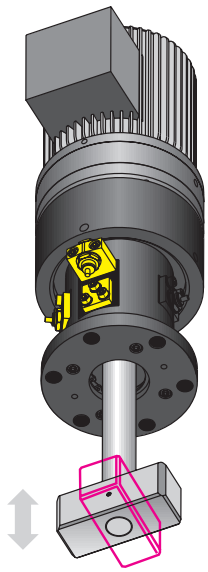


Applications:

Automatic clamping of dies

- on press rams
- on hold-down devices
- at max. ambient temperatures of 70°C

Function:

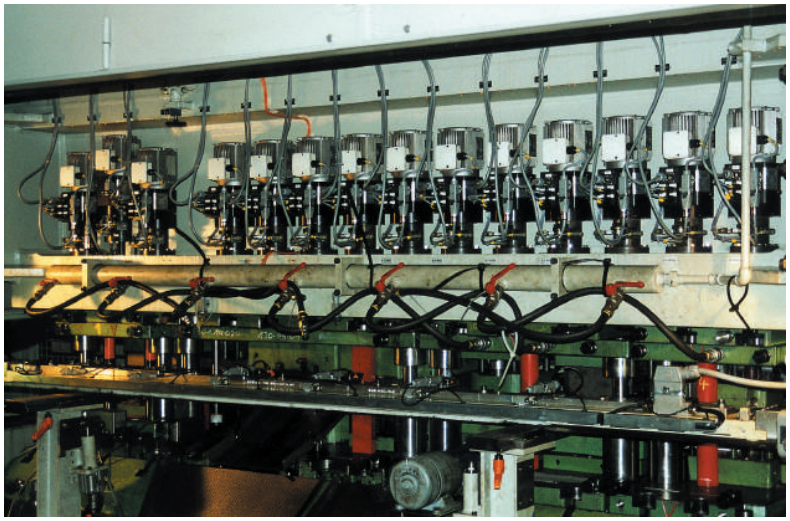
The rotation of the motor is converted into a swivelling movement and a stroke of the tie rod by the flexspine gear and the lead screw. For clamping, the tie rod is swivelled by 90°, starting at the unclamping position, and pulled towards the clamping position.

The clamping force and the clamping and unclamping positions are monitored by inductive proximity switches.

The clamping force is maintained by self-locking.

Special features:

- clamping stroke up to 15 mm, which means high adaptability to varying heights of clamping edges
- position monitoring and an automatic cycle ensure high operational reliability
- central operation of all clamping elements
- compact design, rugged construction
- variable length of tie rod
- resistant to high mechanical loads
- shock-resistant up to a max. ram acceleration of 12 *g*
- suitable for retrofit and for installation in original equipment



Electromechanical swivel and pull clamping elements mounted on a transfer press.

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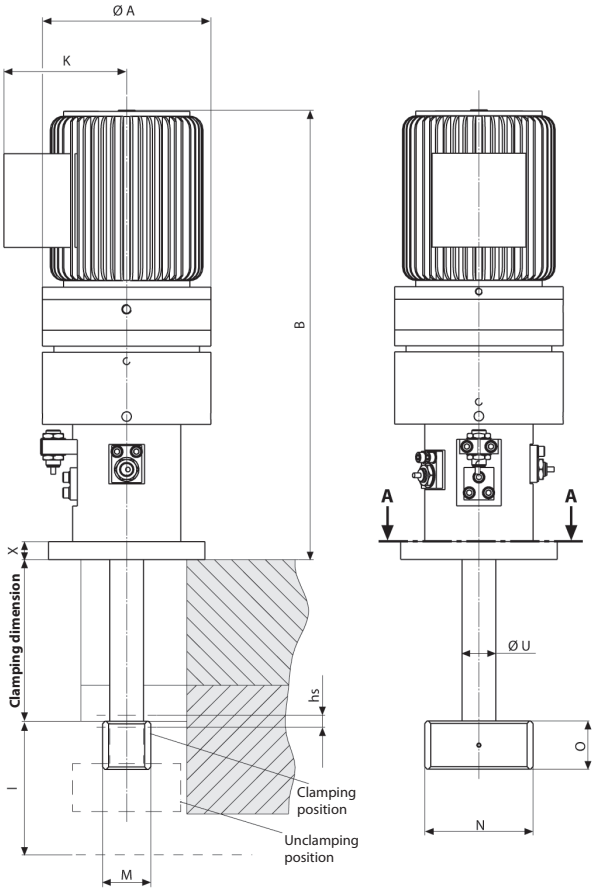
Swivel and pull clamping element electromechanical

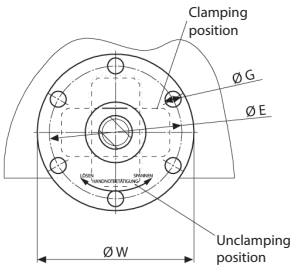
Technical data

Type	HCR-8.2643.0101	HCR-8.2645.0101	HCR-8.2646.0101
Clamping force (kN)	**70**	**120**	**160**
Max. static force (kN)	110	200	300
Clamping speed (mm/s)	3,8	5,7	4,1
Connected motor voltage V/Hz)	400/50	400/50	400/50
Motor rating (kW)	0,55	1,1	1,1
Rated motor current (A)	2,1	3,55	3,55
A (mm)	140	160	195
B (mm)	374	441	500
E (mm)	110	140	160
G (mm)	13,5	13,5	13,5
Clamping stroke hs (mm)	10	10	15
Swivelling stroke (mm)	25	30	40
Installation space I (mm)	90	115	135
K (mm)	102,0	112,5	112,5
M (mm)	40	50	60
N (mm)	90	90	90
O (mm)	40	60	65
U (mm)	28	40	40
W (mm)	130	160	180
X (mm)	15	20	20

Clamping dimension to be quoted in the order

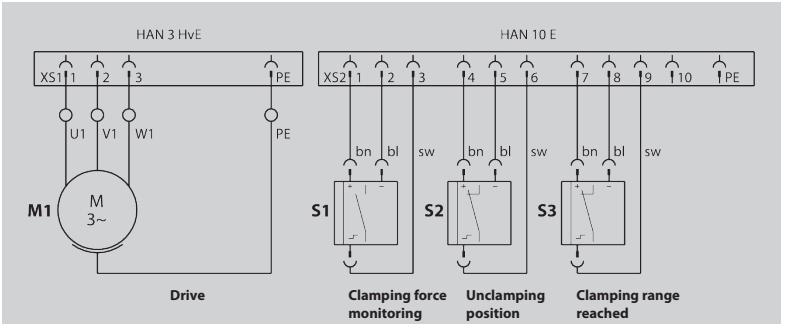


Section A-A



Other clamping dimensions, clamping forces and motor voltages are available on request

Terminal connections



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Swing clamp electromechanical

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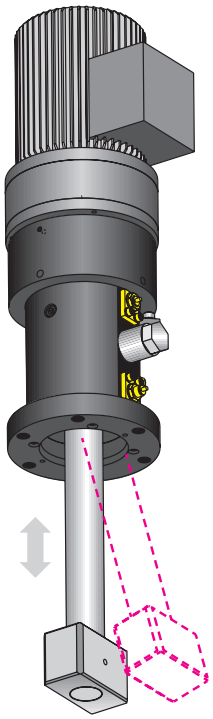


Applications:

Automatic clamping of dies

- on press rams
- on hold-down devices
- at max. ambient temperatures of 70°C

Function:

The rotation of the motor is converted into a swinging movement and a stroke of the tie rod by the flexspine gear, the lead screw and the control pin.

The tie rod swings out by max. 15°.

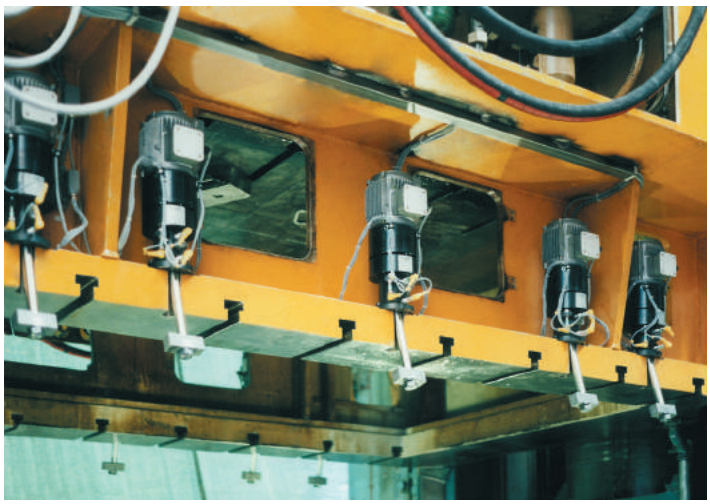
The clamping force is transmitted to the clamping point in the axial direction of the tie rod.

The clamping force and the clamping and unclamping positions are monitored by inductive proximity switches.

The clamping force is maintained by mechanical self-locking.

Special features:

- clamping stroke up to 13 mm, which means high adaptability to varying heights of clamping edges
- position monitoring and an automatic cycle ensure high operational reliability
- central operation of all clamping elements
- compact design, rugged construction
- variable length of tie rod
- resistant to high mechanical loads
- shock-resistant up to a max. ram acceleration of 12 *g*
- suitable for retrofit and for installation in original equipment



Electromechanical swing clamps mounted on a double-column press.

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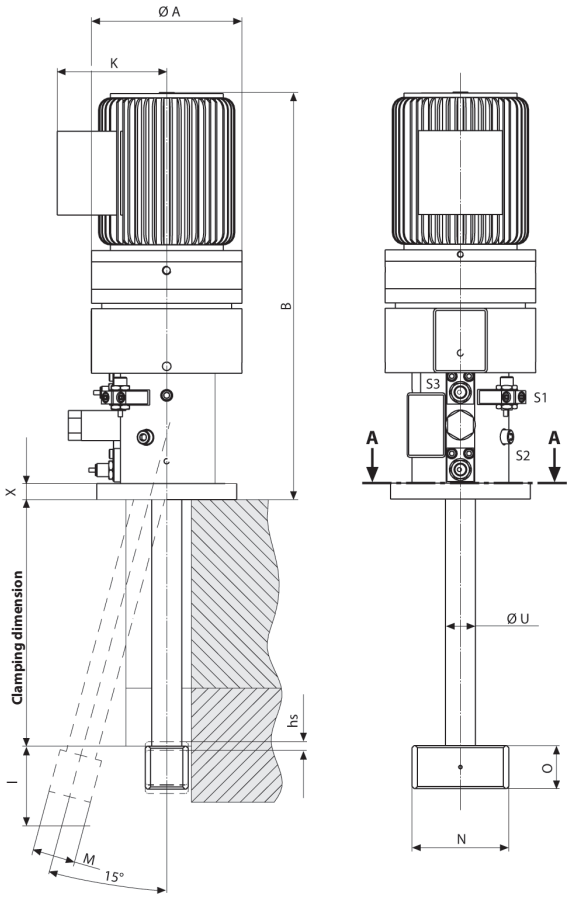
Swing clamp electromechanical

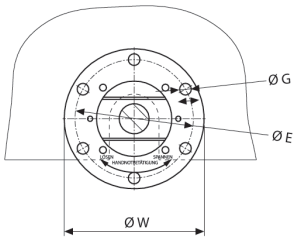
Technical data

Type	HCR-8.2653.0101	HCR-8.2655.0101	HCR-8.2656.0101
Clamping force (kN)	**70**	**120**	**160**
Max. static force (kN)	110	200	300
Clamping speed (mm/s)	3,8	5,7	4,1
Connected motor voltage V/Hz)	400/50	400/50	400/50
Motor rating (kW)	0,55	1,1	1,1
Rated motor current (A)	2,1	3,55	3,55
A (mm)	140	160	195
B (mm)	409	522	602
E (mm)	110	140	160
G (mm)	11,0	13,5	13,5
Clamping stroke hs (mm)	11	12	12
Swing stroke (mm)	8,0	10,5	13,0
Installation space I (mm)	85	120	125
K (mm)	102,0	112,5	112,5
M (mm)	40	50	60
N (mm)	90	90	90
O (mm)	40	60	65
U (mm)	28	40	40
W (mm)	130	160	180
X (mm)	42	57	65

Clamping dimension to be quoted in the order

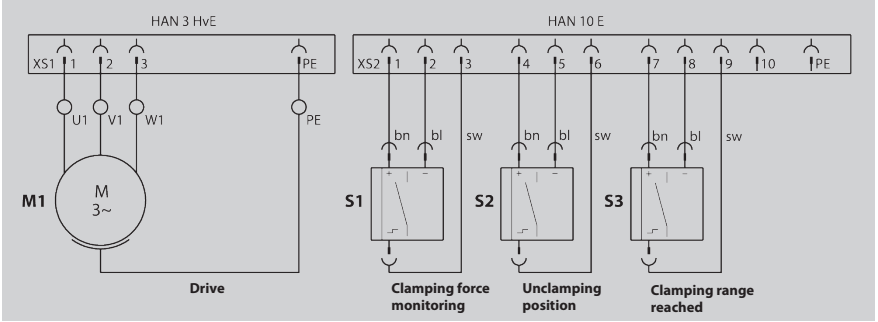


Section A-A



Other clamping dimensions, clamping forces and motor voltages are available on request

Terminal connections



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Wedge clamps for flat clamping edge electro-mechanical, self-locking, with position monitoring

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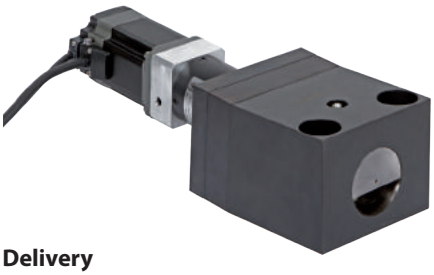


Delivery

- **Wedge clamping element with drive**
  Electrical connection
  -motor cable, firmly connected (L=280mm)
  -control cable, firmly connected (L=280mm)
  (extension cable: see page 3 of this series)
- **Control module**

Position monitoring

The position monitoring is integrated in the drive. The following positions are reported on the control module:

- **Clamping bolts in off-position**
  (retracted)
- **Clamping bolts in clamping position**
  (extended)

Possible fault messages

- Outside the clamping range
- Cable break
- Current peaks
- Over temperature
- Clamping force in not reached

Version with angular gear

By default, the electrical drive is mounted at the rear of the guide housing. Alternatively, a version with angular gear is available (see page 2 of this series).

Applications:

Electro-mechanical wedge clamping elements are used for hydraulic free clamping of dies on sliding tables, in injection molding machines and presses on bed and ram.

Function:

The clamping bolt of the wedge clamping elements is operated by a 24 VDC direct current drive via a snail transmission and a spindle stroke transmission

The self-locking spindle lifting gear stops the actuator in case of power failure and maintains it safely in the reached position.

During clamping, the clamping bolt is moved with low inclination onto the straight clamping edge.

The clamping bolt is completely retracted in the guide housing in off-position.

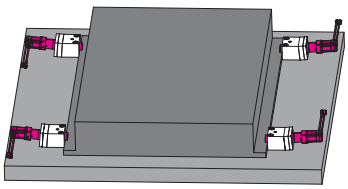
The wedge clamp is equipped with an integrated position monitoring. In addition, fault messages can be output.

The wedge clamping element is controlled via a control module equiped with different data interfaces.

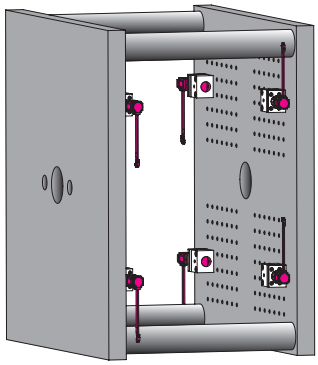
Special features:

- increased operating safety by mechanical self-locking and monitoring of the clamping position
- control of the following functions: clamping and unclamping position, clamping force and speed of the clamping bolt.
- compact electro-mechanical force package
- reclamping on the clamping point for flexible clamping edges possible
- even in case of power failure, safe and self-locking clamped
- optimum automation element
- high-quality corrosion protection for drive and housing

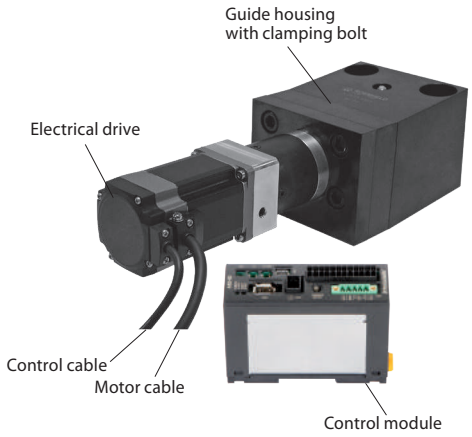
Application examples



Sliding tables



Injection molding machines



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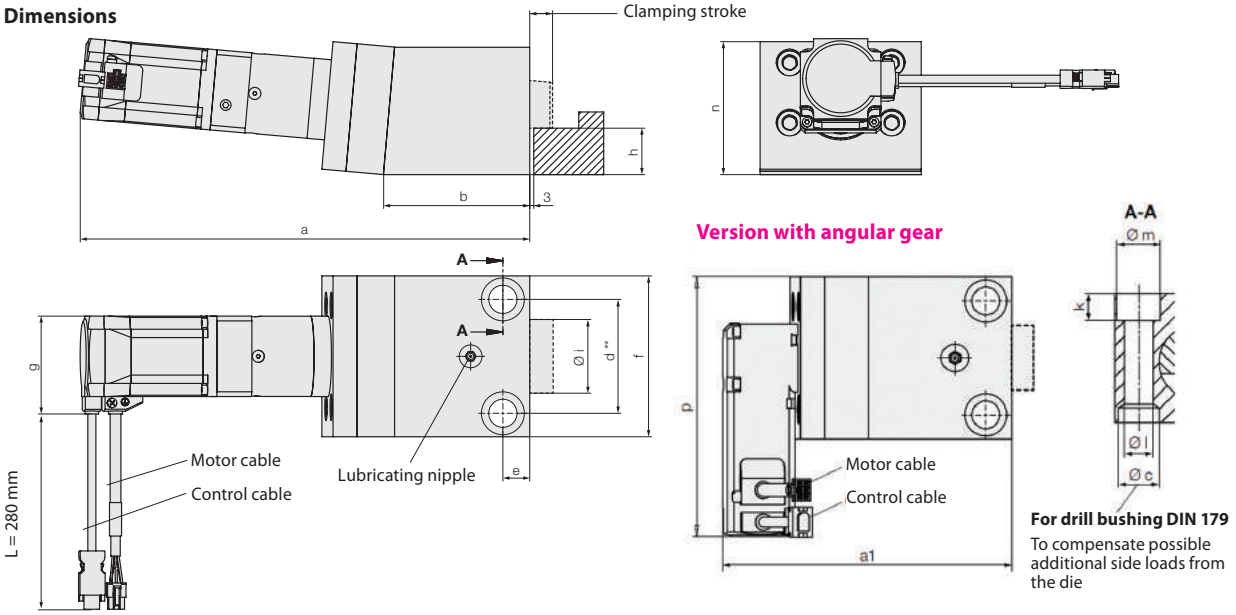
Wedge clamps for flat clamping edge electro-mechanical, self-locking, with position monitoring

Dimensions



Adm. operating force for screws 8.8 (DIN 912)	**[kN]**	**60**	**130**	**190**
for screws 10.9 (DIN 912)	**[kN]**	**90**	**160**	**240**
Fastening screw		**M16**	**M20**	**M24**
Total stroke	[mm]	25	25	28
Clamping stroke	[mm]	16	17	20
Max. temperature	[°C]	70	70	70
Clamping force max.	[kN]	25	35	35
a	[mm]	286	335	350
a1	[mm]	178	276	292
b	[mm]	95	109	125
Øc H7 x depth	[mm]	26/9	30/11	35/11
d** (When using drill bushings ± 0.02)	[mm]	70	85	105
e	[mm]	16	20	25
f	[mm]	100	120	150
g	[mm]	40	73	73
h (±0.1)	[mm]	25	35	40
Ø i	[mm]	40	55	70
k	[mm]	17	20	26
Ø l	[mm]	17	21	26
Ø m	[mm]	26	32	40
n	[mm]	78	100	110
p	[mm]	160	220	235
Weight	[kg]	10	15	22
Rated voltage	[V DC]	24	24	24
Current for empty running	[A]	1.5	1.5	1.5
Max. current	[A]	3.8	3.8	3.8
Code class		IP 54	IP 54	IP 54
Lifting speed	[mm/s]	2	2	2
Part no. without angular gear		**HCR-8.2674.0101**	**HCR-8.2675.0101**	**HCR-8.2676.0101**
Part no. with angular gear		**HCR-8.2674.0201**	**HCR-8.2675.0201**	**HCR-8.2676.0201**

** on request also available with Euromap grid

Accessories			
Drill bushings DIN 179	17 x 16	21 x 20	26 x 20
Part no.	**CLR-3300-287**	**CLR-3300-288**	**CLR-3300-289**

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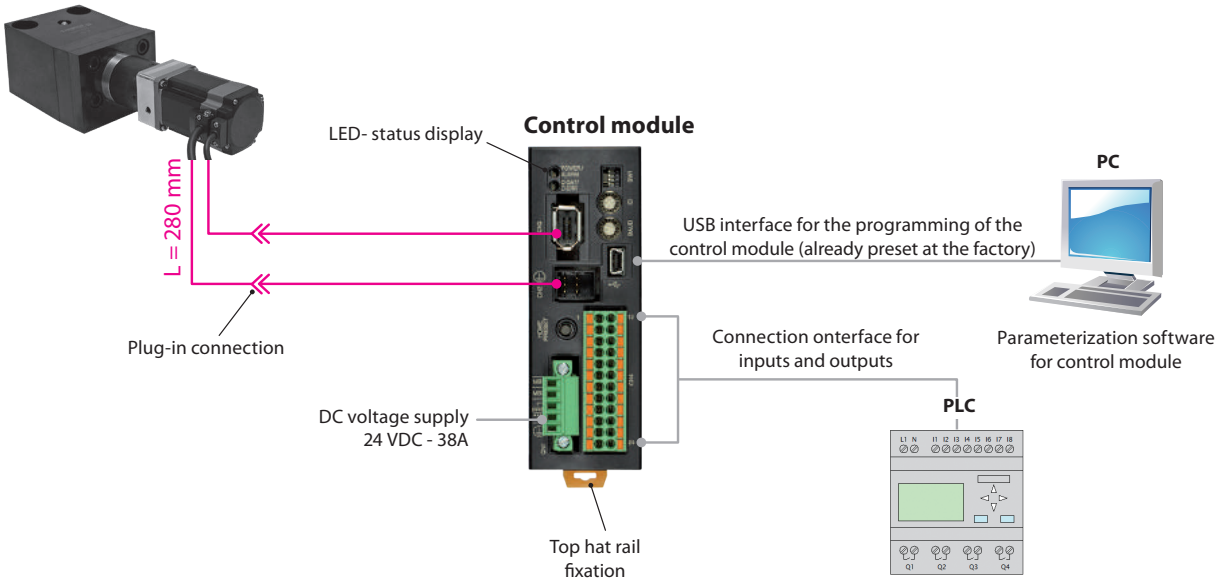
Block diagram and accessories

Wedge clamping element



Accessories

Extension cable

Control cable and motor cable as set

Length of cable	5 m	10 m	15 m	20 m
Part no.	**HCR-2.0975.0046**	**HCR-2.0975.0047**	**HCR-2.0975.0048**	**HCR-2.0975.0049**

Options

on request

- Electromagnetic brake in the clamping element
- Drive laterally angled with angular gear
- Network-converter for CC-Link 1.1, mechatronics II and III and EtherCAT
- Ethernet/network connector RJ45 as the connection between the control modules
- Control module with 48 V DC voltage supply

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DIE LIFTERS
for stamping presses

Optimize your press, with Hilma ball or roller lifters, for safe, easy die handling.

Consult with Hilma to customize a die change system to suit your needs.

- Hydraulic or Mechanical
- Roller or Ball Type
- Robust Steel Bars
- Cartridge Inserts or Rollblock Bar
- Standard or High Temperature

See Section 8

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adaptive
adaptive
adaptive
adaptive

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6

Mechanical clamping elements




Contents
Product group 6

Sliding clamp, mechanical with integral high-pressure spindle

ROEMHELD
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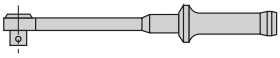
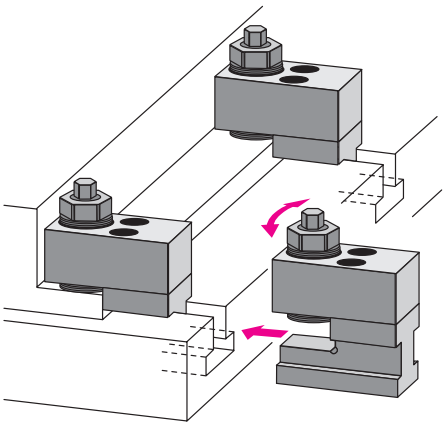
Accessory

Torque wrench 20 - 100 Nm
Part no. CLRH-9-3792-6610-VSA





Note:

Before applying the tightening torque, the high-pressure spindle must be screwed against the clamping edge so that there is no play.

If the parts are not rigid, tighten the high-pressure spindle using the hexagon nut (SW 2) until there is no play.

Applications:

- for clamping and locking dies on press beds and rams
- on beds of machine tools
- when the available space is limited

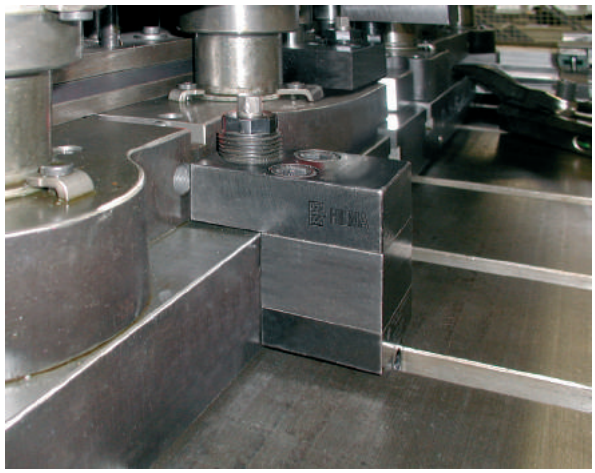
Function:

The sliding clamp is manually placed in the T-slots and screwed against the die clamping edge. Once the high-pressure spindle has been adjusted to suit the height of the clamping edge, the clamping force is built up by turning the hexagon nut (SW 1) in a clockwise direction.

The clamping force achieved depends on the tightening torque selected with the torque wrench.

Advantages:

- suitable for retrofit
- temperature resistance up to 250°C
- compact design and easy handling
- clamping force of between 40 and 80 kN
- high clamping force with low torque
- compensates for large clamping edge tolerances
- no colliding edges, smooth die positioning
- no need for die standardization (width and depth)
- self-locking by patented wedge system



Mechanical sliding clamps fastened to a machine bed.

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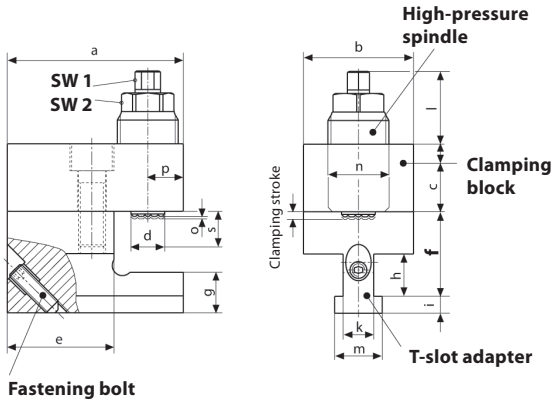
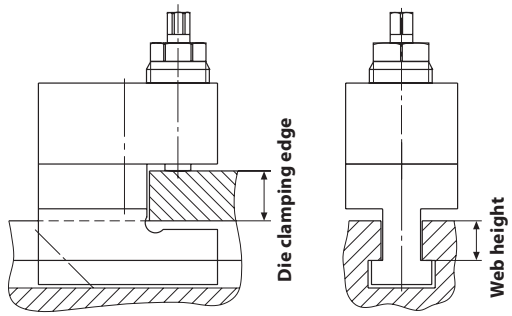
Sliding clamp, mechanical with integral high-pressure spindle

T-slot DIN 650 (mm)	18	22	28
Clamping force (kN)	**40**	**40**	**80**
Clamping stroke (mm)	1,5	1,5	2,2
Max. tightening torque (Nm)	30	30	70
a (mm)	104	104	126
b (mm)	65	65	80
c (mm)	40	40	50
d (mm)	19	19	28
e (mm)	63	63	72
f min. - max. (mm)	50 –106	56 –106	72 –131
g (mm)	24	32	42
h (mm)	25	30	37
i (mm)	10	14	18
k (mm)	18	22	28
l (mm)	50	50	60
m (mm)	28	35	44
n (mm)	M 36 x 3	M 36 x 3	M 48 x 3
p (mm)	21	21	27
Max. travelling path s (mm)	30	30	35
SW 1 (mm)	13	13	17
SW 2 (mm)	30	30	41
Weight (kg)	3,7	4,0	6,5
Part no.	**HCR-2212-185-FXX**	**HCR-2212-225-FXX**	**HCR-2213-285-FXX**



Functional dimension 'f':
die clamping edge
+ web height of T-slot
+ 4 mm
= dimension '**f**'



Special versions are available on request.

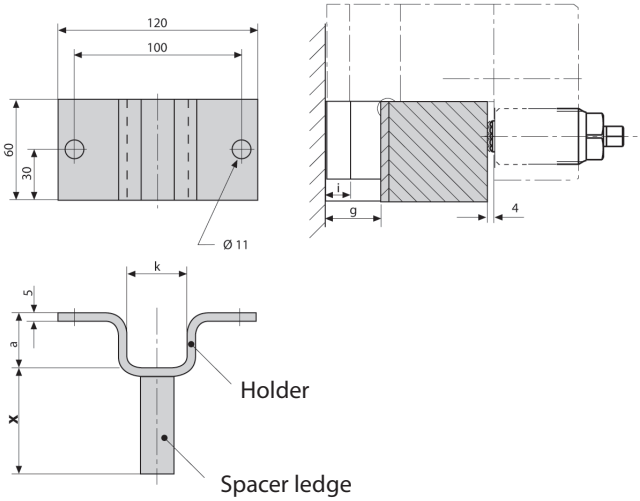
Example of ordering: HCR-2212-185-F80

Sliding clamp, mechanical
T-slot: 18 mm
Clamping force: 40 kN

Functional dimension '**f**' = 80 (in mm) to be quoted in the order

Parking station accommodates the clamping element during die change

T-slot DIN 650 (mm)	18	22	28
a (mm)	25	33	43
k (mm)	30	37	46
i (mm)	10	14	18
g (mm)	24	32	42
Parking station, with holder and spacer ledge Part no.	**HCR-8.2754. 1850.XXX**	**HCR-8.2754. 2250.XXX**	**HCR-8.2754. 2850.XXX**
Holder Part no.	**HCR-2754-180**	**HCR-2754-220**	**HCR-2754-280**



Distance 'x':
x = f + i - g - 4 mm

Dimension **x** to be quoted in the order

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Clamping block, mechanical with integral high-pressure spindle

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Applications:

- for clamping and locking dies on press beds and rams
- on beds of machine tools
- when the available space is limited

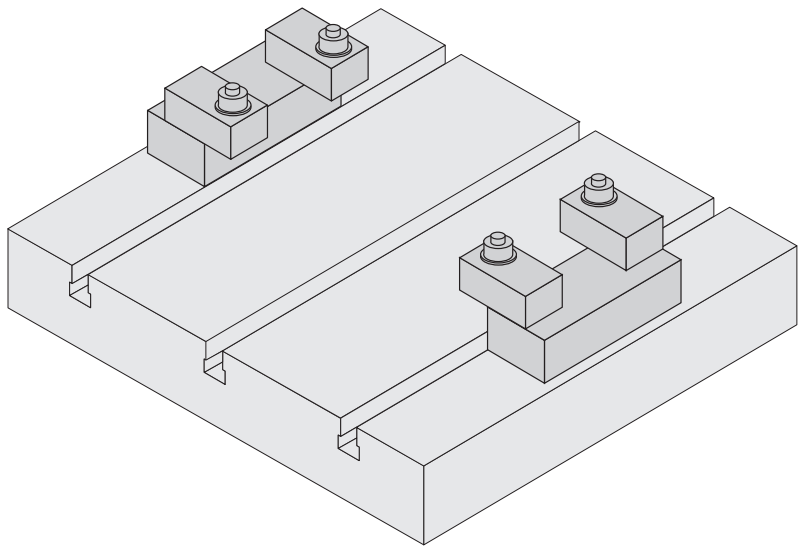
Function:

The high-pressure spindle is manually screwed against the die clamping edge. The clamping force is built up by turning the hexagon nut (SW 1) in a clockwise direction using a torque wrench.

The clamping force achieved depends on the tightening torque selected with the torque wrench.

Advantages:

- suitable for retrofit
- temperature resistance up to 250°C
- compact design
- clamping force of between 40 and 80 kN
- high clamping force with low torque
- compensates for large clamping edge tolerances
- self-locking by patented wedge system
- individually usable
- clamping block with high-pressure spindle
- mounted on spacer ledges



Clamping block with high-pressure spindle, mounted on spacer ledges

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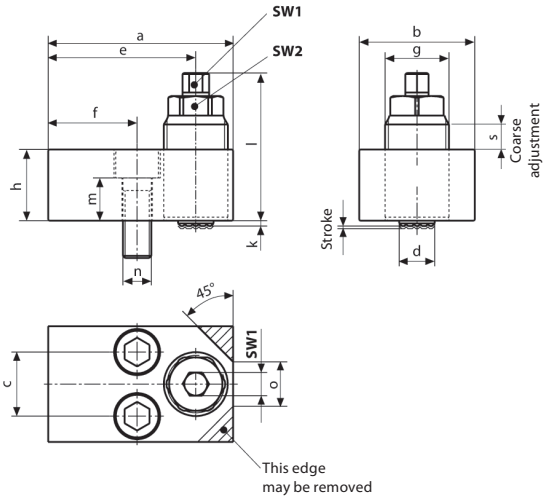
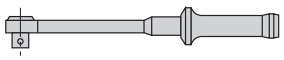
Clamping block, mechanical with integral high-pressure spindle

Clamping force (kN)	40	80
Clamping stroke (mm)	**1,5**	**2,2**
Max. tightening torque (Nm)	30	70
a (mm)	104	126
b (mm)	65	80
c (mm)	36	43
d (mm)	19	28
e (mm)	83	99
f (mm)	50	57
g (mm)	M 36 x 3	M 48 x 3
h (mm)	40	50
k (mm)	3	3
l (mm)	91	111
m (mm)	24	29
n (mm)	M 16	M 20
o (mm)	24	30
Max. travelling path s (mm)	30	35
SW 1 (mm)	13	17
SW 2 (mm)	30	41
Weight (kg)	2,3	4,0
Part no.	**HCR-2212-111**	**HCR-2213-111**



Accessory:

Torque wrench 20 - 100 Nm
Part no. HCR-9.3792.6610



Note:

Before applying the tightening torque, the high-pressure spindle must be screwed against the clamping edge so that there is no play.

If the parts are not rigid, tighten the high-pressure spindle using the hexagon nut (SW 2) until there is no play.

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High-pressure spindle, mechanical with integral wedge system

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Original size
Section of high-pressure spindle

Applications:

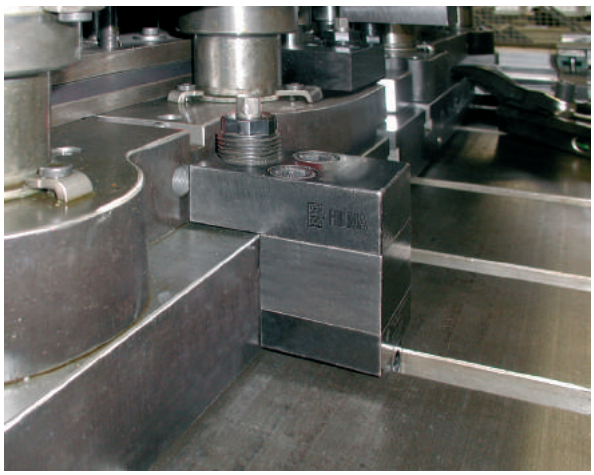
- in ledges and blocks
- for workpiece and die clamping and locking
- when the available space is limited
- in presses, punching machines and machine tools

Function:

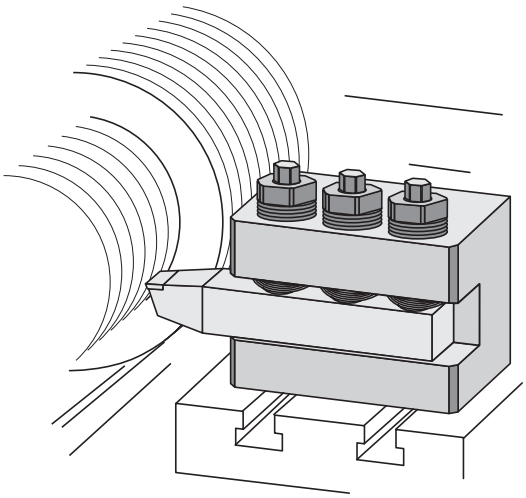
Following manual positioning of the high-pressure spindle against the clamping edge, the wedge system is brought into action by turning the hexagon nut (SW1), and the clamping force is transmitted axially to the clamping point. The required clamping force is achieved by selecting the appropriate torque on the torque wrench (see force-torque diagram). For unclamping, proceed in the reverse order.

Advantages:

- suitable for retrofit
- temperature resistance up to 250°C
- compact design allows for multiple clamping
- clamping force of between 40 and 120 kN
- high clamping force with low torque
- self-locking by patented wedge system
- individually usable



Example of application



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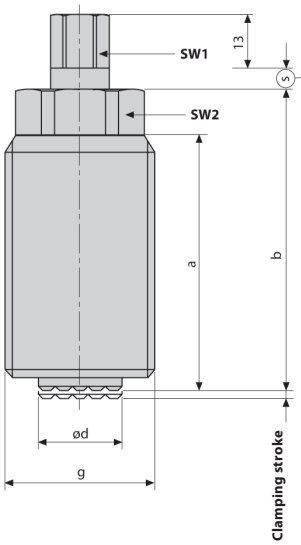
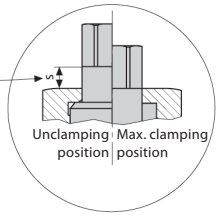
High-pressure spindle, mechanical with integral wedge system

Clamping force (kN)	40	80	120
Clamping stroke (mm)	1,5	2,2	2,5
Max. tightening torque (Nm)	30	70	120
Max. static load (kN)	80	160	240
a (mm)	62	75	90
b (mm)	73	90	110
Ød (mm)	19	28	39
g (mm)	M 36 x 3	M 48 x 3	M 64 x 4
Monitoring of clamping stroke s (mm)	5	7,5	8,5
SW 1 (mm)	13	17	19
SW 2 (mm)	30	41	55
Weight (kg)	0,5	2,0	2,5
Part no.	HCR-2272-210	HCR-2273-210	HCR-2274-210

Other sizes and threads (e.g. inch) are available on request.





Max. clamping position (s)

Accessories:

Torque wrench 20 - 100 Nm
Part no. CLRH-9-3792-6610-VSA
Torque wrench 40 - 200 Nm
Part no. CLRH-9-3792-6620-VSA

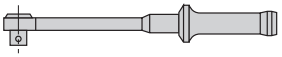
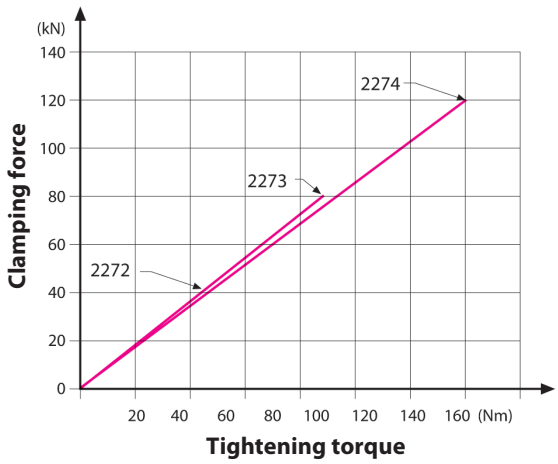


Diagram:
Clamping force - tightening torque



Note:

Before applying the tightening torque, the high-pressure spindle must be screwed against the clamping edge so that there is no play. If the parts are not rigid, tighten the high-pressure spindle using the hexagon nut (SW 2) until there is no play.

High-pressure spindles are permanently lubricated and are maintenance-free under normal conditions of use.

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Clamping nut, mechanical

- Temperature resistance up to 150 °C
- Reclamping on the clamping edge

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Applications:

- clamping and locking of dies on press beds and rams
- on machine tool tables
- when the available space is limited
- if components and tools are not rigid
- where oil-free clamping is desired

Function:

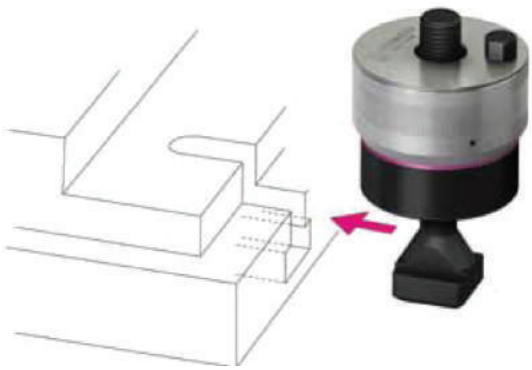
Following manual positioning of the clamping nut against the clamping edge, the integral gear and the Belleville springs will be preloaded by turning the hexagon nut.

As a result, a high clamping force is generated with a small torque. The required clamping force is reliably displayed by clamping force display and the integrated Belleville spring assembly ensures reclamping of the clamping nut in the case of clamping edge changes.

Advantages:

- temperature resistance up to 150 °C
- high safety due to 360° visible clamping force display
- high clamping force with low torque
- easy to retrofit
- clamping nut with through-hole thread, therefore high adaptability to varying heights of clamping edges and tolerances
- reclamping on the clamping edge by preloaded Belleville spring assembly – the clamping force is maintained
- easy clamping and unclamping by hand
- hydraulic-free and maintenance-free clamping
- maximum force density in the smallest space

Application example



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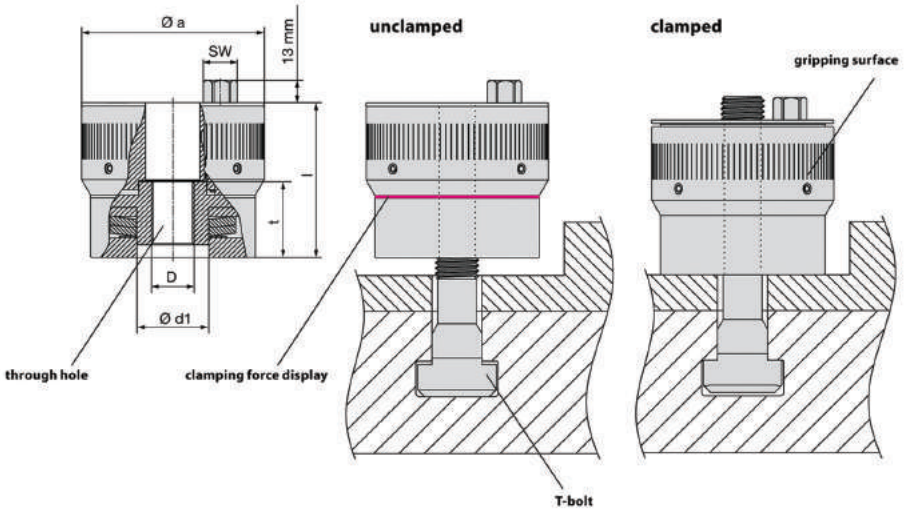
Clamping nut, mechanical

- Temperature resistance up to 150 °C
- Reclamping on the clamping edge



Clamping nut, mechanical with clamping force display

T-slot DIN 650 [mm]	**28**
Clamping force [kN]	**100**
Tightening torque [Nm]	65
D [mm]	M 24*
a [mm]	102
d1 [mm]	40
l [mm]	87
t [mm]	42
SW [mm]	17
Clamping nut, separate Part no.	**HCR-8.2276.0500**
Weight approx. [kg]	4,2
T-bolt (L = 250 mm) Part no.	**HCR-5700-024**

* Additional sizes as well as variations in the thread sizes,
T-slots dimensions and higher temperatures on request.

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Clamping nut, mechanical with integral planetary gear

Applications:

- for clamping and locking dies on press beds and rams
- on beds of machine tools
- when the available space is limited

Function:

Following manual positioning of the clamping nut against the clamping edge, the integral planetary gear is brought into action by turning the hexagon nut. As a result of the gear transmission, the tightening torque is multiplied. In order to reliably ensure the required clamping force, we recommend that a torque wrench is used.

Advantages:

- suitable for retrofit
- compact design allows for multiple clamping
- intensification of clamping force possible in case of multiple clamping
- high clamping force with low torque
- compensates for large clamping edge tolerances
- easy manual clamping and unclamping

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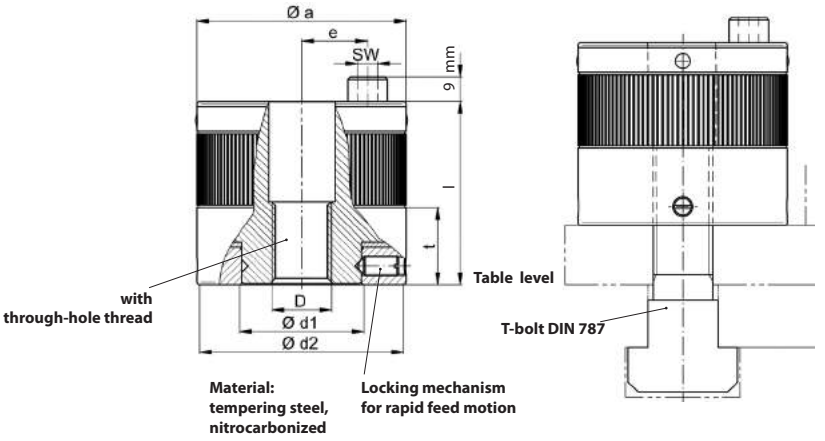
Clamping nut, mechanical, type MD



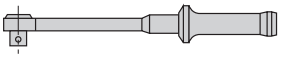
Clamping nut with through-hole thread, type MD

T-slot DIN 650 (mm)	14	18	22	28	36	42
Clamping force (kN)	**60**	**60**	**60**	**120**	**180**	**180**
Tightening torque (Nm)	30	35	40	85	100	110
D (mm)	M 12	M 16	M 20	M24	M 30	M 36
a (mm)	74	74	74	84	105	105
d1 (mm)	40	40	40	50	64	64
d2 (mm)	72	72	72	82	103	103
l (mm)	58	58	58	74	78	78
t (mm)	23	23	23	32	37	37
SW (mm)	8	8	8	8	8	8
Clamping nut, separate Part no.	**HCR-8.2275.0005**	**HCR-8.2275.0006**	**HCR-8.2275.0007**	**HCR-8.2276.0004**	**HCR-8.2277.0004**	**HCR-8.2277.0005**
Approx. weight (kg)	1,6	1,6	1,6	2,5	3,9	3,8
T-bolt Part no.	**HCR-1.0787.1210***	**HCR-1.0787.1169**	**HCR-1.0787.0211**	**HCR-1.0787.1246**	**HCR-1.0787.0304**	**HCR-1.0787.0308**

Other sizes and threads (e.g. inch) are available on request.
* For T-slot 14 mm grade 12.9 is required
Maximum temperature range -30 °C to + 200 °C

Accessories:

Torque wrench 20 - 100 Nm
Part no. CLRH-9-3792-6610-VSA
Torque wrench 40 - 200 Nm
Part no. CLRH-9-3792-6620-VSA



Example of application:
Power clamping nut
Product line MD
for clamping chain
wheels during milling

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Clamping nut, hydro-mechanical

maximum power density in the smallest space

ROEMHELD
HILMA ▪ STARK

Applications:

- for clamping and locking dies on press beds and rams
- on beds of machine tools
- when maximum clamping force is required in the smallest space
- when no power unit is available

Function:

Following manual positioning of the clamping nut against the clamping edge, the integral hydraulic cushion is preloaded by turning the hexagon socket. A low torque is translated into a high clamping force.

In the case of versions without clamping force control, use a torque wrench to ensure safe and defined build-up of the clamping force. In the case of versions with clamping force control, the clamping force indicator pin will project by approx. 2.5 mm when the clamping force is reached.

Advantages:

- clamping nut with a through thread, which means high adaptability to varying heights of clamping edges and tolerances.
- safe clamping using the clamping force indicator pin (option)
- no need for adaptation of the tie rod length
- suitable for retrofit
- intensification of clamping force possible in the case of multiple clamping
- high clamping force with low torque
- easy manual clamping and unclamping

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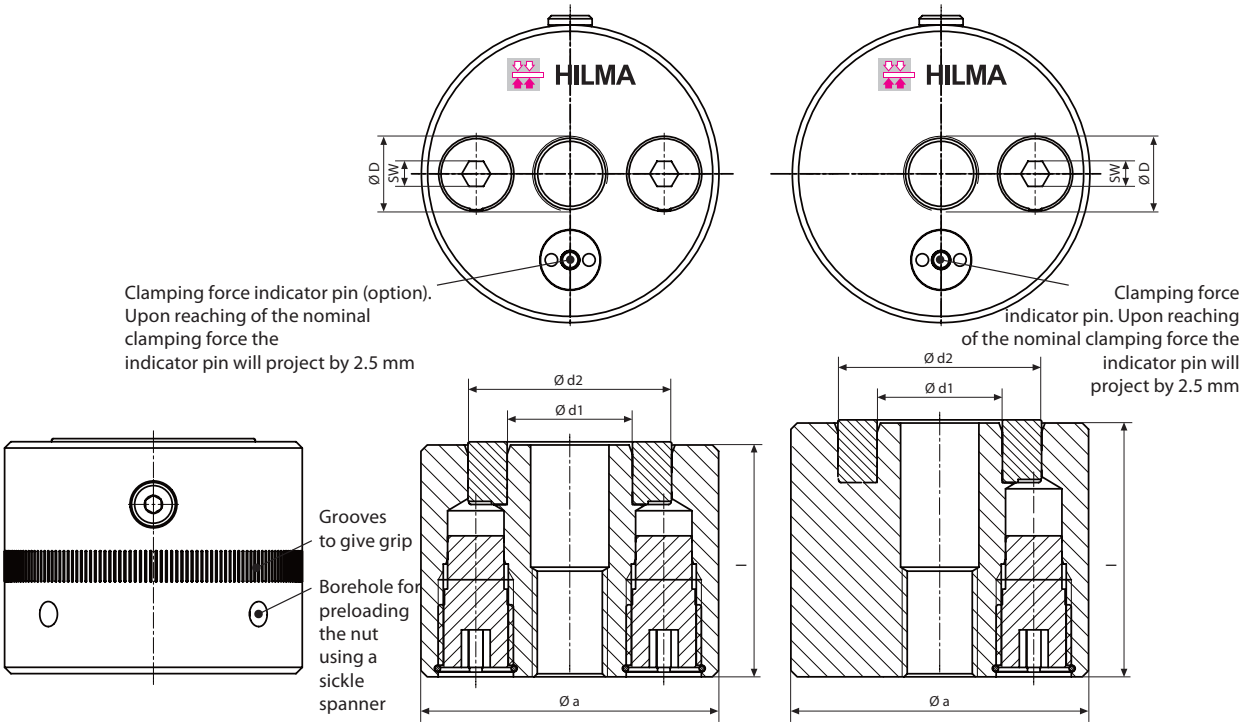
Clamping nut, hydro-mechanical

maximum power density in the smallest space



Clamping nut, supplied separately

Clamping force (kN)	with two tightening screws 60	100	150	with one tightening screw 60	100
Max. stroke* (mm)	2	2	2	2	2
Tightening torque (Nm)	9	30	—	9	30
D (mm)	M 20	M 24	M 30	M 20	M 24
a (mm)	70	95	112	70	95
d1 (mm)	30	40	50	30	40
d2 (mm)	50	65	80	50	65
SW (mm)	8	8	10	8	8
l (mm)	71	75	90	87	91
Weight (kg)	2,0	3,7	6,1	2,3	4,6
without clamping force display Part no.	**HCR-8.2275.0001**	**HCR-8.2276.0001**	**HCR-8.2277.0001**	not available	not available
with clamping force display Part no.**	**HCR-8.2275.0002**	**HCR-8.2276.0002**	**HCR-8.2277.0002**	**HCR-8.2275.0102**	**HCR-8.2276.0102**

* Stroke at maximum adjustment of pressure screws. Preload the nut using a sickle spanner before operating the pressure screws.

** Supplied including Allen wrench, no torque wrench is required. Permissible temperature variation: ±20°C

T-bolt, supplied separately

For T-slot (mm)	22	28	36
Thread	M 20	M 24	M 30
Length (mm)	200	250	250
Property class	8.8	8.8	8.8
Part no.	**HCR-5700-023**	**HCR-5700-024**	**HCR-5700-048**

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Clamping nut, hydraulic-mechanical
High clamping force with preload indicator

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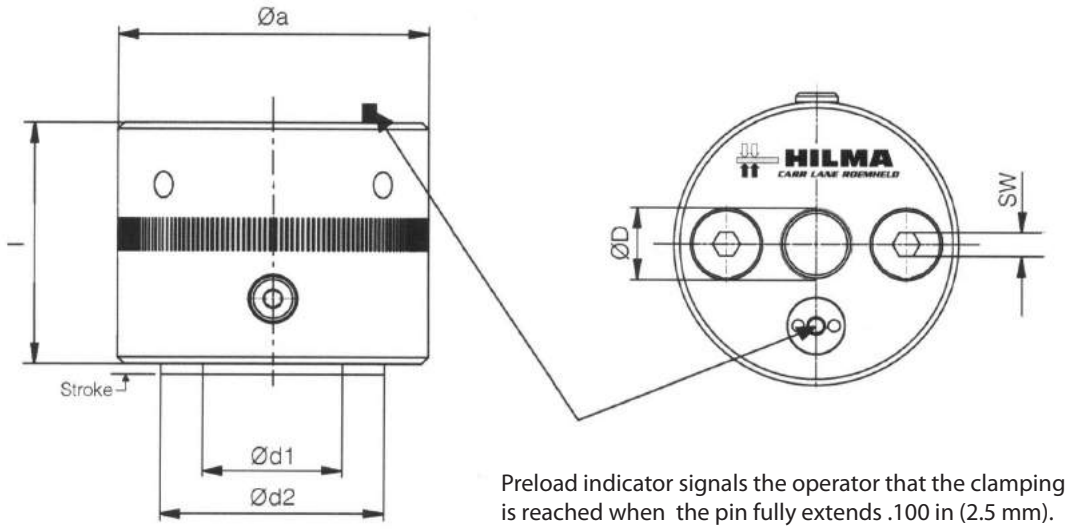
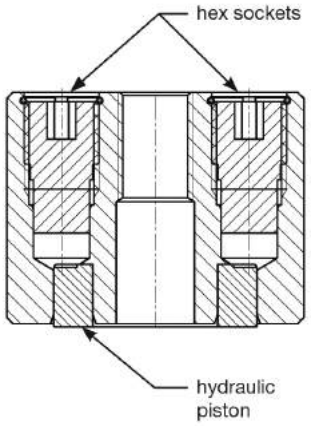


Preload indicator signals the operator that the clamping force is reached when the pin fully extends .100 in (2.5 mm).

Clamping Nut

For T-slot (inch)	$^{13}/_{16}$	$1\text{-}^{1}/_{16}$	$1\text{-}^{5}/_{16}$
Clamping force (lbs)	13,400	22,400	33,700
Max. stroke* (inch)	.078	.078	.078
Tightening torque** (ft lbs)	7	22	-
D (UNC)	$^{3}/_{4}$-10	1-8	$1\text{-}^{1}/_{4}$ - 7
a (inch)	2.75	3.74	4.41
d1 (inch)	1.18	1.57	1.97
d2 (inch)	1.97	2.56	3.15
SW (mm)	8	8	10
l (inch)	2.8	2.95	3.54
Weight (lbs)	4.5	8.2	13.5
Part no.	**HCR-8.2275.0003**	**HCR-8.2276.0003**	**HCR-8.2277.0003**

**Delivery includes Allen wrench



T-bolt, Grade 8

For T-slot (inch)	$^{13}/_{16}$	$^{13}/_{16}$	$1\text{-}^{1}/_{16}$	$1\text{-}^{1}/_{16}$
Thread size (inch)	$^{3}/_{4}$-10	$^{3}/_{4}$-10	1-8	1-8
Thread length (inch)	3.5	5	4.33	4.9
Shaft length (inch)	5	7	6	8
'f' dimension	.125 to 2.125	.625 to 4.125	0.1 to 3	1.5 to 5
Part no.	**HCR-HM-TB075-0500**	**HCR-HM-TB075-0700**	**HCR-HM-TB100-0600**	**HCR-HM-TB100-0800**

*For maximum clamp stroke. Before adjusting the pressure screws, preload the nut using a spanner wrench.
**Each clamp is supplied with an Allen wrench. Torque wrench is not required.
Metric versions and other sizes on request.
Permissible temperature variations: +/- 35˚F Max. (+/-20˚C)
Maximum temperature: 212˚F (100˚C)
***For an explanation of 'f' dimension, see data sheet 3.2130.

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QUICK DIE CHANGE
Automatic or Manual

Manual Clamping Nut
See Section 6

Hilma has been safely clamping dies for more than 50 years. We work with you to develop an automatic or manual die change system to suit your needs.

We provide the products and support to keep you competitive in today's manufacturing environment.

New Automatic Flexline Traveling Clamp
See Section 3

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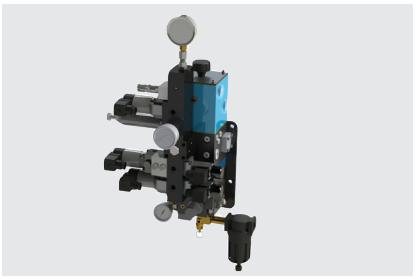
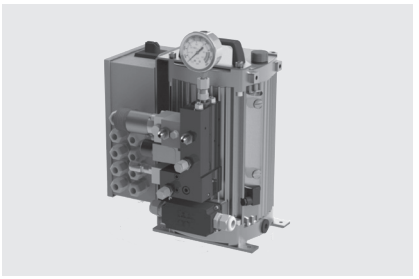
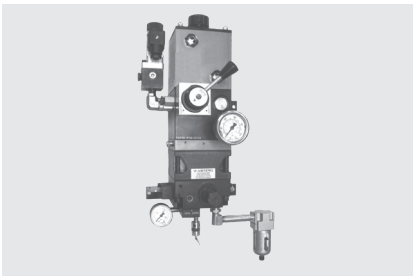
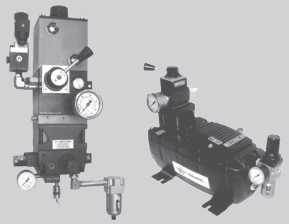
Hydraulic power units





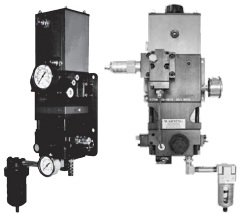


HILMA Power Units and Valve Packages



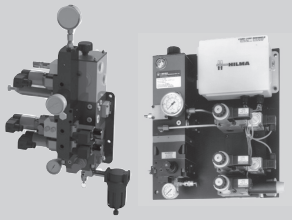
Air/Oil power units
- **for hydraulic die lifters**
- **manually operated die lifter pumps on request**

7.0100.US
7.0150.US



Air/Oil power units
- **for hydraulic die clamp systems, and use with remote valve packages**

7.0200.US
7.0300.US



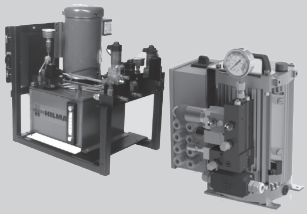
Air/Hydraulic power units
- **activated by manual or solenoid valves**

Air/Oil power units
- **with solenoid valves/pressure switches for hydraulic die clamp and lift systems**

7.0350.US
7.0400.US

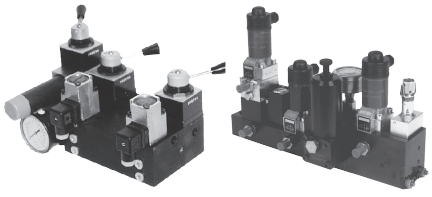
Air/Oil power units
- **for die clamp and lift systems**

7.0500.US



Electric/Hydraulic power unit
- **for die clamp and lift systems**

7.0600.US
7.0700.US



Valve packages
- **solenoid operated**
- **manually operated**

7.0800.US
7.0850.US

Additional power units
- **modular design**
- **accessories and service**

7.1800
7.2500

Air/oil power unit
for use with hydraulic rollblocks
max. operating pressure 1,740 psi

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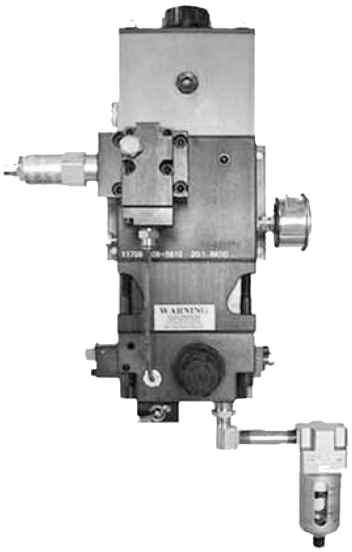
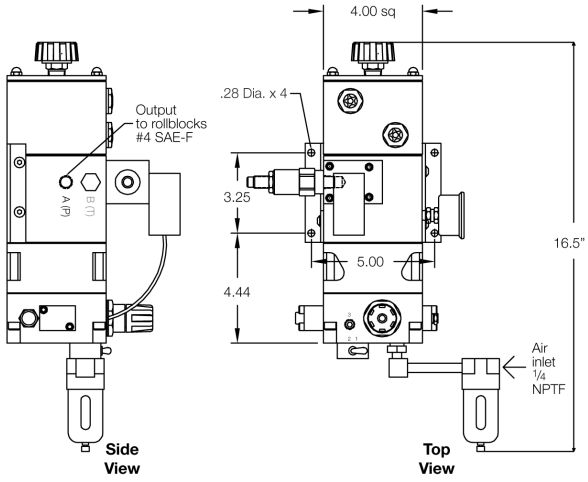


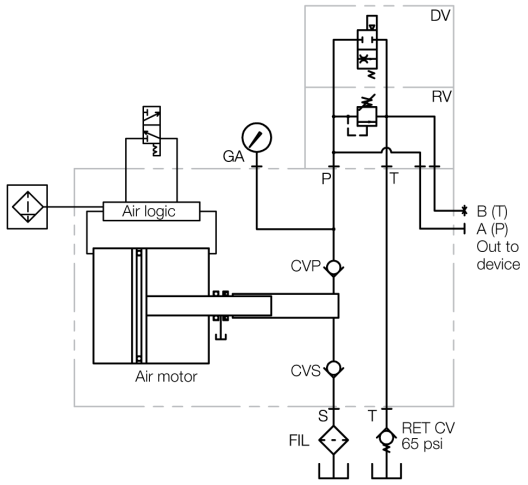


Applications:

The HCR-PA-23X01 is an air-driven hydraulic pump package. It is designed for intermittent use and the actuation of die lifters with operating pressure of 550 to 1,740 psi (40 to 120 bar).

Description:

The pump is actuated by the manual air toggle or solenoid operated valve located at the base of the pump. It has a 40 cu. inch reservoir, with 20 cu. inch usable capacity. The out-put pressure (20:1) is controlled by the adjustable air regulator. A safety circuit relief valve reduces possible pressure intensification caused by overloading the rollblocks. A return line check valve keeps balls or rollers that are not under the die up during stamping.



Note:

Minimum inlet air pressure is 60 psi, and 95 psi is required to achieve 1740 psi hydraulic pressure. Air supplied to pump must be clean, dry and non-lubricated. Air filter is included.

Part no.	Valve	Pressure switch
HCR-PA-23201	manual toggle	no
HCR-PA-23201-PS	manual toggle	yes
HCR-PA-23501	110 VAC	no
HCR-PA-23501-PS	110 VAC	yes
HCR-PA-23601	24 VDC	no
HCR-PA-23601-PS	24 VDC	yes

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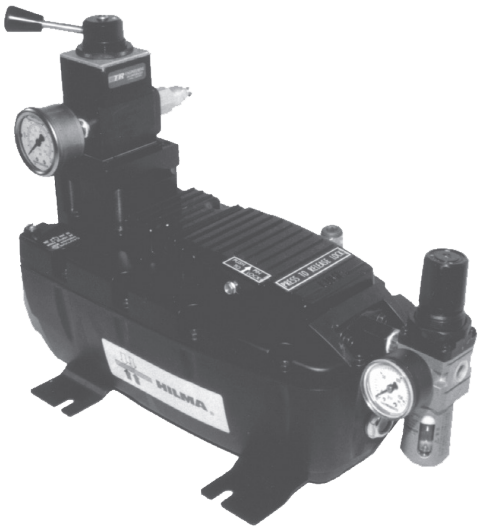
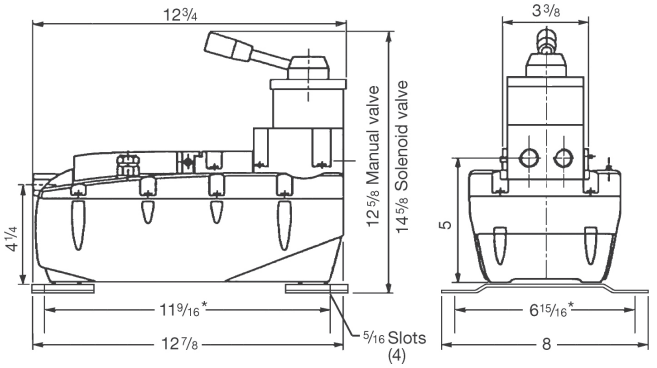
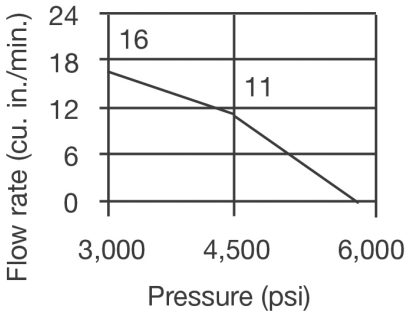
Air/oil power unit
for use with hydraulic rollblocks
max. operating pressure 5,800 psi





* Bolt pattern for mounting screws



Application:

This pump series is for use with high pressure die lifters (page 8.1834A).

Description:

The die lifter pumps include a circuit relief valve which eliminates pressure intensification by overloaded die lifters.
The clamp system pumps include pressure switches to monitor clamping circuits for machine safety.

Advantages:

- compact design
- horizontal mounting

Operating pressure	psi	3,000-5,800
Inlet air pressure	psi	60
Flow rate	(cu in/min)	see graph
Usable fluid capacity	(cu in)	125
Connecting threads		
• Oil ports		G 1/4 BSPP
• Air inlet		1/4 NPT
Weight	(lbs)	14

Part No.	Application	Directional Valve	Circuit Relief Valve	Pressure Switch
HCR-PA-41201	High pressure die lifters	1 manual, 3 pos., 4 way	1	None
HCR-PA-41501	High pressure die lifters	1 110 VAC solenoid 2 pos., 3 way	1	None

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Compact air/oil power unit for hydraulic die clamping of small systems

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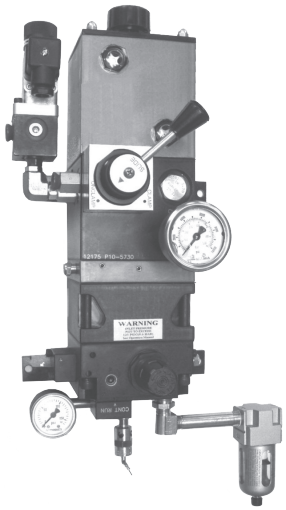

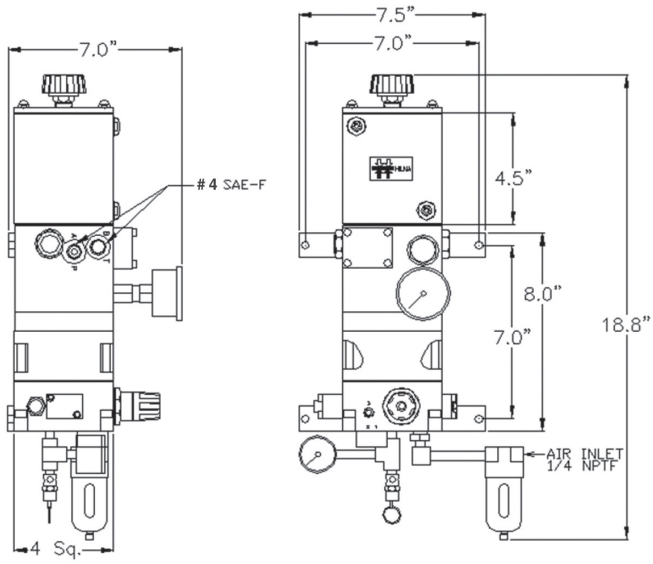

Application:

These air-powered hydraulic units are suitable for small, low volume hydraulic die clamp and lift systems.

Description:

This family of compact, single stage pumps are configured with standard modular components. The proper combination of hydraulic and electrical controls provide hydraulic power source to suit small single circuit systems.
The unit is supplied with a compact air filter and regulator.

Advantages:

- compact design
- oil level sight gauges
- pressure switch for press safety circuit
- vertical mounting

Specials available include:

- larger reservoirs
- horizontal mounting

Technical data			
Max. clamping pressure		psi	5,800
Flow rate (average)		(cu in/min)	60
Reservoir capacity (usable)		(cu in)	60 (30)
air/oil ratio		3.2	75 to 1
Air requirement (minimum)		psi	80
Oil ports		SAE	#4
Air inlet		NPT	3/8"
Solenoid data			
Voltage	**HCR-PA-21510-60** **HCR-PA-21610-60**	VAC VDC	110 24
Duty cycle		continuous	
Pressure Switch			
Adjustable pressure settings		psi	750 to 5,800
Average pressure differential			
at 1,450 psi		psi	350 ± 73
at 7,250 psi		psi	750 ± 116
Switch NO/NC		VAC	5A at 250
Contact rating		VDC	3A at 30

Part No.	Valve	Pressure Switch
HCR-PA-21100-60 use w/remote valves	none	none
HCR-PA-21210-60 Manual, 3 pos., 4-way valve	1	1
HCR-PA-21510-60 110 VAC Solenoid 2 pos., 4-way N/O valve	1	1
HCR-PA-21610-60 24 VDC Solenoid 2 pos., 4-way N/O valve	1	1

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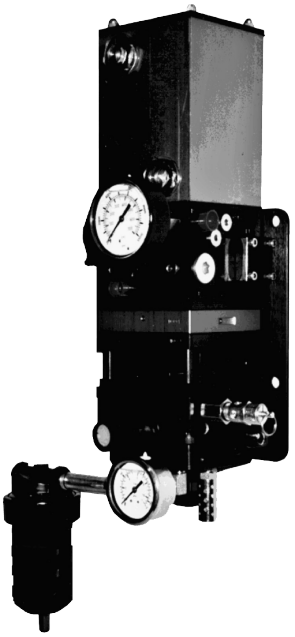
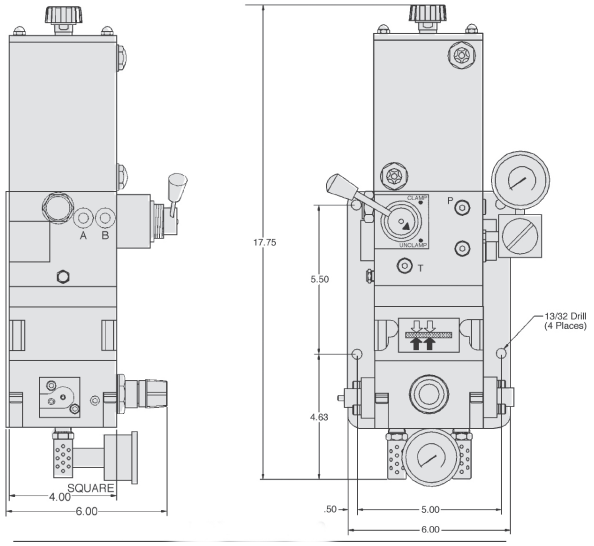
Air/oil power unit for hydraulic die clamping





Application:

These air-powered hydraulic units have been developed for the small to mid-sized hydraulic die clamp and lifter systems.

Description:

This family of compact, two stage pumps are assembled from standard modular components. The proper combination of hydraulic and electrical controls provide a hydraulic power source to suit most needs.

Power Unit is supplied with air filter/regulator.

Advantages:

- compact design
- oil level sight glasses
- horizontal or vertical mounting
- pressure switch for press safety circuit (see chart at right)

Specials available include:

- larger reservoirs
- fluid level switch
- horizontal mounting

Technical data			
Max. clamping pressure		psi	5,800
Flow rate		(cu in/min)	150
Reservoir usable capacity		(cu in)	40
Suction filter	**HCR-U.HF101**	micron	25
air/oil ratio, stage 1			20 to 1
air/oil ratio, stage 2			100 to 1
Air requirement		psi	60
Oil ports		SAE	#4
Air inlet		NPT	3/8"
Solenoid data			
Voltage	**HCR-PA-11510** **HCR-PA-11610**	VAC VDC	110 24
Current		ohms	0.2
Duty cycle		continuous	
Pressure Switch			
Adjustable pressure settings		psi	750 to 5,800
Average pressure differential			
at 1,450 psi		psi	350 ± 73
at 7,250 psi		psi	750 ± 116
Switch NO/NC		VAC	5A at 250
Contact rating		VDC	3A at 30

Part No.	Valve	Pressure Switch
HCR-PA-11100 use w/remote valves	none	none
HCR-PA-11210 Manual, 3 pos., 4-way valve	1	1
HCR-PA-11510 110 VAC Solenoid 2 pos., 4-way valve	1	1
HCR-PA-11610 24 VDC Solenoid 2 pos., 4-way valve	1	1

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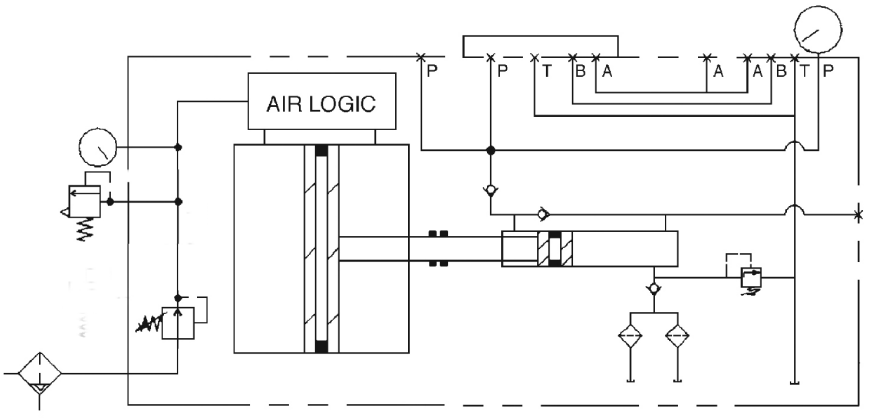
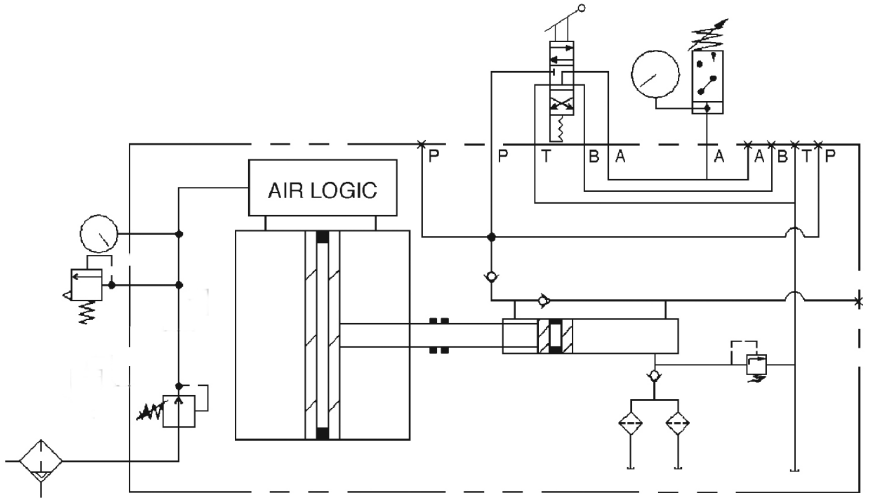
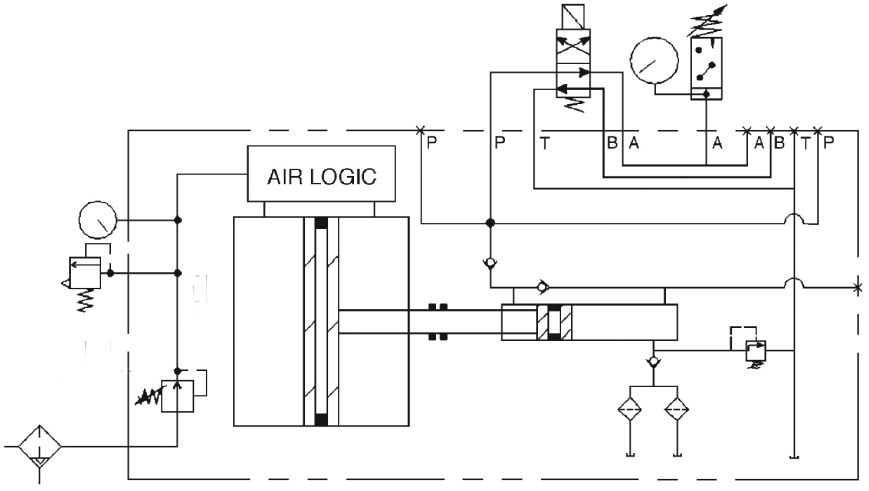


HCR-PA-11100
Power Unit with blanking plate to use with remote valve package.



HCR-PA-11210
Power Unit with a 3 position valve and pressure switch.



HCR-PA-11510
Power Unit with a 2 position/4-way 110 VAC solenoid valve
and pressure switch.

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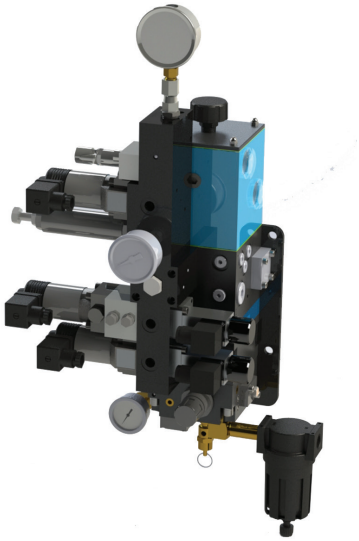
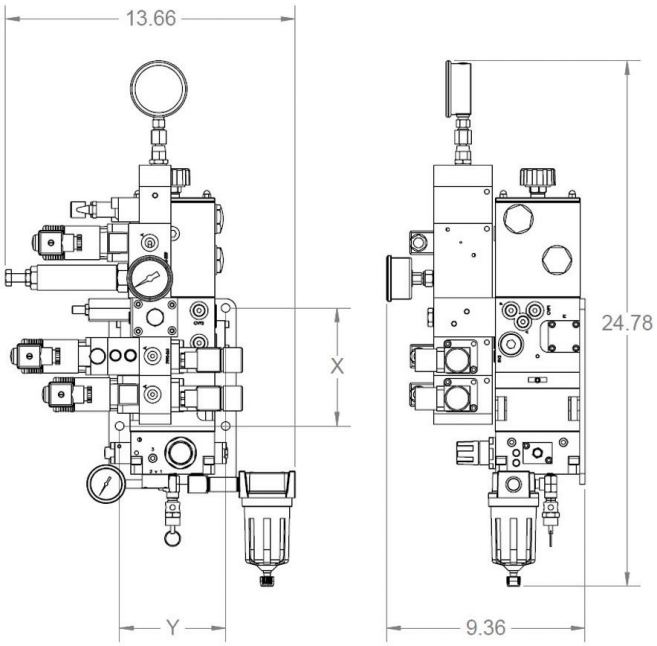
Air/hydraulic power unit ready for installation





HCR-PA-1-1110-4

Application:

This compact air/hydraulic power unit is a complete package ready for installation. With two pumps available, it is particularly well suited for low volume and medium volume die clamping systems.

Description:

The clamping circuits are activated by using either hand operated manual valves or convenient solenoid operated valves. A separate valve with pressure switch is provided for each clamp circuit. The pressure switch with each clamp valve provides the user with a signal indicating that a safe clamp pressure is achieved. The power unit is available with two pump sizes and with various configurations of control valves, including die lifter control valves in various pressure ranges. The pump is a simple air/oil intensifier, which operates intermittently with automatic pressure control, i.e. oil pressure is a ratio of the regulated air inlet pressure. The power unit may be connected to any compressed air system and includes an air pressure reducing valve to regulate incoming air pressure, air pressure gauge, oil level sight glass, valves as specified, air muffler, and convenient valve on pump assembly suitable for vertical mounting surfaces.

Advantages:

- modular unit ready for installation
- compact, light weight design
- zero leak, directional valves maintain clamping pressure in case of power failure
- sight glass for oil level control

Technical data	Series 1 pump	Series 2 pump
Max. operating pressure	5,800 psi	5,800 psi
Average pump displacement	150 in^3/min	60 in^3/min
Reservoir usable capacity	40 in^3	30 in^3
Reservoir total capacity	80 in^3	60 in^3
Mounting hole pattern (X,Y)	(7 in, 7 in)	(5 in, 5.5 in)
Air/oil ratio stage 1	20:1	75:1
Air/oil ratio stage 2	100:1	N/A
Air requirement for max hyd pressure	65 psi	85 psi
Hydraulic port(s)	G1/4 BSPP	G1/4 BSPP
Compressed air port	3/8" NPT	3/8" NPT

Electrical solenoid data	AC type	DC type
Voltage	120 VAC	24 VDC
Current	0.20 Amps	0.38 Amps
Duty cycle	100%	100%

Pressure switch data	
Adjustable pressure settings	750-5,800 psi
Avg. pressure differential at 1,450 psi	350 ± 73 psi
Avg. pressure differential at 7,250 psi	750 ± 116 psi
Switch NO/NC	5A at 250 VAC
Contact rating	3A at 30 VDC

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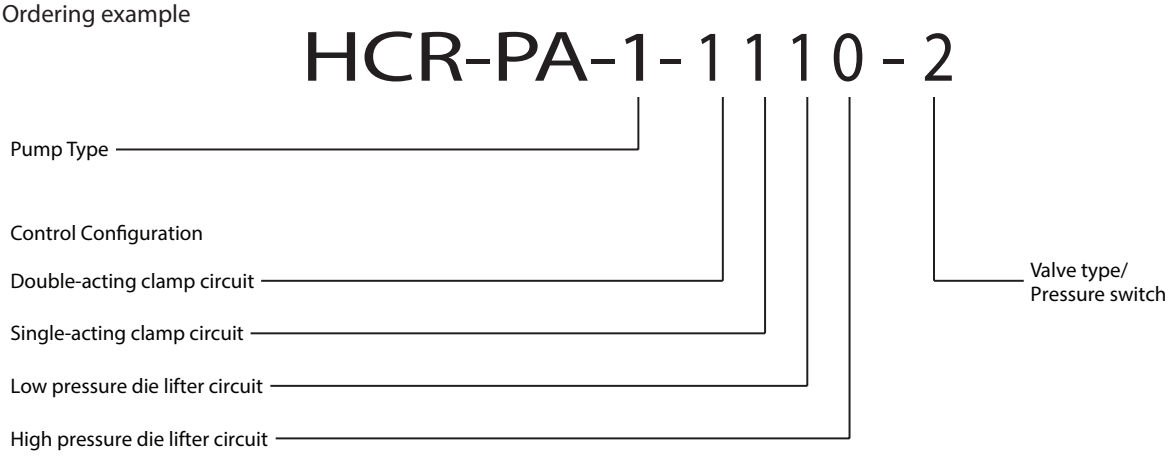
Ordering example, pump displacement, control configuration

Ordering example



Pump Displacement

1	Hydraulic Unit, 150cu. in./min. @ 5800 PSI
2	Hydraulic Unit, 60cu. in./min. @ 5800 PSI

Control Configuration

	Double Acting Clamp Circuit	Single Acting Clamp Circuit	Die Lifter		Application, Special Features
			Low Pressure 550-5500 PSI	High Pressure 5800 PSI	
0100	0	1	0	0	1 single-acting clamp circuit
0101	0	1	0	1	1 single-acting clamp circuit and 1 high pressure die lift circuit
0110	0	1	1	0	1 single-acting clamp circuit and 1 low pressure die lift circuit
1000	1	0	0	0	1 double-acting clamp circuit
1001	1	0	0	1	1 double-acting clamp circuit and 1 high pressure die lift circuit
1010	1	0	1	0	1 double-acting clamp circuit and 1 low pressure die lift circuit
1100	1	1	0	0	1 double-acting clamp circuit and 1 single-acting clamp circuit
1101	1	1	0	1	1 double-acting clamp circuit, 1 single-acting clamp circuit and 1 high pressure die lift circuit
1110	1	1	1	0	1 double-acting clamp circuit, 1 single-acting clamp circuit and 1 low pressure die lift circuit
2000	2	0	0	0	2 double-acting clamp circuits
2001	2	0	0	1	2 double-acting clamp circuits and 1 high pressure die lift circuit
2010	2	0	1	0	2 double-acting clamp circuits and 1 low pressure die lift circuit

Valve Type/Pressure Switch

	Valve Voltage		Manual	Press Enable Pressure Switch(es)	**Directional seat valves** with HAWE hole patterns, mounting dimensions as per HAWE spec sheet D7300, size 1 **Machine Safety** Pressure switch connected to the press enable circuit. Switch setting is 15% (min.) below clamping pressure. Press operation is allowed only when set pressure is reached. If clamp pressure drops below setting, the press is automatically stopped.
	110 VAC	24 VDC			
0					
1	✔				
2	✔			✔	
3		✔			
4		✔		✔	
5			✔		
6			✔	✔	

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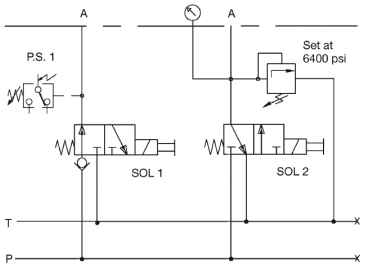
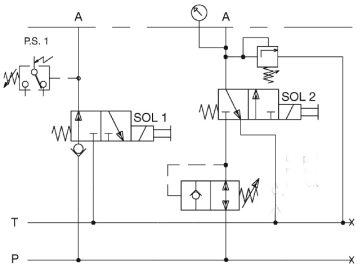
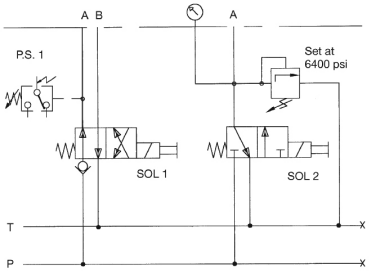
Hydraulic Schematics, Control Configurations



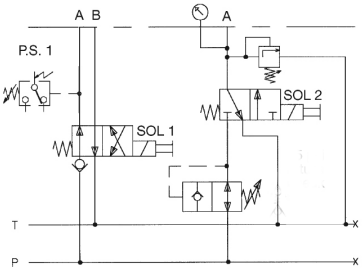
HCR-PA-X-0101-X
(1) Single acting clamp
(1) High pressure die lift



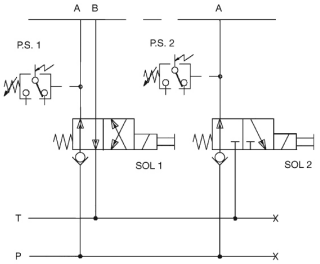
HCR-PA-X-0110-X
(1) Single acting clamp
(1) Low pressure die lift



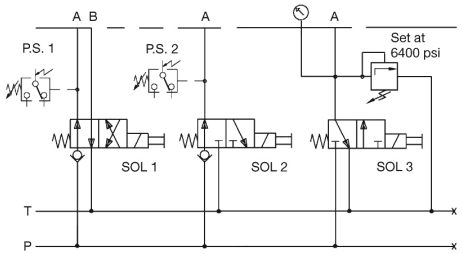
HCR-PA-X-1001-X
(1) Double acting clamp
(1) High pressure die lift



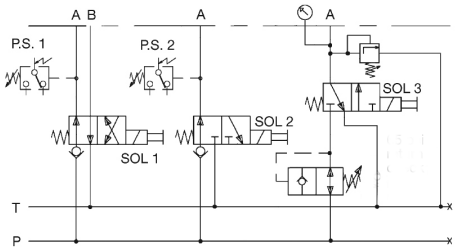
HCR-PA-X-1010-X
(1) Double acting clamp
(1) Low pressure die lift



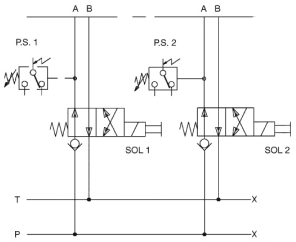
HCR-PA-X-1100-X
(1) Double acting clamp
(1) Single acting clamp



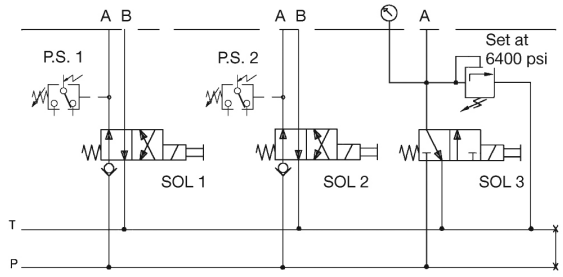
HCR-PA-X-1101-X
(1) Double acting clamp
(1) Single acting clamp
(1) High pressure die lift



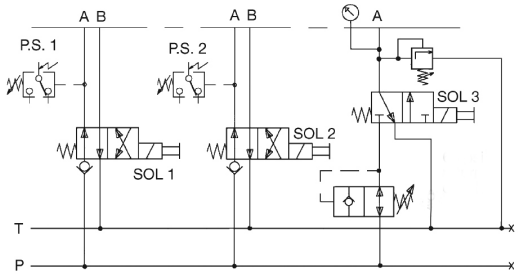
HCR-PA-X-1110-X
(1) Double acting clamp
(1) Single acting clamp
(1) Low pressure die lift



HCR-PA-X-2000-X
(2) Double acting clamp

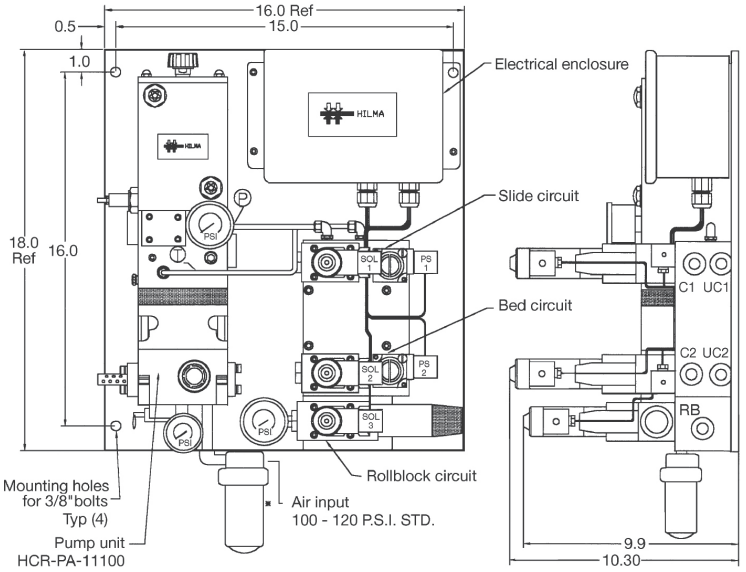


HCR-PA-X-2001-X
(2) Double acting clamp
(1) High pressure die lift



HCR-PA-X-2010-X
(2) Double acting clamp
(1) Low pressure die lift

Air/oil power unit
modular power unit with solenoid valves



HCR-PA-S521T shown

Application:

The modular pump valve packages have been developed for controlling small to mid-size die clamp and lift systems.

Description:

The pump valve packages are supplied complete with required pump, valves, pressure switches and electrical connections mounted on a common plate for fast, convenient installation on press frames. An electrical terminal box allows easy connection to clamp and die lift controls and press interlocks. Safety pressure switch in each clamp circuit line provides a signal to the press enable circuit in the event of a pressure loss. The pump valve packages are assembled from standard components.

For more information on the pump unit, see catalog page 7.0300.

For more information on the valve package, see catalog page 7.0402.

Advantages:

- modular unit
- simplified installation
- press enable pressure switches

Other solenoid control voltages available upon request.
Special power units available upon request.

Air Requirement	60 psi @ 30 cfm
Max. Hydraulic Operating Pressure	5,800 psi
Hydraulic Ports	7/16-20 (#4 SAE)
Solenoid Voltage	110 VAC

Part No.	Clamp Circuits	Die Lifter Circuit	
		Reduced Pressure 400-2, 175-PSI	System Pressure 5,800 PSI max
HCR-PA-S511T	1	1	
HCR-PA-S511T-H	1		1
HCR-PA-S520T	2		
HCR-PA-S521T	2	1	
HCR-PA-S521T-H	2		1

* For 24 VDC solenoid voltage, use HCR-PA-S6XXT.

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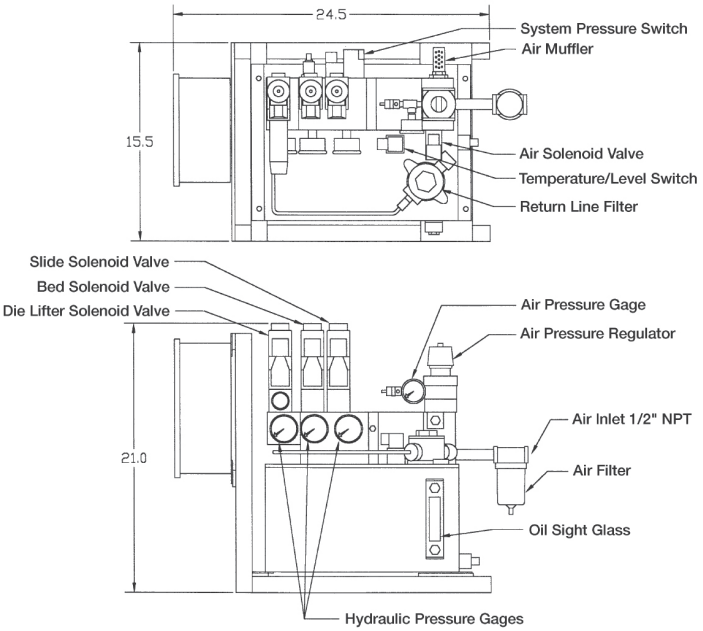
Air/oil power unit modular power unit with solenoid valves



Application:

These air-powered hydraulic units have been developed for the mid-sized to large hydraulic die clamp and lift systems.

Description:

The power units with safety circuits have been developed in view of the special requirements of hydraulic die clamping on presses. The pumps are supplied complete with required valves, pressure switches and electrical controls ready for connections to the press.

The pumps are assembled from standard modular components. This provides a selection of the proper combination of hydraulic and electrical controls for most die clamping applications.

The die lifter circuit provides an adjustable pressure reducer with circuit relief and a return line check valve. This keeps the die lifters that are not under the die up during stamping.

Power unit comes complete in a protective frame with a remote pendant with key switches.

Special power units available on request.

Separate clamp circuit pressure switches on request.

Advantages:

- fast clamp/unclamp times
- pressure filter
- return line filter
- temp/level switch
- system pressure switch

Technical data

Hydraulic		
Max. clamping pressure	psi	5,800
Flow rate (average)	(cu in/min)	220
Reservoir capacity	gal	5
Reservoir usable capacity	(cu/in)	847
Pressure filter	micron	25
Suction strainer	micron	175
Return line filter	micron	10
air/oil ratio, stage 1		20:1
air/oil ratio, stage 2		75:1
Air requirement		80 psi, 1/2" NPT inlet
Clamp output ports		#6 SAE
Die lifter output port		#4 SAE
Solenoid data		
Voltage	VAC	110
Current	Amps	0.2
Duty cycle	continuous	
Pressure Switch data		
Adjustable pressure settings	psi	750 to 5,800
Average pressure differential		
at 1,450 psi	psi	350 ± 73
at 7,250 psi	psi	750 ± 116
Switch NO/NC		single pole
Contact rating	VAC VDC	5A at 250 3A at 30

Part No.	Clamp Circuits	Die Lifter Circuit		Pendant Key Switches
		Reduced Pressure 400-2, 175-PSI	System Pressure 5,800 PSI max	
HCR-PA-51510	1			1
HCR-PA-51511	1	1		2
HCR-PA-51511-H	1		1	2
HCR-PA-51520	2			2
HCR-PA-51521	2	1		3
HCR-PA-51521-H	2		1	3

* Add -1 to end of part number to order without pendant station.
* 24 VDC solenoid voltage upon request.

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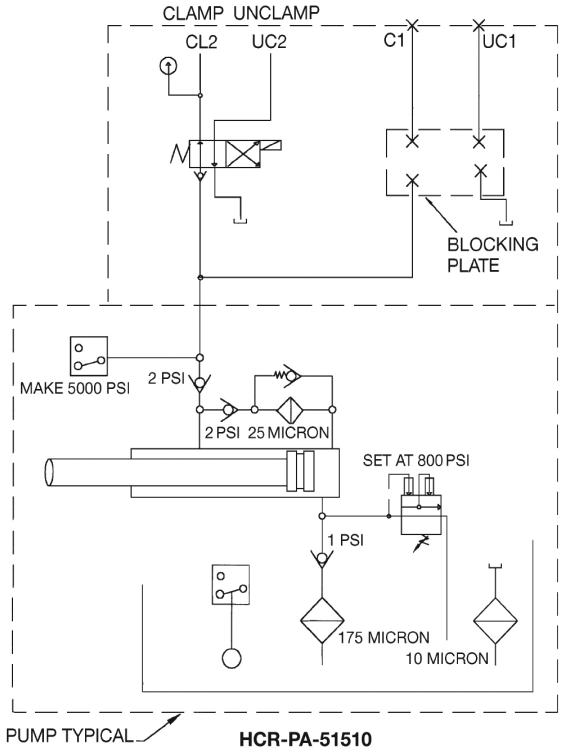
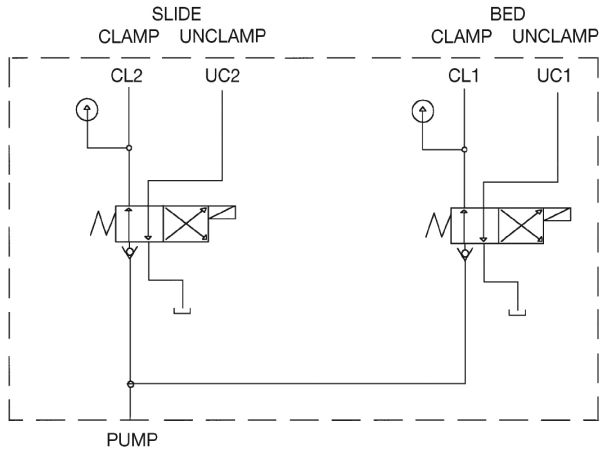
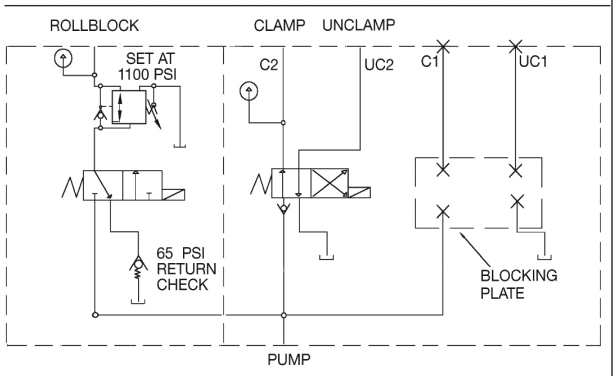


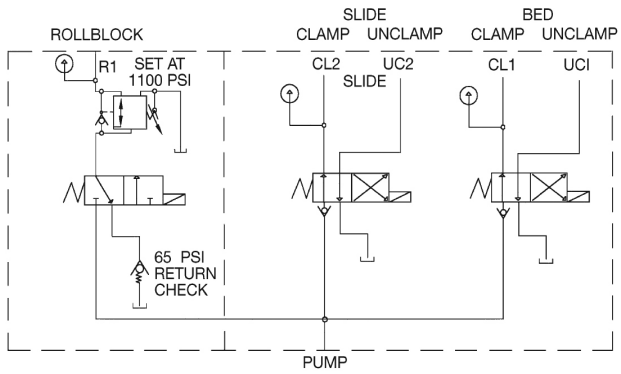
HCR-PA-51510



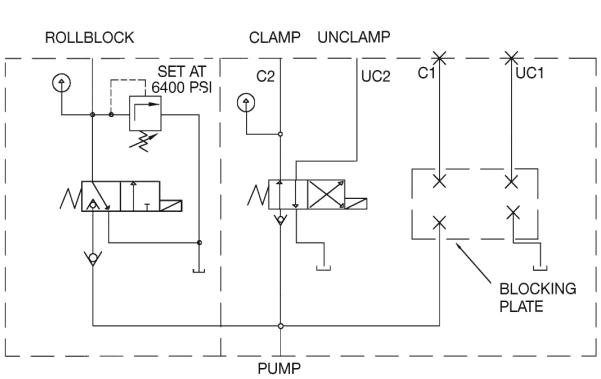
HCR-PA-51520



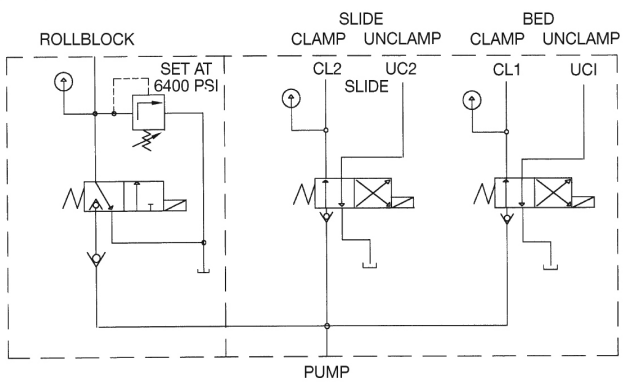
HCR-PA-51511



HCR-PA-51521



HCR-PA-51511-H



HCR-PA-51521-H

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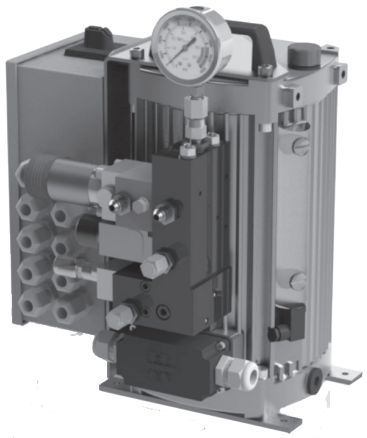
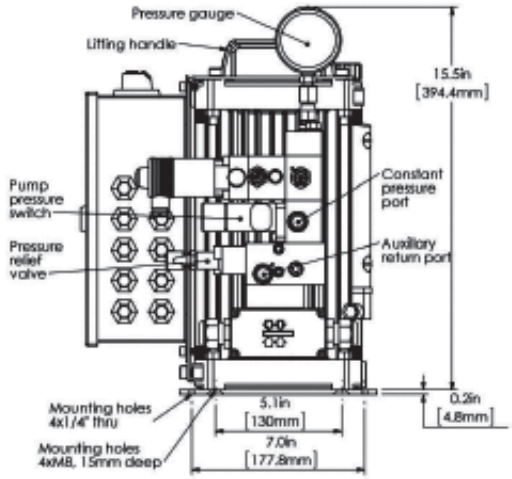
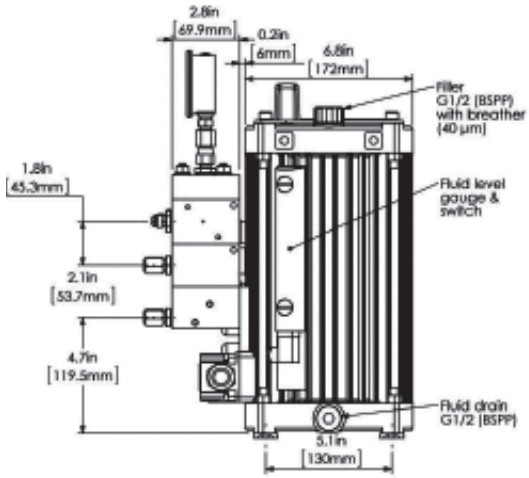
Electric power unit compact







Application:

Electrically driven high-pressure hydraulic unit for operating small and midsize clamping systems. Suitable for both single-acting and double-acting cylinders. Unit operates intermittently with automatic pressure controls. The required operating pressure is preset on a pressure switch that controls the motor. When the set pressure is reached, the motor is automatically switched off. If the pressure drops 10% below the set value, the pressure switch starts the motor again.

Description:

Complete with motor, pump, oil tank, manifold block, pressure gauge, pressure switch, valves and electrical system. The radial piston pump is bi-directional and fixed displacement. Zero leakage poppet type directional valves. Electrical system is to US standards. The control voltage (24VDC or 120VAC) is supplied by the customer. The oil level and temperature sensor is standard. Optional equipment includes remote control pendant and machine safety pressure switches.

Die lifter circuit:

The low pressure die lifter circuit provides an adjustable reducer with a circuit relief valve. The high pressure die lifter circuit operates at full system pressure. Both include a circuit relief valve which reduces possible pressure intensification caused by overloading the die lifters.

Advantages:

- modular unit ready for installation
- compact, light weight design
- zero leak, directional valves maintain clamping pressure in case of power failure
- highly reliable radial piston pump ensures long service life
- fluid immersed, direct drive motor, and finned aluminum housing provides optimum efficiency
- zero leak fittings and valves
- sight glass for oil level control
- oil temperature/level switch

	230 VAC 3Ø	460 VAC 3Ø
Max. pressure	400 bar (5800 psi)[1]	
Power supply frequency	60 Hz	
Control voltage	120 VAC or 24 VDC[2]	
Flow rate	1.8 L/min (110 cu.in./min)[1]	
Usable fluid capacity	1.85 L (112 cu.in.)[1]	
Reservoir capacity	3.9 L (238 cu.in.)[1]	
Power @ max. pressure	0.75 kW (1 hp)	0.9 kW (1.2 hp)
Motor amperage	3.9 amps	2.1 amps
Noise level @ 1 meter (3.3 feet)	65 dBA	
Max. duty cycle	25-40 %	
Approx. weight w/ one valve & oil	25 kg / 55 lbs	

[1]Different flow rates, max. pressures and tank sizes available upon request.
[2]Control voltage supplied by customer.

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Ordering example

HCR-PE-6-2001-110

- Pump type
- Control Configuration
  - Double-acting clamp
  - Single-acting clamp
  - Low pressure die lifter
  - High pressure die lifter
- Valve package/monitoring system
- Electric control
- Without remote pendant

Pump Type

6	Hydraulic unit, 110 cu. in./min. @ 5800 PSI

Control Configuration

	Double acting clamp circuit	Single acting clamp circuit	Die Lifter		Application, Special features
			Low Pressure 550 - 5500 PSI	High Pressure 5800 PSI	
0100	0	1	0	0	1 single-acting clamp circuit
0101	0	1	0	1	1 single acting clamp circuit and high pressure die lift circuit
0110	0	1	1	0	1 single-acting clamp circuit and low pressure die lift circuit
1000	1	0	0	0	1 double-acting clamp circuit
1001	1	0	0	1	1 double-acting clamp circuit and high pressure die lift circuit
1010	1	0	1	0	1 double-acting clamp circuit and low pressure die lift circuit
1100	1	1	0	0	1 double-acting clamp circuit and 1 single-acting clamp circuit
1101	1	1	0	1	1 double-acting clamp circuit, 1 single-acting clamp circuit and 1 high pres. die lift circuit
1110	1	1	1	0	1 double-acting clamp circuit, 1 single-acting clamp circuit and 1 low pres. die lift circuit
2000	2	0	0	0	2 double-acting clamp circuits
2001	2	0	0	1	2 double-acting clamp circuits and 1 high pressure die lift circuit
2010	2	0	1	0	2 double-acting clamp circuits and 1 low pressure die lift circuit

Valve Package/Monitoring System

	Valve Voltage		Press Enable Pressure Switch	Temp/Level Switch
	110 VAC	24 VDC		
0				✓
1	✓			✓
2	✓		✓	✓
3		✓		✓
4		✓	✓	✓

Electric Control

0	Without Electric	With Terminal Box	460 Volts 3 Phase 60 Hz
1	With Electric	For Remote Pendant	
2	Without Electric	With Terminal Box	230 Volts 3 Phase 60 Hz
3	With Electric	For Remote Pendant	

Remote Pendant

0	Without Remote Pendant

Pressure relief valve and pressure switch:
Operating pressure infinitely adjustable from 725 to 5,800 psi.

Directional seat valves:
With HAWE hole patterns, mounting dimensions as per HAWE spec sheet D7300, size 1.

Machine Safety:
Pressure switch connected to the machine control system. Switch setting is 15% (min.) below clamping pressure. Machine operation is allowed only when set pressure is reached. If pressure drops below setting, machine is automatically stopped.

Oil level and temperature switch:
Both oil level and temperature switch are provided to automatically switch off the pump motor if there is lack of oil or the temperature exceeds 140°F.

With electric, for remote pendant or control panel:
Hydraulic unit can be supplied ready to install with the necessary circuit breakers, motor starter, overload protection, etc., already wired to an electrical enclosure for use with remote pendant, or control panel. Power for valve control is supplied by customer.

Without electric, with terminal box:
Optionally, the unit can be supplied with just the motor, valves, and pressure switch wired to a terminal strip. This is often desired for new machine controls.

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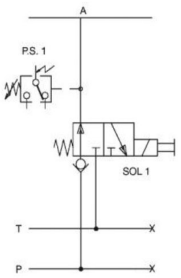
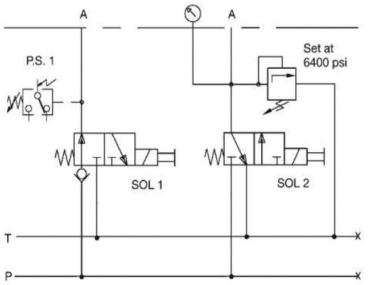
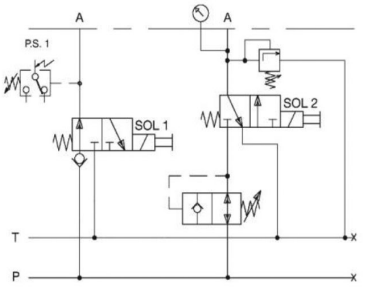
Hydraulic schematics, control configuration



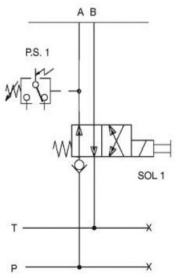
HCR-PE-60100
(1) Single acting clamp



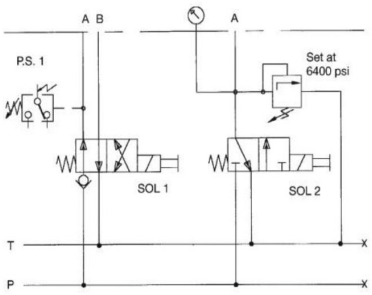
HCR-PE-60101
(1) Single acting clamp
(1) High pressure die lift



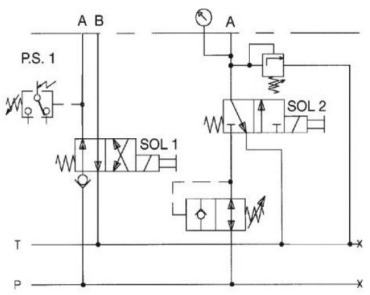
HCR-PE-60110
(1) Single acting clamp
(1) Low pressure die lift



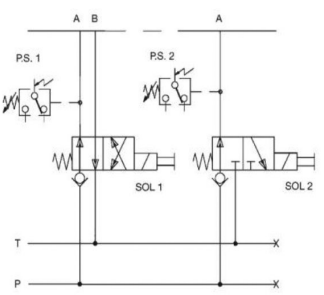
HCR-PE-61000
(1) Double acting clamp



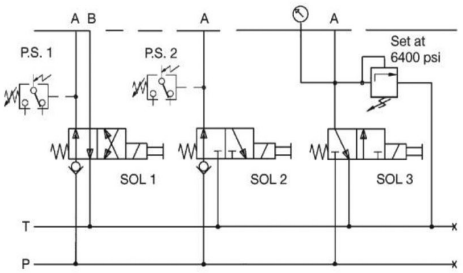
HCR-PE-61001
(1) Double acting clamp
(1) High pressure die lift



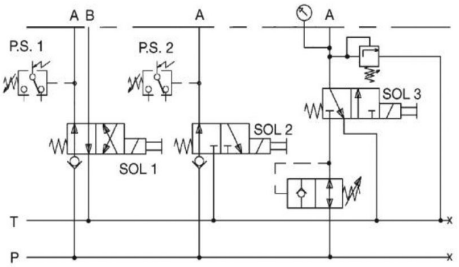
HCR-PE-61010
(1) Double acting clamp
(1) Low pressure die lift



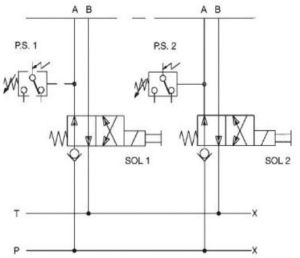
HCR-PE-61100
(1) Double acting clamp
(1) Single acting clamp



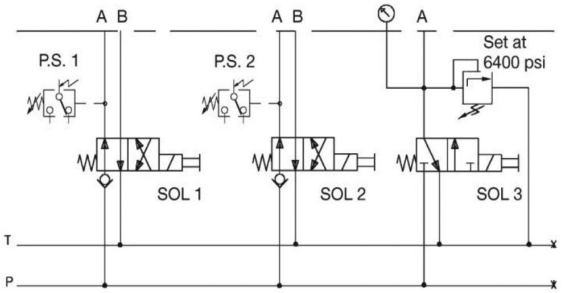
HCR-PE-61101
(1) Double acting clamp
(1) Single acting clamp
(1) High pressure die lift



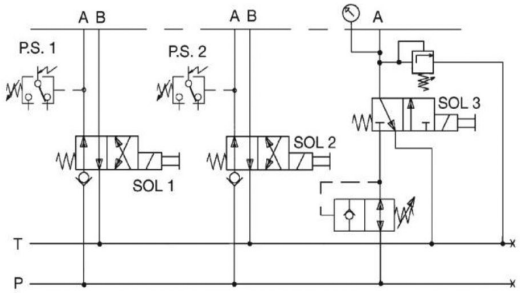
HCR-PE-61110
(1) Double acting clamp
(1) Single acting clamp
(1) Low pressure die lift



HCR-PE-62000
(2) Double acting clamp



HCR-PE-62001
(2) Double acting clamp
(1) High pressure die lift



HCR-PE-62010
(2) Double acting clamp
(1) Low pressure die lift

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Electrical power unit large capacity

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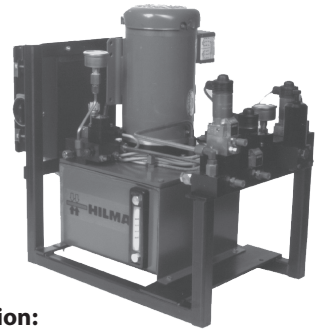


Application:
Electrically driven high-pressure hydraulic unit for operating small and midsize clamping systems. Suitable for both single-acting and double-acting cylinders. Unit operates intermittently with automatic pressure control. The required operating pressure is preset on a pressure switch that controls the motor. When the set pressure is reached, the motor is automatically switched off. If the pressure drops 10% below the set value, the pressure switch starts the motor again. Additional pressure switches can be supplied for machine safety. These switches are to be interfaced to stop the machine if clamping pressure drops more than 15%.

Description:
Complete with motor, pump, oil tank, manifold block, pressure gauge, pressure switch, valves and electrical system. The radial piston pump is bi-directional and fixed displacement. Zero leakage poppet type directional valves. Electrical system is to US standards. The oil level and temperature sensor is standard. Optional equipment includes remote control pendant and machine safety pressure switches.
Pump frame is standard on three valve power units.

Die lifter circuit:
The low pressure die lifter circuit provides an adjustable reducer with a circuit relief valve.
The high pressure style die lifter circuit operates at full system pressure. It includes a circuit relief valve which reduces possible pressure intensification caused by overloading the die lifters.

Important notes:
Hydraulic power units should be positioned off the press area away from operator's handling space. Make sure:
– that oil ports, pressure switches, oil drain plug and oil filler cap are easily accessible.
– that pressure gauge, oil sight glasses and signal lamps are visible.
Operating conditions, tolerances, and other data, see data sheets 1.1000-12.

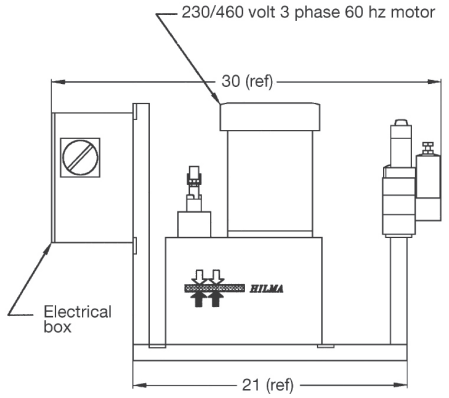
Electrical system:
Main connection (L1, L2, L3, GND) without connector plug, electric motor 1.5 Hp, 1740 rpm, 230/460 volts, 3 phase, 60 cycles, control voltage 24 VDC, or 110 VAC.

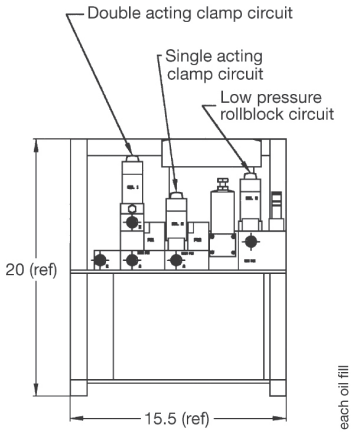
Directional valves:
Poppet valves – zero leakage, max. operating pressure 5,800 psi flow rate 106 cu in/min.

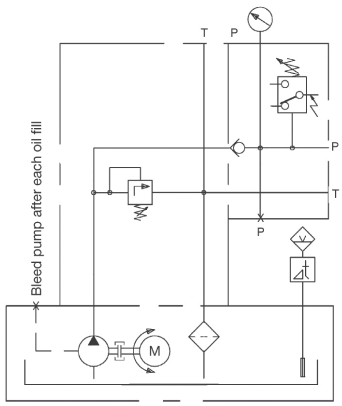
Oil connection:
1/4 JIC male fitting/G 1/4 port

Hydraulic fluid:
See data sheets 1.1000-12.

Advantages:
- modular unit ready for installation
- compact, light weight design
- directional valves open in clamping position, maintains clamping pressure in case of a power failure
- remote pendants wired direct
- sight glass for oil level control
- pump frame included with most models







HCR-PE-7000
BASIC PUMP UNIT

Power supply		230/460 volts 3 phase 60 hz
Flow rate	(cu in/min)	106
Usable fluid capacity	(cu in)	400
Reservoir capacity	(cu in)	690
Horsepower		1.5
Amperage		4.6/2.3
Noise level @ 3 ft.	(dBA)	67
Max. uninterrupted running time	(sec)	15-120
Max. % of cycle pump should operate		25-40%

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Ordering example, pump displacement, control configuration

Ordering example

H C R – P E – 7 2 0 0 1 - 1 1 1

- Pump displacement
- **Control configuration**
  - Double-acting clamp
  - Single-acting clamp
  - Low pressure die lifter
  - High pressure die lifter
- Valve package/ Monitoring system
- Electric control
- Remote pendant

Pump displacement

7	Hydraulic unit, 106 cu. in./min. @ 5800 PSI

Control Configuration

	Double acting clamp circuit	Single acting clamp circuit	Die Lifter: Low Pressure 550-1100 PSI	Die Lifter: High Pressure 5800 PSI	Application, Special features
0100	0	1	0	0	1 single-acting clamp circuit
0101	0	1	0	1	1 single-acting clamp circuit and high pressure die lift circuit
0110	0	1	1	0	1 single-acting clamp circuit and low pressure die lift circuit
1000	1	0	0	0	1 double-acting clamp circuit
1001	1	0	0	1	1 double-acting clamp circuit and high pressure die lift circuit
1010	1	0	1	0	1 double-acting clamp circuit and low pressure die lift circuit
1100	1	1	0	0	1 double-acting clamp circuit and 1 single-acting clamp circuit
1101	1	1	0	1	1 double-acting clamp circuit, 1 single-acting clamp circuit and 1 high pres. die lift circuit
1110	1	1	1	0	1 double-acting clamp circuit and low pressure die lift circuit
2000	2	0	0	0	2 double-acting clamp circuits
2001	2	0	0	1	2 double-acting clamp circuits and 1 high pressure die lift circuit
2010	2	0	1	0	2 double-acting clamp circuits and 1 low pressure die lift circuit

Valve Package/Monitoring system

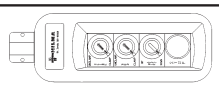
	Valve Voltage: 110 VAC	Valve Voltage: 24 VDC	Press Enable Pressure Switch	Temp/Level Switch
0				✓
1	✓			✓
2	✓		✓	✓
3		✓		✓
4		✓	✓	✓

Electric control

0	Without Electric	With Terminal Box	460 Volts 3 Phase
1	With Electric	For Remote Pendant	60 Hz
2	Without Electric	With Terminal Box	230 Volts 3 Phase
3	With Electric	For Remote Pendant	60 Hz

Remote pendant

0	Without Remote Pendant
1	With Remote Pendant



Pendant includes key operated switches.

Pressure relief valve and pressure switch:
Operating pressure infinitely adjustable from 725 to 5,800 psi.

Directional seat valves:
With HAWE hole patterns, mounting dimensions as per HAWE spec sheet D7300, size 1.

Machine Safety:
Pressure switch connected to the machine control system. Switch setting is 15% (min.) below clamping pressure. Machine operation is allowed only when set pressure is reached. If pressure drops below setting, machine is automatically stopped.

Oil level and temperature switch:
Both oil level and temperature switch are provided to automatically switch off the pump motor if there is lack of oil or the temperature exceeds 140°F.

With electric, for remote pendant or control panel:
Hydraulic unit can be supplied ready to install with the necessary circuit breakers, motor starter, overload protection, etc., already wired to an electrical enclosure for use with remote pendant, or control panel. Power for valve control is supplied by customer.

Without electric, with terminal box:
Optionally, the unit can be supplied with just the motor, valves, and pressure switch wired to a terminal strip. This is often desired for new machine controls.

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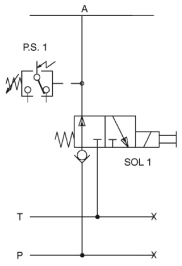
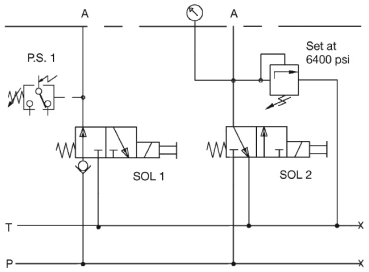
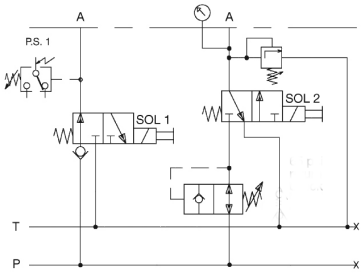


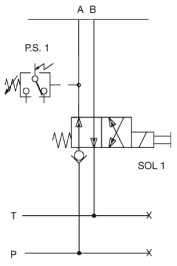
HCR-PE-70100
(1) Single acting clamp



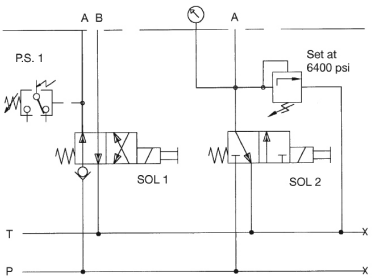
HCR-PE-70101
(1) Single acting clamp
(1) High pressure die lift



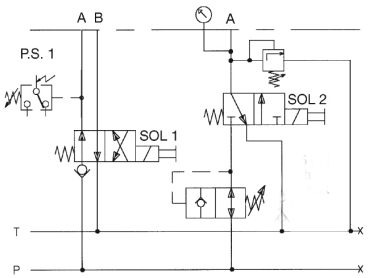
HCR-PE-70110
(1) Single acting clamp
(1) Low pressure die lift



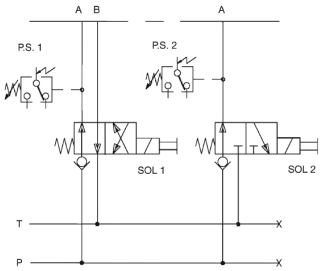
HCR-PE-71000
(1) Double acting clamp



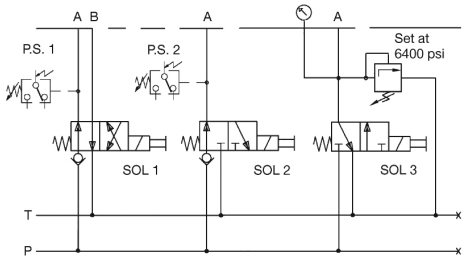
HCR-PE-71001
(1) Double acting clamp
(1) High pressure die lift



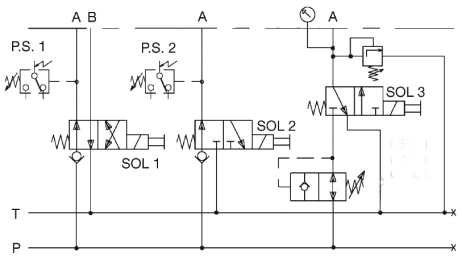
HCR-PE-71010
(1) Double acting clamp
(1) Low pressure die lift



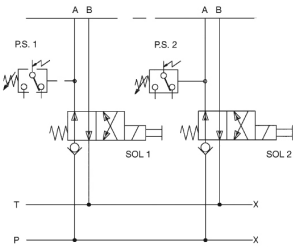
HCR-PE-71100
(1) Double acting clamp
(1) Single acting clamp



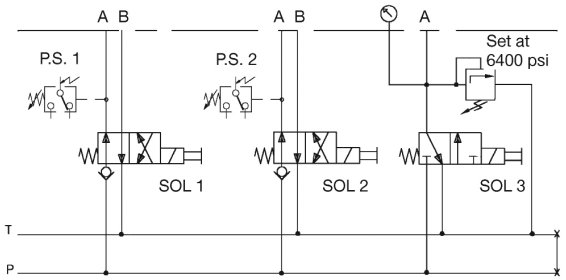
HCR-PE-71101
(1) Double acting clamp
(1) Single acting clamp
(1) High pressure die lift



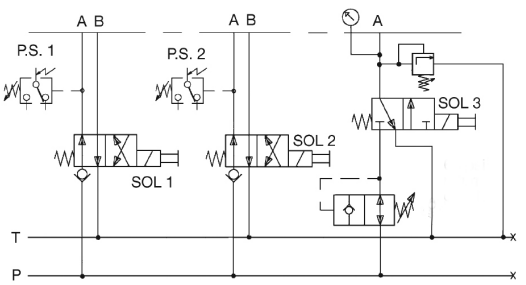
HCR-PE-71110
(1) Double acting clamp
(1) Single acting clamp
(1) Low pressure die lift



HCR-PE-72000
(2) Double acting clamp



HCR-PE-72001
(2) Double acting clamp
(1) High pressure die lift



HCR-PE-72010
(2) Double acting clamp
(1) Low pressure die lift

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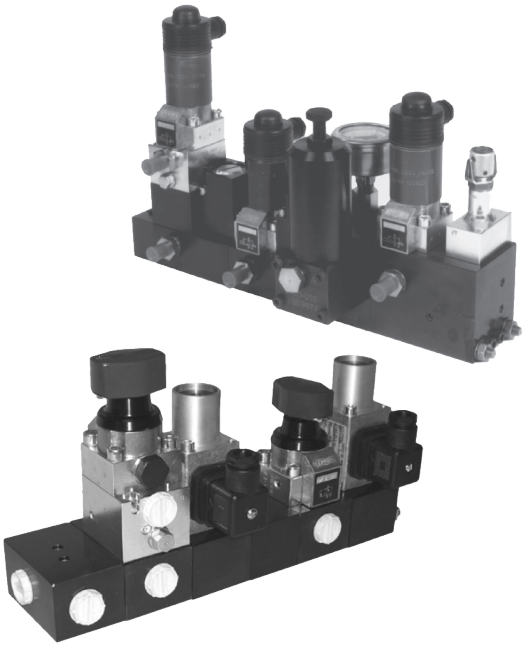
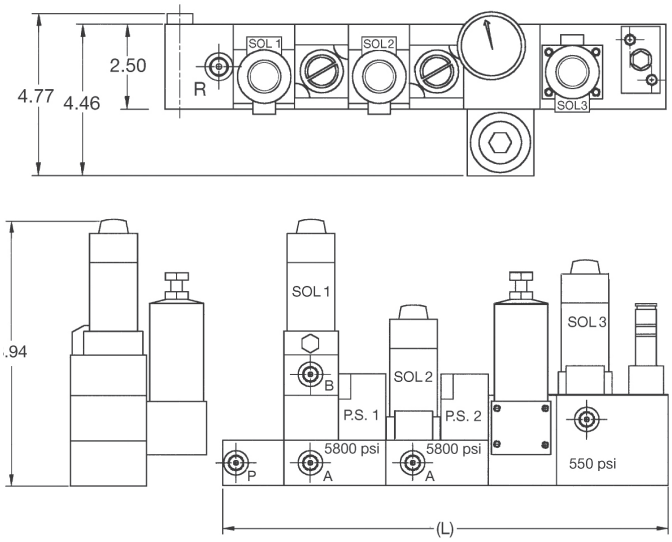
Valve packages
manual and solenoid operated





Technical data

Hydraulic		
Max. clamping pressure	psi	7,250
Low pressure die lifter	psi	450-4,600
Max. flow rate	(cu in/min)	490
Ports	BSPP	G 1/4
Electrical data		
	AC TYPE	**DC TYPE**
Voltage	110 VAC	24 VDC
Inrush current	.2 A	.83 A
Holding current	.2 A	.83 A
Duty cycle ≤ 104˚F (40˚C)	100%	100%
Pressure switch data		
Adjustable pressure setting	psi	750 to 5,800
Average pressure differential		
at 1,450 psi	psi	350 ± 73
at 7,250 psi	psi	750 ± 116
Switch NO/NC		single pole
Contract rating	VAC	5 A at 250
	VDC	3 A at 30

Adapter fittings available

CLR-816-F	G 1/4 to 1/4 JIC
CLR-807-F	G 1/4 to 5/16 JIC
CLR-806-F	G 1/4 to 1/4 compression
CLR-802-F	G 1/4 to 1/4 compression

Application:

These modular valve packages provide safe solenoid control of the hydraulic fluid to the die clamps and filters.

Description:

The clamping pressure, as supplied from a separate pump unit and controlled by one of these integrated valve packages, can actuate single or double-acting clamp circuits in the bed and ram. Safety pressure switch in each clamp line provides a signal to the press enable circuit in the event of a pressure loss.

The low pressure die lifter circuit provides an adjustable pressure reducer with circuit relief valve.

The high pressure die lifter circuit, operates at the clamp system pressure and includes a circuit relief valve. This safety valve prevents the rollblocks from being overloaded.

Specials available on request.

Advantages:

- solenoid valves can be operated via P.L.C. system or manual switch
- zero-leakage poppet design with built-in check valve
- very compact
- suitable for new or existing press room equipment

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Ordering example

HCR–VP–S2001-1

- Valve package, solenoid (S) / manual (M)
- Double-acting clamp circuit(s)
- Single-acting clamp circuit(s)
- Low pressure die lifter circuit(s)
- High pressure die lifter circuit(s)
- Valve Pressure switch

Control Configuration

	Double clamp circuit	Single clamp circuit	Die Lifter: Low Pressure 550-1100 psi	Die Lifter: High Pressure 5800 psi	Application, Description	Approx. weight lbs	(L) Approx. length (inches)
0100	0	1	0	0	1 single-acting clamp circuit	8	5.75
0101	0	1	0	1	1 single-acting clamp circuit and high pressure die lift circuit	18	9.44
0110	0	1	1	0	1 single-acting clamp circuit and low pressure die lift circuit	26	11.69
1000	1	0	0	0	1 double-acting clamp circuit	11	5.75
1001	1	0	0	1	1 double-acting clamp circuit and high pressure die lift circuit	21	9.44
1010	1	0	1	0	1 double-acting clamp circuit and low pressure die lift circuit	29	11.69
1100	1	1	0	0	1 double-acting clamp circuit and 1 single-acting clamp circuit	25	9.12
1101	1	1	0	1	1 double-acting, 1 single-acting clamp circuit and 1 high pressure die lift circuit	35	12.81
1110	1	1	1	0	1 double-acting, 1 single-acting clamp circuit and 1 low pressure die lift circuit	43	15.06
2000	2	0	0	0	2 double-acting clamp circuits	19	9.12
2001	2	0	0	1	2 double-acting clamp circuits and 1 high pressure die lift circuit	29	12.81
2010	2	0	1	0	2 double-acting clamp circuits and 1 low pressure die lift circuit	47	15.06

Valve Pressure Switch

	Valve Voltage: 110 VAC	Valve Voltage: 24 VDC	Manual Valve	Press Enable Pressure Switch(s)
0				
1	✓			
2	✓			✓
3		✓		
4		✓		✓
5			✓	
6			✓	✓

Directional seat valves:
- with HAWE hole patterns, mounting dimensions as per HAWE spec sheet D7300, size 1

Machine Safety:
Pressure switch connected to the press enable circuit. Switch setting is 15% (min.) below clamping pressure. Press operation is allowed only when set pressure is reached. If pressure drops below setting the press is automatically stopped.

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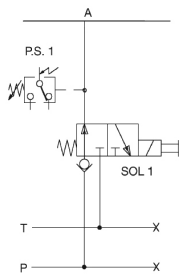
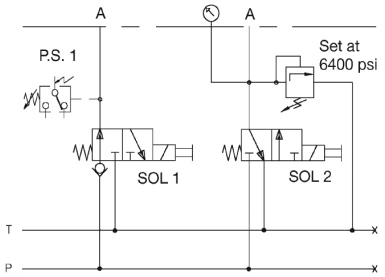
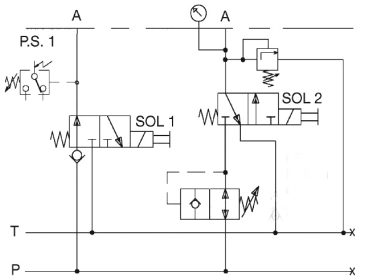


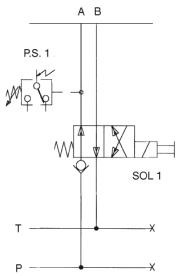
HCR-VP-S0100-X
(1) Single acting clamp



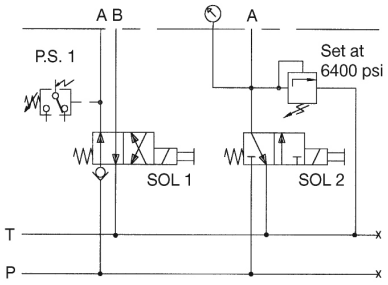
HCR-VP-S0101-X
(1) Single acting clamp
(1) High pressure die lift



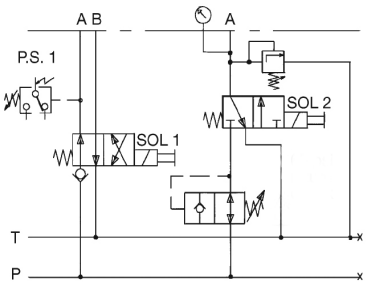
HCR-VP-S0110-X
(1) Single acting clamp
(1) Low pressure die lift



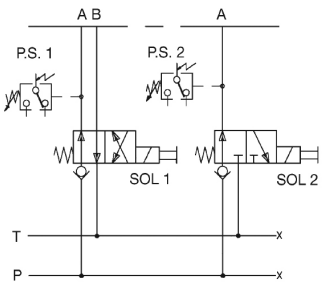
HCR-VP-S1000-X
(1) Double acting clamp



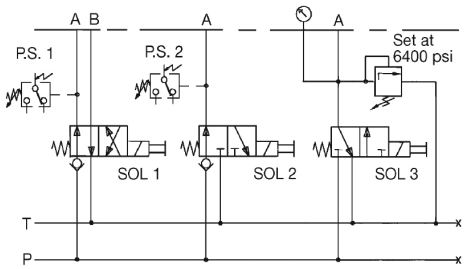
HCR-VP-S1001-X
(1) Double acting clamp
(1) High pressure die lift



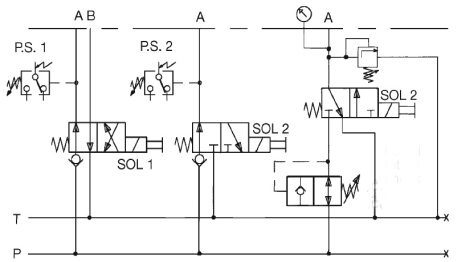
HCR-VP-S1010-X
(1) Double acting clamp
(1) Low pressure die lift



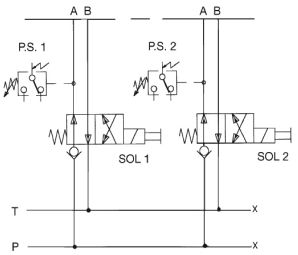
HCR-VP-S1100-X
(1) Double acting clamp
(1) Single acting clamp



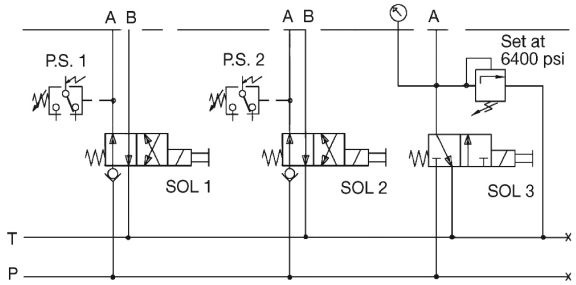
HCR-VP-S1101-X
(1) Double acting clamp
(1) Single acting clamp
(1) High pressure die lift



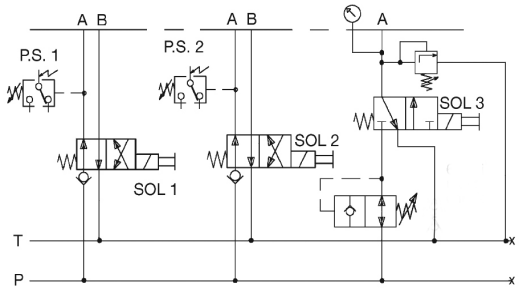
HCR-VP-S1110-X
(1) Double acting clamp
(1) Single acting clamp
(1) Low pressure die lift



HCR-VP-S2000-X
(2) Double acting clamp



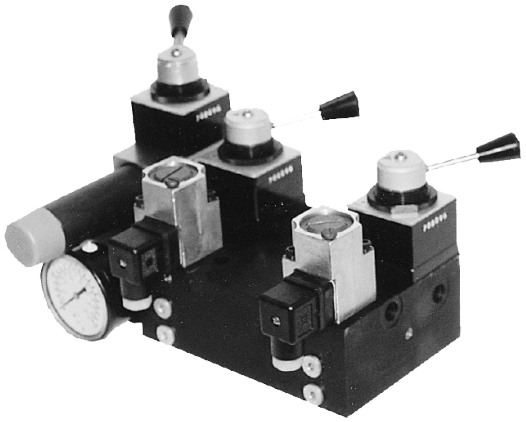
HCR-VP-S2001-X
(2) Double acting clamp
(1) High pressure die lift

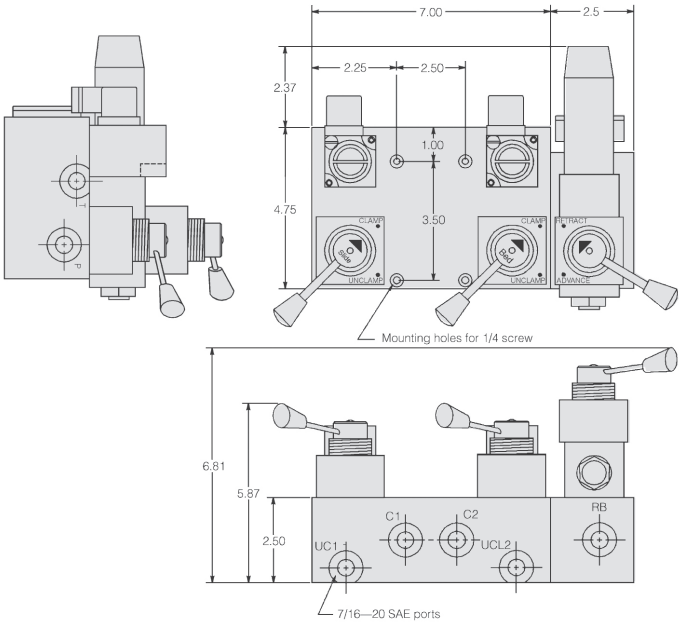


HCR-VP-S2010-X
(2) Double acting clamp
(1) Low pressure die lift

Solenoid Symbol Shown

Valve packages manually operated





Application:

These manually operated valve packages provide a safe, convenient means of controlling the hydraulic fluid to die clamp and lifters for any press applications in a simple integrated unit.

Description:

The clamping pressure, as supplied from a separate pump unit, can actuate single- or double-acting clamps in the bed and ram safely. Pressure switches in the clamp line(s) (C1, C2) provide a signal to the press circuit if a valve is not activated or in the event of a pressure loss.

The reduced-pressure die-lifter circuit provides an adjustable reducer with circuit relief. A return line check valve keeps balls or rollers that are not under the die up during stamping.

The H-style die lifter circuit operates at full system pressure. It includes a circuit relief valve which reduces possible intensification caused by overloading the die lifters.

Can be mounted in any position.

Advantages:

- economical
- suitable for new or retrofit
- press enabled pressure switches

Technical data

Hydraulic		
Max. clamping pressure	psi	5,800
Die lifter pressure		See chart
Max. flow rate	(cu in/min)	693
Oil ports	SAE	7/16-20 UNC
Pressure switch data		
Adjustable pressure setting	psi	750 to 5,800
Average pressure differential		
at 1,450 psi	psi	350 ± 73
at 7,250 psi	psi	750 ± 116
Switch NO/NC		single pole
Contract rating	VAC	5 A at 250
Contact	VDC	3 A at 30

Part no.	Clamp circuits	Die lifter circuit		Weight (lbs.)
		Reduced pressure 400-2,175-PSI	System pressure 5,800 PSI max	
HCR-VP-M01		1		7.0
HCR-VP-M01-H			1	6.5
HCR-VP-M10	1			8.5
HCR-VP- M11	1	1		15.5
HCR-VP-M11-H	1		1	15.0
HCR-VP-M20	2			10.5
HCR-VP-M21	2			17.5
HCR-VP-M21-H	2		1	17.0

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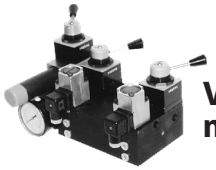
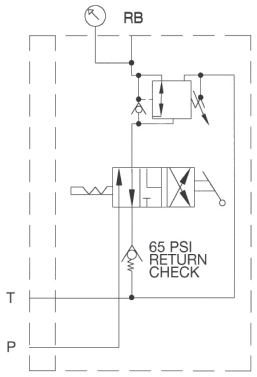
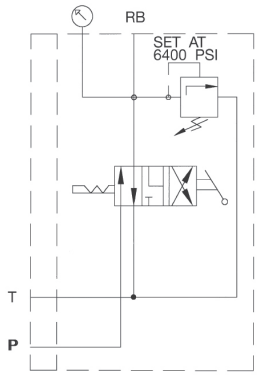


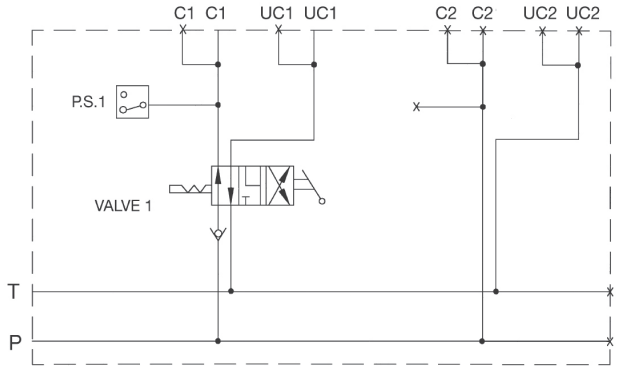
Valve packages manually operated



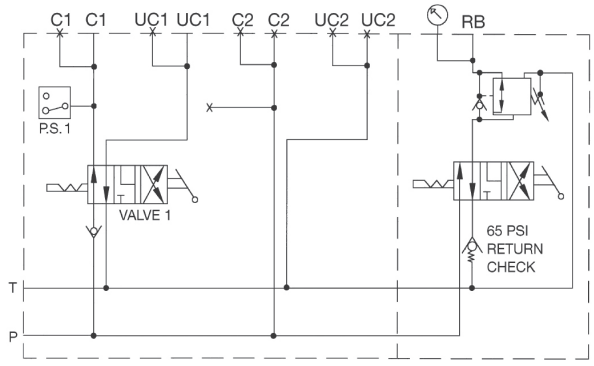
HCR-VP-M01



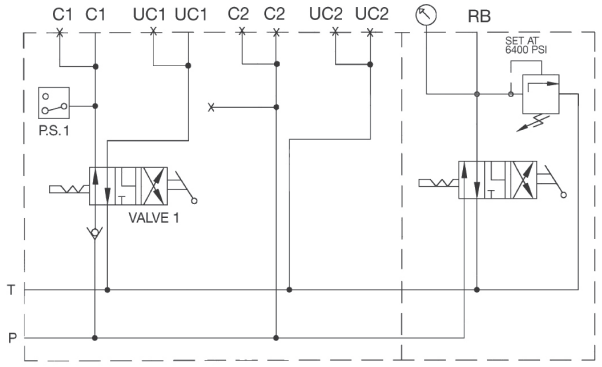
HCR-VP-M01-H



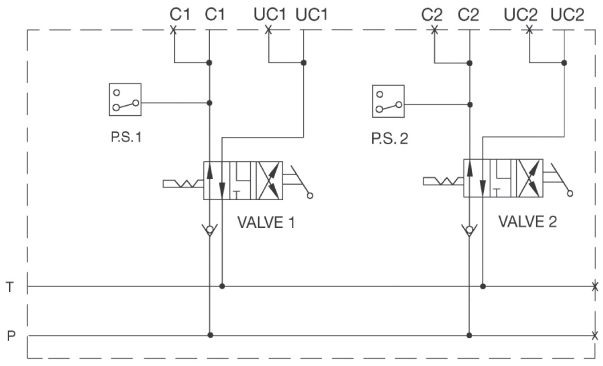
HCR-VP-M10



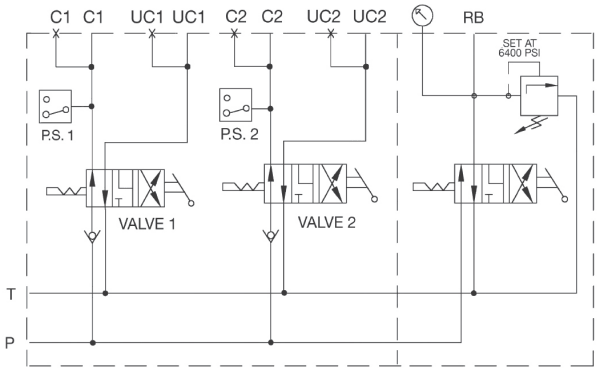
HCR-VP-M11



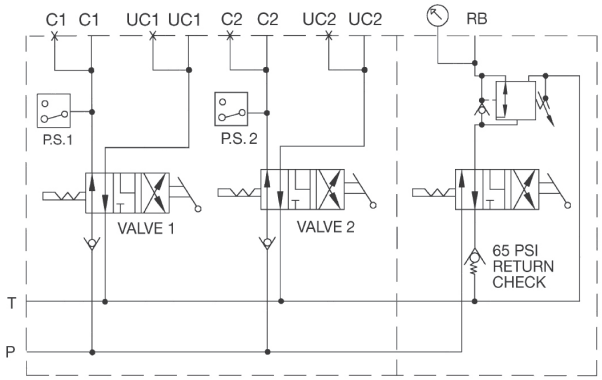
HCR-VP-M11-H



HCR-VP-M20



HCR-VP-M21-H



HCR-VP-M21

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Application:

For the operation of hydraulic clamping fixtures and other handling and clamping systems on machine tools.

Description:

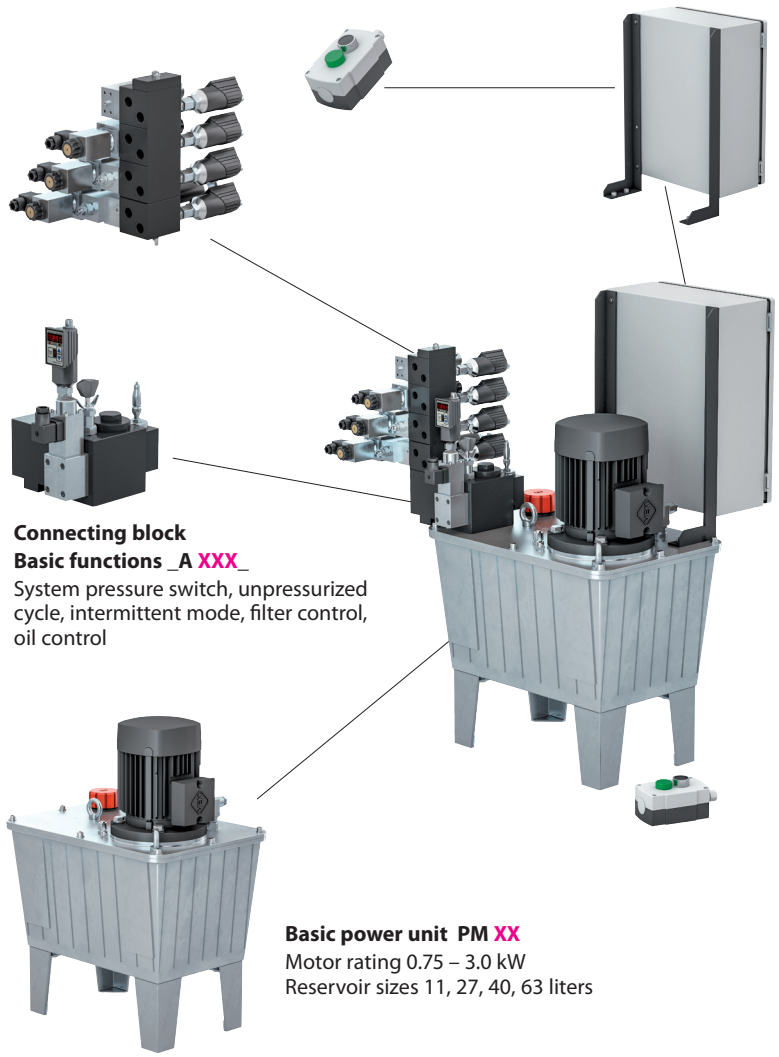
The power units of this series consist of individual modules that are selected depending on the application and are assembled on the basis of a type code to a power unit ready for use.

Modules:

- Power unit (reservoir, pump, motor)
- Connecting block basic functions
- Valve block with up to 4 control circuits
- Electronics

Valve block
Control circuit _V1 XX X XXX SX_ ..._V4
Poppet/spool valves, function triggering, additional functions

Electronics _E X
Electric control, terminal box



Connecting block
Basic functions _A XXX_
System pressure switch, unpressurized cycle, intermittent mode, filter control, oil control

Basic power unit PM XX
Motor rating 0.75 – 3.0 kW
Reservoir sizes 11, 27, 40, 63 liters

Characteristics

- for single and double-acting cylinders
- continuously adjustable operating pressure
- expandable to up to 8 pressure circuits
- constant flow rate
- wide range of valves
- wide range of hydraulic functions
- energy-saving mode S3 (intermittent mode) or S6 (unpressurized cycle)
- supplied ready for connection

Equipment - Standard

- connecting block with pressure relief valve
- pressure filter 10 µm
- oil level gauge
- stick thermometer
- design without piping

Equipment - Options

- electronic system pressure switch (with teach-in function*)
- system pressure switch or machine tool interlock
  mechanical or electronic
- electrical oil level control
- electrical temperature control
- return filter
- electrical filter control
- electric control
- terminal box
- foot switch or manual switch
- key switch

Performance data

p max. [bar]	**Q** [l/min]	**Reservoir** [l]			
120	12		27	40	63
160	8.8		27	40	63
160	12			40	63
200	1.5	11	27	40	63
200	3.3	11	27	40	63
200	4.5	11	27	40	63
200	6.2		27	40	63
200	8.8			40	63
350	3.6		27	40	63
350	5.3			40	63
400	2.5	11	27	40	63
450	4.2			40	63
500	0.9	11	27	40	63
500	1.5	11	27	40	63
500	2.6		27	40	63
500	3.7			40	63
500	0.7 / 5.2	11	27	40	63
500	0.7 / 8.8	11			

Further pump variants and equipment available on request.

* special system software for simplified system pressure adjustment

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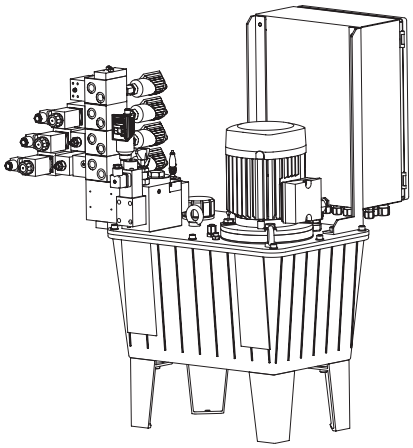
Power units in modular design

type code "structure and determination"

Type code: PMXX_AXXX_V1-XX X XXX SX_V2-XX X XXX SX_V3-XX X XXX SX_V4-XX X XXX SX_EX

- Basic power unit
- Basic functions
- Control circuit 1
- Switch variant
- Control circuit 2
- Switch variant
- Control circuit 3
- Switch variant
- Control circuit 4
- Switch variant
- Electronics



Modular design:

By the use of pre-assembled modules, module power units can be flexibly implemented in the short term and in a cost-effective way.

The modular design and numerous design options allow a flexible adaptation to the respective application.

Module power units are particularly suitable as a base to build complex hydraulic controls. A linkable basic block offers the user the possibility to expand the power unit with different function and control elements for the specific application.

Determination of the type code:

A type code that results from the used modules is available for the different module components and results in the final part number for the power unit.

To select the correct arrangement, size and performance of the individual components, you will find all parameters and their type code on the following pages.

Safety features:

- Precisely defined clamping force by continuously adjustable operating pressure
- Electronic system pressure switch with digital pressure display (option)
- Repeatability ± 1 bar
- Renewed oil supply after a pressure drop of max. 10 %
- Machine tool interlock (option) at a pressure drop of max. 20 %, is automatically updated in case of pressure adjustment
- Oil level and temperature control (option)
- Precise oil temperature display by stick thermometer
- Pressure filter 10 µm in the connecting block
- Screen disks in the ports
- Control voltage 24 V DC
- Pressure maintenance in case of power failure due to hermetically sealed poppet valves
- Overpressure protection of the individual pressure circuits (option)

Important notes:

These power units are exclusively designed for the industrial use of pressure generators for hydraulic fixtures.

All connected hydraulic components must be leakage-free and designed for the maximum operating pressure of the power unit.

The power unit generates very high pressures. The connected cylinders generate very high forces so that there is a permanent danger of crushing in the effective area of the piston rod. The manufacturer of the fixture or the machine is obliged to provide effective protection devices.

Installation, start up and maintenance have to be made according to the operating manual by authorized experts.

Technical data	
Designs	
• Gear pump	max. 200 bar
• Piston pump	max. 500 bar
• Pump combination	max. 80 / 500 bar
Type of mounting	foot mounting
Port size	G 1/4, G 3/8 and G 1/2
Direction of rotation (view from above onto the drive shaft)	
• Gear pump	clockwise rotation
• Piston pump	any
• Pump combination	counterclockwise rotation
Mounting position	upright
Usable oil volume	50 % of reservoir volume
Vol. efficiency	η vol = 85 – 95 %

* Other voltages/frequencies on request.
Special approvals on request.

Electrical characteristics - Motor	
Nominal voltage*	400 V up to 2.2 kW star connection 400 V from 3 kW delta connection
Type	squirrel cage rotor, 4-pole
Voltage type*	three-phase AC voltage, 50 Hz
Code class	IP 55
Max. relative cycle time	depending on the operating pressure specifications for 100 % or 40 % ED see page 4

The calculation of the relative duty cycle is based on a cycle time of 10 min. With 40 % ED, e.g. the maximum load within the cycle should not exceed 4 min.

During the remaining time, the motor can carry a load of up to 50 % of the nominal output and should run continuously.

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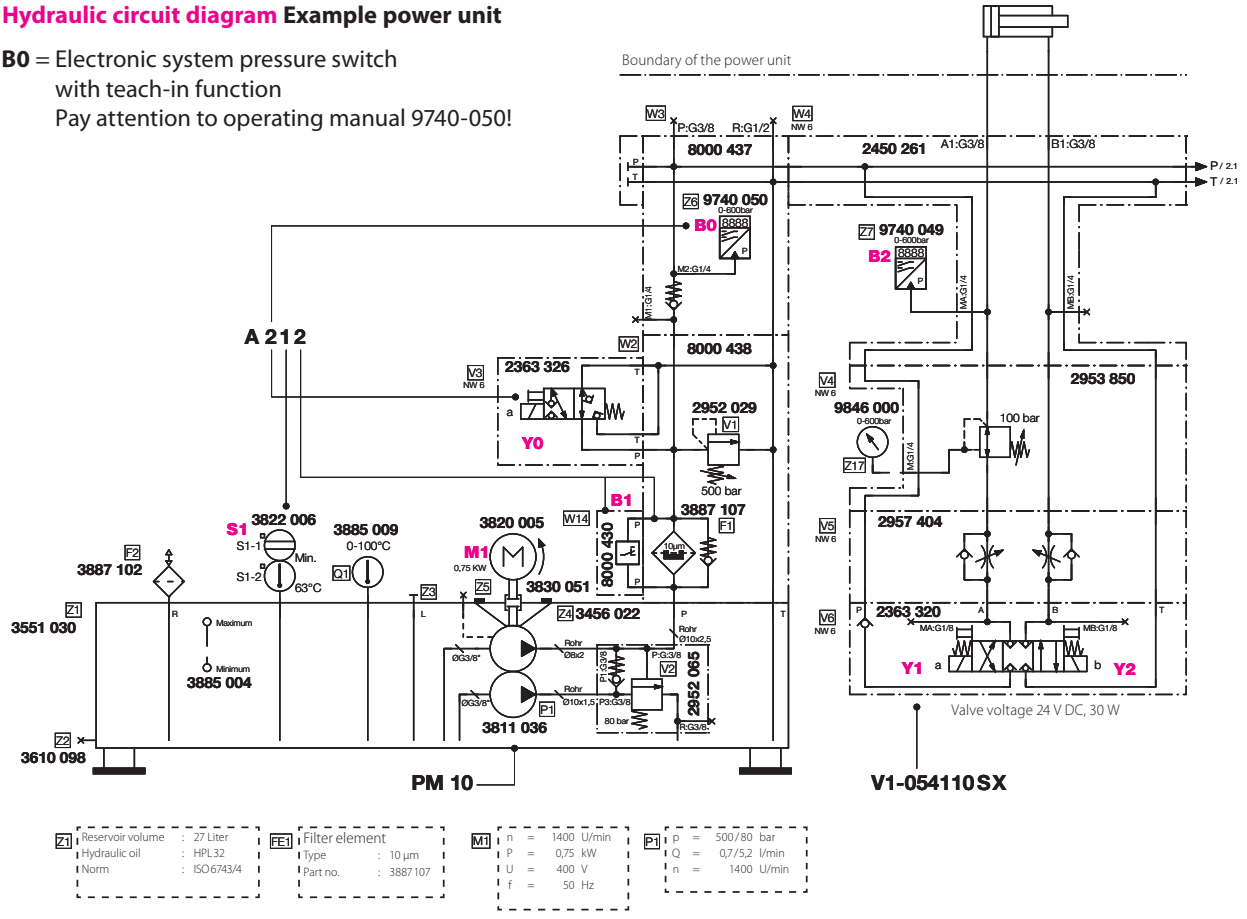
Hydraulic circuit diagram Example power unit

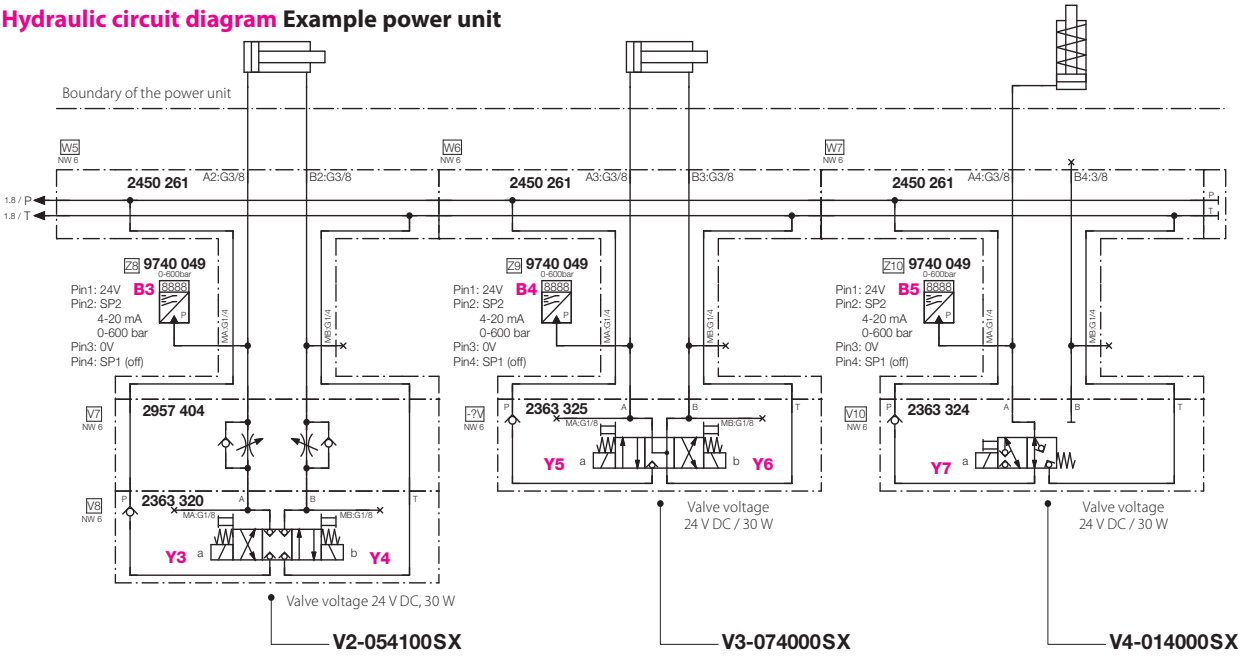
B0 = Electronic system pressure switch
with teach-in function
Pay attention to operating manual 9740-050!



Z1	Reservoir volume	: 27 Liter	FE1	Filter element		M1	n = 1400 U/min
	Hydraulic oil	: HPL32		Type	: 10 µm		P = 0,75 kW
	Norm	: ISO 6743/4		Part no.	: 3887 107		U = 400 V
							f = 50 Hz

P1	p =	500 / 80 bar
	Q =	0,7 / 5,2 l/min
	n =	1400 U/min

Hydraulic circuit diagram Example power unit



** see previous page "Electrical characteristics - Motor"

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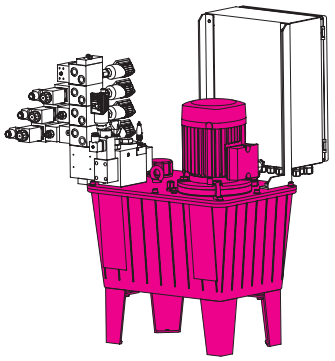
Power units in modular design

type code for power unit size "PMXX"

Type code: PMXX_AXXX_V1-XX X XXX SX_V2-XX X XXX SX_V3-XX X XXX SX_V4-XX X XXX SX_EX



Basic power unit:

The basic selection takes place based on pressure p and flow rate Q. The size of the reservoir depends on the application conditions (e. g. environmental temperature, cycle time and function).

*** Note**

In case of the two-stage pump (RZ) the gear pump (large flow rate) is switched to unpressurized cycles by the integrated idling control valve as soon as a pressure of 80 bar is exceeded.
Up to 80 bar, both flow rates will add up.

4 reservoir sizes: 11 l, 27 l, 40 l, 63 l

5 motor sizes: 0.75 kW, 1.1 kW, 1.5 kW, 2.2 kW, 3.0 kW

15 pump types: gear pumps, piston pumps, two-stage pumps*

Example:

Reservoir 11 l, max. 200 bar, gear pump 1.5 l/min, 0.75 kW = **PM 01**
Reservoir 27 l, max. 350 bar, piston pump 3.6 l/min, 2.2 kW = **PM 19**

Operating pressure [bar]		Flow rate	Motor rating	Reservoir volume	Pump type	PM XX
at 100 % ED	at 40 % ED**	Q [l / min]	P [kW]	V [l]		
425	**500**	0.9	0.75	11	Piston pump	**02**
425	**500**	0.9	0.75	27	Piston pump	**09**
425	**500**	0.9	0.75	40	Piston pump	**21**
425	**500**	0.9	0.75	63	Piston pump	**38**
375	**500**	1.5	1.1	11	Piston pump	**05**
375	**500**	1.5	1.1	27	Piston pump	**12**
375	**500**	1.5	1.1	40	Piston pump	**24**
375	**500**	1.5	1.1	63	Piston pump	**41**
430	**500**	2.6	2.2	27	Piston pump	**18**
430	**500**	2.6	2.2	40	Piston pump	**30**
430	**500**	2.6	2.2	63	Piston pump	**47**
415	**500**	3.7	3.0	40	Piston pump	**34**
415	**500**	3.7	3.0	63	Piston pump	**51**
500	**500**	0.7 / 5.2*	0.75	11	Two-stage pump	**03**
500	**500**	0.7 / 8.8*	1.5	11	Two-stage pump	**54**
500	**500**	0.7 / 5.2*	0.75	27	Two-stage pump	**10**
500	**500**	0.7 / 5.2*	0.75	40	Two-stage pump	**22**
500	**500**	0.7 / 5.2*	0.75	63	Two-stage pump	**39**
365	**450**	4.2	3.0	40	Piston pump	**35**
365	**450**	4.2	3.0	63	Piston pump	**52**
310	**400**	2.5	1.5	11	Piston pump	**07**
310	**400**	2.5	1.5	27	Piston pump	**14**
310	**400**	2.5	1.5	40	Piston pump	**26**
310	**400**	2.5	1.5	63	Piston pump	**43**
310	**350**	3.6	2.2	27	Piston pump	**19**
310	**350**	3.6	2.2	40	Piston pump	**31**
310	**350**	3.6	2.2	63	Piston pump	**48**
290	**350**	5.3	3.0	40	Piston pump	**36**
290	**350**	5.3	3.0	63	Piston pump	**53**
200	**200**	1.5	0.75	11	Gear pump	**01**
200	**200**	1.5	0.75	27	Gear pump	**08**
200	**200**	1.5	0.75	40	Gear pump	**20**
200	**200**	1.5	0.75	63	Gear pump	**37**
170	**200**	3.3	1.1	11	Gear pump	**04**
170	**200**	3.3	1.1	27	Gear pump	**11**
170	**200**	3.3	1.1	40	Gear pump	**23**
170	**200**	3.3	1.1	63	Gear pump	**40**
170	**200**	4.5	1.5	11	Gear pump	**06**
170	**200**	4.5	1.5	27	Gear pump	**13**
170	**200**	4.5	1.5	40	Gear pump	**25**
170	**200**	4.5	1.5	63	Gear pump	**42**
180	**200**	6.2	2.2	27	Gear pump	**15**
180	**200**	6.2	2.2	40	Gear pump	**27**
180	**200**	6.2	2.2	63	Gear pump	**44**
175	**200**	8.8	3.0	40	Gear pump	**32**
175	**200**	8.8	3.0	63	Gear pump	**49**
130	**160**	8.8	2.2	27	Gear pump	**16**
130	**160**	8.8	2.2	40	Gear pump	**28**
130	**160**	8.8	2.2	63	Gear pump	**45**
130	**160**	12	3.0	40	Gear pump	**33**
130	**160**	12	3.0	63	Gear pump	**50**
99	**120**	12	2.2	40	Gear pump	**29**
95	**120**	12	2.2	27	Gear pump	**17**
95	**120**	12	2.2	63	Gear pump	**46**

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Pumping

Piston pumps

Type	radial piston pump
Nominal pressure max.	500 bar
Flow rates*	3.6 / 5.3 l/min to 350 bar
	2.5 l/min to 400 bar
	4.2 l/min to 450 bar
	0.9 / 1.5 / 2.6 / 3.7 l / min to 500 bar
Direction of rotation*	any
Speed range	continuous operation 100 ... 2000 1/min, short-time operation up to 2850 1/min
Feature	high-pressure application, harsh operating conditions (e.g. punching / stamping)

Gear pumps

Type	2 opposite gears
Nominal pressure max.	200 bar
Flow rates*	1.5 / 3.3 / 4.5 / 6.2 / 8.8 l / min to 200 bar
	12 l/min to 160 bar
Direction of rotation*	clockwise rotation
Speed range	700 ... 3000 1/min
Feature	intermediate-pressure application, high flow rate

Two-stage pump

Type		radial piston pump and gear pump screwed together
		continuous drive shaft
Nominal pressure max.		500 bar
Flow rate*	up to approx. 80 bar	total flow rate active (gear plus piston pump)
	from approx. 80 bar	only flow rate of piston pump active
Direction of rotation*		counterclockwise rotation
Speed range		700 ... 2000 1/min, in short-time operation up to 2850 1/min
Feature		high flow rate up to approx. 80 bar, high pressure up to 500 bar
Typical application		quickly move large volume consumers and clamp them with high pressure

* at rated speed 1450 1/min
** direction of rotation (view from above onto the drive shaft)

Different flow rates and other pumps are available on request.

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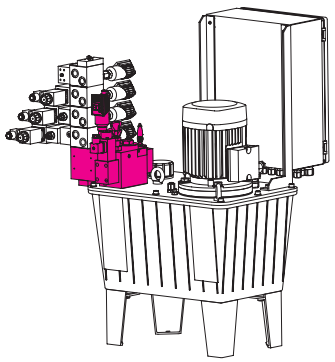
Power units in modular design
type code for connecting block
basic function "AXXX"

Type code: PMXX_AXXX_V1-XX X XXX SX_V2-XX X XXX SX_V3-XX X XXX SX_V4-XX X XXX SX_EX



Standard equipment:
- Connecting block with pressure relief valve
- System check valve
- Pressure filter 10 µm
- Oil level gauge
- Oil temperature gauge (stick thermometer)
- Filler and reservoir ventilation
- Prepared for additional features

Connecting block basic functions:
In addition to the standard equipment, additional features for the basic unit can be selected.

Teach-in function:
For teaching, the desired switching as well as reverse switching points are calculated and saved by pressing the Enter/Set key of the system. Thus, the system pressure switch is ready for operation (run mode). The teach mode is activated by releasing the reset function.
(Detailed technical data see page 10 of this series).

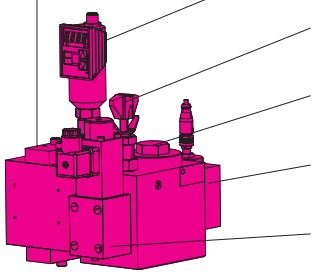
_AX X X_

with pressure gauge, without system pressure switch, without vavle for unpressurized cycle	**0**
with electronic system pressure switch for intermittent cycle	**1**
with system pressure switch and valve for unpressurized cycle, p_{max} = 500 bar	**2**
with system pressure switch and valve for unpressurized cycle, p_{max} = 315 bar	**3**
with pressure gauge, without system pressure switch, with valve for unpressurized cycle, p_{max} = 500 bar	**4**
with pressure gauge, without system pressure switch, with valve for unpressurized cycle, p_{max} = 315 bar	**5**

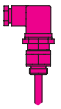
with visual temperature and oil level display (standard)	**0**
with temperature and oil level control switch and visual temperature and oil level display	**1**

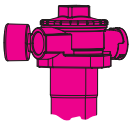
with pressure filter (standard)	**0**
pressure and return filter	**1**
pressure filter with filter control	**2**
pressure filter and return filter with filter control	**3**

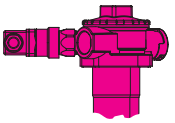
Connecting block including pressure filter and pressure relief valve, P port G 3/8, R port G 1/2 and system check valve
(The retrofitting of individual features is possible at any time).



Additional options:


Oil control
(oil level / oil temperature)


Return filter


Return filter with filter control

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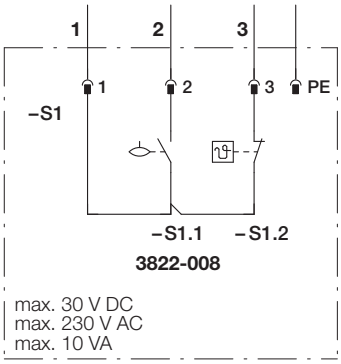
Monitoring functions - Power unit

Oil control (oil temperature too high or oil level too low)	
Contact oil temperature	break contact, opens at approx. 63 °C
Contact oil level	make contact, closes when oil above the float
Type of connection	connector, 3-pin as per DIN 43650 Pin 1: common root Pin 2: level Pin 3: temperature
Max. switching voltage	230 V AC
Max. switching current	1 A
Max. contact rating	10 VA
Medium temperature max.	85 °C
Code class	IP 65
For oil reservoir 11 litres	Part no. 3822-008
For oil reservoir 27 litres	Part no. 3822-006
For oil reservoir 40 litres	Part no. 3822-048
For oil reservoir 63 litres	Part no. 3822-005

Note: The oil control can be retrofitted.
Several switching points for temperature and /or level on request.

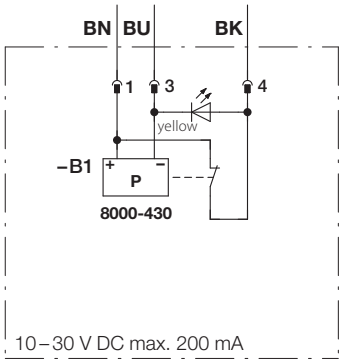


Pressure filter control

For plug-type connector with illuminated display with snap switching element
Plunger material stainless steel

Switching voltage	min. 12 V
Switching current	min. at 24 V 10 mA
Connection	connector, M12, 4-pin
Part no.	8000-430

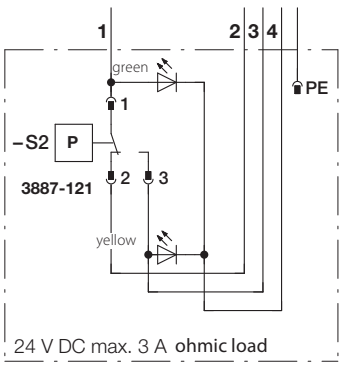
Note: The pressure filter control can be retrofitted.



Return filter control

Operating pressure	0 … 10 bar
Material	body polyamide, connecting parts steel galvanized, membrane NBR, seal copper
Code class	IP 67
Electrical connection	cable socket DIN 43650 - AF3
	cable diameter 6 … 8 mm
Max. switching voltage	30 V DC
Max. switching current	0.25 A
Max. contact rating	3 W
Part no.	3887-121

Note: The return filter control can be retrofitted.



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Power units in modular design

type code for valve bloc for control circuits
"V1-XX X XXX SX" to "V4-XX X XXX SX"

Type code: PMXX_AXXX_**V1-XX X XXX SX**_V2-XX X XXX SX_V3-XX X XXX SX_V4-XX X XXX SX_EX

The determination of control circuit V2-XX X XXX SX, V3-XX X XXX SX and V4-XX X XXX SX is the same as of control circuit V1-XX X XXX SX.

V1-XX X XXX SX

Control valves

	Function	
as reserve space	with blind plate	**00**
3/2 directional poppet valve, 500 bar, without auxiliary energy P->A	1 x single acting	**01**
3/2 directional poppet valve, 500 bar, without auxiliary energy A->R	1 x single acting	**02**
3/2 directional poppet valve, 250 bar, without auxiliary energy P->A	1 x single acting	**03**
3/2 directional poppet valve, 250 bar, without auxiliary energy A->R	1 x single acting	**04**
4/3 directional poppet valve, 500 bar, without auxiliary energy all connections closed	1 x double acting	**05**
4/3 directional poppet valve, 250 bar, without auxiliary energy all connections closed	1 x double acting	**06**
4/3 directional poppet valve, 500 bar, without auxiliary energy A + B->R	1 x double acting	**07**
4/3 directional poppet valve, 250 bar, without auxiliary energy A + B->R	1 x double acting	**08**
2 x 3/2 directional poppet valve, 500 bar, without auxiliary energy P->A + B	2 x single acting	**09**
2 x 3/2 directional poppet valve, 500 bar, without auxiliary energy A + B->R	2 x single acting	**10**
2 x 3/2 directional poppet valve, 500 bar, without auxiliary energy P->A / B->R	2 x single acting	**11**
2 x 3/2 directional poppet valve, 250 bar, without auxiliary energy P->A + B	2 x single acting	**12**
2 x 3/2 directional poppet valve, 250 bar, without auxiliary energy A + B->R	2 x single acting	**13**
2 x 3/2 directional poppet valve, 250 bar, without auxiliary energy P->A / B->R	2 x single acting	**14**
2 x 4/2 directional spool valve, 315 bar, without auxiliary energy P->A / B->R	1x double-acting, not leakage-free	**15**
4/3 directional spool valve, 315 bar, without auxiliary energy all connections closed	1x double-acting, not leakage-free	**16**
4/3 directional spool valve, 315 bar, without auxiliary energy A + B->R	1x double-acting, not leakage-free	**17**
4/3 directional spool valve, 315 bar, without auxiliary energy P->R, A + B closed	1x double-acting, not leakage-free	**18**
4/3 directional spool valve, 315 bar, without auxiliary energy all connections connected	1x double-acting, not leakage-free	**19**
without mounting plate, P and R closed	without	**XX**

Pressure switch

without system pressure switch for machine tool interlock	**0**
piston pressure switch in A for machine tool interlock	**1**
piston pressure switch in B for machine tool interlock	**2**
piston pressure switch in A + B for machine tool interlock	**3**
electronic system pressure switch in A for machine tool interlock	**4**
electronic system pressure switch in B for machine tool interlock	**5**
electronic system pressure switch in A + B for machine tool interlock	**6**

Flow control valves

without flow control valve	**0**
with flow control valve in A + B, supply throttling, 500 bar	**1**
with flow control valve in A + B, supply throttling, 315 bar	**2**

Pressure valves

without pressure reducing valve	**0**
pressure reducing valve in A with pressure display	**1**
pressure reducing valve and pressure relief valve in A with pressure display	**2**
pressure reducing valve in P with pressure display	**3**
pressure reducing valve in P and pressure relief valve in A with pressure display	**4**
pressure reducing valve in P and pressure relief valve in B with pressure display	**5**
pressure reducing valve in P and pressure relief valve in A + B with pressure display	**6**
pressure relief valve in A	**7**
pressure relief valve in B	**8**
pressure relief valve in A + B	**9**

Check valves

without intermediate plate check valves	**0**
intermediate plate twin check valves in A + B max. 315 bar	**1**
intermediate plate check valve in A max. 315 bar	**2**
intermediate plate check valve in B max. 315 bar	**3**

Switch

without switch	**0**
hand switch, latching with pilot light green	**1**
foot switch, latching with pilot light green	**2**
3-way selector switch, latching with pilot light green	**3**
key switch, latching with pilot light green	**4**
2 x hand switch, latching with pilot light green	**5**
2 x foot switch, latching with pilot light green	**6**
2 x key switch, latching with pilot light green	**7**

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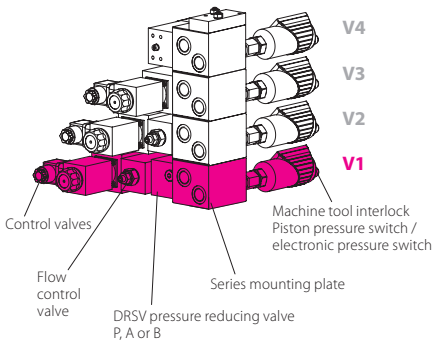


Valve block (max. 4 control circuits V1 – V4)

The equipment of the control circuits is based on the functional requirements of the application; the maximum pressures as well as the design-related differences in poppet and spool valves are to be considered.

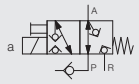
Special versions:

Switch combinations and special switches are possible on request.
It is also always possible to deviate from the prescribed standard.
For example, more than 4 control circuits can be set up. It is possible to implement additional hydraulic functions.
The electrical control can be designed even more individually up to the installation of programmable logic controllers and touch panels for human-machine communication.

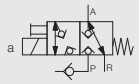
Switching symbols

Control valves

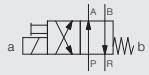
3/2 directional poppet valve
V1-01
V1-03



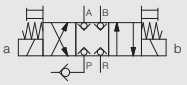
V1-02
V1-04



4/2 directional spool valve
V1-15

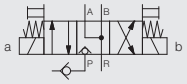


4/3 directional poppet valve
V1-05
V1-06

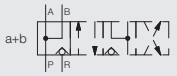


with 4th switching function
Solenoid "a" and "b" operated

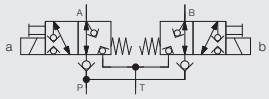
V1-07
V1-08



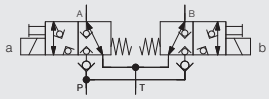
with 4th switching function
Solenoid "a" and "b" operated



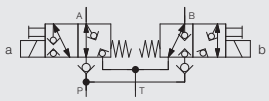
Double 3/2 directional poppet valve
V1-09
V1-12



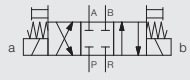
V1-10
V1-13



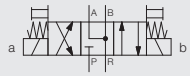
V1-11
V1-14



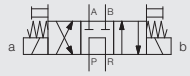
4/3 directional spool valve
V1-16



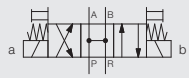
V1-17



V1-18



V1-19



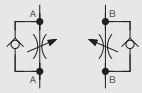
Pressure switch

Piston pressure switch
V1-XX 1
V1-XX 2
V1-XX 3

Electronic pressure switch
V1-XX 4
V1-XX 5
V1-XX 6

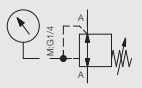
Flow control valves

Flow control valve
V1-XX X 1
V1-XX X 2

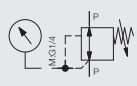


Pressure valves

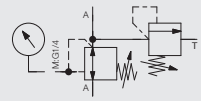
Pressure reducing valve
V1-XX X X1



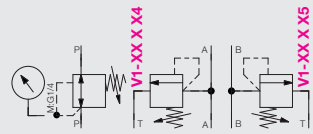
V1-XX X X3



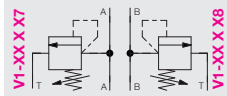
Pressure reducing valve with pressure relief valve
V1-XX X X2



V1-XX X X6

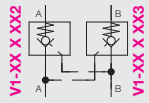


Pressure relief valve
V1-XX X X9



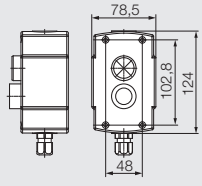
Check valves

Intermediate plate twin check valve
V1-XX X XX1

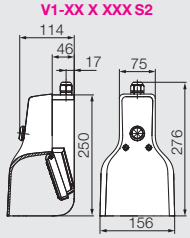


Switch Connecting cable 3 m, other lengths on request

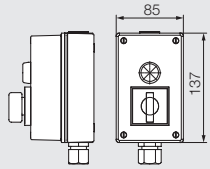
Manual switch
V1-XX X XXX S1



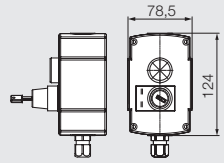
Foot switch
V1-XX X XXX S2



3-way selector switch
V1-XX X XXX S3



Key switch
V1-XX X XXX S4



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Types of valves

Poppet valves, hermetically sealed	
Adm. operating pressure	up to 500 bar
Adm. flow rate	up to 20 l/min
Flow direction	in the direction of the arrow as per symbol
Hydraulic oil	HLP 22 as per DIN 51524
Connection	flange for mounting plate assembly
Type of mounting	4 screws M 6
Nominal voltage	24 V DC, + 5 % / – 10 %
Pick-up and holding power	30 W
Make time	60 ms
Brake time	60 ms
Max. cycles	2000 /h
Duty cycle	100 % ED
Code class	IP 65 (IEC 60529)
Connection	cable socket as per DIN EN 175 301-803 and ISO 4400

Spool valves, leakage-afflicted

Leakage rate	up to 20 ccm/min at 100 bar
Adm. operating pressure	up to 315 bar
Adm. flow rate	up to 80 l/min
Flow direction	in the direction of the arrow as per symbol
Hydraulic oil	HLP 32 or 46 as per DIN 51524
Connection	flange, hole pattern as per DIN 24340, form A CETOP 4.2 – 4.3, ISO 4401 for mounting plate assembly
Type of mounting	4 screws M 5
Nominal voltage	24 VDC, + 10 % / – 10 %
Pick-up and holding power	30 W
Make time	20 – 45 ms
Brake time	10 – 25 ms
Max. cycles	15000 / h
Duty cycle	100 % ED
Code class	IP 65 as per DIN 40050
Connection	cable socket as per DIN EN 175 301-803 and ISO 4400
Other voltages and/or actuations available on request	

Note to pressure reducing valves

Max. input pressure:	[bar]	500
Adjustable output pressure	[bar]	30 … 380
(other pressure ranges on request)		

Note to pressure relief valves

Max. input pressure:	[bar]	500
Adjustable reaction pressure	[bar]	50 … 500
(other pressure ranges on request)		

For the protection of pressure reducing valves, additional pressure relief valves are recommended.

Pressure switch variants

Electronic pressure switches	
Recommended hydraulic oil	HLP 22, 32 and 46 as per DIN 51524
Pressure ranges	0 … 600 bar
Excess pressure [bar]	50 % of the nominal pressure (PN)
Pressure pick-up	Peak-value memory every 2 ms
Operating voltage	12 to 32 V DC (residual ripple < 10 %), protected against reverse polarity
Voltage drop	< 2 V
Current consumption	< 60 mA
Switching outputs	2 x pnp switching, no/nc 1 A short circuit protection switching output 2 is omitted if current output is parameterized
Delay time	0 to 20 s, switch on and off delay separately adjustable
Range of adjustment switching point	6 to 600 bar
Reverse switching point	5 to 594 bar
Switching frequency	max. 125 Hz
Reproducibility	< ± 0.1 % of the final value
Current output	if parameterized, switching output 2 is omitted 0/4 to 20 mA, 20 to 0/4 mA, starting point and final point selectable
Load	max. RL [W] = (Ub – 8V) / 20 mA
Error detection	analog output in case of line break
Rise time	5 ms (10 % to 90 % of PN)
Damping	0 to 20 s, adjustable
Linearity deviation	max. ± 0.25 % of PN
System pressure display	4 x 7 segment LED display
Display damping	0 to 20 s, adjustable
Switching function display	2x LED red
Operating temperature	– 20 °C to + 80 °C
Temperature drift	< ± 0.2 % / 10 K (– 10 °C to + 70 °C)
Pressure port	G1/4 A, SW 19
Sensor head material	stainless steel 1.4435
Housing material	PA 6.6, polyester
Code class	IP 65 as per EN 60529
Electric connection	M12 connector 4-pin
As system pressure switch	Part no. 9740-050* with teach-in function for easy system pressure adjustment
For machine tool interlock	Part no. 9740-049*

Mechanical pressure switch

Piston switch	Technical data as per ROEMHELD data sheet F 9.732
* Detailed operating instructions available on request	

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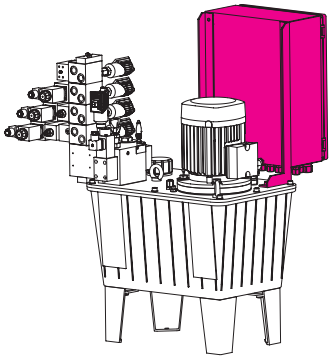
Type code: PMXX_AXXX_V1-XX X XXX SX_V2-XX X XXX SX_V3-XX X XXX SX_V4-XX X XXX SX_EX



Electronics
The function triggering can be realized in various ways.

The following are available for selection:

- **without electric control, without terminal box**
  connection of the individual components and electric control provided by the customer
- **with terminal box, without electric control**
  connections of the individual components are connected to the terminal strip of the terminal box, the connection will be made to the customer's electric control
- **with electric control, without terminal box**
  function triggering by customer contacts or selected switches

_E X

without electric control, without terminal box.	0
with terminal box	1
with electric control and function triggering provided by the customer	2
with electric control and function triggering in a common housing	3
with electric control and function triggering in individual housings	4

U = 3/ N / PE 400 V 50 Hz
Other voltages and frequencies of 1 Ph. 110 V to 3 Ph. 500 V 50/60 Hz on request
Special approvals on request.

Function triggering provided by the customer:
Potential free contacts from a customer control.

Function triggering in a common housing:
The selected switches in control circuits are installed in one operating housing and connected to the electrical control.

Function triggering in individual housings:
The selected switches in the control circuits are design as shown on page 9 of this series, and individually connected to the electric control.

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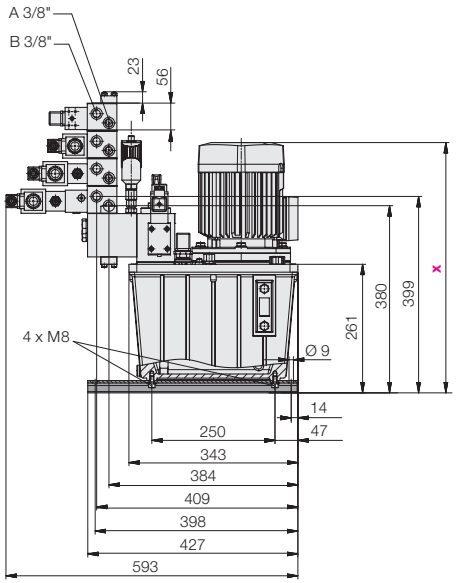
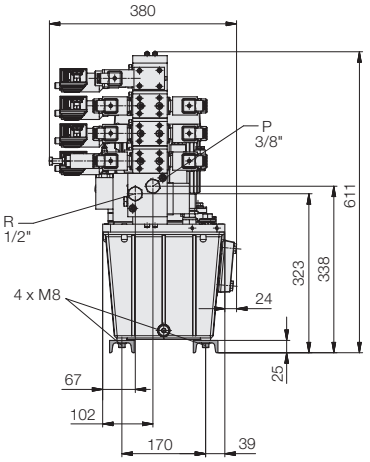
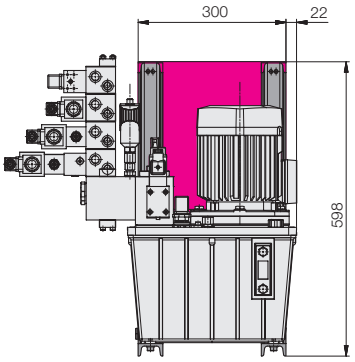
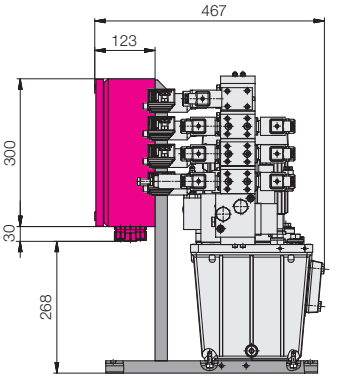
Example power unit 11 liters
without electronics _E0



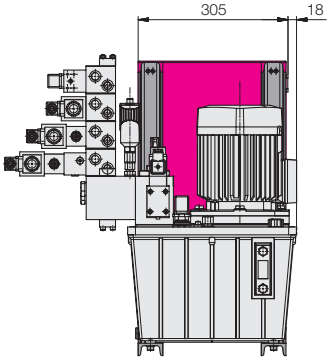


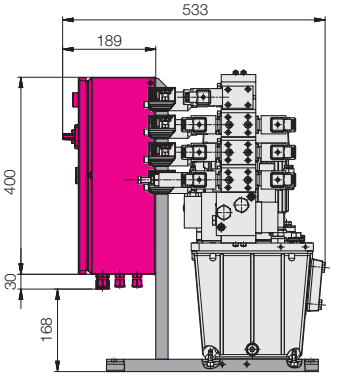
with terminal box _E1





with electric control _E2





Dimensions in mm

Example power unit 11 liters

(Dimensions in mm)

Power unit 11 liters	without electronics	with terminal box	with electric control
x (motor 0.75 kW)	493	493	493
x (motor 1.1 kW)	509	509	509
x (motor 1.5 kW)	531	531	531

Reservoir volume	Type code for example power unit	Part no.
11	**PM** 03_**A**212_**V**1-054110 S0_**V2**-054100 S0_**V3**-074000 S0_**V4**-014000 S0_**E**0	**8456004**
11	**PM** 03_**A**212_**V**1-054110 S0_**V2**-054100 S0_**V3**-074000 S0_**V4**-014000 S0_**E**1	**8456003**
11	**PM** 03_**A**212_**V**1-054110 S0_**V2**-054100 S0_**V3**-074000 S0_**V4**-014000 S0_**E**2	**8456002**

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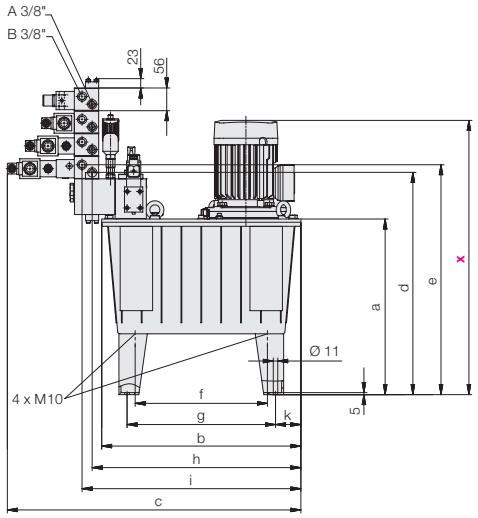
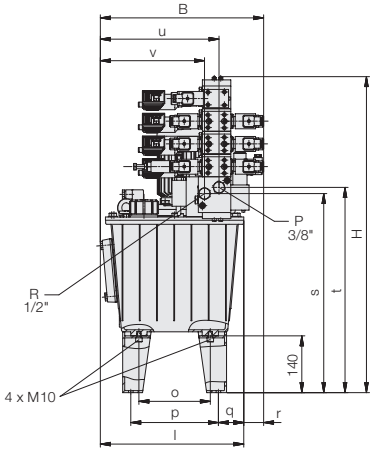
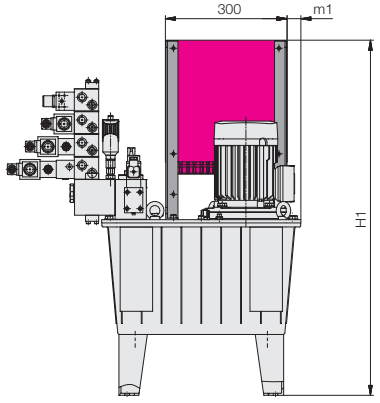
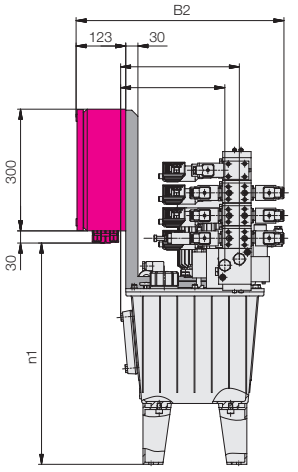
Example power unit 27 / 40 / 63 liters
without electronics _E0



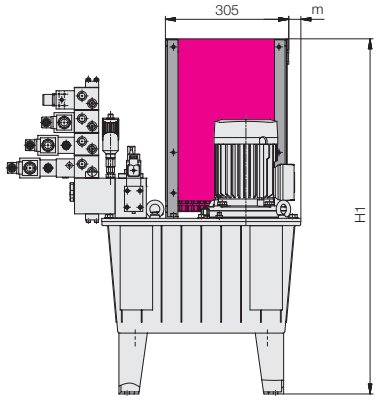


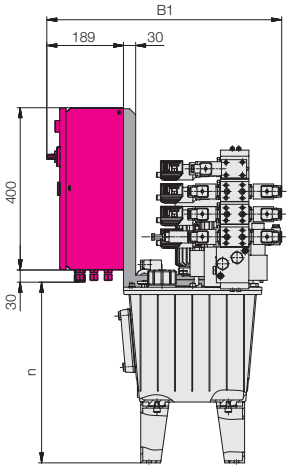
with terminal box _E1





with electric control _E2





Dimensions in mm

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Example power unit 27 / 40 / 63 liters

(Dimensions in mm)

Dimension table power unit	27 liters	40 liters	63 liters
X **(motor 0.75 kW)**	661	691	741
X **(motor 1.1 kW)**	677	707	757
X **(motor 1.5 kW)**	699	729	779
X **(motor 2.2 kW)**	727	757	807
X **(motor 3.0 kW)**		784	834
a	433	463	513
b	491	525	615
c	724	758	848
B	403	485	539
B1	579	662	712
B2	513	596	646
d	548	578	628
e	567	597	647
f	326	341	423
g	366	381	463
h	515	549	639
H	779	809	859
H1	876	906	956
i	540	574	664
j	233	233	233
k	63	72	77
l	354	436	490
m	30	41	66
m1	34	45	70
n	446	476	526
n1	546	576	626
o	176	241	283
p	216	281	323
q	63	72	76
r	49	49	49
s	491	521	571
t	506	536	586
u	293	375	429
v	257	339	393

Reservoir volume	Type code for example power unit	Part no.
27	**PM**10_**A**212_**V1**-054110 S0_**V2**-054100 S0_**V3**-074000 S0_**V4**-014000 S0_**E**0	**8457003**
27	**PM**10_**A**212_**V1**-054110 S0_**V2**-054100 S0_**V3**-074000 S0_**V4**-014000 S0_**E**1	**8457002**
27	**PM**10_**A**212_**V1**-054110 S0_**V2**-054100 S0_**V3**-074000 S0_**V4**-014000 S0_**E**2	**8457001**
40	**PM**22_**A**212_**V1**-054110 S0_**V2**-054100 S0_**V3**-074000 S0_**V4**-014000 S0_**E**0	**8458003**
40	**PM**22_**A**212_**V1**-054110 S0_**V2**-054100 S0_**V3**-074000 S0_**V4**-014000 S0_**E**1	**8458002**
40	**PM**22_**A**212_**V1**-054110 S0_**V2**-054100 S0_**V3**-074000 S0_**V4**-014000 S0_**E**2	**8458001**
63	**PM**39_**A**212_**V1**-054110 S0_**V2**-054100 S0_**V3**-074000 S0_**V4**-014000 S0_**E**0	**8459003**
63	**PM**39_**A**212_**V1**-054110 S0_**V2**-054100 S0_**V3**-074000 S0_**V4**-014000 S0_**E**1	**8459002**
63	**PM**39_**A**212_**V1**-054110 S0_**V2**-054100 S0_**V3**-074000 S0_**V4**-014000 S0_**E**2	**8459001**

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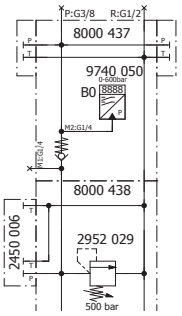
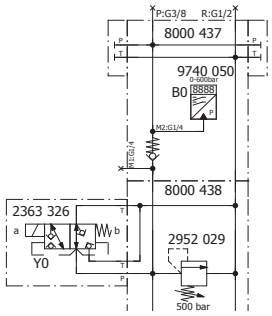
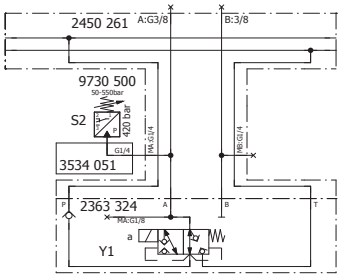
PMXX_A1
intermittent cycle



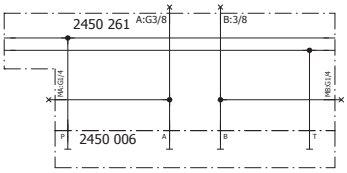
PMXX_A2_…
unpressurised cycle, 500 bar



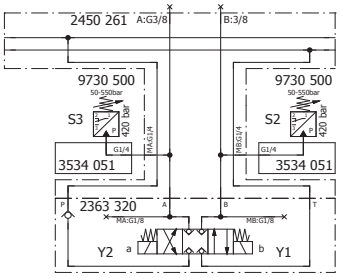
PMXX_AXXX_V1-011000_…
1x single acting, 500 bar with MI in A



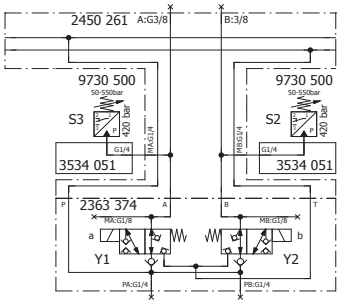
PMXX_AXXX_V1-XXXXXX_V2-000000_…
2. Valve combination as reserve space,
closed with a blind plate for later retrofitting



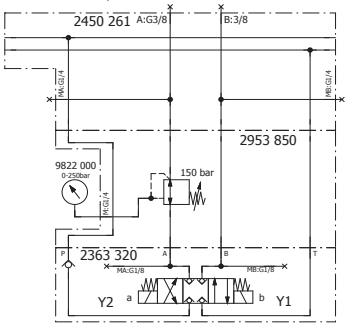
PMXX_AXXX_V1-053000_…
1x double acting, 500 bar
with MI in A+B



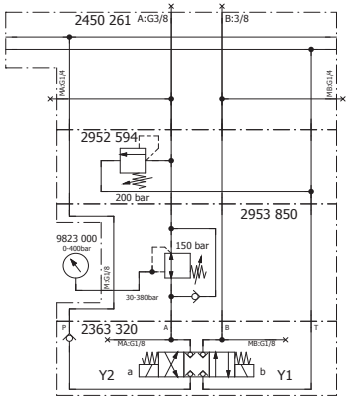
PMXX_AXXX_V1-093000_…
2x single acting, 500 bar
with MI in A+B



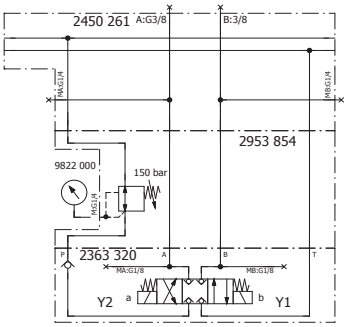
PMXX_AXXX_V1-050010_…
1x double acting, valve 500 bar
pressure reduction in A, 150 bar



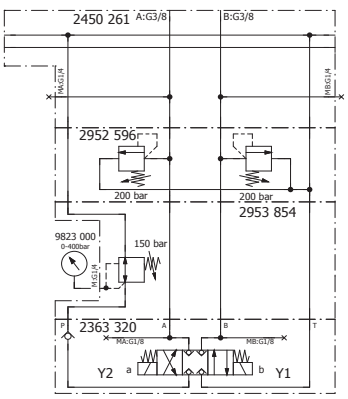
PMXX_AXXX_V1-050020_…
1x double acting, valve 500 bar
pressure reduction in P, 150 bar



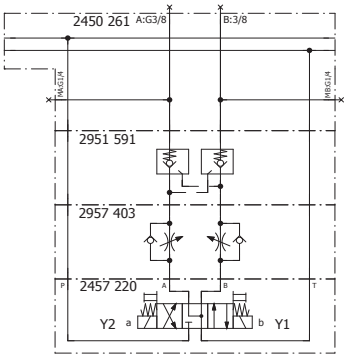
PMXX_AXXX_V1-050030_…
1x double acting, valve 500 bar
pressure reduction in P, 150 bar



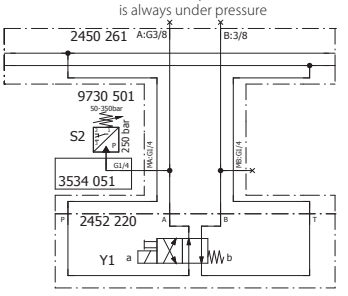
PMXX_AXXX_V1-050060_…
1x double acting, valve 500 bar
pressure reduction in P, 150 bar



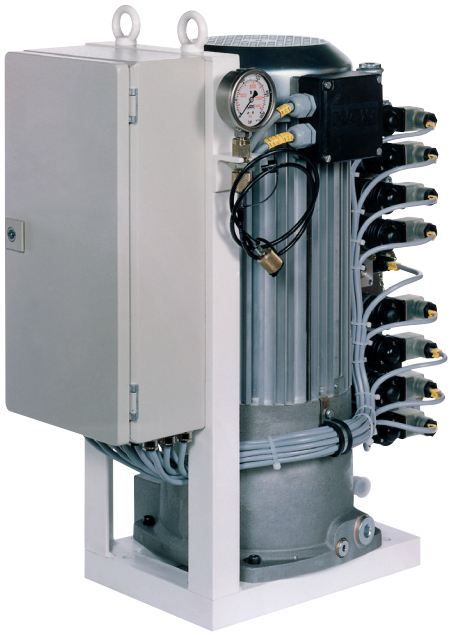
PMXX_AXXX_V1-170201_…
1x double acting, 350 bar with
twin flow control check valve and
twin check valve



PMXX_AXXX_V1-151000_…
1x double acting, 315 bar with MI in A
one of the two pressure lines
is always under pressure

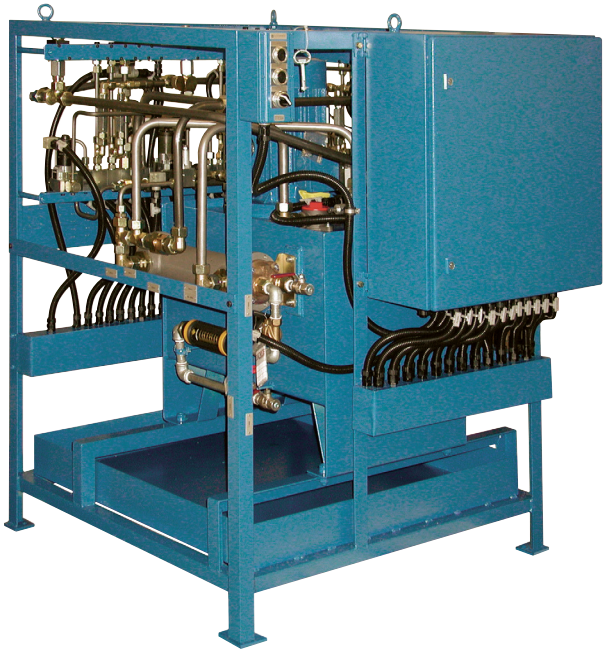


Power units with large flow rate



Technical data

Max. flow rate	**4.2 l/min.**
Max. operating pressure	400 bar
Reservoir volume	9 l
Oil port	G ⅜
Hydraulic fluid	Hydraulic oil HLP 46 to DIN 51524
Motor voltage	380-420 V/50 Hz/3~
Motor rating	2.2 kW
Type of valve	Poppet valves, leak-proof, max. 500 bar
Valve voltage	24 VDC
Type of protection	IP 54
Dimensions (LxBxH)	approx. 400 x 400 x 600 mm depending on flow rate and valve design
Weight	approx. 40 - 60 kg depending on design



Frame-type power unit for 3 forging presses:
12 clamping circuits with pressure reduction for temperature compensation
high pressure 4.2 l/min., 400 bar
cooling return flow: 45 l/min., 10 bar

Technical data

Max. flow rate	**45 l/min.**
Max. operating pressure	400 bar
Other technical data will be made available during the course of the project	

Planning and installation of complete oil-hydraulic systems including complex electrical controls, designed to suit Hilma-Roemheld clamping elements used by our customers. Suitable for all clamping elements used on presses, especially on power and forging presses.

Our large range of power units and clamping elements for presses enables us to meet your specific requirements.

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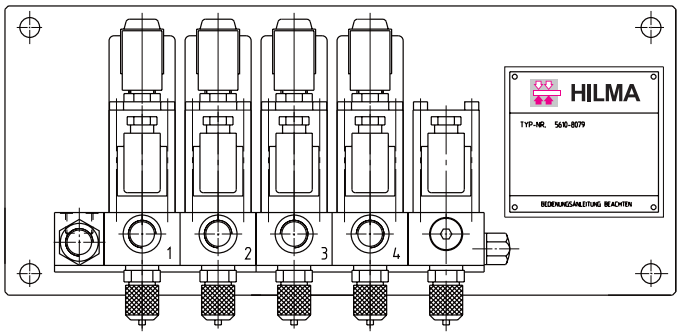
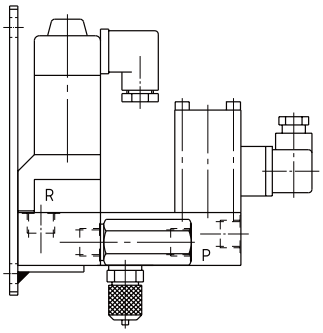
Valve packages fastened to the press ram or the press bed





4-circuit valve packages with pump pressure switch

Technical data

Max. flow rate	**8 l/min**
Oil port	G ⅜
Hydraulic fluid	Hydraulic oil HLP 46 to DIN 51524
Type of valve	Seat valves, leak-proof, max. 500 bar
Solenoid voltage	24 V DC

Other versions are available upon request.

The service we offer you

In addition to the cost effectiveness of our products, our customers also benefit from our efficient service.

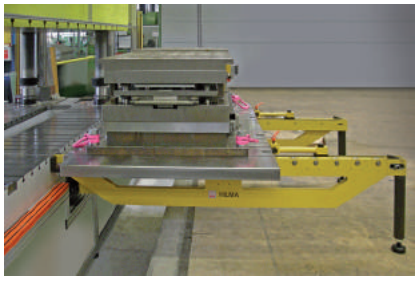
Our service includes
- preparation and installation of hydraulic systems to suit specific applications
- manufacture, installation and commissioning of complete hydraulic systems
- repair and maintenance of hydraulic cylinders, clamping elements and power units supplied
- trouble-shooting and repair on the customer's premises
- constant repair service and fast response on our premises

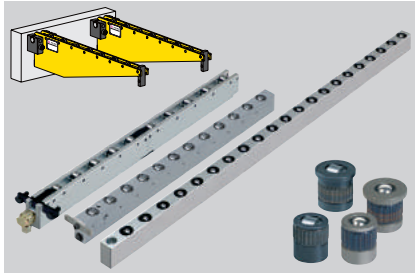
All over the world our service is ready to act and to guarantee immediate help.

Specially trained, experienced staff make sure that problems are solved rapidly and proficiently.

You can rely on us!

Die changing technique





DIE LIFTER APPLICATION DATA SHEET

Contact Name:_____ Company Address:

Company Name:_____

Phone Number:_____

E-Mail Address:_____

Press Bed Information:

Bolster Dimensions L-R:_____ F-B:_____

Number of T-Slots L-R:_____ F-B:_____ Other:_____

Dimensions of T-Slot a:_____ b:_____ f:_____ h:_____

Temperature at press bed:_____ ☐F ☐C

Does the press bed have an opening? ☐No ☐Yes; if yes, please provide a drawing.

Die Information:

Maximum Weight:_____ lbs, Minimum Weight:_____ lbs

Dimensions: Maximum L-R:_____ F-B:_____

Minimum L-R:_____ F-B:_____

Dies Loaded From:_____ Dies Unloaded From:_____

Die Lifters (Rollblocks):

☐ Spring Loaded ☐ Ball (for movement in all directions)

☐ Hydraulic ☐ Roller (movement in one direction)

Die Lifter Pump:

☐ Manual Toggle ☐ Solenoid Valve 120 VAC

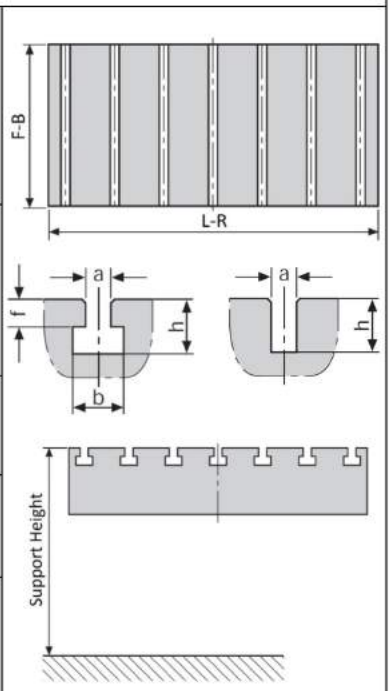
☐ Pressure Switch ☐ Solenoid Valve 24 VDC

Carrying Consoles:

☐ Hanging ☐ Supported ☐ Swiveling

Support Height*:_____

*needed for supported and swiveling consoles



Notes:_____

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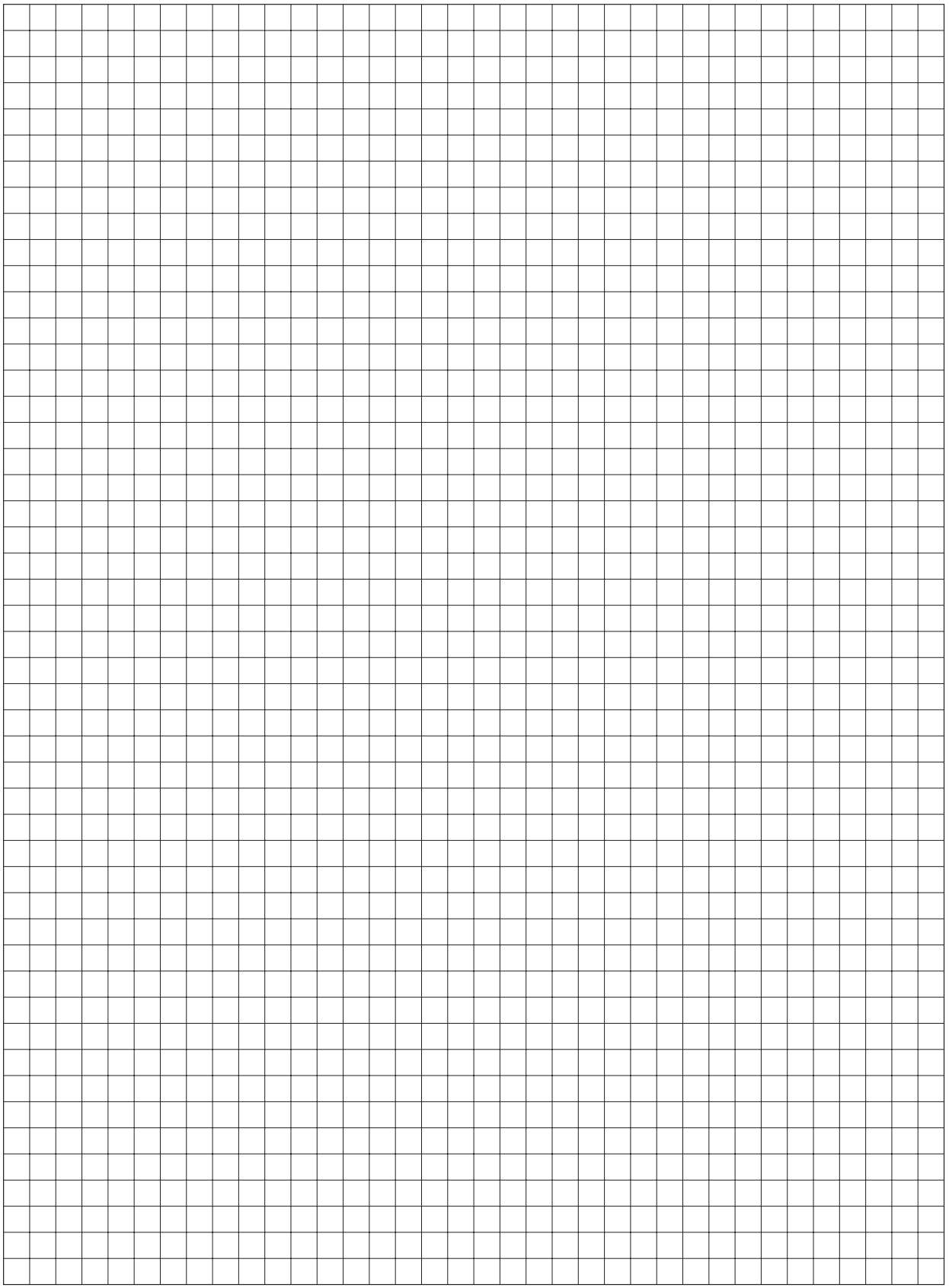
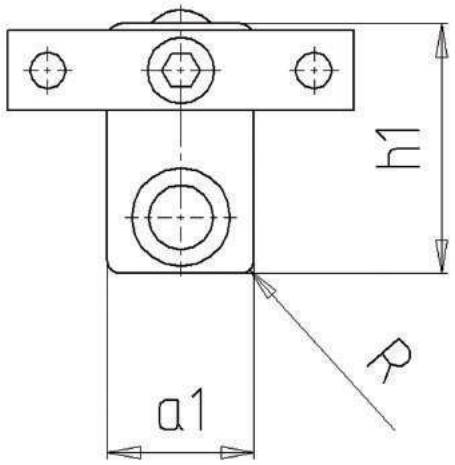
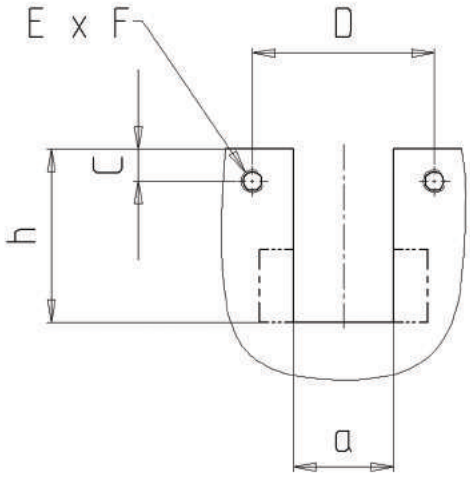


ROEMHELD
HILMA ▪ STARK



Die Lifter



Rectangular Slot

ANSI Standard Slots
ANSI/ASME B5.1M-1985 (R2009)

Slot dim.	$^{13}/_{16}$	1 $^{1}/_{16}$
a (in)	.811 (+.010/-.016)	1.063 (+.010/-.016)
h* (in)	1.157 (+.008/-0)	1.531 (+.008/-0)
C (in)	0.197	0.276
D (in)	1.417	1.575
E	M5	M5
F (in)	0.315	0.315

Die lifter dim.	$^{13}/_{16}$	1 $^{1}/_{16}$
a1 (in)	0.803 (-.024/-.031)	1.063 (-.024/-.031)
h1* (in)	1.157 (-.008/-.016)	1.531 (-.008/-.016)
R (in)	0.039 x 45°	0.039 x 45°

Metric Standard Slot
DIN 650

Slot dim.	18mm	22mm	28mm	36mm
a (mm)	18 (+.20/-0)	22 (+.25/-0)	28 (+.25/-0)	36 (+.30/-0)
h* (mm)	30 (+.20/-0)	38 (+.20/-0)	48 (+.20/-0)	61 (+.20/-0)
C (mm)	5	7	9	10
D (mm)	36	40	50	55
E	M5	M5	M6	M6
F (mm)	8	8	12	12

Die lifter dim.	18mm	22mm	28mm	36mm
a1 (mm)	18 (-.2/-.5)	22 (-.2/-.5)	28 (-.2/-.5)	36 (-.2/-.5)
h1* (mm)	30 (-.2/-.4)	38 (-.2/-.4))	48 (-.2/-.4)	61 (-.2/-.4)
R (mm)	1 x 45°	1 x 45°	1 x 45°	2 x 45°

* special die lifter heights available upon request

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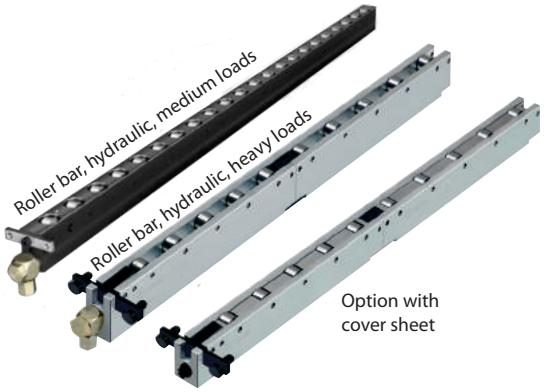
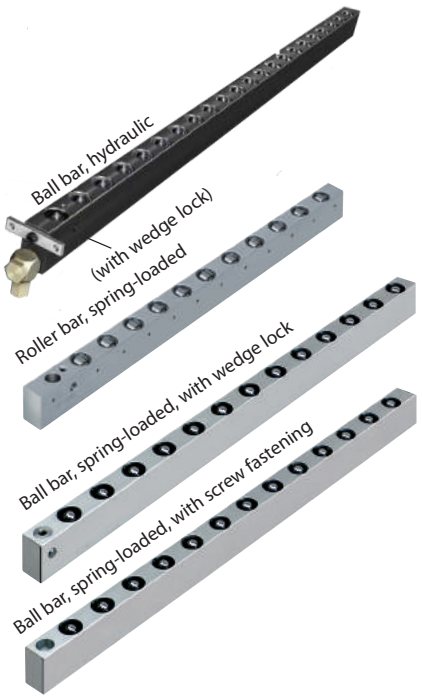
Roller and ball bars for easy and safe die change





Load: 20 - 100 kg
Hole: 20 - 40 mm

Load: 40 - 220 kg
Hole: 20 - 40 mm

Applications:

- Fits in T-slots and rectangular slots of press beds for easy die change
- die change streamlining

Roller bar, hydraulically lifted
for heavy loads, for linear movement of dies:
On the underside of the roller bar lifting pistons are provided. Pressure is applied to these pistons using hydraulic pressure generators, which lift then the complete roller bar. The die positioned on the roller bars is not in contact with the table top and can be easily moved and positioned. The basic bodies are made from a high-strength and robust aluminium alloy.
Max. operating pressure: 400 bar
Load-bearing capacity: up to 160 kN/m, roller spacing 50 mm.
Any length up to 2500 mm is possible using modular segments.
Fastening of the roller bar using a fastening plate.

Roller bar, hydraulically lifted
for medium loads, for linear movement of dies:
The lifting pistons are provided below each roller allowing rollers to be lifted individually. The basic bodies are made from a high-strength aluminium alloy. Lifting pistons are provided below each roller allowing each roller to be lifted individually.
Max. operating pressure: 120 bar.
Max. load-bearing capacity: 99 kN/m, flexible roller spacing and orientation.
Any variable length in a single piece design up to 2900 mm.
Fastening of the roller bar using a fastening plate or a wedge lock.

Ball bar, hydraulically lifted for medium loads ,
for flexible horizontal movement of dies:
Oil pressure is applied using a hydraulic pressure generator to lift each ball bar individually. The die positioned on the ball bars is not in contact with the table top and can be easily moved.
Max. operating pressure: 100 bar
Max. load-bearing capacity: 55 kN/m, flexible ball spacing.
Any length in a single piece design up to 2900 mm.
Fastening of the ball bar using a fastening plate or a wedge lock.

Ball bar with spring pack for lightweight loads
for flexible horizontal movement of dies:
When preloaded, the balls project over the table level by up to 2 mm.
When the die is clamped, the balls are pressed into the bar body against the spring force until they are flush with the table level.
Max. load-bearing capacity: 27 kN/m, flexible ball spacing.
Any variable length in one-piece design up to 2900 mm.
Fastening of the ball bar using a fastening crossbar or a wedge lock.

Roller bar with spring pack
for medium loads, for linear movement of dies:
Function and design of the roller bar similar to spring-loaded ball bars.
Load-bearing capacity slightly increased thanks to the use of rollers.
Max. load-bearing capacity: 66 kN/m, flexible roller spacing and orientation.
Any variable length in one-piece design up to 2900 mm.
Fastening of the roller bar using a fastening crossbar or a wedge lock.

Ball and roller inserts with spring pack
For installation in tables without T-slots:
The spring-loaded ball and roller inserts are individually inserted into drilled holes. The function is similar to that of ball or roller bars with a spring pack.
Max. load-bearing capacity: 2200 N, stroke up to 3 mm.

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Phone 800-827-2526 Fax 636-386-8034 www.roemheld-usa.com

Roller bars, hydraulic, with lifting of the bar max. load 160 kN/m, max. operating pressure 400 bar

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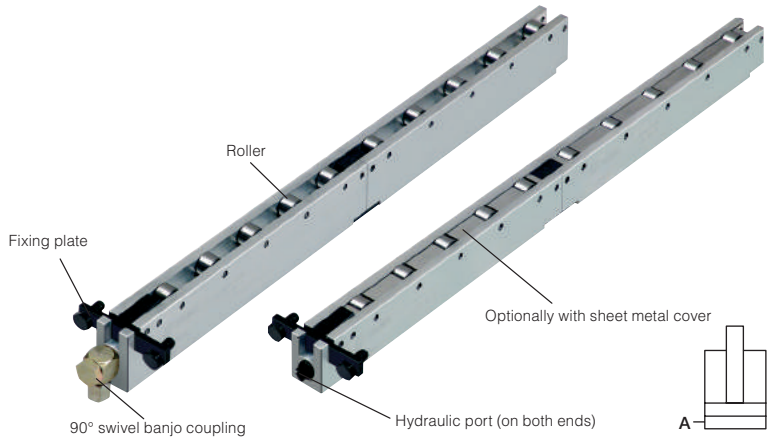


Advantages
- Easy and safe die change
- Hydraulic lifting of the complete bar
- Very high loads
- Lengths up to 2500 mm in 250 mm long segments
- The hydraulic supply is protected inside the slot base
- Easy cleaning of the bars and rollers by open design
- Low weight (version in aluminium)

Application
- In T-slots and rectangular slots of the press bed for easy die change without any problems
- Die change streamlining

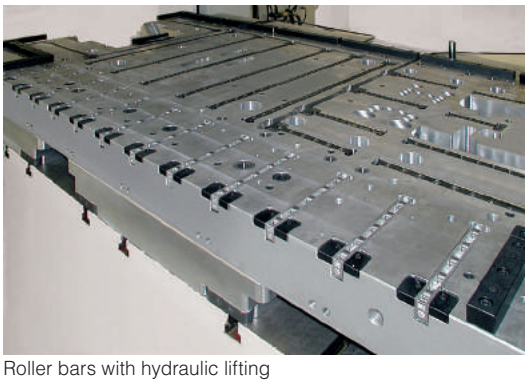
Delivery
- Roller bar
- Fixing plate
- 90° swivel banjo coupling

Description
Roller bar with hydraulic lifting of the complete bar for heavy loads and linear movement of the dies.
On the underside of the roller bar, lifting pistons are provided. Pressure is applied to these pistons using hydraulic pressure generators, which lift then the complete roller bar. The die positioned on the roller bars is not in contact with the table top and can be easily moved linearly and positioned.

Technical data

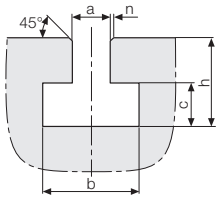
Max. operating pressure	[bar]	400
Max. load	[kN/m]	160
Roller spacing	[mm]	50
Material of the bar		aluminium (steel on request)
Fixing of the bar		fixing plate or positioning pin
Standard lengths	[mm]	250 … 2500 consisting of 250 mm long segments
Intermediate lengths	[mm]	shortening of the segments in 50 mm increments

Application example



Roller bars with hydraulic lifting

T-slot tolerances as per DIN 650



a	b	c	**h min.**	h max.	n max.
22 H12	37^{+3}	16^{+2}	**38**	45	1.6
28 H12	46^{+4}	20^{+2}	**48**	56	1.6
36 H12	56^{+4}	25^{+3}	**61**	71	2.5

Dimensions in mm
$\mathbf{h_{min.}}$ = minimum dimension as per DIN 650

The height of the roller bars is designed for the dimension $h_{min.}$ of the slot dimension.

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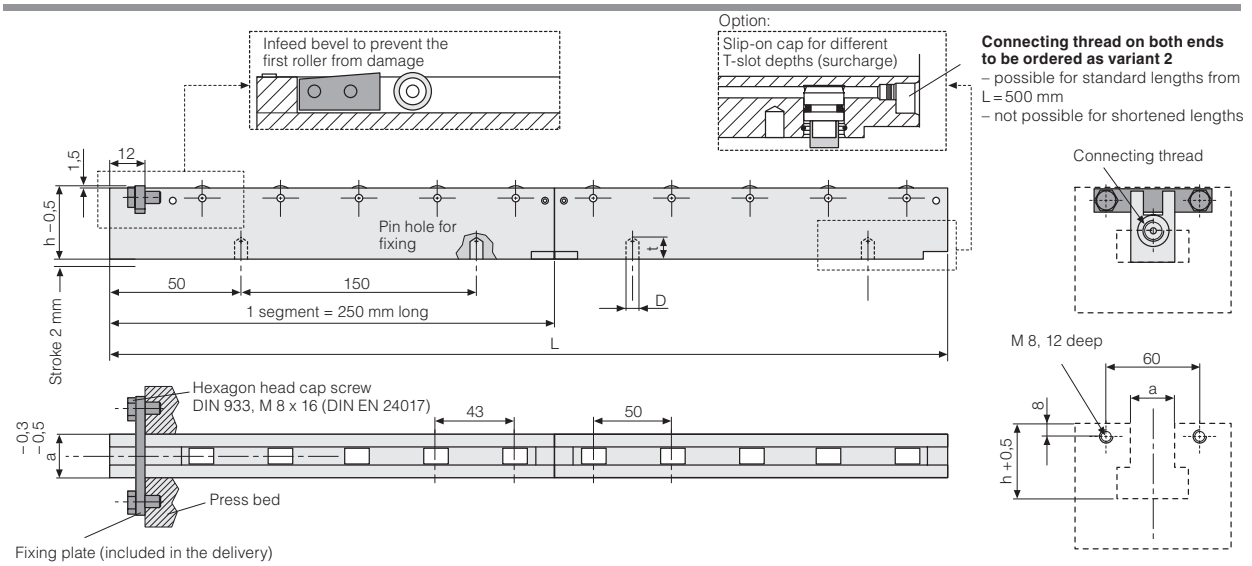
Roller bars, hydraulic, with lifting of the bar
max. load 160 kN/m, max. operating pressure 400 bar



Technical data

Max. temperature 100 °C

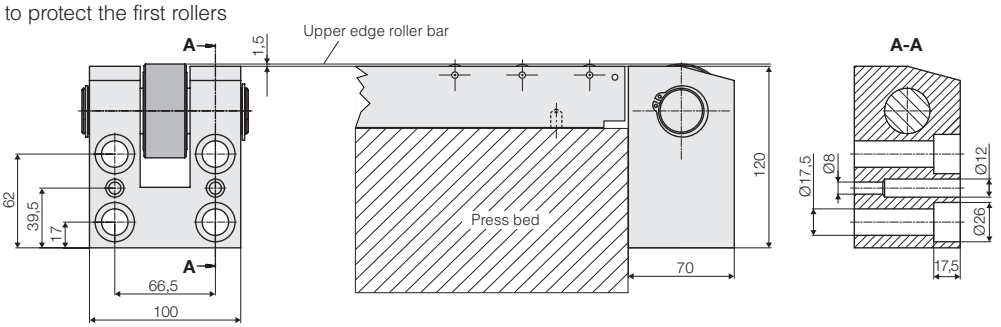
Slot width (a) [mm]		22	28	36
Slot depth (h)	[mm]	38	48	61
Slot depth max. (h)	[mm]	45	56	71
Load/roller	[kN]	6.0	6.4	8.0
Number of rollers/segment (= 250 mm)		5	5	5
Number of pistons/segment (= 250 mm)		5	4	5
Connecting thread		G 1/8	G 1/8	G 1/4
Max. operating pressure	[bar]	400	400	400
Roller Ø x width	[mm]	16 x 12	16 x 12	19 x 12
Stroke	[mm]	2	2	2
Oil volume/segment	[cm³]	1.54	1.60	2.00
D	[mm]	6.5	8.5	8.5
t	[mm]	9	12	12

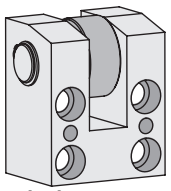
Fixing plate is included in the delivery.

Accessories

Infeed support

to protect the first rollers





Dimensions in [mm]

Socket head cap screw DIN 912, M16 x 100
Tightening torque Ma = 120 Nm
Dowel pin DIN 1481 Ø 8 x 40
Part no. 7 1834 0042

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Roller bars, hydraulic, with lifting of the bar
max. load 160 kN/m, max. operating pressure 400 bar

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Standard lengths

Part no.

for slot width a = 22 mm			for slot width a = 28 mm			for slot width a = 36 mm		
Length (L) [mm]	Load [kN] at 400 bar	**Part no.**	Length (L) [mm]	Load [kN] at 400 bar	**Part no.**	Length (L) [mm]	Load [kN] at 400 bar	**Part no.**
250	30	**8 1834 5100L250**	250	32	**8 1834 6100L250**	250	40	**8 1834 7100L250**
500	60	**8 1834 5110L500**	500	64	**8 1834 6110L500**	500	80	**8 1834 7110L500**
750	90	**8 1834 5115L750**	750	96	**8 1834 6115L750**	750	120	**8 1834 7115L750**
1000	120	**8 1834 5120L1000**	1000	128	**8 1834 6120L1000**	1000	160	**8 1834 7120L1000**
1250	150	**8 1834 5130L1250**	1250	160	**8 1834 6130L1250**	1250	200	**8 1834 7130L1250**
1500	180	**8 1834 5140L1500**	1500	192	**8 1834 6140L1500**	1500	240	**8 1834 7140L1500**
1750	210	**8 1834 5150L1750**	1750	224	**8 1834 6150L1750**	1750	280	**8 1834 7150L1750**
2000	240	**8 1834 5160L2000**	2000	256	**8 1834 6160L2000**	2000	320	**8 1834 7160L2000**
2250	270	**8 1834 5170L2250**	2250	288	**8 1834 6170L2250**	2250	360	**8 1834 7170L2250**
2500	300	**8 1834 5180L2500**	2500	320	**8 1834 6180L2500**	2500	400	**8 1834 7180L2500**

Intermediate lengths

Possible intermediate lengths: 300 to 2450 mm. Produced by shortening of the segments in 50 mm increments.

Determination of the carrying force for intermediate lengths

for slot width a = 22 mm		for slot width a = 28 mm		for slot width a = 36 mm	
Shortening by [mm]	Carrying force reduction [kN]	Shortening by [mm]	Carrying force reduction [kN]	Shortening by [mm]	Carrying force reduction [kN]
50	6	50	8	50	8
100	12	100	16	100	16
150	18	150	16	150	24
200	24	200	24	200	32

Examples for intermediate lengths of roller bar L = 500 mm

Part no.

for slot width a = 22 mm			for slot width a = 28 mm			for slot width a = 36 mm		
Length (L) [mm]	Load [kN] at 400 bar	**Part no.**	Length (L) [mm]	Load [kN] at 400 bar	**Part no.**	Length (L) [mm]	Load [kN] at 400 bar	**Part no.**
300	36	**8 1834 5110L300**	300	40	**8 1834 6110L300**	300	48	**8 1834 7110L300**
350	42	**8 1834 5110L350**	350	48	**8 1834 6110L350**	350	56	**8 1834 7110L350**
400	48	**8 1834 5110L400**	400	48	**8 1834 6110L400**	400	64	**8 1834 7110L400**
450	54	**8 1834 5110L450**	450	56	**8 1834 6110L450**	450	72	**8 1834 7110L450**

Connecting thread on both ends: Variant "2"

– possible for standard lengths from L = 500 mm
– not possible for shortened lengths

Part no.
add **"-2"** to the part no. of the roller bar

Example: 8 1834 5110L500 -2

Special versions

Sheet metal cover
The roller bars are also available with sheet metal cover between the rollers on request.

T-connector
For bar lengths from 1500 mm, it is recommended to equip the individual segments with T-connectors (see figure on page 1 of this series).
Thus, the roller bars are reinforced and the dimensional stability is increased.

Customized special versions
Different heights, lengths, strokes, roller and piston number per segment, other customized versions as well as inch versions are available on request.

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RH-rollblocks, rectangular style for ASA T-slots (3,000 psi)

Application:

- exact height adjustment by precision lowering of the lifting column These rollblocks are used in pairs or sets to lift the die and provide a roller surface to easily roll the die in and out during the die change process. For use in ASA B5.1-1949 T-slots specifications or rectangular slots, see chart below for dimensions. Deeper T-slots can be shimmed to suit

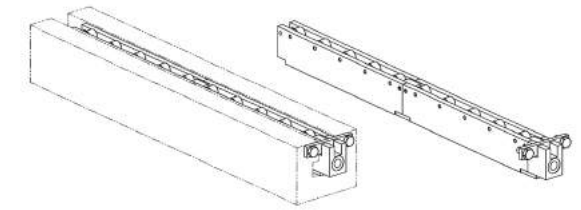
Description:

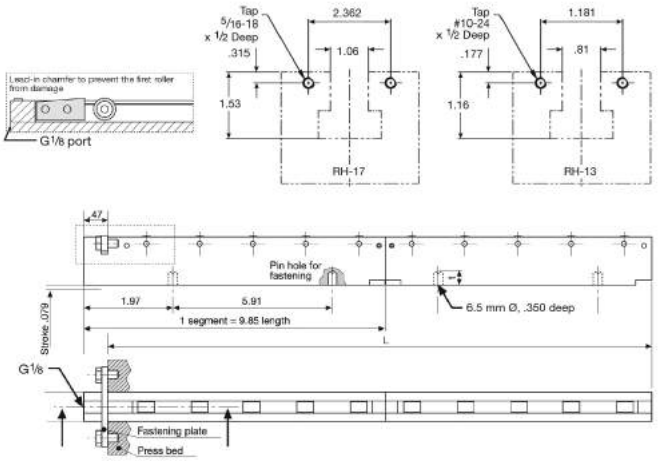
The RH rollblock consists of a bar with rollers, mounted in the upper channel. When pressurized the internal pistons push down against the bottom of the T-slot, lifting the roller assembly and die. Recommended operating pressure is 3,000 psi. Pressure range is 1,000 to 5,800 psi maximum. A safety circuit relief set for 10% over the operating pressure, must be included to prevent pressure intensification caused by rollblock overload. See Section 7 of this catalog for pumps or valve packages.

Rollblocks for 22, 28, and 36mm Metric T-slots sizes also available.

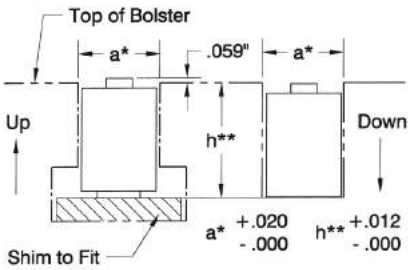
Advantages:

- modular design provides quick delivery
- each roller provides linear movement
- rolling resistance is 1-3% of the die weight
- each roller is a prelubricated cam roller bearing mounted in a common block
- rollblock can be secured with the included plate retainer or with pins mounted in the base of the T-slot





Slot size	13/16"	1-1/16"
a	.81	1.06
h	1.16	1.53



Part No.	T-slot size	L (in)*	Max. load per roller at 3,000 psi	# of Rollers	Max. lift capacity at 3,000 psi
HCR-RH-13-5	13/16"	9.38	220	8	1,760
HCR-RH-13-10	13/16"	19.23	220	16	3,520
HCR-RH-13-15	13/16"	29.08	220	24	5,280
HCR-RH-13-20	13/16"	38.93	220	32	7,040
HCR-RH-13-25	13/16"	48.78	220	40	8,800
HCR-RH-17-5	1-1/16"	9.38	700	5	3,500
HCR-RH-17-10	1-1/16"	19.23	700	10	7,000
HCR-RH-17-15	1-1/16"	29.08	700	15	10,500
HCR-RH-17-20	1-1/16"	38.93	700	20	14,000
HCR-RH-17-25	1-1/16"	48.78	700	25	17,500
HCR-RH-17-30	1-1/16"	58.63	700	30	21,000
HCR-RH-17-35	1-1/16"	68.48	700	35	24,500
HCR-RH-17-40	1-1/16"	78.33	700	40	28,000

Stock Items
***Intermediate, Metric, and Longer Lengths Available**

Based on these parameters, we will devise the ball bar for your specific application. Please contact us, we will be pleased to offer you advice!

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Roller bars, hydraulic, with lifting of the bar max. load 70 kN/m, max. operating pressure 100 bar

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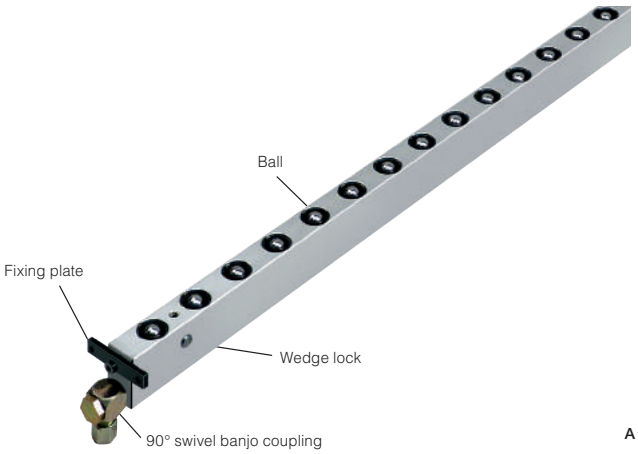


Advantages

- Easy and safe die change
- Variant program with many selection possibilities
- Hydraulic lifting of each individual ball
- Variable length in a single piece design
  up to 2900 mm
- Slot depth, ball spacing and bar length
  configurable for every application

Application

- In T-slots and rectangular slots of the press bed for easy die change without any problems
- Die change streamlining

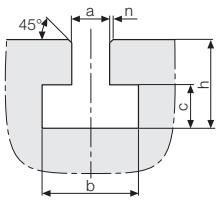
Delivery

- Ball bar
- Fixing plate

Description

Ball bar with hydraulic lifting of the individual balls for medium loads and flexible horizontal movement of the dies. Oil pressure is applied to lift each ball insert individually. The die positioned on the ball bars is not in contact with the table top and can be easily moved and positioned.

T-slot tolerances as per DIN 650



Technical data

Max. operating pressure	[bar]	100
Max. load	[kN/m]	70
Ball spacing		flexible
Material of the bar		steel
Max. temperature	[°C]	250
Fixing of the bar		fixing plate or wedge lock
Max. bar length*	[mm]	variable* up to 2900

* The minimum bar lengths depends on the ball spacing G with at least 3 balls (see the following page)

a	b	c	**h min.**	h max.	n max.
18 H12	30^{+2}	12^{+2}	**30**	36	1.6
22 H12	37^{+3}	16^{+2}	**38**	45	1.6
28 H12	46^{+4}	20^{+2}	**48**	56	1.6
36 H12	56^{+4}	25^{+3}	**61**	71	2.5

Dimensions in mm
$\mathbf{h_{min.}}$ = minimum dimension as per DIN 650

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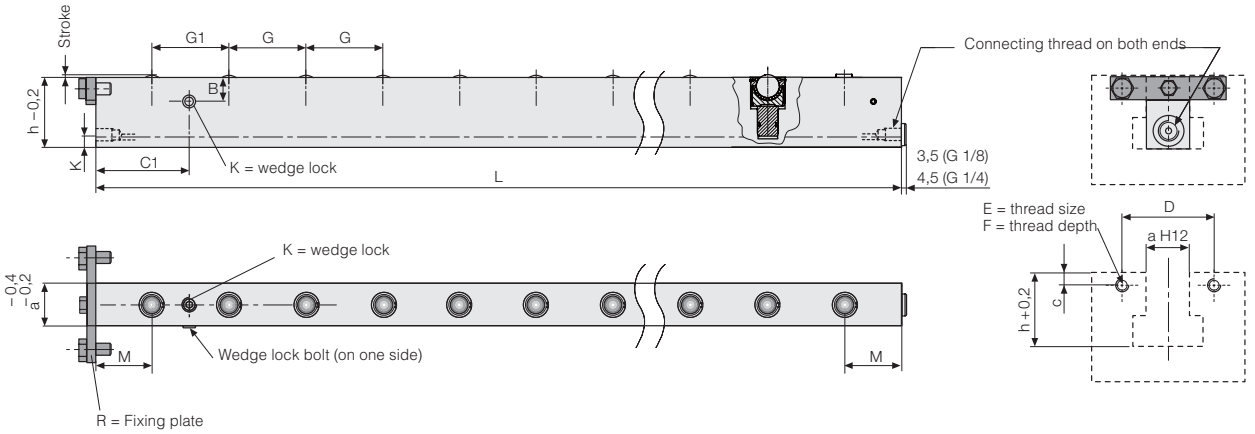
Roller bars, hydraulic, with lifting of the bar max. load 70 kN/m, max. operating pressure 100 bar



Technical data

Slot width (a)	**[mm]**	**18**	**22**	**28**	**36**	**13/16"**	**1 1/16"**
Slot depth min. (h)	[mm]	29.5	37	42	53	29.4	37.4
Slot depth standard (h)	**[mm]**	**30**	**38**	**48**	**61**	**29.4**	**38.9**
Slot depth max.** (h)	[mm]	45	55	60	75	40	58
Ball spacing G min.	[mm]	20	23	28	34	20	23
Ball spacing G1 min.	[mm]	26	32	37	43	26	32
Ball spacing G/G1 standard	**[mm]**	**30**	**40**	**45**	**50**	**30**	**40**
Ball spacing G/G1 max.	[mm]	60	80	90	100	60	80
L min.	[mm]	*)	*)	*)	*)	*)	*)
L max.	[mm]	2900	2900	2900	2900	2900	2900
Stroke	[mm]	1	2	2	2	1	2
Longer stroke	[mm]	–	–	3	3	–	–
Load/ball	[kN]	0.79	1.1	1.5	2.5	0.79	1.1
Connecting thread		G 1/8	G 1/8	G ¼	G ¼	G 1/8	G ¼
Oil volume/ball insert	[cm³]	0.08	0.23	0.31	0.51	0.08	0.23
B	[mm]	12	16	16	16	12	16
C	[mm]	5	7	9	10	5	7
C1	[mm]	35	46	51	56.5	35	46
D	[mm]	36	40	50	55	36	40
E	[mm]	M5	M5	M6	M6	M5	M5
F	[mm]	8	8	12	12	8	8
K	[mm]	8	8.5	11	11	8	11
M	[mm]	22.5	30	32.5	35	22.5	30

*) L min. depends on the ball spacing G with at least 3 balls
**) only with steel bars
Fixing plate and 90°elbow coupling are included in the delivery.

Product configurator

For the selection and configuration of roller and ball bars, a product configurator is available on our website. After entering the parameters, the configurator determines the desired roller or ball bars with all technical data and the identification number of the characteristics which are identical with the order number. In addition, a drawing with all dimensions will be provided.

Link to the configurator:
roemheld-usa.com/die-lifter-configurator/

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Roller bars, hydraulic, with lifting of the bar max. load 70 kN/m, max. operating pressure 100 bar

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Ball bars with hydraulic lifting are individually configured and manufactured depending on the application. Within the limits specified in the measurement chart, the following parameters can be selected based on a code for part numbers:

bar material, slot width, bar lengths, fixation, slot depth, ball spacing and ball orientation.

- **Stroke**
  The ball bar is equipped with standard stroke (1 or 2 mm). For slot width 28 and 36, alternatively a larger stroke of 3 mm is available.

- **Operating temperature**
  Depending on the temperature range, the admissible carrying force of the ball bars is reduced:

  up to 100 °C: 100 % of the carrying force
  > 100 – 150 °C: 95 % of the carrying force
  > 150 – 200 °C: 70 % of the carrying force
  > 200 – 250 °C: 60 % of the carrying force

  e.g. steel up to 200 °C with 70% of the carrying force

- **Slot width (a)**
  Selection from the table on the previous page.

  e. g. a = 28 mm

- **Bar lengths (L)**
  Depending on the ball spacing (G) and the parameter (M) results the possible bar length. Indicate the desired length (e.g. bed length) for your ball bar. Please note that a ball bar must be equipped with at least 3 balls.

  e.g. L = 1445 mm

- **Fixation**
  K = wedge lock
  R = fixing plate

  e.g. fixing plate = R

- **Slot depth (h)**
  If the slots in your application are lower than the default value, specify the corresponding dimension (up to h min.)
  For slots which are deeper than the default value, spacer bars can be inserted. For steel versions, specify the corresponding dimension (up to h max.).

  e.g. h = 43 mm

- **Ball spacing (G) or load of the bar**
  By changing the spacing of the balls, the load of the ball bar can be varied. Please note that the load is indicated for the full length of the bar. Therefore, both the load and the ball spacing must be selected to suit the die weight and the die supporting length.
  Please indicate the desired ball spacing or load of the ball bar, or the maximum die weight and the die dimensions.

Note for the calculation of the bar length

The spacing of the first two balls G1 is limited by the position of the wedge lock. The following applies: G = G1, however when selecting G < G1 min the spacing G1 will not be reduced below the minimum value.

e.g. G = 60 mm
or **load per bar = 36 kN**
or **number of balls = 24**
or **die weight and exterior dimensions**

Code for part numbers

Variant program

Ball bar, hydraulic

Version number
(for internal purposes only)

8 92X7 XXXX L XXXX X GXX HXX

Stroke
1 = standard
2 = longer

Bar material/operating temperature
6 = steel / 100 °C
5 = steel / 200 °C
4 = steel / 250 °C

Slot width a in [mm]
18 = 18 mm
22 = 22 mm
28 = 28 mm
36 = 36 mm
13 = 13/16" (20.6 mm)
17 = 1 1/16" (27 mm)

Slot depth h in [mm]
in steps of 0.1 mm

Ball spacing G in [mm]
in steps of 1 mm

Fixation
K = wedge lock
R = fixing plate

Bar length L in [mm]
in steps of 1 mm

Example of ordering

Ball bar hydraulic

8 9217 6X28 L 1445 R G60 H43

- 9217: Stroke, Standard 2 mm
- 6X28: Bar material, Steel; Slot width, 28 mm
- L 1445: Length, 1445 mm
- R: Fixing plate
- G60: Ball spacing, 60 mm
- H43: Slot depth, 43 mm

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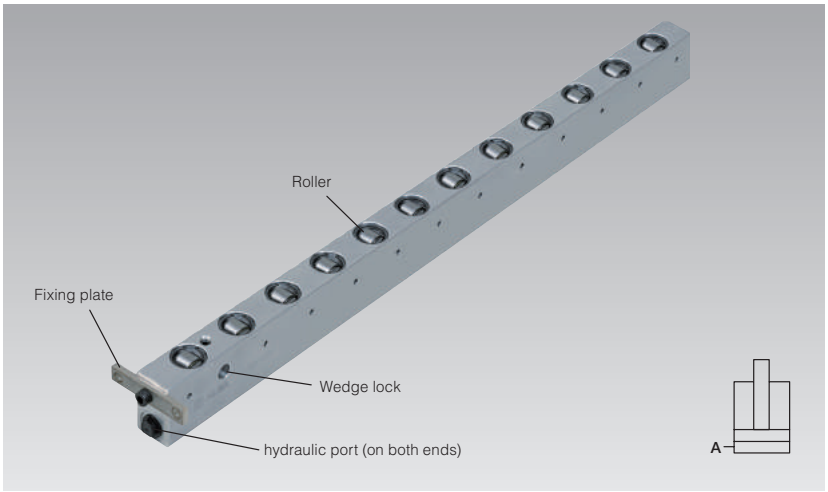
Roller bars, hydraulic, with lifting of individual rollers max. load 126 kN/m, max. operating pressure 120 bar



Advantages

- Easy and safe die change
- Variant program with many selection possibilities
- Hydraulic lifting of each individual roller
- Variable length in a single piece design up to 2900 mm
- Slot depth, roller spacing and bar length configurable for every application

Application

- In T-slots and rectangular slots of the press bed for easy die change without any problems
- Die change streamlining

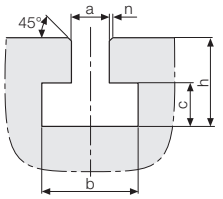
Delivery

- Roller bar
- Fixing plate

Description

Roller bars with hydraulic lifting of the individual rollers for medium loads and linear movement of the dies.
Contrary to the roller bars as per data sheet WZ 8.18340, the lifting pistons are below each roller. Each roller is lifted individually. The base body remains in its position.
The die positioned on the rollers is not in contact with the table top and can be easily moved linearly and positioned.

T-slot tolerances as per DIN 650



Technical data

Max. operating pressure	[bar]	120
Max. load	[kN/m]	126
Roller spacing and orientation		flexible
Material of the bar		steel
Max. temperature	[°C]	250
Fixing of the bar		fixing plate or wedge lock
Max. bar length*	[mm]	variable* up to 2900

* The minimum bar lengths depends on the roller spacing G with at least 3 rollers (see the following page).

a	b	c	**h min.**	h max.	n max.
18 H12	30^{+2}	12^{+2}	**30**	36	1.6
22 H12	37^{+3}	16^{+2}	**38**	45	1.6
28 H12	46^{+4}	20^{+2}	**48**	56	1.6
36 H12	56^{+4}	25^{+3}	**61**	71	2.5

Dimensions in mm
$\mathbf{h_{min.}}$ = minimum dimension as per DIN 650

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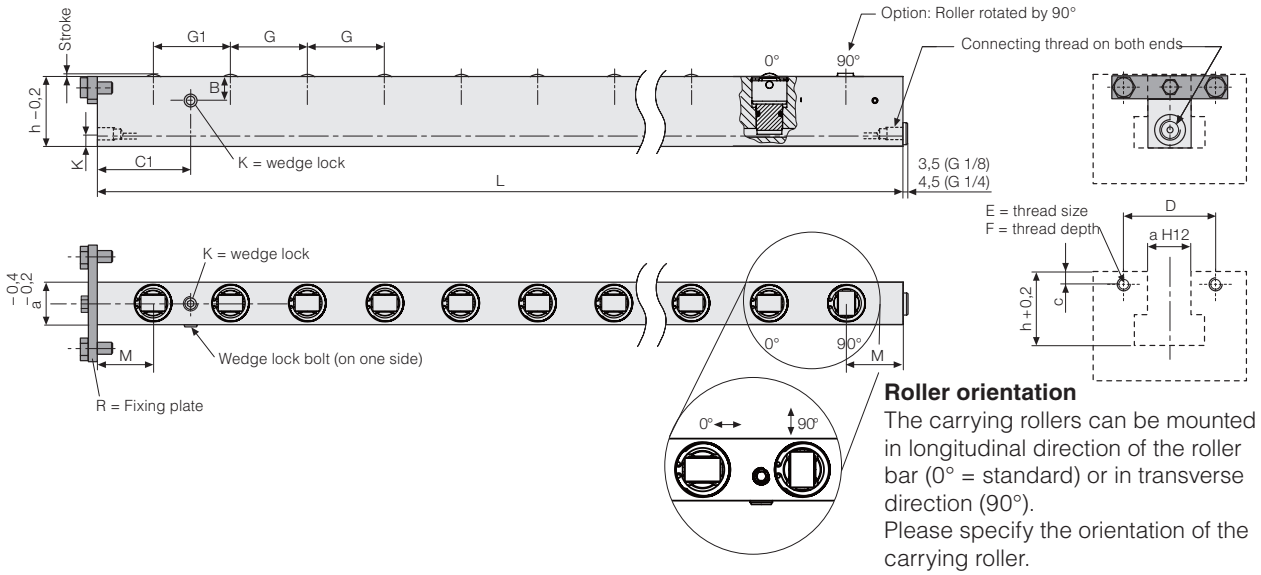
Roller bars, hydraulic, with lifting of individual rollers max. load 126 kN/m, max. operating pressure 120 bar



Roller orientation

The carrying rollers can be mounted in longitudinal direction of the roller bar (0° = standard) or in transverse direction (90°).
Please specify the orientation of the carrying roller.
e.g. X = 90°

Technical data

Slot width (a)	**[mm]**	**18**	**22**	**28**	**36**	**13/16"**	**1 1/16"**
Slot depth min. (h)	[mm]	29.5	37.5	43	54.5	29.4	38
Slot depth standard (h)	**[mm]**	**30**	**38**	**48**	**61**	**29.4**	**38.9**
Slot depth max.** (h)	[mm]	45	55	60	75	40	58
Roller spacing G min.	[mm]	20	23	28	34	20	23
Roller spacing G1 min.	[mm]	26	32	37	43	26	32
Roller spacing G/G1 standard	**[mm]**	**30**	**40**	**45**	**50**	**30**	**40**
Roller spacing G/G1 max.	[mm]	60	80	90	100	60	80
L min.	[mm]	*)	*)	*)	*)	*)	*)
L max.	[mm]	2900	2900	2900	2900	2900	2900
Stroke	[mm]	1	2	2	2	1	2
Longer stroke	[mm]	–	–	3	3	–	–
Load/roller	[kN]	1.14	1.85	3.0	4.5	1.14	1.85
Connecting thread		G 1/8	G 1/8	G ¼	G ¼	G 1/8	G ¼
Oil volume/roller insert	[cm³]	0.10	0.31	0.51	0.76	0.10	0.31
B	[mm]	12	16	16	16	12	16
C	[mm]	5	7	9	10	5	7
C1	[mm]	35	46	51	56.5	35	46
D	[mm]	36	40	50	55	36	40
E	[mm]	M5	M5	M6	M6	M5	M5
F	[mm]	8	8	12	12	8	8
K	[mm]	8	8.5	11	11	8	11
M	[mm]	22.5	30	32.5	35	22.5	30

*) L min. depends on the roller spacing G with at least 3 rollers
**) only with steel bars
Fixing plate and 90°elbow coupling are included in the delivery.

Product configurator

For the selection and configuration of roller and ball bars, a product configurator is available on our website. After entering the parameters, the configurator determines the desired roller or ball bars with all technical data and the identification number of the characteristics which are identical with the order number. In addition, a drawing with all dimensions will be provided.

Link to the configurator:
roemheld-usa.com/die-lifter-configurator/

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Roller bars, hydraulic, with lifting of individual rollers max. load 126 kN/m, max. operating pressure 120 bar

Roller bars with hydraulic lifting are individually configured and manufactured depending on the application. Within the limits specified in the measurement chart, the following parameters can be selected based on a code for part numbers:

bar material, slot width, bar lengths, fixation, slot depth, roller spacing and roller orientation.

- **Stroke**

The roller bar is equipped with standard stroke (1 or 2 mm). For slot width 28 and 36, alternatively a larger stroke of 3 mm is available.

- **Operating temperature**

Depending on the temperature range, the admissible carrying force of the roller bars is reduced:

up to 100 °C: 100 % of the carrying force
> 100 – 150 °C: 95 % of the carrying force
> 150 – 200 °C: 70 % of the carrying force
> 200 – 250 °C: 60 % of the carrying force

e.g. steel up to 200 °C with 70 % of the carrying force

- **Slot width (a)**

Selection from the table on the previous page.
e. g. a = 28 mm

- **Bar lengths (L)**

Depending on the roller spacing (G) and the parameter (M) results the possible bar length. Indicate the desired length (e.g. bed length) for your roller bar. Please note that a roller bar must be equipped with at least 3 rollers.
e.g. L = 1445 mm

- **Fixation**

K = wedge lock
R = fixing plate
e.g. fixing plate = R

- **Roller spacing (G) or load of the bar**

By changing the spacing of the rollers, the load of the roller bar can be varied. Please note that the load is indicated for the full length of the bar. Therefore, both the load and the roller spacing must be selected to suit the die weight and the die supporting length.
Please indicate the desired roller spacing or load of the ball bar, or the maximum die weight and the die dimensions.

Note for the calculation of the bar length

The spacing of the first two rollers G1 is limited by the position of the wedge lock. The following applies: G = G1, however when selecting G < G1 min the spacing G1 will not be reduced below the minimum value.
e.g. G = 60 mm
or load per bar = 72 kN
or number of rollers = 24
or die weight and exterior dimensions

- **Slot depth (h)**

If the slots in your application are lower than the default value, specify the corresponding dimension (up to h min.) For slots which are deeper than the default value, spacer bars can be inserted. For steel versions, specify the corresponding dimension (up to h max.).
e.g. h = 43 mm

- **Roller orientation**

The carrying rollers can be mounted in longitudinal direction of the roller bar (0° = standard) or in transverse direction (90°). Please specify the orientation of the carrying roller.
e. g. X = 90°

Code for part numbers

Variant program

Roller bar, hydraulic

Version number
(for internal purposes only)

8 92X5 XXXX L XXXX X GXX HXX X

Stroke
1 = standard
2 = longer

Bar material / operating temperature
6 = steel / 100 °C
5 = steel / 200 °C
4 = steel / 250 °C

Slot width a in [mm]
18 = 18 mm
22 = 22 mm
28 = 28 mm
36 = 36 mm
13 = 13/16" (20.6 mm)
17 = 1 1/16" (27 mm)

Roller orientation
X = 90°
not applicable for 0°

Slot depth h in [mm]
in steps of 0.1 mm

Roller spacing G in [mm]
in steps of 1 mm

Fixation
K = wedge lock
R = fixing plate

Bar length L in [mm]
in steps of 1 mm

Example of ordering

Roller bar hydraulic
8 9215 6X28 L 1445 R G60 H43

- 9215: Stroke Standard 2 mm
- 6X28: Bar material Steel; Slot width 28 mm
- L 1445: Length 1445 mm
- R: Fixing plate
- G60: Roller spacing 60 mm
- H43: Slot depth 43 mm

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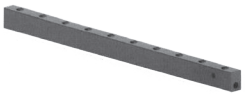
Hydraulic roller bar, steel housing standard 1-1/16 inch sizes in stock



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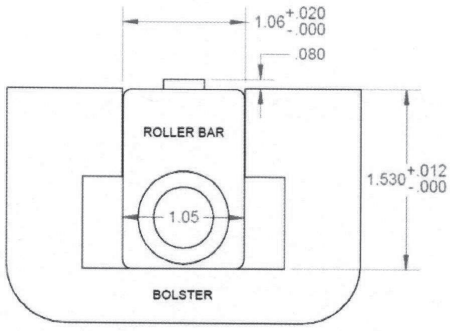
Application:

These roller bars are used in pairs or sets to lift the die and provide a roller surface to easily roll the die in and out during the die change process. For use in ASA 861-1949 T-slots specifications or rectangular slots 1-$^{1}/_{16}$ inch wide. Deeper T-slots can be shimmed to suit.

Description:

The roller bar consists of a bar that is equipped by hydraulically operated supporting rollers for movement in line with the bar. Rollers can be positioned for front to back or left to right movement. Maximum operating pressure is 1,740 psi (120 bar). A circuit relief valve must be provided to prevent pressure intensification caused by overloading the rollers.

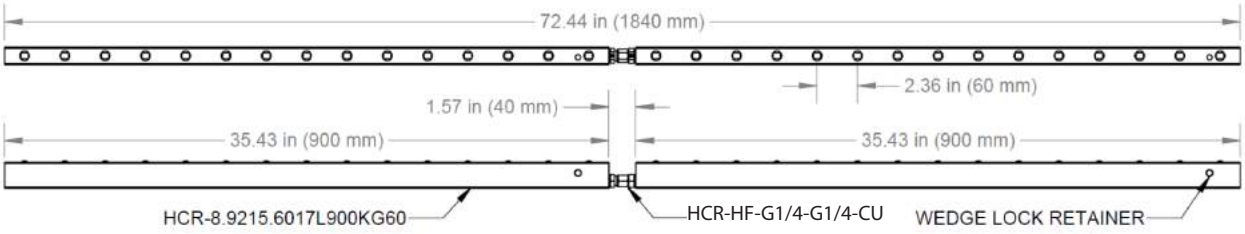


Advantages:

- each roller provides linear movement
- roller bar includes wedge lock retainer
- other sizes available upon request
- steel housing

Important notes:

G 1/4 ports on both ends to couple the roller bars together to suit special lengths. See catalog page 8.1834B for additional data, sizes and roller bar.



Part No.	Length inch (mm)	Max. load per roller lbs (kN)	Max. lift capacity lbs (kN)	# of Rollers	Slot (inch)	Weight
HCR-8.9215.6017L600KG60	23.62 (600)	415 (1.85)	4,158 (18.50)	10	1-$^{1}/_{16}$"	4.7 kg
HCR-8.9215.6017L900KG60	35.43 (900)	415 (1.85)	6,236 (27.75)	15	1-$^{1}/_{16}$"	7.0 kg
HCR-8.9215.6017L1200KG60	47.24 (1200)	415 (1.85)	8,315 (37.00)	20	1-$^{1}/_{16}$"	9.3 kg
HCR.8.9215.6017L1500KG60	59.06 (1500)	415 (1.85)	10,394 (46.25)	25	1-$^{1}/_{16}$"	11.6 kg
Accessories						
HCR-HF-G1/4-G1/4-CU	Coupling Union, G$^{1}/_{4}$					

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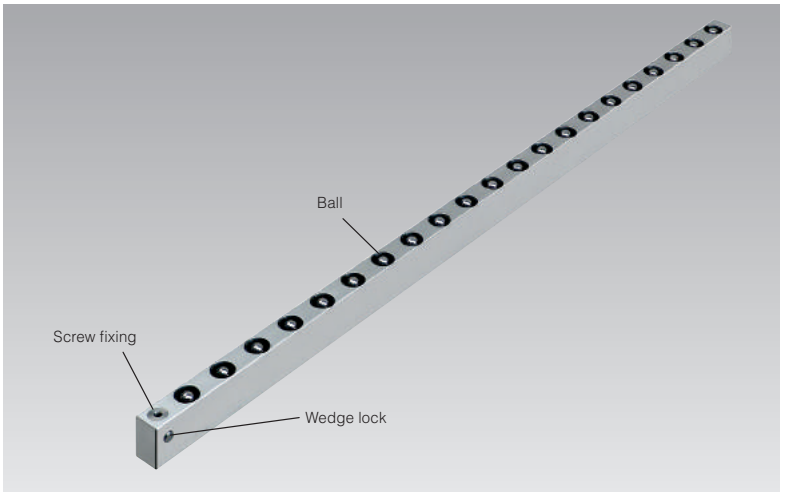
Roller bars, mechanical with spring pack, loads up to 27 kN/m



Advantages

- Easy and safe die change
- No hydraulic supply required
- Variant program with many selection possibilities
- Variable length in a single piece design up to 2900 mm
- Slot depth, ball spacing and bar length configurable for every application
- Low weight (version in aluminium)

Application

- In T-slots and rectangular slots of the press bed for easy die change without any problems
- Die change streamlining

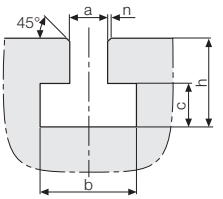
Delivery

- Ball bar
- Wedge lock (option)

Description

Ball bar with spring pack for light loads and flexible horizontal movement of the dies. When preloaded, the balls project over the bed level by up to 2 mm. When the die is clamped, the balls are pressed into the bar body against the spring force until they are flush with the bed level.

T-slot tolerances as per DIN 650



Technical data

Max. load	[kN/m]	27
Ball spacing		flexible
Material of the bar		aluminium or steel
Max. temperature	[°C]	with aluminium bars: 100 with steel bars: 250
Fixing of the bar		Screw fixing or wedge lock
Max. bar length*	[mm]	variable* up to 2900

* The minimum bar lengths depends on the ball spacing G with at least 3 balls (see the following page).

a	b	c	**h min.**	h max.	n max.
22 H12	37^{+3}	16^{+2}	**38**	45	1.6
28 H12	46^{+4}	20^{+2}	**48**	56	1.6
36 H12	56^{+4}	25^{+3}	**61**	71	2.5

Dimensions in mm
$\mathbf{h_{min.}}$ = minimum dimension as per DIN 650

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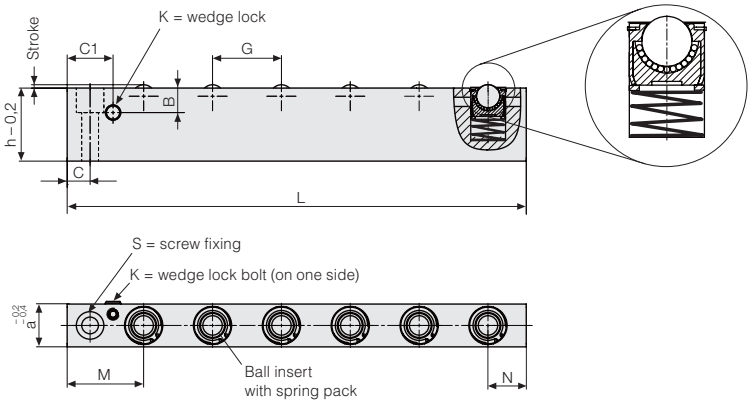
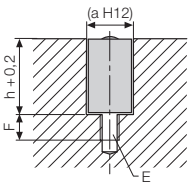
Roller bars, mechanical
with spring pack, loads up to 27 kN/m





Technical data

Slot width (a)	**[mm]**	**18**	**22**	**28**	**36**	**13/16"**	**1 1/16"**
Slot depth min. (h)	[mm]	29.4	38	48	46	29.4	38
Slot depth standard (h)	**[mm]**	**30**	**38**	**48**	**61**	**29.4**	**38.9**
Slot depth max.** (h)	[mm]	45	55	60	75	40	58
Ball spacing G min.	[mm]	20	23	28	34	20	23
Ball spacing G standard	**[mm]**	**30**	**40**	**45**	**50**	**30**	**40**
Ball spacing G max.	[mm]	60	80	90	100	60	80
L min.	[mm]	*)	*)	*)	*)	*)	*)
L max.	[mm]	2900	2900	2900	2900	2900	2900
Stroke	[mm]	1	2	2	2	1	2
Load/ball	[kN]	0.22	0.42	0.63	1.00	0.22	0.42
B	[mm]	12	16	16	16	12	16
C	[mm]	10	12.5	15	20	10	12.5
C1	[mm]	10	24.5	30	35	10	24.5
E	[mm]	M6	M8	M10	M10	M6	M8
F	[mm]	11	13	15	15	11	13
M	[mm]	27.5	40	50	57.5	27.5	40
N	[mm]	12.5	15	25	27.5	12.5	15

*) L min. depends on the ball spacing G with at least 3 balls
**) only with steel bars

Product configurator

For the selection and configuration of roller and ball bars, a product configurator is available on our website. After entering the parameters, the configurator determines the desired roller or ball bars with all technical data and the identification number of the characteristics which are identical with the order number. In addition, a drawing with all dimensions will be provided.

Link to the configurator:
roemheld-usa.com/die-lifter-configurator/

Roller bars, mechanical with spring pack, loads up to 27 kN/m

Ball bars with spring pack are individually configured and manufactured depending on the application. Within the limits specified in the measurement chart, the following parameters can be selected based on a code for part numbers:

bar material, slot width, bar lengths, fixation, slot depth and ball spacing.

- **Bar material/operating temperature**

Aluminium or steel can be selected as bar material. For operating temperatures >100 °C, a steel version is required. Depending on the temperature range, the admissible carrying force of the ball bars is reduced:

up to 100 °C: 100 % of the carrying force
>100 – 150 °C: 95 % of the carrying force
>150 – 200 °C: 70 % of the carrying force
>200 – 250 °C: 60 % of the carrying force

e.g. steel up to 200 °C with 70 % of the carrying force

- **Slot width (a)**

Selection from the table on page 2

e. g. a = 36 mm

- **Bar lengths (L)**

Depending on the ball spacing (G) and the parameter (M) results the possible bar length. Indicate the desired length (e.g. bed length) for your ball bar. Please note that a ball bar must be equipped with at least 3 balls.

e.g. L = 1380 mm

- **Fixation**

K = wedge lock
S = screw fixing

e.g. screw fxing = S

- **Ball spacing (G) or load of the bar**

By changing the spacing of the balls, the load of the ball bar can be varied. Please note that the load is indicated for the full length of the bar. Therefore, both the load and the ball spacing must be selected to suit the die weight and the die supporting length.
Please indicate the desired ball spacing or load of the ball bar, or the maximum die weight and the die dimensions.

e.g. G = 35 mm

or **load per bar = 38 kN**
or **number of balls = 38**
or **die weight and exterior dimensions**

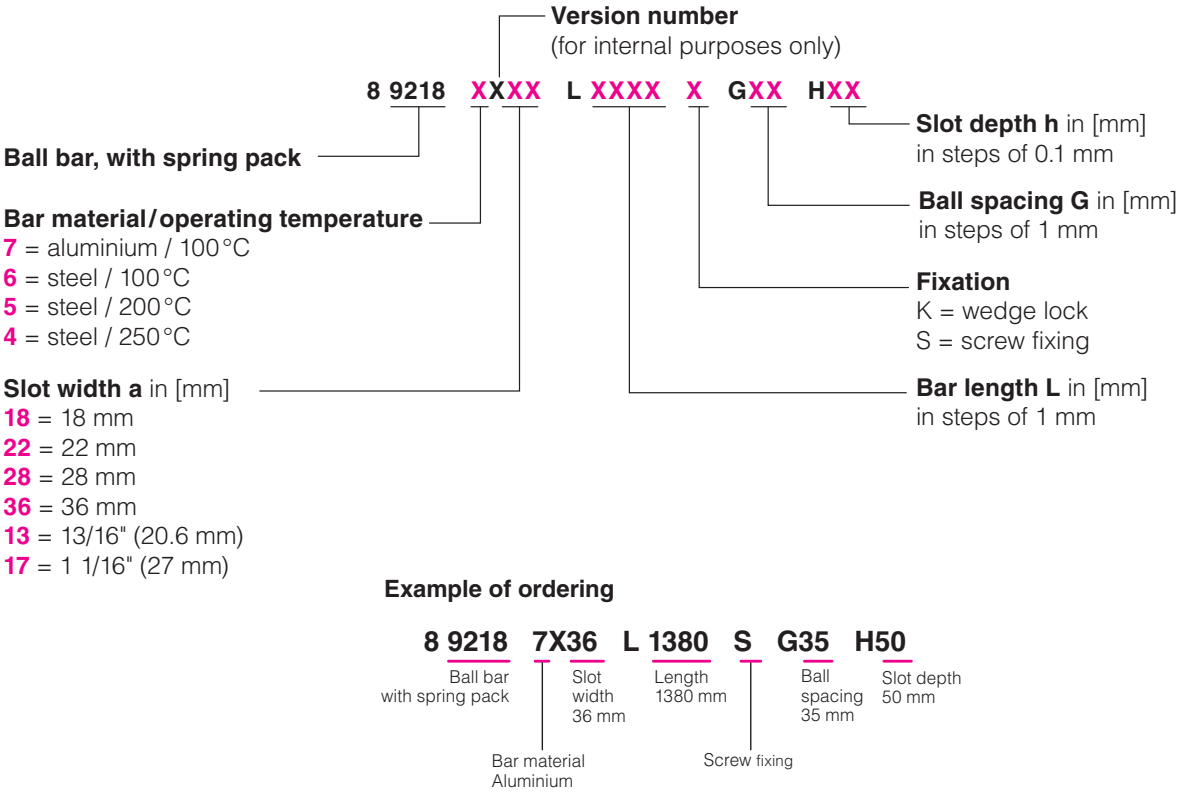
- **Slot depth (h)**

If the slots in your application are lower than the default value, specify the corresponding dimension (up to h min.) For slots which are deeper than the default value, spacer bars can be inserted. For steel versions, specify the corresponding dimension (up to h max.).

e.g. h = 50 mm

Code for part numbers

Variant program



Example of ordering

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Roller bars, mechanical with spring pack, loads up to 66 kN/m

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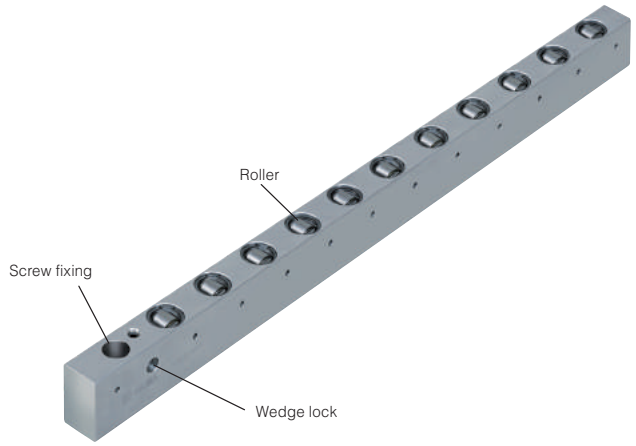


Advantages

- Easy and safe die change
- No hydraulic supply required
- Variant program with many selection possibilities
- Variable length in a single piece design up to 2900 mm
- Slot depth, roller spacing and bar length configurable for every application
- Low weight (version in aluminium)

Application

- In T-slots and rectangular slots of the press bed for easy die change without any problems
- Die change streamlining

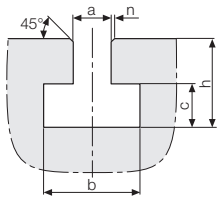
Delivery

- Roller bar
- Wedge lock (option)

Description

Roller bar with spring pack for medium loads and flexible horizontal movement of the dies. When preloaded, the rollers project over the bed level by up to 2 mm. When the die is clamped, the rollers are pressed into the bar body against the spring force until they are flush with the bed level.

T-slot tolerances as per DIN 650



Technical data

Max. load	[kN/m]	66
Roller spacing and orientation		flexible
Material of the bar		aluminium or steel
Max. temperature	[°C]	with aluminium bars: 100 with steel bars: 250
Fixing of the bar		Screw fixing or wedge lock
Max. bar length*	[mm]	variable* up to 2900

* The minimum bar lengths depends on the roller spacing G with at least 3 rollers (see the following page).

a	b	c	**h min.**	h max.	n max.
22 H12	37^{+3}	16^{+2}	**38**	45	1.6
28 H12	46^{+4}	20^{+2}	**48**	56	1.6
36 H12	56^{+4}	25^{+3}	**61**	71	2.5

Dimensions in mm
$\mathbf{h}_{\mathbf{min.}}$ = minimum dimension as per DIN 650

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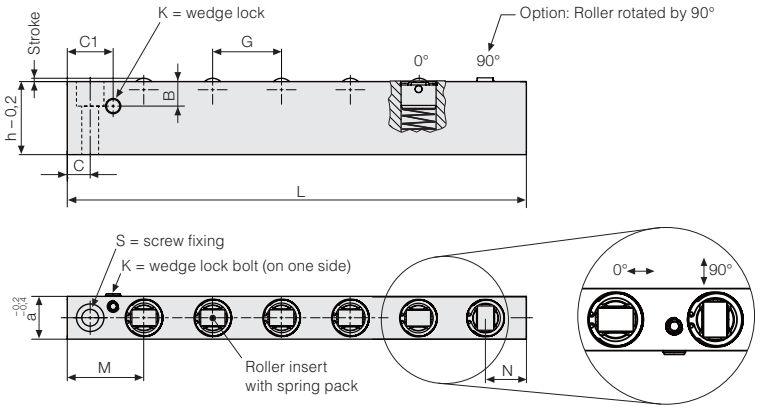
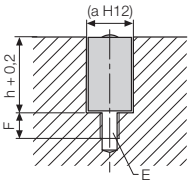
Roller bars, mechanical with spring pack, loads up to 66 kN/m





Roller orientation
The carrying rollers can be mounted in longitudinal direction of the roller bar (0° = standard) or in transverse direction (90°).
Please specify the orientation of the carrying roller.
e.g. X = 90°

Technical data

Slot width (a)	**[mm]**	**18**	**22**	**28**	**36**	**13/16"**	**1 1/16"**
Slot depth min. (h)	[mm]	28.5	34.5	42	51.5	28.5	34.5
Slot depth standard (h)	**[mm]**	**30**	**38**	**48**	**61**	**29.4**	**38.9**
Slot depth max.** (h)	[mm]	45	55	60	75	40	58
Roller spacing G min.	[mm]	20	23	28	34	20	23
Roller spacing G standard	**[mm]**	**30**	**40**	**45**	**50**	**30**	**40**
Roller spacing G max.	[mm]	60	80	90	100	60	80
L min.	[mm]	*)	*)	*)	*)	*)	*)
L max.	[mm]	2900	2900	2900	2900	2900	2900
Stroke	[mm]	1	2	2	2	1	2
Load/roller	[kN]	0.6	0.9	1.4	2.4	0.6	0.9
B	[mm]	12	16	16	16	12	16
C	[mm]	10	12.5	15	20	10	12.5
C1	[mm]	10	24.5	30	35	10	24.5
E	[mm]	M6	M8	M10	M10	M6	M8
F	[mm]	11	13	15	15	11	13
M	[mm]	27.5	40	50	57.5	27.5	40
N	[mm]	12.5	15	25	27.5	12.5	15

*) L min. depends on the roller spacing G with at least 3 rollers
**) only with steel bars

Product configurator

For the selection and configuration of roller and ball bars, a product configurator is available on our website. After entering the parameters, the configurator determines the desired roller or ball bars with all technical data and the identification number of the characteristics which are identical with the order number. In addition, a drawing with all dimensions will be provided.

Link to the configurator:
roemheld-usa.com/die-lifter-configurator/

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Roller bars, mechanical
with spring pack, loads up to 66 kN/m

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Roller bars with spring pack are individually configured and manufactured depending on the application. Within the limits specified in the measurement chart, the following parameters can be selected based on a code for part numbers:

bar material, slot width, bar lengths, fixation, slot depth, roller spacing and roller orientation.

- **Bar material/operating temperature**

Aluminium or steel can be selected as bar material. For operating temperatures >100 °C, a steel version is required. Depending on the temperature range, the admissible carrying force of the roller bars is reduced:

up to 100 °C: 100 % of the carrying force
>100 – 150 °C: 95 % of the carrying force
>150 – 200 °C: 70 % of the carrying force
>200 – 250 °C: 60 % of the carrying force

e.g. steel up to 200 °C with 70 % of the carrying force

- **Slot width (a)**

Selection from the table on page 2

e. g. a = 36 mm

- **Bar lengths (L)**

Depending on the roller spacing (G) and the parameter (M) results the possible bar length. Indicate the desired length (e.g. bed length) for your roller bar. Please note that a roller bar must be equipped with at least 3 rollers.

e.g. L = 1380 mm

- **Fixation**

K = wedge lock
S = screw fixing

e.g. screw fxing = S

- **Roller spacing (G) or load of the bar**

By changing the spacing of the rollers, the load of the roller bar can be varied. Please note that the load is indicated for the full length of the bar. Therefore, both the load and the roller spacing must be selected to suit the die weight and the die supporting length.
Please indicate the desired roller spacing or load of the ball bar, or the maximum die weight and the die dimensions.

e.g. G = 35 mm

or **load per bar = 92.1 kN**
or **number of rollers = 38**
or **die weight and exterior dimensions**

- **Slot depth (h)**

If the slots in your application are lower than the default value, specify the corresponding dimension (up to h min.) For slots which are deeper than the default value, spacer bars can be inserted. For steel versions, specify the corresponding dimension (up to h max.).

e.g. h = 45 mm

- **Roller orientation**

The carrying rollers can be mounted in longitudinal direction of the roller bar (0° = standard) or in transverse direction (90°).
Please specify the orientation of the carrying roller.

e. g. X = 90°

Code for part numbers
Variant program

Version number
(for internal purposes only)

8 9216 XXXX L XXXX X GXX HXX X

Roller bar, with spring pack

Bar material/operating temperature
7 = aluminium / 100 °C
6 = steel / 100 °C
5 = steel / 200 °C
4 = steel / 250 °C

Slot width a in [mm]
18 = 18 mm
22 = 22 mm
28 = 28 mm
36 = 36 mm
13 = 13/16" (20.6 mm)
17 = 1 1/16" (27 mm)

Roller orientation
X = 90°
not applicable for 0°

Slot depth h in [mm]
in steps of 0.1 mm

Roller spacing G in [mm]
in steps of 1 mm

Fixation
K = wedge lock
S = screw fixing

Bar length L in [mm]
in steps of 1 mm

Example of ordering

8 9216 7X36 L 1380 S G35 H45 X

- 8 9216: Roller bar with spring pack
- 7: Bar material Aluminium
- X36: Slot width 36 mm
- L 1380: Length 1380 mm
- S: Screw fixing
- G35: Roller spacing 35 mm
- H45: Slot depth 45 mm
- X: Roller orientation 90°

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Roller bars, mechanical with spring pack, max. load 2.4 kN

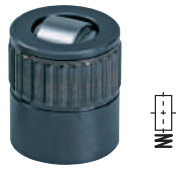
Description
When preloaded, the rollers or balls project over the bed level by up to 3 mm. When the die is clamped, the balls are pressed into the bar body against the spring force until they are flush with the bed level.

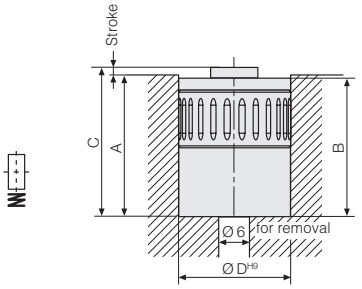
Advantages
- Easy and safe die change
- For installation in beds/tables without T-slots
- Versions without and with flange

Application
For installation in individual bore holes in press beds without T-slots

Important note
Provide a bore hole or notch for removal, if there is no through hole possible from below.

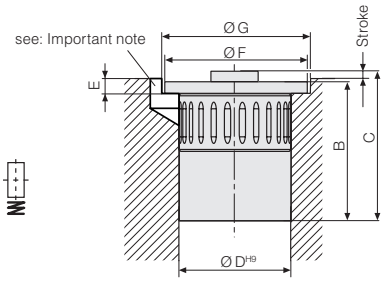
Roller insert without flange





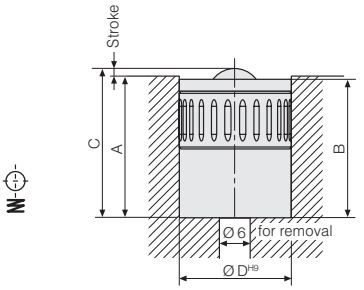
Load	[N]	600	900	1400	2400
Stroke*	[mm]	1.5	2.0	2.0	2.0
A	[mm]	30.0 +0.1	32.0 +0.1	43.5 +0.1	52.5 +0.1
B	[mm]	29.9	31.9	43.4	52.4
C	[mm]	31.5	34.0	45.5	54.5
Ø D	[mm]	20	24	30	40
Part no.		8121 00605	8121 00611	8121 00618	8121 00622

Roller insert with flange



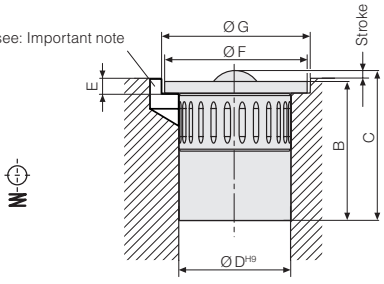
Load	[N]	600	900	1400	2400
Stroke*	[mm]	1.5	2.0	2.0	2.0
B	[mm]	29.9 +0.1	31.9 +0.1	43.4 +0.1	52.4 +0.1
C	[mm]	31.5	34.0	45.5	54.5
Ø D	[mm]	20	24	30	40
E	[mm]	3.5 +0.1	3.5 +0.1	4.5 +0.1	5.5 +0.1
Ø F	[mm]	24.5	29.5	34.5	47.5
Ø G	[mm]	25 +0.2	30 +0.2	35 +0.2	48 +0.2
Part no.		8121 00606	8121 00612	8121 00619	8121 00623

Ball insert without flange



Load	[N]	200	400	600	1000
Stroke*	[mm]	1.5	1.5	2.0	3.0
A	[mm]	24.0 +0.1	28.5 +0.1	34.0 +0.1	45.0 +0.1
B	[mm]	23.6	28.5	34.0	44.8
C	[mm]	25.5	30.0	36.0	48.0
Ø D	[mm]	20	24	30	40
Part no.		8121 00005	8121 00011	8121 00018	8121 00022

Ball insert with flange



Load	[N]	200	400	600	1000
Stroke*	[mm]	1.5	1.5	2.0	2.0
B	[mm]	23.5	28.5	34.0	44.0
C	[mm]	25.2	30.2	36.0	46.0
Ø D	[mm]	20	24	30	40
E	[mm]	3.5 +0.1	4.0 +0.1	4.5 +0.1	5.6 +0.1
Ø F	[mm]	24.5	29.5	34.5	47.5
Ø G	[mm]	25 +0.2	30 +0.2	35 +0.2	48 +0.2
Part no.		8121 00006	8121 00012	8121 00019	8121 00023

* Special stroke on request

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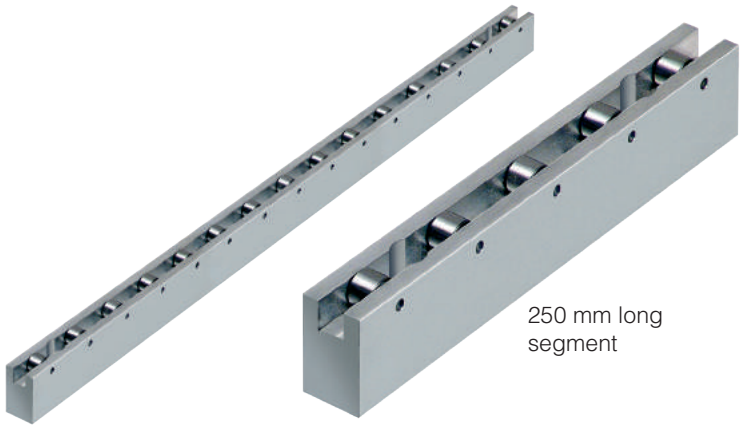
Roller conveyors, mechanical
without spring pack, without lifting of rollers, max. load 56 kN/m



250 mm long segment

Advantages

- Universal use
- Simple and sturdy design
- Any length up to 2500 mm is possible using modular segments

Application

- In T-slots and rectangular slots of the press bed for easy die change without any problems
- Die change streamlining

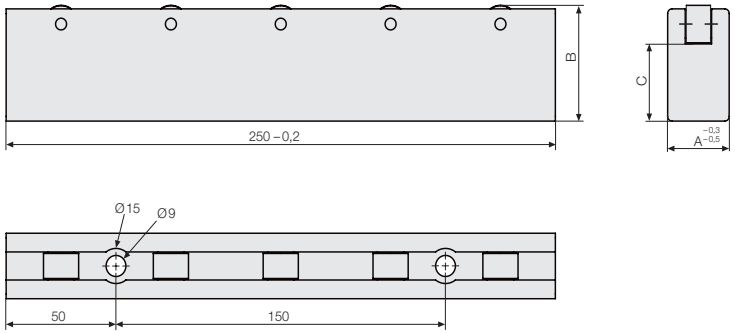
Description

These universal roller conveyors have been developed for easy and safe conveying of heavy dies.
All roller conveyors are manufactured in segments of 250 mm to which further segments can be added until the desired length is obtained.
The base bodies of the roller conveyors are made of a high-strength and robust aluminium alloy.
The roller bars are fixed through mounting holes provided in the segments.

Special versions

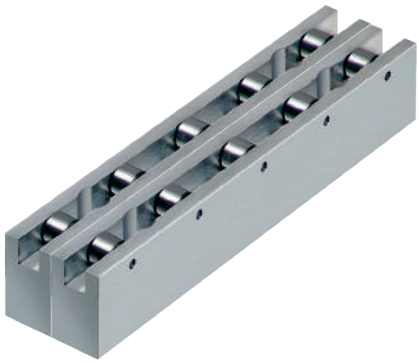
- Overall lengths of max. 2900 mm in a single-piece design
- Increased load by a closer arrangement of the rollers

Dimensions / Technical data



Bar width A	[mm]	22	28	36
Load/segment	**[kN]**	**32**	**32**	**39**
Load/m	[kN]	128	128	156
Segment length	[mm]	250	250	250
Load/roller	[kN]	6.4	6.4	8.0
Roller Ø x width	[mm]	16 x 12	16 x 12	19 x 12
B	[mm]	39.5	49.5	62.5
C	[mm]	23	33	43
Part no.		**8 1834 5000**	**8 1834 6000**	**8 1834 7000**

Increased load by package design



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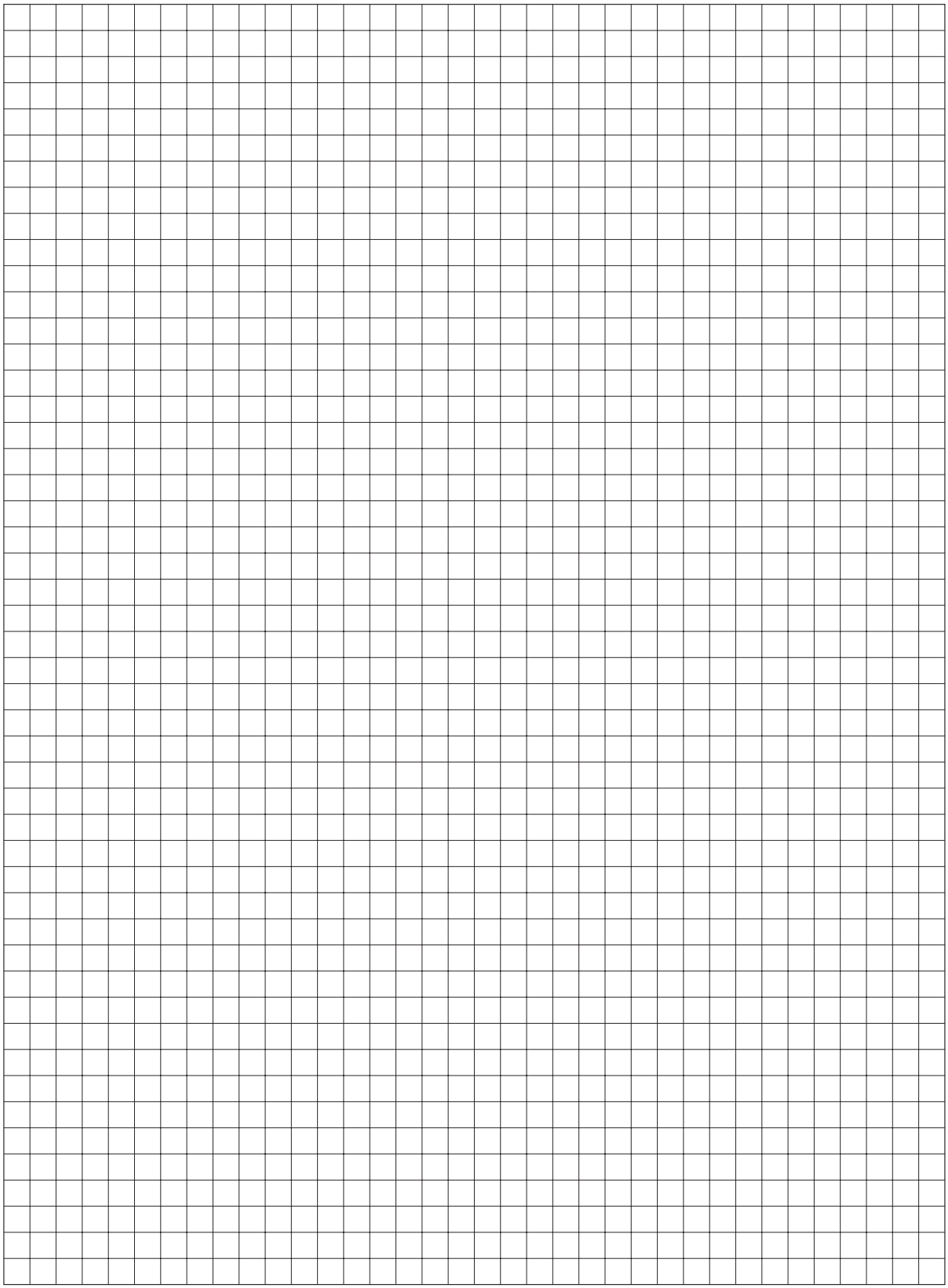
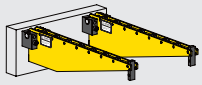
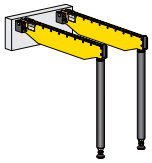
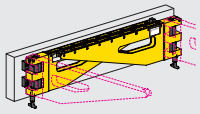


	**Carrying consoles, hanging** load per pair 5 to 30 kN	WZ 8.18350
	**Carrying consoles, supported** load per pair 20 to 250 kN	WZ 8.18351
	**Carrying consoles, swivelling to the left and right** load per pair 10 to 60 kN	WZ 8.18352
	**Die changing consoles, electrically driven** with push-pull drive die weight of up to 25 tons	WZ 8.18353
	**Die changing consoles, manually driven** crank handle and transmission gearing die weight of up to 6 tons	WZ 8.18354
	**Hydraulic pumps, manually operated** max. operating pressure 100, 200 and 500 bar	WZ 8.800
	**Die changing cart RW, manually movable** with optional auxiliary drive and safety docking station max. load capacity 500 kg	WZ 8.8900
	**Die changing cart RW, manually movable** with safety docking station max. load capacity 1000 kg	WZ 8.8901
	**Die changing cart RWA, with electric drive** with electro-hydraulic lifting platform die changing table and hydraulic ball bars max. load capacity 1200 or 1600 kg	WZ 8.8902

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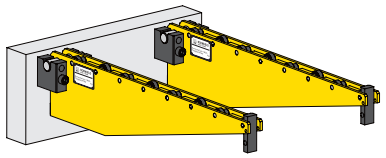
Carrying consoles, hanging or easy and efficient die change on the press bed load per pair 5 to 30 kN



Advantages

- Safe handling of heavy dies with ease
- Less downtime by easy and efficient die change
- High-quality, shock-resistant coating
- High load

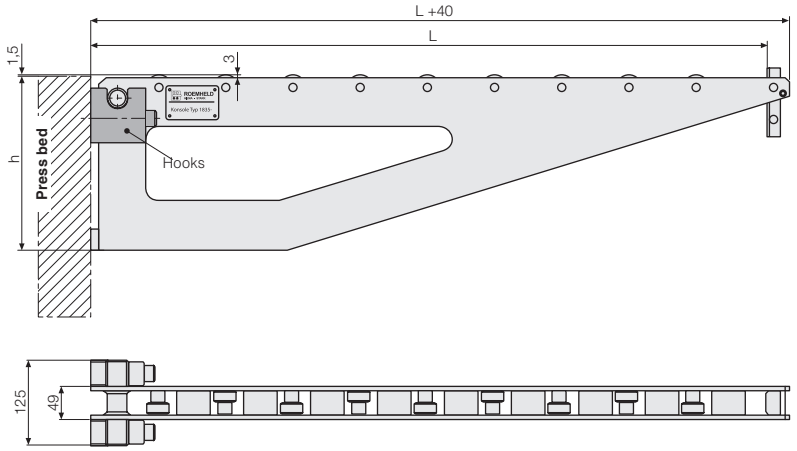
Application

Carrying consoles allow a safe, effort and time-saving change of heavy dies on the press bed.

Description

The carrying consoles are hung in the hooks on the die changing side of the press. The hooks are supplied with the consoles. The consoles are used as a pair. Their size must be selected to suit the highest die weight.

The die is loaded onto the consoles using a crane or a forklift truck. The carrying rollers consist of high-strength hardened needle bearings. The end stop can be bypassed in one direction.
The surface is provided with a shock-resistant coating in RAL1004, golden yellow.



Delivery

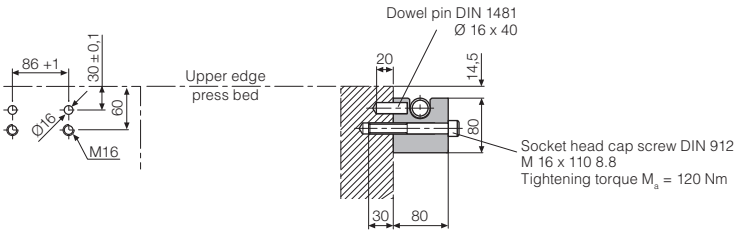
2 carrying consoles (pair)
1 set of hooks (4 off)

Accessories

Hooks

Hanging consoles may be used for several presses. In this case, an additional set of hooks is required and can be ordered as an accessory or replacement (1 set = 4 off).
Part no. 7 18350007

Hole pattern for hooks

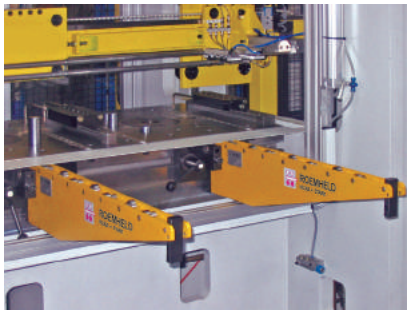


Technical data

Load (pair) [kN]	Support length L [mm]	Height h [mm]	Weight (pair) [kg]	**Part no.** (pair)
5	500	120	23	**8 18350001**
10	500	150	26	**8 18350002**
10	800	180	40	**8 18350003**
10	1000	250	48	**8 18350104**
20	800	250	40	**8 18350105**
20	1000	300	57	**8 18350006**
20	1250	350	80	**8 18350107**
30	800	400	60	**8 18350008**
30	1000	450	74	**8 18350009**
30	1250	500	107	**8 18350010**

Customized carrying consoles

as e.g. sliding carrying consoles are available on request.



Hanging, sliding carrying consoles

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Carrying consoles, supported or easy and efficient die change on the press bed load per pair 20 to 250 kN

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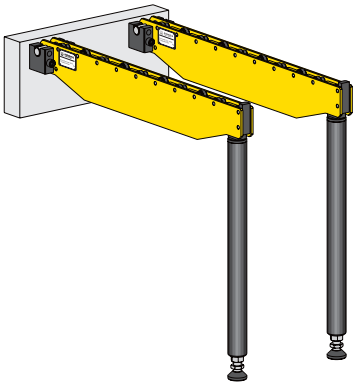


Application

Carrying consoles allow a safe, effort and time-saving change of heavy dies on the press bed.

Delivery

2 carrying consoles (pair)
1 set of hooks (4 off)
2 supporting feet

Advantages

- Safe handling of heavy dies with ease
- Less downtime by easy and efficient die change
- High-quality, shock-resistant coating
- High load

Description

The carrying consoles are hung in the hooks on the die changing side of the press. The hooks are supplied with the consoles. The consoles are used as a pair. Their size must be selected to suit the highest die weight. In order to cope with heavy and large dies, the console is provided with an additional support.
To compensate the unevenness on the floor, the supports are designed as adjustable supports with a ball-and-socket joint. The support height may be changed subsequently by ± 60 mm.

The die is loaded onto the consoles using a crane or a forklift truck. The carrying rollers consist of high-strength hardened needle bearings. The end stop can be bypassed in one direction. The surface is provided with a shock-resistant coating in RAL1004, golden yellow.

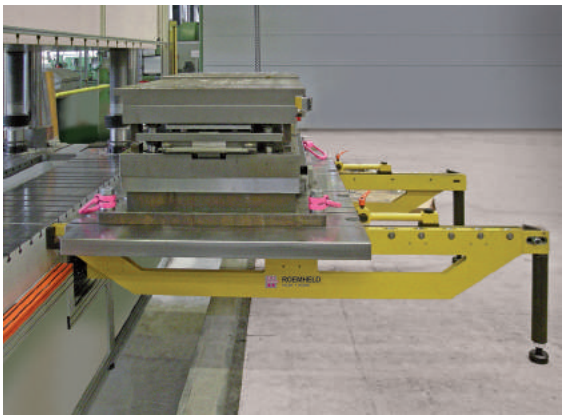
Accessories

Hooks

Hanging consoles may be used for several presses. In this case, an additional set of hooks is required and can be ordered as an accessory or replacement. (1 set = 4 off)

Load [kN]	Part no.
20 – 40	**7 1835 0007**
60 – 100	**7 1835 0021**
160 – 250	**7 1835 0022**

Application example



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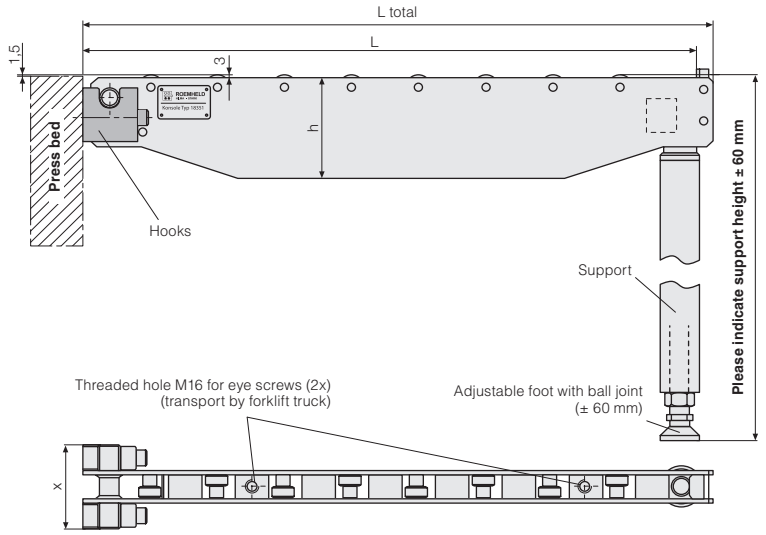
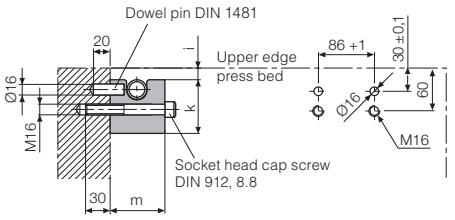
Carrying consoles, supported or easy and efficient die change on the press bed load per pair 20 to 250 kN



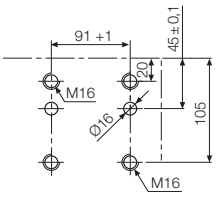
Hole pattern for hooks

Console 20 – 40 kN



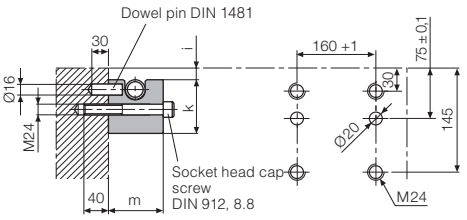
Socket head cap screws DIN 912
M16 x 100
Tightening torque Ma = 120 Nm
Dowel pin DIN 1481 Ø16 x 40

Console 60 – 100 kN



Socket head cap screws DIN 912
M16 x 50 and M16 x 110
Tightening torque Ma = 120 Nm
Dowel pin DIN 1481 Ø16 x 50

Console 160 – 250 kN



Socket head cap screws DIN 912
M24 x 70 and M24 x 160
Tightening torque Ma = 250 Nm
Dowel pin DIN 1481 Ø20 x 80

Technical data

Load (pair) [kN]	Support length L [mm]	L total [mm]	Dimensions [mm] h	i	k	m	x	Weight [kg]	**Part no.** (pair)
20	1000	1040	150	14.5	80	80	125	82	**8 183 53001**
20	1250	1290	180	14.5	80	80	125	100	**8 183 53102**
20	1600	1640	200	14.5	80	80	125	116	**8 183 53003**
40	1000	1040	200	14.5	80	80	125	80	**8 183 53204**
40	1250	1290	200	14.5	80	80	125	90	**8 183 53205**
40	1600	1640	225	14.5	80	80	125	110	**8 183 53206**
60	1000	1030	200	5	115	100	131	85	**8 183 53209**
60	1250	1280	220	5	115	100	131	100	**8 183 53210**
60	1600	1630	240	5	115	100	131	125	**8 183 53211**
60	2000	2030	270	5	115	100	131	150	**8 183 53212**
100	1250	1280	250	5	115	100	131	115	**8 183 53213**
100	1600	1630	280	5	115	100	131	140	**8 183 53214**
100	2000	2030	320	5	115	100	131	175	**8 183 53215**
160	1600	1685	260	5	170	150	216	390	**8 183 53216**
160	2000	2085	260	5	170	150	216	475	**8 183 53217**
160	2500	2585	280	5	170	150	216	605	**8 183 53218**
250	2500	2585	360	5	170	150	216	615	**8 183 53220**

Delivery
2 carrying consoles (pair)
1 set of hooks (4 off)
2 supporting feet

Please specify the exact support height when ordering.

Example of ordering:
8 183 53001, support height 1000 mm
Console 1000 mm long
max. 20 kN
Support height 1000 mm

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Carrying consoles, swivelling to the left and right or easy and efficient die change on the press bed load per pair 10 to 60 kN

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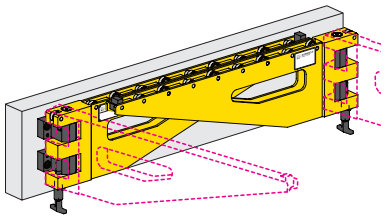


Advantages

- Safe handling of heavy dies with ease
- Less downtime by easy and efficient die change
- High-quality, shock-resistant coating
- High load
- Low space requirement due to swivelling carrying consoles

Application

Carrying consoles allow a safe, effort and time-saving change or transport of heavy dies.

Description

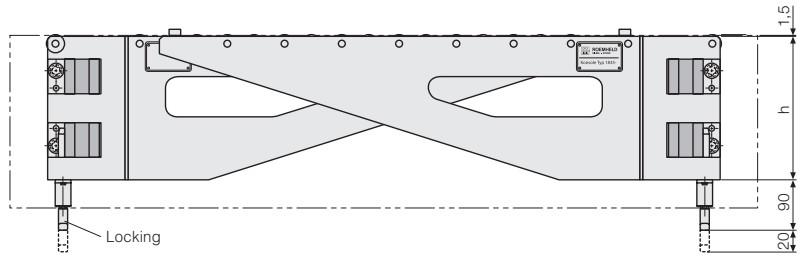
The carrying consoles are hung in the hooks on the die changing side of the press. The hooks are supplied with the consoles. The consoles are used as a pair. Their size must be selected to suit the highest die weight.

The die is loaded onto the consoles using a crane or a forklift truck. The carrying rollers consist of high-strength hardened needle bearings. The end stop can be bypassed in one direction.
The surface is provided with a shock-resistant coating in RAL1004, golden yellow.

Swivelling carrying consoles are supplied in pairs with pre-mounted holders, ready for connection.
Special designs and double-swivel carrying consoles are available on request.

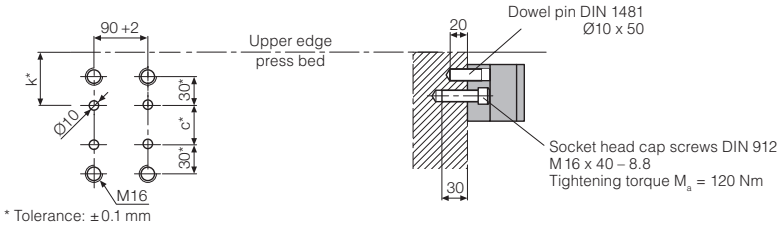
Delivery

2 carrying consoles (left and right side)
4 holders (pre-mounted)



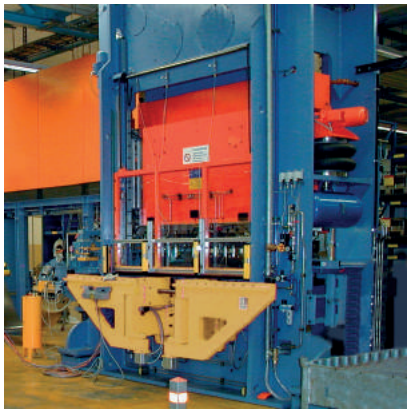
The carrying consoles can be swivelled to the left and right

Hole pattern for holders



* Tolerance: ±0.1 mm

Application example



Swivelling carrying consoles on a press

Technical data

Load (pair) [kN]	Support length L [mm]	Dimensions [mm] c ±0.1	g	h	k ±0.1	Weight (pair) [kg]	**Part no.** (pair)
10	500	20	550	200	91.5	46	**8 183 51 001**
10	1000	70	1050	250	91.5	74	**8 183 51 002**
20	1000	120	1050	300	91.5	85	**8 183 51 003**
20	1250	170	1300	350	91.5	108	**8 183 51 004**
40	1000	210	1050	450	121.5	130	**8 183 51 105**
40	1250	260	1300	500	121.5	160	**8 183 51 106**
60	1000	310	1050	550	121.5	165	**8 183 51 107**
60	1250	460	1300	700	121.5	230	**8 183 51 108**

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Die changing consoles, electrically driven for easy and efficient die change on the press bed with push-pull drive, die weight of up to 25 tons

Application

Die changing system directly adapted to the press for effort and time-saving change of heavy dies.
The drive system has been developed on the basis of standard die changing consoles and can be easily installed as it requires only little space. Thus, it is very suitable for both retrofitting and new constructions.

Description

The die changing system with special push-pull drive makes handling of dies easier and ensures effort and time-saving change of dies with a maximum weight of 25 tons in places difficult to access.
(Higher loads on request)

Roller and ball bars in the T-slots of the bed provide for easy insertion of the die. Individual solutions including automatic die changing and integration in the press are possible.

Dimensioning and further technical details in the course of the project. Please contact us!

Advantages

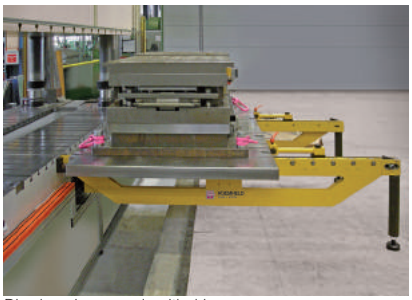
- Safe handling of heavy dies with ease
- Less downtime by easy and efficient die change
- Small batch sizes can be easily realized
- High load
- Easy handling
- Easy insertion of the dies, either manually or automatically, with roller or ball bars
- Individual system with integration of the press possible
- Flexible use at several presses

Function

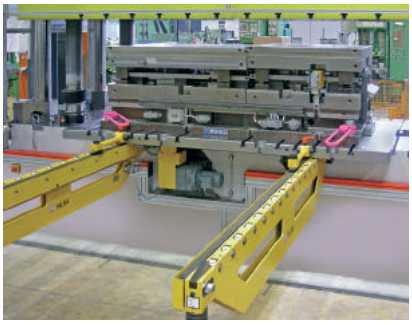
The drive unit and the carrying console are hung in hooks provided on the press for this purpose and then locked. The die is deposited on the consoles using a crane or a forklift truck.
After the die has been deposited, it can be connected to the push-pull docking device of the changing station.
The integral chain drive system allows the user automatic die loading and positioning, just by depressing a push-button on a separate remote control pendant.

During a die change, the press bed is free, i.e. the push and pull elements do not project over the press bed. Also the rear side of the press is completely free. This changing station is suitable for almost any press, can be easily removed and is easy to handle.

Application examples



Die changing console with drive

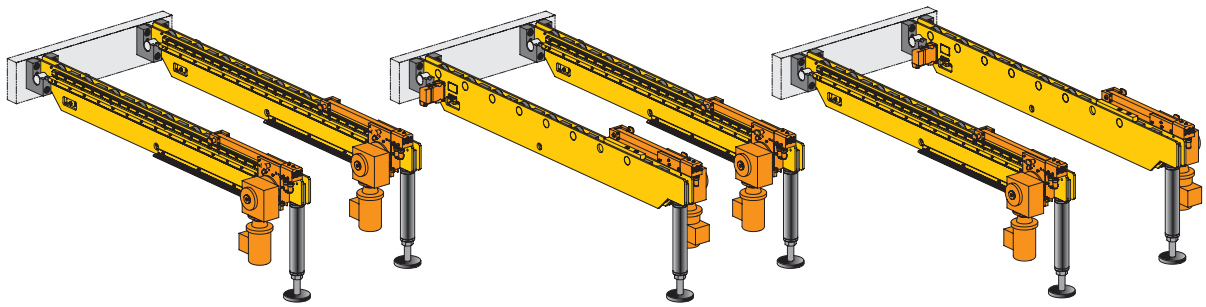


Die changing console with drive

Die changing console with drive and side loading of the press.

Variants of the die changing console

Various variants with two driven, synchronized drive consoles and with drive motor at left/right side.
The length of the console, adaptor and loads are flexibly selectable.



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927 Horan Drive, Fenton, MO 63026
Phone 800-827-2526 Fax 636-386-8034 www.roemheld-usa.com

Die changing consoles, manually driven for easy and efficient die change on the press bed crank handle & transmission gearing, die weight of up to 6 tons

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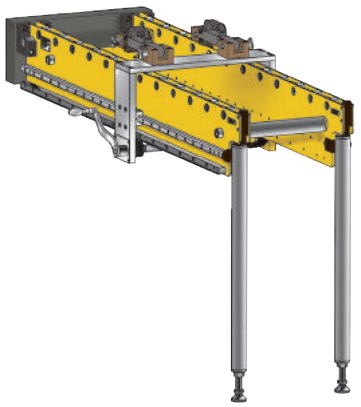
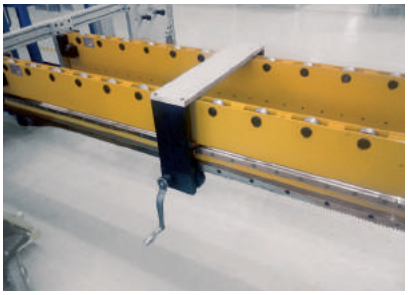


Advantages

- Safe handling of heavy dies with ease
- Less downtime by easy and efficient die change
- Easy handling
- Easy manual insertion of the dies with roller or ball bars in the press bed
- Increased safety for the operator
- Low-cost alternative to an electric drive

Application examples



Die changing console with drive

Die changing console with drive

Application

Die changing system directly adapted to the press for effort and time-saving change of heavy dies.
The drive system has been developed on the basis of standard die changing consoles and can be easily installed as it requires only little space. Thus, it is very suitable for both retrofitting and new constructions.

Description

This die changing console with crank handle and transmission gearing makes handling of dies easier and ensures an effort and time-saving change of dies with a maximum weight of 6 tons in places difficult to access.
(Higher loads on request)

Roller and ball bars in the T-slots of the bed provide for easy insertion of the die. Individual solutions including automatic die changing and integration in the press are possible.

Delivery

2 carrying consoles (pair)
1 set of hooks (4 off)
2 supporting feet
1 set of hooks (2 off)

Function

The drive console is hung in hooks provided on the press for this purpose and then locked. The die is deposited on the consoles using a crane or a forklift truck.
After the die has been deposited, it can be connected to the push-pull docking device of the changing station.
A crank handle at the side allows the user a safe and effortless insertion and positioning of the die.

During a die change, the press bed is free, i.e. the push and pull elements do not project over the press bed. Also the rear side of the press is completely free. This changing station is suitable for almost any press, can be easily removed and is easy to handle.

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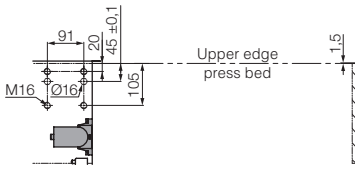
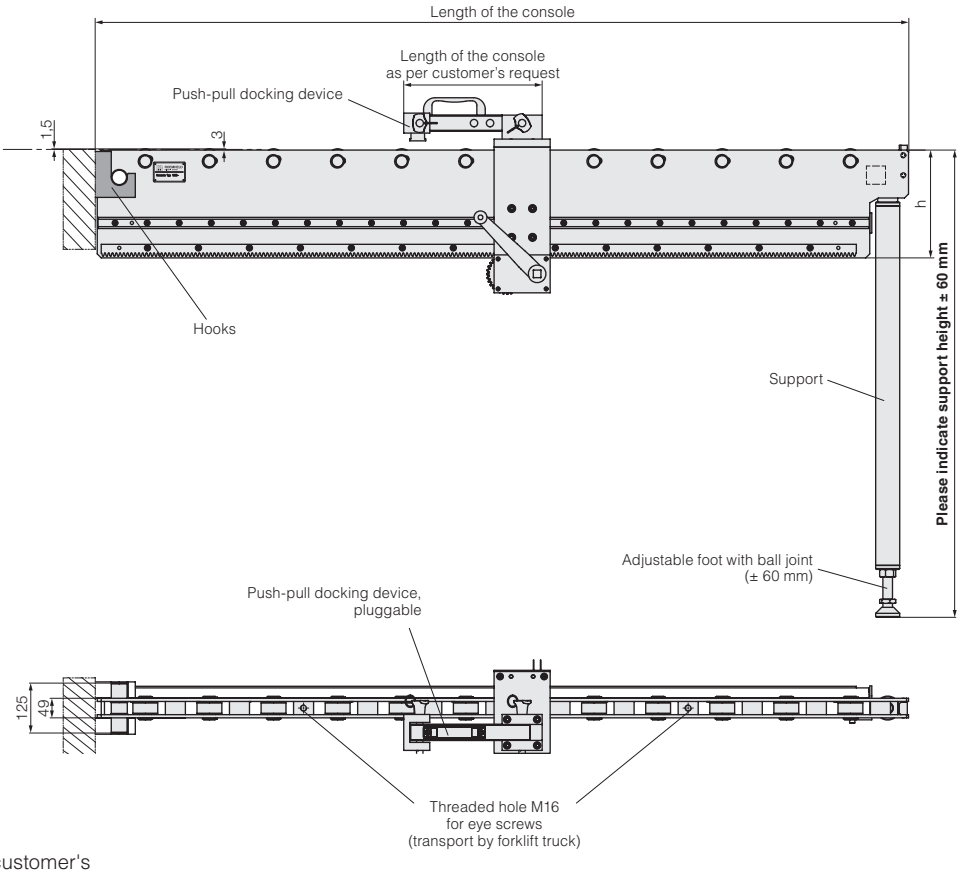
927 Horan Drive, Fenton, MO 63026
Phone 800-827-2526 Fax 636-386-8034 www.roemheld-usa.com

Die changing consoles, manually driven for easy and efficient die change on the press bed crank handle & transmission gearing, die weight of up to 6 tons

Hole pattern for holders

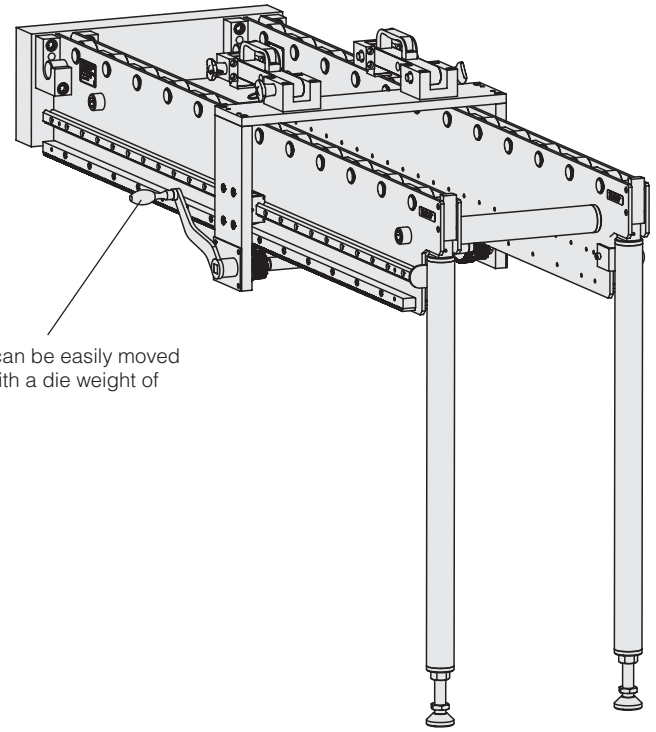




Technical data

Length of the console	as per customer's request
Support height	as per customer's request
Die weight	up to 6 tons

Dimensioning and further technical details in the course of the project.



Crank handle can be easily moved by one hand with a die weight of 6 tons.

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Die changing cart
manually movable, with optional auxiliary drive
with safety docking station

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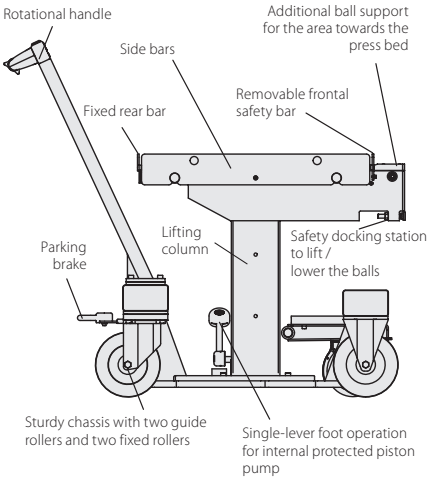
Figure RW with auxiliary drive



Applications:

Die changing carts RW facilitate the handling of medium-weight dies and enable dies weighing up to 500 kg to be safely transported in an easy and time saving way.

All cart types are especially designed for pressing and punching dies as well as for injection and casting molds.

Description:

Die changing carts RW are manually moved. For easier movement, the front axle can be optionally equipped with a battery driven auxiliary drive.

The die changing table is equipped with ball inserts which facilitate the manual insertion of the dies. During the transport, the ball inserts are lowered and the die is protected against movement. In addition, the die is secured against falling down by safety bars at all sides of the die changing table.

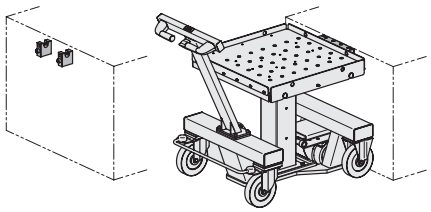
The die changing table can be adjusted in height by a hydraulic lifting column with single-lever foot operation.

For transport, the center of gravity of the load must be positioned in the center of the cart and the lifting columns must be completely lowered.

Safety docking station

During the transport of the die, the balls are always lowered and the die is protected against movement. Lifting of the ball inserts is made by successful docking to the press bed. The die weight is supported at the press bed.

Docking situation

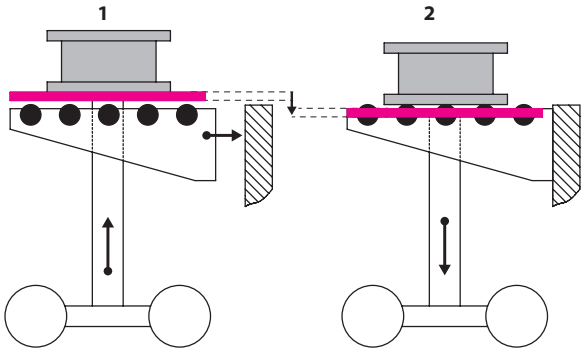


Advantages:

- time-saving die change
- material gentle transport
- highest safety by automatic docking station and anti-slip protection
- easy movement by optional battery driven auxiliary drive
- sturdy and scratch-proof ball table with hard-anodized surface
- documentation and design in compliance with CE standards
- exact positioning
- exact height adjustment by precision lowering
- improved ergonomics for the user
- additional protection against falling down of dies by safety bars on all sides
- safe positioning of the cart by pedal parking brake

1. Transport
- Lifting column extended
- Ball inserts lowered
- Die on table plate

2. Docking
- Lifting column lowered
- Ball inserts lifted
- Die on ball inserts



Version with safety docking station and ball table

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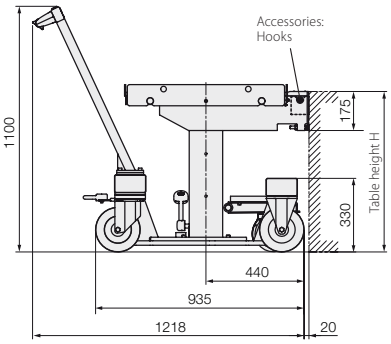
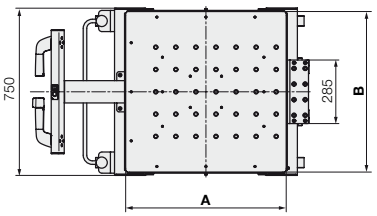
Die changing cart
technical data, dimensions





Technical data

Die Changing Cart RW

Max. load capacity: 500 kg

Table sizes

Version		1	2
Length A x width B	**[mm]**	**720 x 720**	**720 x 450**

Lifting range

Version		1	2	3
Total stroke	**[mm]**	**200**	**300**	**400**
Usable stroke	[mm]	140	240	340
Min. table height H	[mm]	540	620	720
Max. table height H	[mm]	680	860	1060

Technical data

Auxiliary drive		
Running performance	[km]	2 with full load (5 with average load)
Displacement speed	[km/h]	3
Charging time (approx. 90 %)	[h]	1.5 to 3 (depending on the battery charger)
Battery		24 V DC, Ni-MH, 140 Wh (6 Ah)

Part numbers

Table size [mm]	**Total stroke** [mm]	**Auxiliary drive**	**Part numbers**
720 x 720	200	without	**HCR-8.8913.0100**
720 x 720	300	without	**HCR-8.8913.0101**
720 x 720	400	without	**HCR-8.8913.0102**
720 x 450	200	without	**HCR-8.8913.0103**
720 x 450	300	without	**HCR-8.8913.0104**
720 x 450	400	without	**HCR-8.8913.0105**
720 x 720	200	with	**HCR-8.8913.0106**
720 x 720	300	with	**HCR-8.8913.0107**
720 x 720	400	with	**HCR-8.8913.0108**
720 x 450	200	with	**HCR-8.8913.0109**
720 x 450	300	with	**HCR-8.8913.0110**
720 x 450	400	with	**HCR-8.8913.0111**

Scope of supply: Die changing cart with one set of hooks and battery charger

Versions

The die changing cart RWA is available in 2 table sizes and 3 stroke ranges.
Every version can optionally be equipped with an auxiliary drive.

Optional auxiliary drive

All elements of the auxiliary drive are integrated in the front axle: the electric motor including gear, long-life batteries with high energy density and a power control for optimum control of the motor.

The rotational handle consists of two solid handles, speed and direction of the drive can be controlled by means of a lever at the right handle.

An integrated level compensation ensures an optimum contact pressure of the drive wheel on the hall floor.

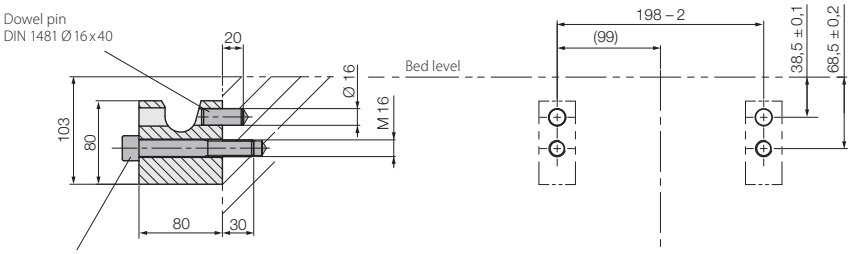
A covering protects the drive against shocks and splash water. The high drive torque of the electric motor (17 Nm / 20 da N) facilitates considerably the movement of the changing cart.

Accessories

Battery charger 1.8 A
(included in the delivery)
100 … 230 V AC, 50 / 60 Hz
Charging time 3 h (approx. 90 %)
Part no. HCR-7.8913.0013

Quick battery charger 4A
100 … 230 V AC, 50 / 60 Hz
Charging time 1.5 h
(approx. 90 %)
Part no. HCR-7.8913.0015

Hooks (Set of 2 off)
to position and lock the die changing cart
Part no. HCR-7.8913.0001



Socket head cap screw
DIN 912-M 16 x 110 - 8.8
Ma = 120 Nm

Dimensions are valid for the infeed height of the die 1.5 mm above the machine table

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Phone 800-827-2526 Fax 636-386-8034 www.roemheld-usa.com

Die Changing Cart RW
manually movable with safety docking station
max. load capacity 1,000 kg

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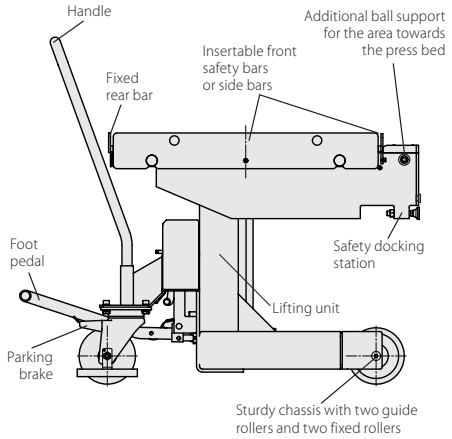


Applications:

Die changing carts RW facilitate the handling of heavy dies and enable dies weighing up to 1000 kg to be safely transported in an easy and time saving way.

All cart types are especially designed for pressing and punching dies as well as for injection and casting molds.

Description:

Die changing carts RW are manually moved.

The die changing table is equipped with ball inserts which facilitate the manual insertion of the dies. During the transport, the ball inserts are lowered and the die is protected against movement. In addition, the die is secured against falling down by safety bars at all sides of the die changing table.

The die changing table can be adjusted in height by means of a pedal-operated lifting unit. Precision lowering is effected by a pedal – additional precision lowering for lowering the lifting unit with millimeter accuracy.

For transport, the center of gravity of the load must be positioned in the center of the cart and the lifting columns must be completely lowered.

Version

Table size:	720 x 720 mm
Usable stroke:	635 mm

Precision lowering

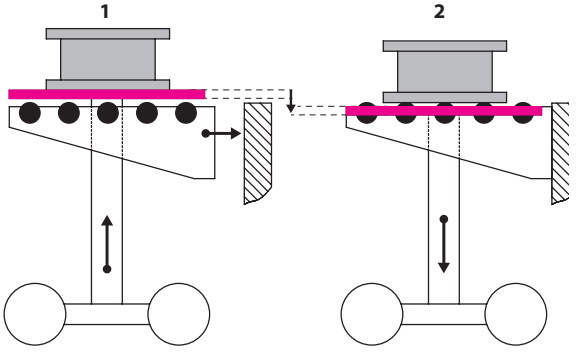
for lowering of the lifting unit with millimeter accuracy by pedal.

Advantages:

- time-saving die change
- material gentle transport
- highest safety by automatic docking station and anti-slip protection
- easy movement by optional battery driven auxiliary drive
- sturdy and scratch-proof ball table with hard-anodized surface
- documentation and design in compliance with CE standards
- exact positioning
- exact height adjustment by precision lowering
- improved ergonomics for the user
- additional protection against falling down of dies by safety bars on all sides
- safe positioning of the cart by pedal parking brake

1. Transport
- Lifting column extended
- Ball inserts lowered
- Die on table plate

2. Docking
- Lifting column lowered
- Ball inserts lifted
- Die on ball inserts



Version with safety docking station and ball table

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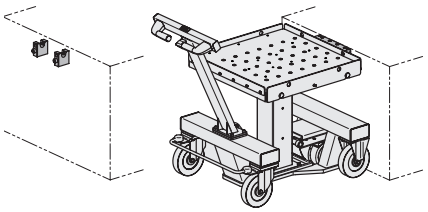
927 Horan Drive, Fenton, MO 63026
Phone 800-827-2526 Fax 636-386-8034 www.roemheld-usa.com

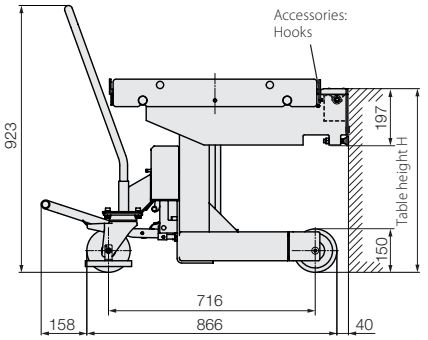
Die Changing Cart RW
manually movable with safety docking station
max. load capacity 1,000 kg

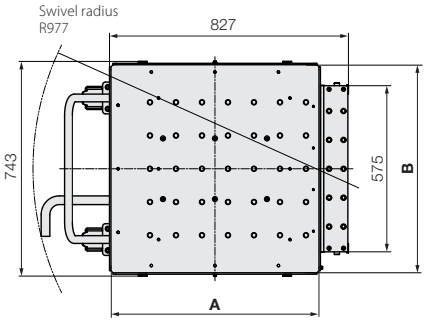
Safety docking station

During the transport of the die, the balls are always lowered and the die is protected against movement. Lifting of the ball inserts is made by successful docking to the press bed. The die weight is supported at the press table.

Docking situation







Technical data

Max. load capacity: 1000 kg

Lifting range

Total stroke	[mm]	700
Usable stroke	[mm]	635
Min. table height H	[mm]	650
Max. table height H	[mm]	1285

Table size* [mm] A	Table size* [mm] B	Total stroke [mm]	Auxiliary drive**	Part number
720	720	700	without	**HCR-8.8913.1000**

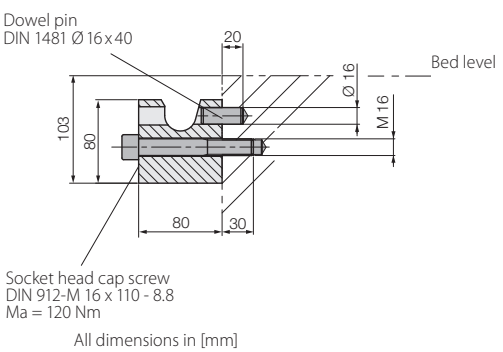
* other table sizes on request
** with auxiliary drive on request

Delivery

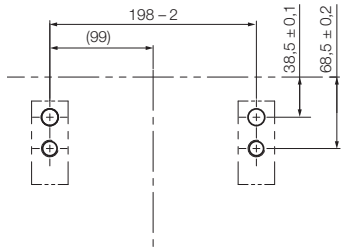
One set (2 off) of hooks is included in the delivery of the die changing cart; the hooks can also be ordered as an accessory.

Accessories

Hooks (1 set = 2 off)
to position and lock the die changing cart
Part no. HCR-7.8913.0001



All dimensions in [mm]



Dimensions are valid for the infeed height of the die 1.5 mm above the machine table

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Die changing cart with electrical drive RWA with electro-hydraulic lifting platform, die changing table and hydraulic ball bars

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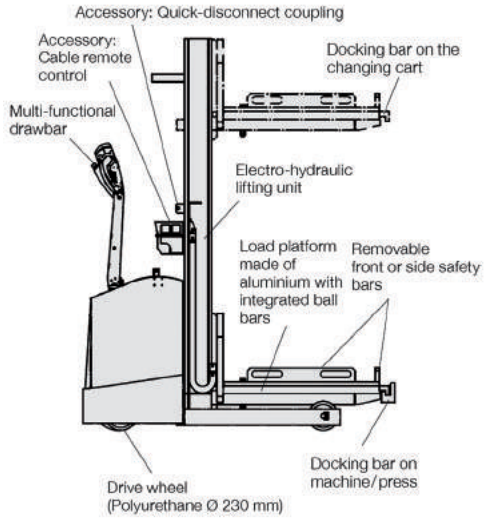

Operation:

The operation of the die changing cart RWA is completely made at the multi-functional drawbar.

- Rotary switch for continuous and sensitive driving (speed control)
- Toggle switch for reduced speed 2.0 km/h
- Push-button for driving with reduced speed and vertical drawbar position
- Steering (by drawbar)
- Slide switch for sensitive lifting and lowering of the lifting platform
- Push-button for lifting/lowering of the balls (as an option)
- Signal horn and key switch
- Main current safety switch (EMERGENCY STOP)

Multi-functional display for display of battery status and operating hours maintenance intervals and error messages

Versions:

The die changing cart RWA is available with 4, 6 or 8 ball bars and with different table sizes.

Power supply:

The power supply of the electric drive, the lifting platform and the ball bars is made via an installed battery 24 V DC with 240 Ah.

This battery can be completely charged within 12 hours with a battery charger included in the delivery.

Automatic slow driving at low battery status as well as automatic lift cutout in the case of further discharge.

The maximum running performance is approximately 3 hours at full load.

Application:

- The die changing cart RWA is used for the transport and the change of pressing and punching dies as well as injection and casting molds up to a weight of 1600 kg.

Description:

The die changing cart RWA is an electrically driven walking and lifting cart, especially equipped for the transport and the change of dies.

The electro-hydraulic lifting platform is designed as die changing table with integrated hydraulic ball bars, which facilitate the manual insertion of the dies onto the press table.

During the transport, the balls are always lowered and the die is protected against movement.

A safety circuit ensures that the die changing cart can only be displaced with lowered ball bars.

In addition, the die is secured on the lifting platform by removable front safety bars or side bars.

For the transfer of the die to the press, the lifting platform is equipped with a protrusion.

Advantages:

- safe and gentle die transport of heavy dies
- time-saving die change
- integrated die changing table with hydraulic ball bars
- high safety by docking bars and lowerable ball bars
- protection against falling down of dies by removable side bars
- simple and central operation with multi-functional drawbar
- multi-function display on the drawbar
- robust vehicle technology
- modular design with standard drive

Versions as per customer's request:

- Roller bars instead of ball bars
- Ball or roller distance
- Dimensions of the lifting platform
- Radio remote control

Option

Die changing cart with quick-disconnect coupling for external ball or roller bars. The die changing cart RWA can be optionally equipped with an additional hydraulic control circuit with quick-disconnect coupling for the operation of the hydraulic ball and roller bars in the press table. The operating pressure is 80 bar.

Quick-disconnect coupling

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Die changing cart with electrical drive technical data, dimensions

Technical data

Max. die weight	[kg]	1600
Lifting range	[mm]	250 – 1650
Load capacity at the load center of gravity 400/600 mm	[kg]	1600/600
Platform size	[mm]	1150 x 800*
Ball spacing	[mm]	76
Stroke of the ball bars	[mm]	2
Max. lifting force / bar	[kN]	8.8
Max driving speed	[km/h]	5
Running performance		approx 3 h at full load
Empty weight	[kg]	1200

* Individual platform sizes and ball distances on request.

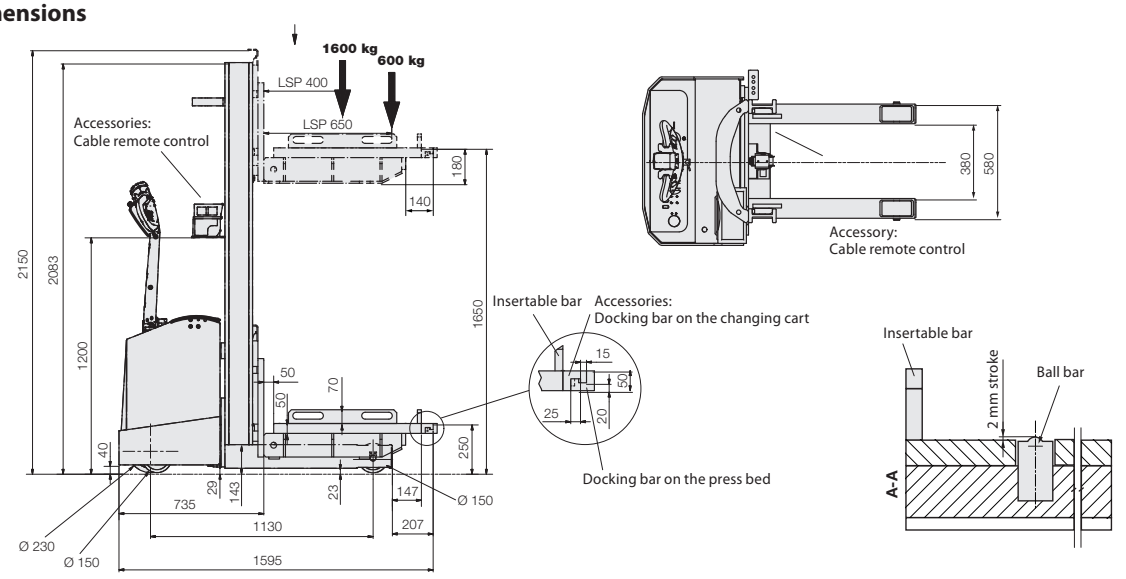
Scope of supply:

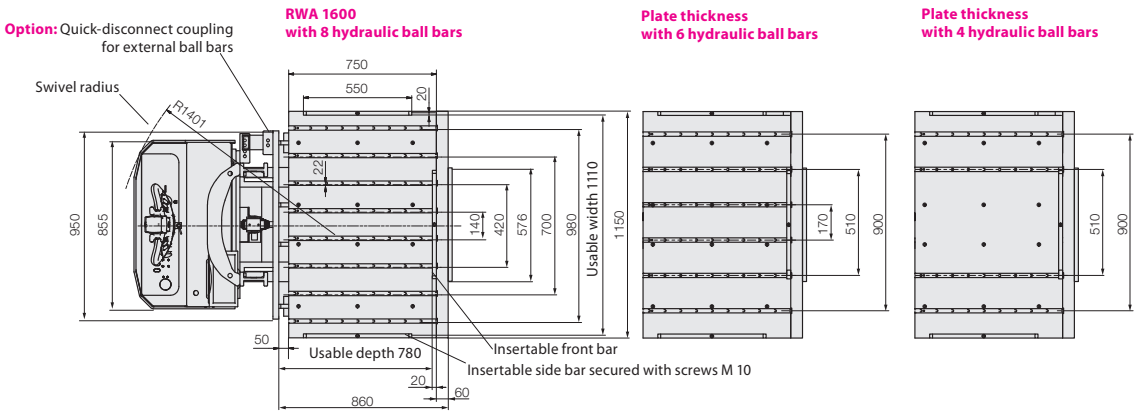
- Changing cart with built-in battery
- Battery charger
- Lifting platform
- 4 or 6 hydraulic ball bars
- Removable side and front bars

Further accessories and options in addition to the standard scope of delivery, see next page.

Type	RWA 1600/4	RWA 1600/6	RWA 1600/8
Number of ball bars (each 744 mm long)	4	6	8
Part no.	**HCR-8.8913.1600**	**HCR-8.8913.1610**	**HCR.8.8913.1620**
Die Changing Cart with quick-disconnect coupling			
Part no.	**HCR-8.8913.1601**	**HCR-8.8913.1611**	**HCR.8.8913.1621**

Dimensions





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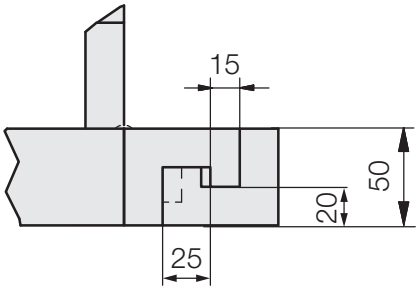
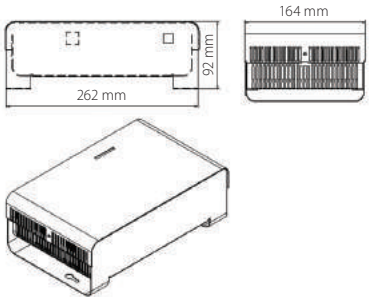
Die changing cart with electrical drive accessories

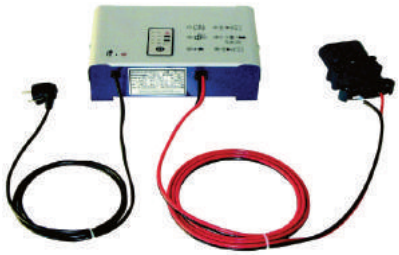


Docking bars
To obtain the exact insertion height at the press table, the lifting platform and the press table can be provided with docking bars.

Docking bars
for fixing at the changing cart
Part no.: HCR-8.8913.0022

Docking bars
for fixing at the machine
Part no.: HCR-8.8913.0023





Extra battery charger E 230 G*
Charging time: 2 h
Code class: IP 21
Part no.: HCR-8.8913.0025

* USA version on request

Cable remote control with the functions:
- Lifting/lowering
- Driving: forwards/backwards
- Emergency stop

(Mounting position see drawing on previous page)

Part no.: HCR-8.8913.0026

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Quick Die Clamping And Changing Systems

We can offer a wide range of quick die change solutions for your press. Contact our Hilma engineers to find the system that works best for your needs!

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M-TECS
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magnetic

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Magnetic clamping technique

For thermoplastics, elastomers, duroplastics, pressure die casting and metal forming

Contents
Product group 9

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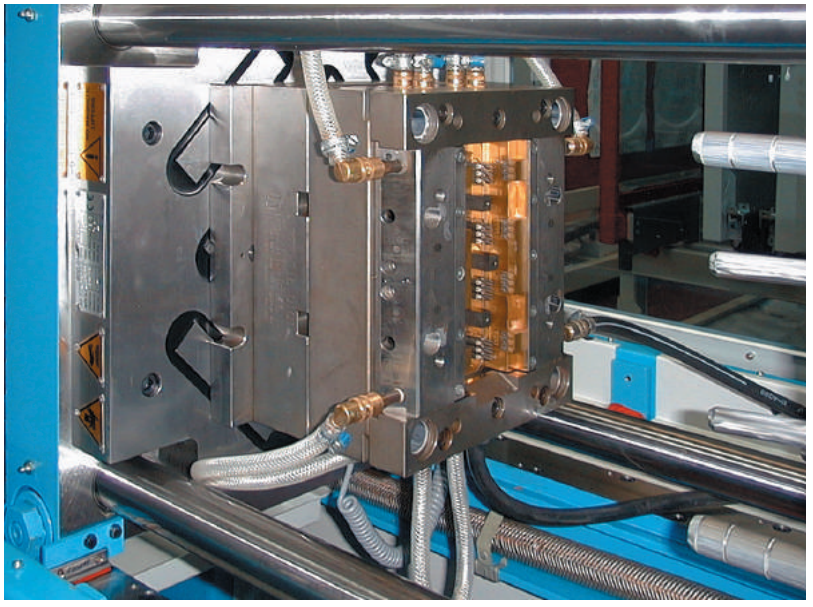
M-TECS magnetic clamping system general information

M-TECS magnetic plates ensure maximum power concentration. If a mold does not completely cover the magnetic plate surface, forces are directed to the clamping area, precisely where they are needed. This gives you maximum safety – a clear benefit particularly for small or medium molds.

Also, large molds are safely kept in place with the highest clamping forces. However for all types of machines, mold change takes just a matter of minutes. The solid webs between the poles result in outstanding rigidity of the structure which has a positive effect on product quality, mold wear and, as a consequence, on mold maintenance costs.

Magnetic clamping system on a vertical press for temperatures up to 240° C

Best time for retrofitting



Plastic injection molding using M-TECS 120

Advantages:

- perfect technology
- short downtimes
- low set-up costs
- increased productivity
- low investment costs
- rapid amortization
- enhanced production quality
- fewer rejects
- less mold wear, hence reduced maintenance costs

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Good start – quick change

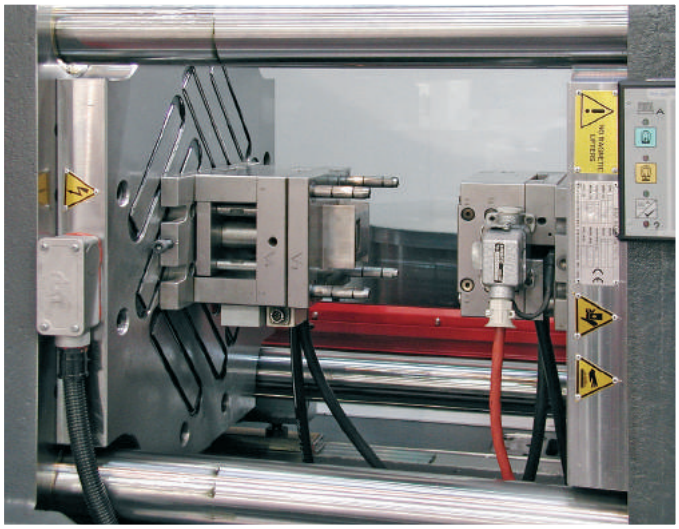
Gain time with M-TECS –
Low downtimes. High productivity. Low set-up cost.

Small batches entail frequent mold change. Whenever only few parts are required, M-TECS magnetic clamping technology provides a clear competitive advantage:

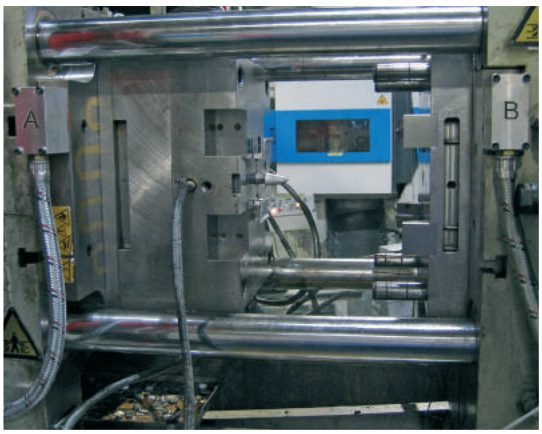
- low downtimes
- low set-up costs
- increased productivity

M-TECS is a magnetic clamping technology that sets standards for magnetic quick change systems for the plastics processing industry. M-TECS 120 and M-TECS 240 operate with an electric permanent magnet. Special long poles give maximum safety, maximum force, and perfect reliability.

The systems are designed to suit all types of machines (both horizontal and vertical) and can be easily retrofitted. Relatively low investment cost and short amortization times will convince all those who depend on flexibility and speed in the plastics processing industry.



**Even the smallest molds are securely held. Due to the long pole concentration effect maximum magnetic forces are transmitted into the mold base plate.
Machine FM 110 Electra, magnetic force 8 tons**



Magnetic clamping system on URPE die casting machine CC 125, closing force 1500 kN, magnetic force 110 kN, temperature range up to 240° C.

Test-run on exacting courses

M-TECS clamping systems were first used in the ceramics industry. In this environment, where conditions are much rougher than in injection molding, they have been widely applied and have handsomely stood the test.

M-TECS 120 and M-TECS 240 have proved demonstrably convincing in terms of force, safety, and reliability.
With their intriguing logic, both systems provide the most flexible and user-friendly handling.

Based on more than 30 years' experience in the field of magnetic clamping systems, M-TECS products have achieved a technological top position in the market.

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M-TECS 120

The quick change system for thermoplastics
Temperature stable up to 120° C

M-TECS magnetic clamping systems provide evident benefits: Injection molds, even if not standardized, can be easily and quickly changed without need for mold change. As a result of a clamping force which is evenly distributed all over the clamping surface, wear of the molds is considerably reduced which means lower mold maintenance costs.
With no moving parts, the system itself is basically maintenance-free. It is suitable for retrofitting on existing injection molding machines or incorporating into new machines.

M-TECS 120 being stable up to 120 °C, largely covers the whole temperature range that may occur in the thermoplastics processing industry. The magnetic poles have been designed to build up an actual clamping force of 18 kg/cm². Highest quality materials are used for the long pole design which is based on a double-magnet technology. Its outstanding power concentration makes the system much stronger than any comparable magnetic plates.

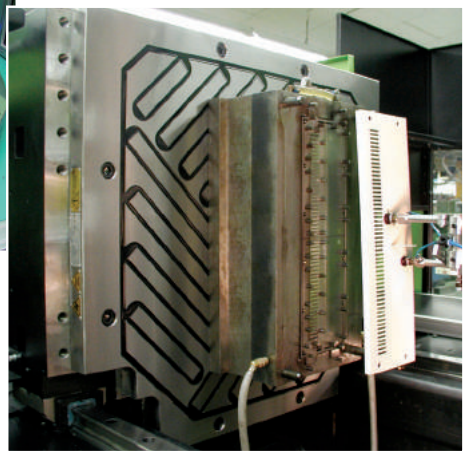
Technical data
M-TECS 120

Max. temperature	120° C
Specific magnetic force	18 kg/cm²
Effective magnetic force	5 – 12 kg/cm²
Magnetic penetration depth	15 – 20 mm
Plate thickness	47 mm
Fixing	as per Euromap

Available for all machine sizes

M-TECS 120-K – Changing time just a few minutes

M-TECS 120 - on a vertical rotary turntable machine



M-TECS 120 – An exceptional concentration of force: The magnetic force is transmitted through the long poles with double magnets into the clamping surface

A convincing technology to rely upon

Basically, the electric permanent magnet clamping system is firmly kept in place even in the case of a power failure: electricity is required for just 1–2 seconds to first magnetize the system.
Then permanent magnets generate the required magnetic clamping force so that the system operates independently of any power source. Only for releasing the mold is electric power required again (for 1–2 seconds) in order to demagnetize the clamping plate.
The integrated electronic controls monitor the magnetic force and the mold center and protect the system from overheating. This is our concept of advanced safety for man and machine.

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M-TECS 240

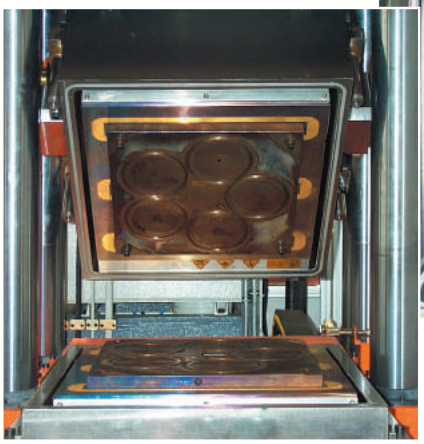
The quick change system for elastomer and thermosetting plastics
Temperature resistant up to 240° C

M-TECS 240 opens up new paths for the rubber and the thermosetting plastics processing industries. With no downtime or waiting time to cool down or heat up molds, changing times can sometimes be cut by hours.
Using the advanced magnetic clamping technology, molds can be changed even when they are hot as the operator will not make contact with them at all. This is both convenient and safe.

The magnetic plates have a complete metal surface. With no T-slot between the heating and the mold, temperatures inside the mold are quite homogeneous, which gives an enhanced production quality.
The system is available in various designs, for presses and injection molding machines of all sizes, vertical and horizontal, with or without heating.
A real highlight is the magnetic clamping plate M-TECS 240 with an integral heating plate.

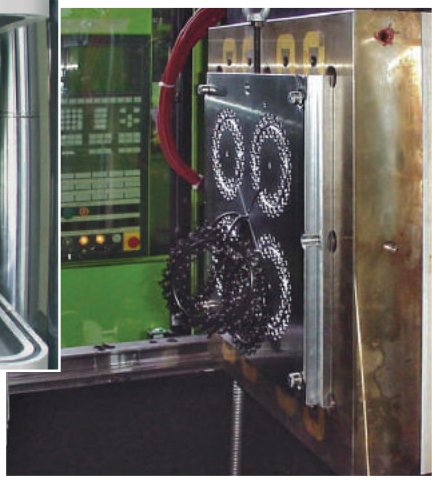
Technical data
M-TECS 240

Max. temperature	240° C
Specific magnetic force	18 kg/cm²
Effective magnetic force	5 – 12 kg/cm²
Magnetic penetration depth	15 – 20 mm
Plate thickness	55 – 85 mm (85 mm incl. heating plate)



M-TECS 240
Rubber press with vacuum chamber

M-TECS 240 on a vertical press – various molds on a machine bed without loss of space due to clamping claws



M-TECS 240 magnetic heating plate on an elastomer machine – full-surface magnetic force gives full-surface contact and more homogeneous temperatures

Guaranteed adaptability to any power level and any system design

M-TECS magnetic clamping systems have been CE tested and comply with the provisions of the applicable machine guidelines 98/37 EEC, 73/23 EEC and EMC 89/336.

The magnetic plates can be designed to fit various mold systems. With their highly flexible layout, they may be adapted to suit a large range of sizes and shapes. Each pole can be considered as an independent power source. Standard or special designs are available. You get a 2-year guarantee on both systems.

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Electric Control M1C and M2C
for magnetic clamping systems M-TECS

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Manual remote control

Description

Electric control M1C
The electric control M1C is used for small and medium-sized machines.

Dimensions	500 x 500 x 250 mm
Error display	not available
Connections	1 to 2

Electric control M2C
The electric control M2C is used for large machines.
An additional LCD display allows a quick diagnosis by the display of the error code.

Dimensions	vary depending on the machine size
Error display	yes
Connections	1 to 8

Manual remote control
With removable key-operated switch on the manual remote control to prevent unauthorized actuation.

Advantages
- Highest safety standards (as per EN 201/EN 289)
- Standardized integration via EUROMAP 70 interface
- Simple error diagnosis by software readout
- Easy to maintain by exchangeable master module
- Compact design
- Status display on the LED panel

Integration into the machine
For the integration of the magnetic clamping system into the machine, there are the following three alternatives:

Euromap 70.0 (complete integration)
- Two-channel release signal to the machine
- 3 release signals from the machine to the magnetic clamping system
- Control via remote control with key-operated switch (included in the delivery)
- Interface cable with plug connection

Euromap 70.1 (complete integration)
- Two-channel release signal to the machine
- 3 release signals from the machine to the magnetic clamping system
- Control via machine panel
- Interface cable with plug connection

Retrofit interface (partial integration)
- Two-channel release signal to the machine
- Without release signal from the machine to the magnetic clamping system
- 3-minute timer as a time slot for demagnetization
- Second key-operated switch as safe state for the release of the magnetic clamping system
- Interface cable with plug connection

Technical basic data

Voltage*	[V]	380 – 480
Frequency*	[Hz]	50 / 60
Fuses	[A]	32
Code class		IP 54

* as per customer's request

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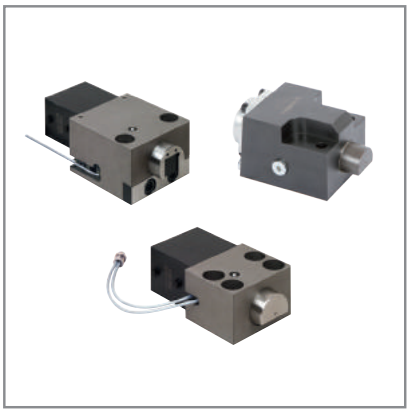
Die clamping and changing systems
from Hilma




Please contact us if you would like further information such as technical data sheets or spreadsheets for ROI calculation.
Also, we will be pleased to provide sample calculations of investment cost and amortization times, tailored to your application.

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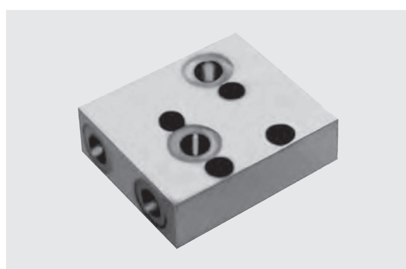

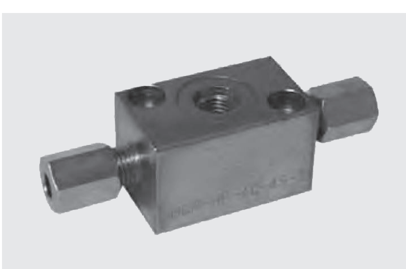

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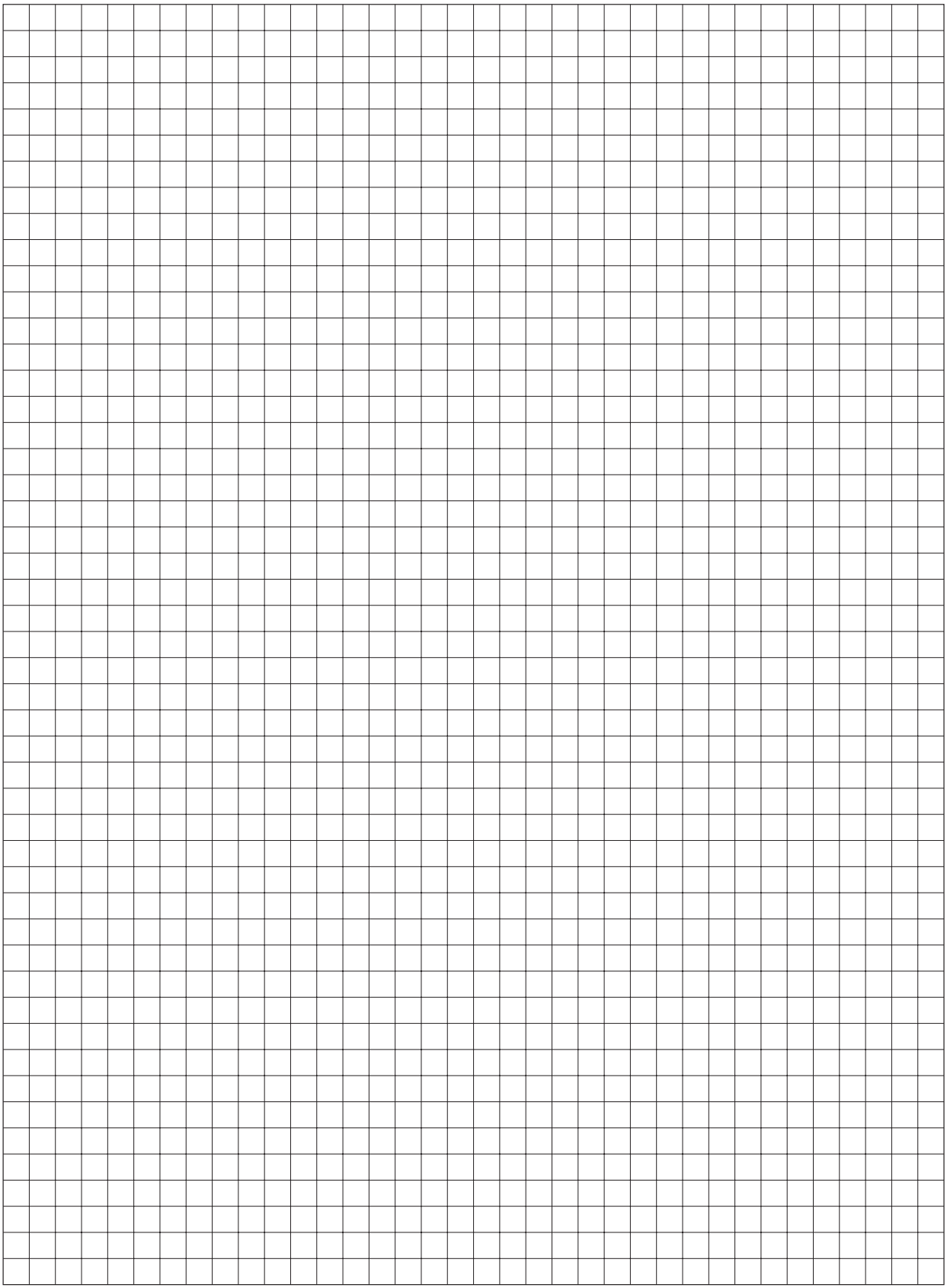

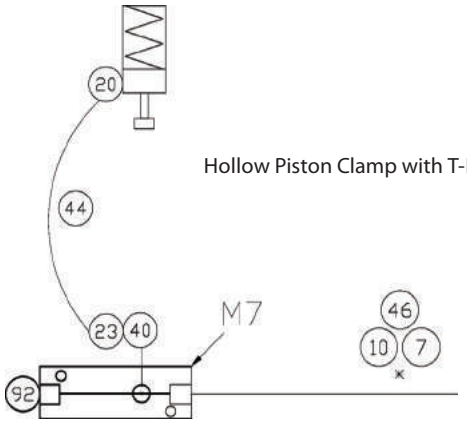

Figure 1

This expanded view of the diagram for a single hollow piston clamp shows the item numbers of the parts needed to connect this clamp to the circuit.

Application:

The hydraulic installation kit is custom designed per the needs of the application.

The components are selected to make the hydraulic connections to the various elements of the Hilma die clamp and lift system as shown on a diagram provided.

Description:

The kit includes lengths of steel tube with couplings, mounting clips and fittings plus the necessary bulk hose with reusable hose end fittings, all indicated by specific item numbers on the diagram. The diagram (see Figure 2) is a line schematic with the item numbers (see Figure 1) that link each part of the kit to an inventory sheet. The sheet also has generic part drawings to help identify each component. Individually purchased elements such as clamps, rollblocks, manifolds, connection blocks, and the power unit are identified on the diagram with their part numbers. An installation manual is included to help with tips and necessary procedures to facilitate the installation.

Advantages:

- all components selected for the maximum operating pressure, ports size and type
- line drawing with itemized list, to simplify the installation
- hose connections for moving parts, rigid tubing for fixed parts

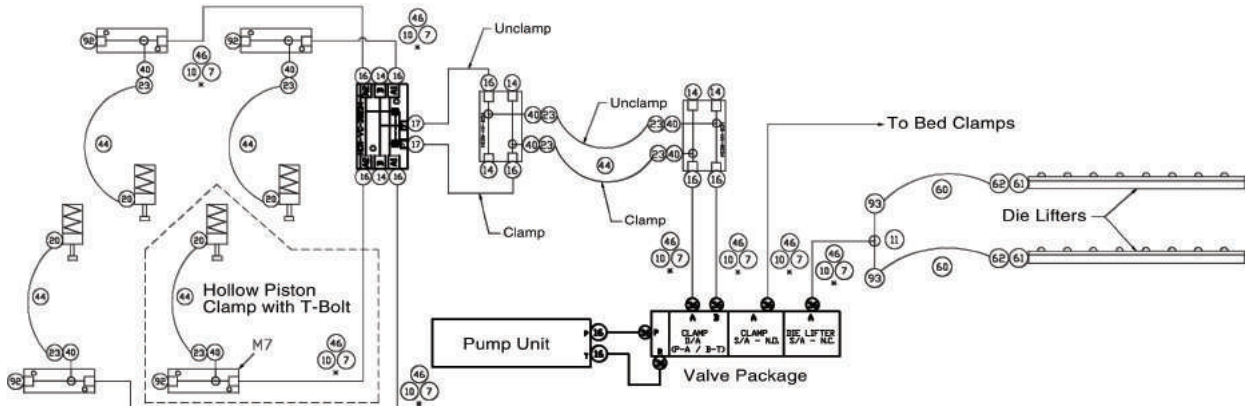

Figure 2

This kit diagram covers the pump and remote valve package with the four hollow piston clamps, hoses, and safety connection blocks on the slide and two rollblocks for the bolster.

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Control Panels
for controlling power units

Part no.	Clamp circuits	Die lifter circuits	Size
HCR-EC-S10	1	0	8 x 10 x 4
HCR-EC-S11	1	1	10 x 10 x 6
HCR-EC-S20	2	0	10 x 10 x 6
HCR-EC-S21	2	1	10 x 10 x 6

Application:

Control panels are used to operate clamp and die lift circuits which can be combind with the press's safety interlocks.

Description:

Standard prewired control panels with keyed swicthes for clamp controls and standard switches for die lift controls. Includes pilot lights for power on, slide clamped and bed clamped. Latching relays are used for bottom dead center and press enable circuits.

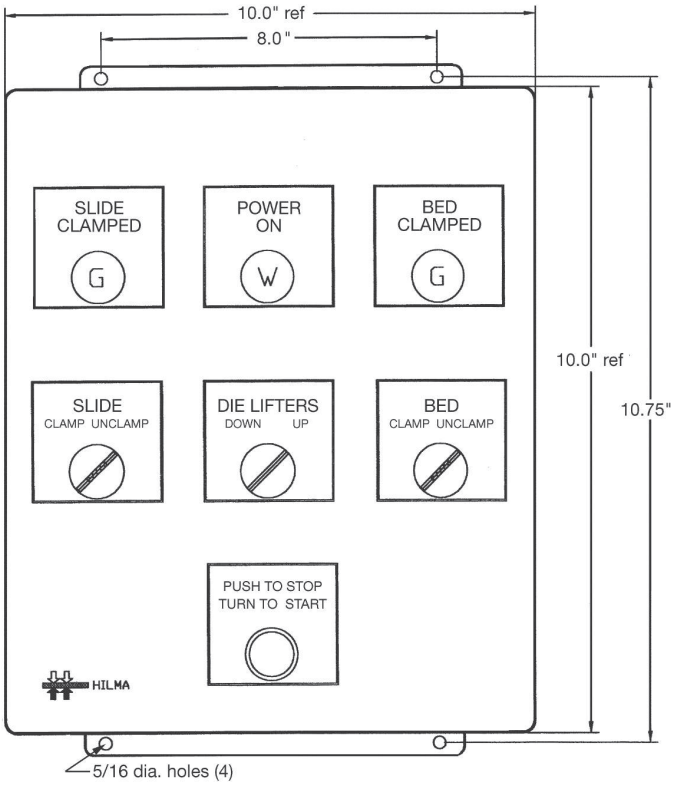
The control panel operates with 110 control voltage. Suitable for use with most Hilma power units with 110 VAC solenoid valves.

Advantanges:

- oil tight 10 x 10 x 6 enclosure or 8 x 10 x 4 enclosure for EC-S10
- prewire to terminal strip
- press safety interlock circuit
- clamp pressure LEDs
- keyed clamp switces

Specials:

Special control panels and complete PLC controls available upon request.



HCR-EC-S21 shown

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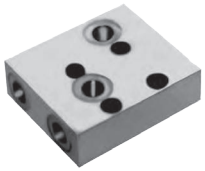

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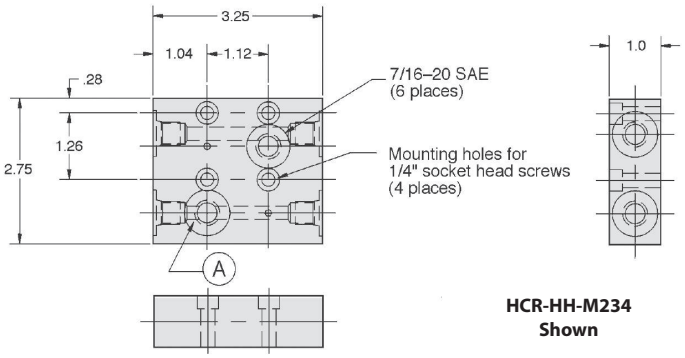
Manifold blocks single

Part no.	No. of circuits	No. of ports per circuit	Size of "A" SAE port (Th'd.)
HCR-HH-M134	1	3	#4 (7/16-20)
HCR-HH-M136	1	3	#6 (9/16-18)
HCR-HH-M144	1	4	#4 (7/16-20)
HCR-HH-M146	1	4	#6 (9/16-18)
HCR-HH-M234	2	3	#4 (7/16-20)
HCR-HH-M236	2	3	#6 (9/16-18)



HCR-HH-M234 Shown

Application:

These manifolds provide an oil distribution block for mounting directly on the press.

Description

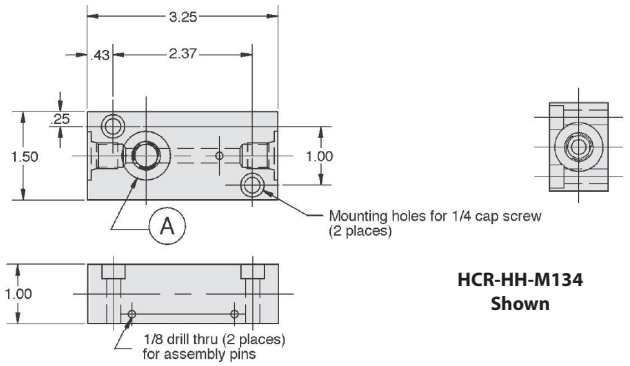
The manifolds are used as a secure transition point from rigid mounted tubing to flexible hose such as:

- From the press column to the slide clamp circuit.
- From the bolster or slide to the movable clamps.

Advantages:

- single units can be pinned together to create a multi-circuit manifold (pins included)
- standard SAE ports

Specials available on request.



HCR-HH-M134 Shown

HCR-HH-M134

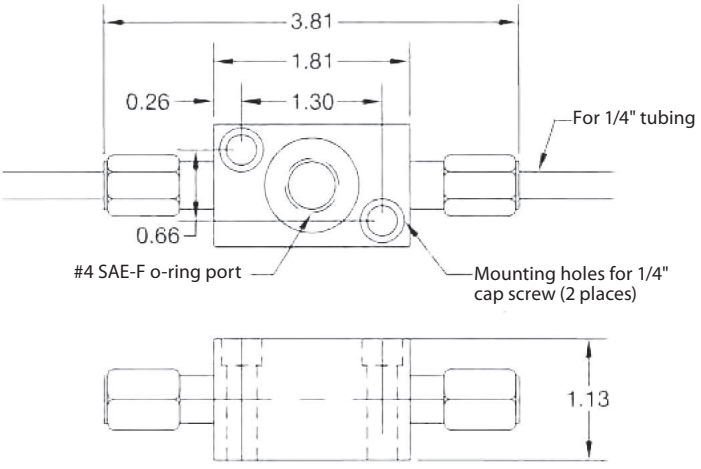
No. of circuits
No. of ports
Size of ports

HCR-HF-4C-4S-T

This custom manifold provides 1/4" compression fittings for tubing and SAE #4 outlet port for hose connection.

Nuts and ferrules included.

Optional cap HCR-HF-4-FNU-S



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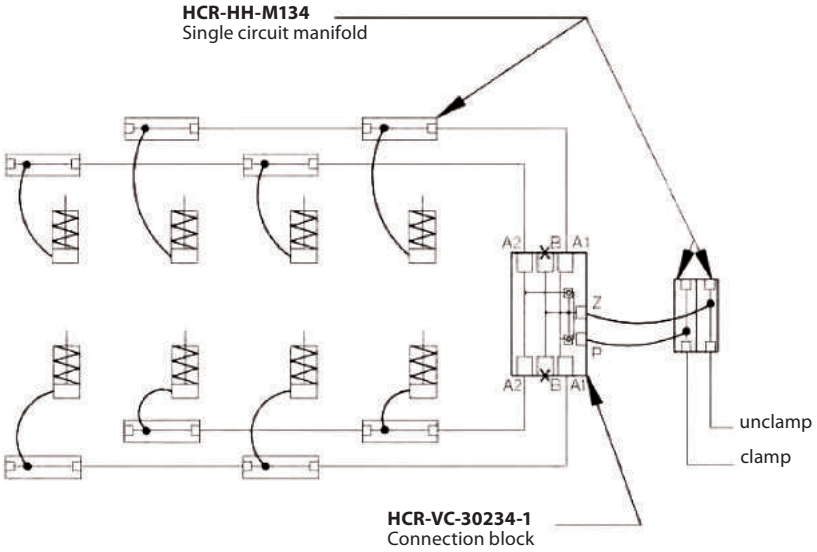
Application example A:

Hollow piston clamp circuit for the press side.

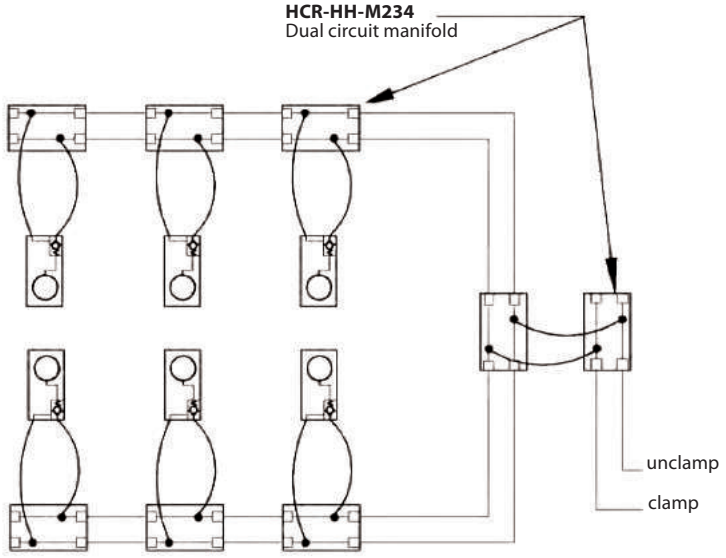
This circuit includes single-acting spring return cylinders with connection block having dual pilot operated check valve safety circuits.



Application example B:

Sliding clamp circuit for the press slide.

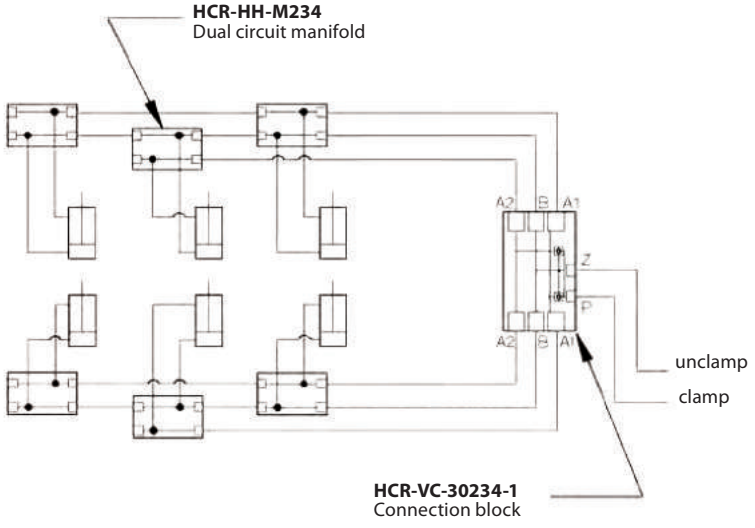
These clamps are single-acting spring return cylinders with an intergrated pilot operated check vlave in each clamp.



Application example C:

Double-acting clamp circuit for the press bolster.

Manifolds are used with hoses for service of clamps. This circuit includes double-acting cylinders such as a swing sink clamp, with a connection block having dual pilot operated check valve safety circuits.



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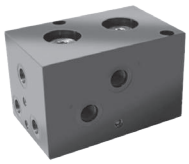
Connection Block
dual pilot operated check valves/ dual safety circuits



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Application:

This connection block provides an important safety function for most press clamp circuits. It can be used with single- or double-acting clamps on the press bed or slide.

Description:

The block splits incoming clamp line into two circuits. This provides dual safety protection for the bed or slide circuit by means of two pilot operated check valves.

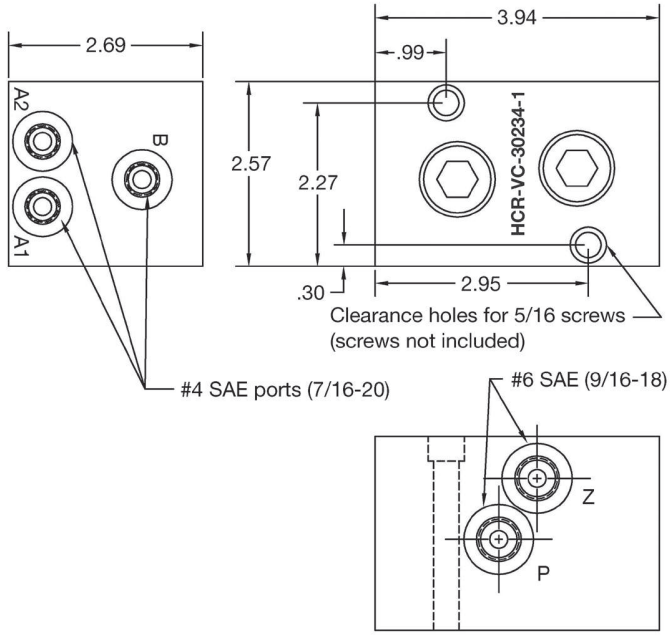
If there is a pressure loss in one circuit (A1) the opposite clamps in circuit (A2) stay clamped.

The pressure loss, monitored by a pressure switch at the pump triggers the press E-stop circuit.

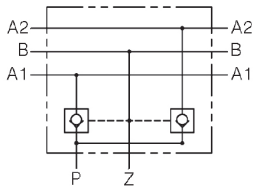
Not for use in high temperature applications.

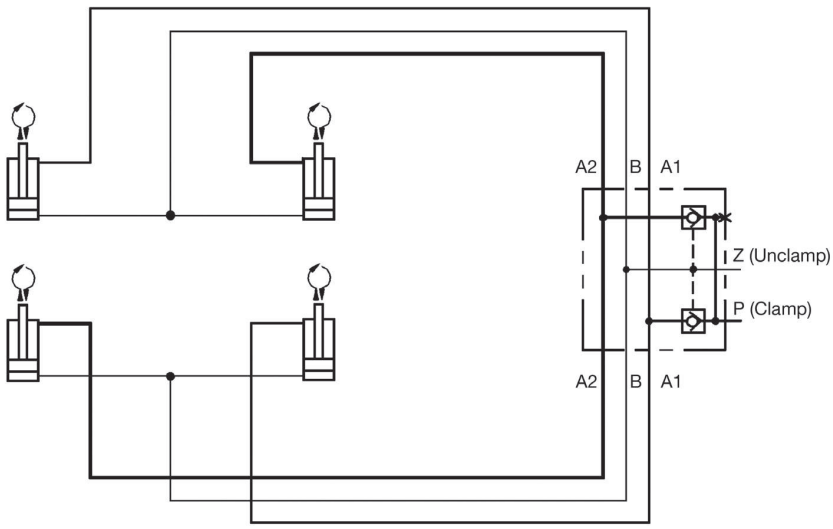
Advantages:

- dual safety circuits
- zero leak check valves



Schematic symbol





Typical schematic application:
Bed die clamp circuit using four swing sink clamps.

Technical data

Max. operating pressure	(psi)	5,800
Max. flow rate	(cu in/min)	900
Output ports	SAE (thread)	#4 (7/16-20)
Input ports	SAE (thread)	#6 (9/16-18)
Weight	(lbs)	7.5
Release pressure of check valves is 38% of clamp pressure		
Part no.		**HCR-VC-30234-1**

Carr Lane Roemheld Mfg Co.
927 Horan Drive, Fenton, MO 63026
Phone 800-827-2526 Fax 636-386-8034 www.roemheld-usa.com

CARR LANE ROEMHELD GUARANTEE OF QUALITY

Carr Lane Roemheld components are carefully designed, manufactured, inspected, and individually tested prior to shipment. In the unlikely case you find a defect in materials or workmanship within 12 months after receipt, we will promptly repair or replace the component, in accordance with our Limited Warranty below. Our liability is limited to replacement of the part and this warranty does not apply to altered or misapplied products.

Limited Warranty

Seller warrants that the product described herein will be free from defects in material and workmanship. If any failure to conform to this warranty be found within twelve (12) months, from date of receipt of the product by Buyer, and Seller is given immediate notification thereof, Seller, upon being satisfied of the existence of such nonconformity, will correct the same by replacement of the defective product or making suitable repairs. If the Seller is unable to correct such nonconformity by replacement of the product or making suitable repairs, whether due to the nature of such nonconformity, the use made by the Buyer of the product, or for any other reason, it will return to Buyer the price set forth herein, or where appropriate, the unit price for such number or quantity of products as shall have such nonconformity which Seller is unable to correct, upon Seller's receipt of the nonconforming product f.o.b. its plant; provided, however, no product shall be returned to Seller without its express written consent; and provided further that such receipt of any nonconforming product will not be required where it is no longer possible for Buyer to return the same to Seller. In no event shall Seller be liable to Buyer, either directly or by way of contribution or indemnity, for direct, special, incidental or consequential damages such as, but not limited to, property damage, loss of profit, damages based on loss of use of the product, or damages for cover, whether the claim for any such damages be based on warranty, express or implied, contract, tort, or otherwise. THE FOREGOING IS SELLER'S SOLE WARRANTY WITH RESPECT TO THE PRODUCT. SELLER MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.