

HILMA M-TECS Magnetic Clamping Safety Features

M-TECS PERMANENT MAGNET CLAMPING SYSTEM SECURELY HOLDS YOUR MOLD IN PLACE, EVEN IN THE CASE OF A POWER FAILURE

Permanent magnets in the M-TECS system generate the required magnetic clamping force independent of any power source, which holds your mold in place, even the case of a power failure. Electrical power is only required for 1-2 seconds to initially magnetize or demagnetize the mold.

The M-TECS integrated electronic controls constantly monitor the platen's magnetic force and its temperature to protect the clamping system. This status of the magnetic system is indicated on the control pendant, the LED diagnostic panel and interfaced with the machine controls.

A fault will signal the press, protecting the operator and the equipment.

M-TECS Safety Features

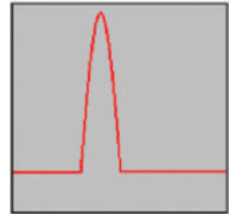
- **Mag/Demag Current Monitor**
- **Detaching Sensor Circuit**
- **Platen Mounted Limit Switch**
- **Thermal Protection**
- **Software Scan Circuit**
- **Over Cycle Circuit Protection**
- **QMC Selector Switch**
- **Clamp/Unclamp Safety Process**



Mag/Demag Current Monitor -

This circuit monitors the current to magnetize and demagnetize. If the current is not within specification, the displays will signal a fault.

Detaching Sensor Circuit - This circuit detects small movement of the mold by monitoring the coils of the magnetic platen. Mold movement will cause a voltage spike in the detaching circuit, sending a signal to the press controls.



Platen Mounted Limit Switch - This switch is designed to detect the presence of a mold in the injection molding machine. When the mold is in position, the limit switch will be depressed and allow the mold to be clamped. When clamped, the M-TECS controller provides a permissive signal to the machine for press operation.

On M-TECS 120 systems, limit switches are standard features. Both fixed and moveable magnetic platens will have a limit switch located near the center of each platen. The location of the switch defines the minimum mold size.

On M-TECS 230 systems, limit switches may be included. Dual redundant limit switches and radius buttons are also available per the demands of the application.

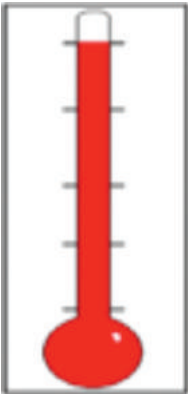


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Thermal Protection – The platen is protected with a thermal sensor. Without this safety feature, the magnetic clamping force can be reduced and the internal coils and magnets can be permanently damaged if the temperature increases above a safe level.

This sensor monitors the temperature of the magnetic platens, and is designed to stop all operation when the temperature is exceeded. It is automatically reset.

Software Scan Circuit – This program, designed within the controller, periodically scans the system software for proper operation. This includes proper current levels for magnetizing the platens and constant real time monitoring of the remote sensors. In the event there is a fault, it displays on the LED panel and the injection mold machine is immediately brought to a stop.



M-TECS QMC Selector Switch – This keyed selector switch is mounted on the remote control pendant.



Clamp /Unclamp Safety Process – It is very difficult to accidentally magnetize or demagnetize the mold.

To demagnetize, the M-TECS system has four steps that are required:

1. A signal that the press is in set up mode is required from the IMM
2. A signal is given with the MTEC key switch that should be turned on after the IMM is in the set up mode
3. The operator must press two buttons on the remote pendant at the same time
4. These two buttons must be held for at least one second

To magnetize, the platen mounted limit switch must be depressed, then the four steps listed above must also be executed.



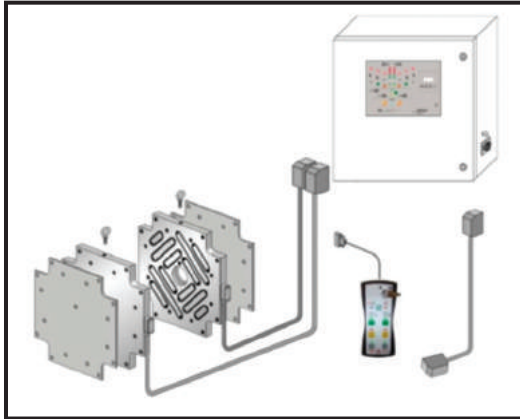
M-TECS Magnetic Clamping System to Machine Interface – The following components are part of the standard M-TECS system to be assembled at time of installation:

- Moving platen
- Interface box CD1 (per SPI & Euromap)
- Stationary platen
- Keyswitch
- M1C or M2C controller
- Remote control
- LED diagnostic panel
- All required cables
- Thermal isolation pads are also supplied when ordered with integrated heated platens.

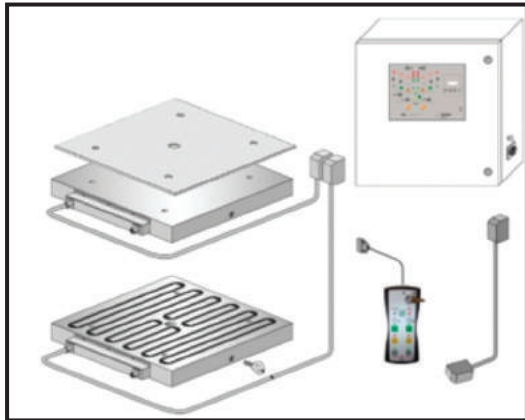


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This interface provides the communication between the control system and the injection molding machine. The interface package is included with a standard M-TECS system.



M-Tecs 120 system for a horizontal IMM



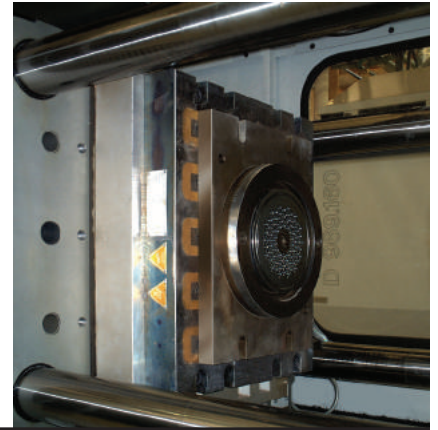
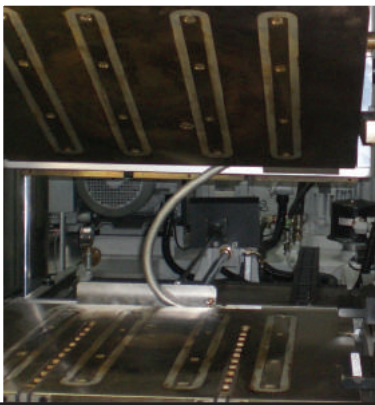
M-Tecs 230 system for a vertical press

Run Mode – The machine receives a permissive signal to run by the M-TECS system by means of a contact closure (dry contact). This occurs when the platen mounted limit switch is closed, and the temperature is within the defined tolerance range.

Set-Up Mode for Mold Change – To magnetize or demagnetize the mold, the machine should be in the set-up mode and in a defined position or state, where a safe mold change can occur, the machine controls can then release the M-TECS system to clamp or unclamp. Changes to the machine software are normally not required. Voltage supply for the controls: 208, 400 or 480 VAC (Single phase) Control Voltage 24VDC.



HILMA M-TECS



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