MC Controllers



For full product information, visit www.sti.com. Use the SpeedSPEC Code for quick access to the specific web page.

MC3, MC4 and MC6 Series **Safety Mat Controllers**

The MC Series safety mat controllers are used in conjunction with a four-wire, normally open, safety mat where perimeter guarding is required. These control reliable controllers send a stop signal to the guarded machine when an object of sufficient weight is detected on the active mat area.

The MC Series controllers, when combined with a four-wire UM or UMQ series mat, provide access guarding and improved productivity. The work area is fully visible and accessible.

The controller meets the requirement of EN 1760-1:1998, EN 13849-1, ANSI/RIA 15.06-1999 (R2009), ANSI B11.19-2010, OSHA 1910-217C, CSA and UL508.

· A Rapid Delivery Product: Select models are available for shipment today or within 3 to 5 days

Options

- · Lid-mounted reset key switch
- Quick disconnect for incoming power and relay outputs

CE & ®

- Quick disconnects up to 6 mat zone inputs

- Solid-state safety output module

Safety relay output module

MC6

- Universal power input
- Up to 6 mat zone inputs
- Six mat zone status indicator LEDs
- Select from Automatic Start, Start/Restart Interlock or Start Interlock operating modes
- MPCE monitoring
- Remote access to reset functions
- 2-digit numeric display for fault diagnostics
- · Surface mount, lockable metal enclosure

Description

MC3

The MC3 DIN mount controller may be used in applications that do not require the feature set of the MC6 controller. The MC3 single zone mat controller has removable terminal blocks and operates only on 24 VDC.

MC4

The MC4 is a NEMA 4, 12 rated single zone mat controller. This controller may be used in applications when the diagnostic features of the MC6 may not be required. The MC4 may be ordered in either 24 VDC or the universal auto-selecting power supply for 100-240 VAC.

MC₆

The MC6 is a NEMA 4, 12 controller with six individual mat zone indicators and is designed to be backward compatible with the MC4. Both units are dimensionally identical. This is where the similarities stop: The MC6 has full featured diagnostics with a 24 VDC and an optional universal power supply (100-240 VAC autoselecting). It is a controller that can be used anywhere in the world.

Additional Guarding Requirements

A safety mat system is often only one part of a machine guarding solution. If the safety mat does not protect all access to the point of operation, additional guarding must be used. Safety mat systems should only be used to detect the presence, not the absence, of a force.

Perimeter Guarding Requirements

For perimeter guarding installations, the guarded machine or robot controller must be wired such that any stop signal generated by the safety mat system will cause an immediate stop of the hazardous motion. The machine or robot must only be restarted by the actuation of a manual reset switch. This reset switch must be located outside the area of hazardous motion and positioned such that the hazardous area can be observed by the switch operator. The purpose of this arrangement is to prevent a machine or robot from automatically restarting once the sensing weight is no longer detected by the safety mat sensing area.

Select models are available for Rapid Delivery.





Specifications

Controller Specifications	МСЗ	MC4	MC6
Performance		,	
Category 3 Safety Device:	Yes		
Max Input Resistance:	8 ohm per input channel		
Response Time:	< 30 msec		
Indications:	1 - Green = Run 1 - Red = Stop 1 - Green = Mat Clear		1 - 2 Digit Diagnostic Display 1 - Green = Run 1 - Red = Stop 1 - Green = Mat Clear 1 - Yellow = Interlock 6 - Red = Mat Zones
Operational Modes: (Selectable)	Automatic Start, Start/Restart Interlo	ck	DIP Switch Selected, Automatic Start, Start/Restart Interlock Start Interlock
Electrical			- Interiori
Power Input:	24 VDC ± 15% < 3 watts	24 VDC ± 10% < 3 watts or Autoselecting, 100 - 240 VAC ± 10%, 20 watts	24 VDC ± 10% 10 watts (Relay), 24 VDC ± 10% 50 watts (Solid- State), or Autoselecting, 100 - 240 VAC ± 10%, 20 watts
Safety Inputs:	One - 4-wire UM Safety Mat, or group series as one input. Approximately 12 multiple mats may be connected to a single zone in series; Do not exceed 8 ohms per input channel Connections for up to six, - 4-wire UM Safety Mats Approximately 12 multiple mats may be connected to a single zone in series Do not exceed 8 ohms per input channel		
Safety Output Relays:	2 NO and 2 NC		2 NO and 1 NC
Maximum Switched Current:	230 VAC, 6 A, 1500 watts 24 VDC - 2	2 A Inductive, 6 A Resistive	230 VAC, 7 A, 1600 watts 24 VDC 2 A Inductive, 6 A Resistive
MPCE:	n/a		DIP Switch -
Aux. Output Relay:	None (NC may be used as Aux)		1 NO and 1 NC
Maximum Switched Current:	230 VAC, 6 A, 1500 watts 30 VDC, 1.0 A	230 VAC, 6 A, 1500 watts	125 VAC, 0.5 A
Relay Life:	Mechanical = 10M operations		
Terminal Blocks:	Removable Pressure point screw	Cage clamp terminal strip	Cage clamp terminal strip & 2-part terminal blocks
Options	MOL	19	
Solid-State Outputs			
Solid-State Safety Outputs:	n/a		2 Current Sourcing 24 VDC (PNP)
Maximum Switched Current:	n/a		0.625 A @ 24 VDC
Solid-State Aux. Outputs:	n/a		0.625 A @ 24 VDC 1 Current Sourcing (PNP) and 1 Current Sinking (NPN)
			0.625 A @ 24 VDC 1 Current Sourcing (PNP) and
Solid-State Aux. Outputs: Maximum Switched Current:	n/a		0.625 A @ 24 VDC 1 Current Sourcing (PNP) and 1 Current Sinking (NPN) Current Sourcing Max: 0.5 A @ 24 VDC Current Sinking Max:
Solid-State Aux. Outputs:	n/a	Yes	0.625 A @ 24 VDC 1 Current Sourcing (PNP) and 1 Current Sinking (NPN) Current Sourcing Max: 0.5 A @ 24 VDC Current Sinking Max:
Solid-State Aux. Outputs: Maximum Switched Current: Reset Function	n/a n/a		0.625 A @ 24 VDC 1 Current Sourcing (PNP) and 1 Current Sinking (NPN) Current Sourcing Max: 0.5 A @ 24 VDC Current Sinking Max:
Solid-State Aux. Outputs: Maximum Switched Current: Reset Function Key-switch (factory installed):	n/a n/a n/a		0.625 A @ 24 VDC 1 Current Sourcing (PNP) and 1 Current Sinking (NPN) Current Sourcing Max: 0.5 A @ 24 VDC Current Sinking Max: 0.1 A @ 24 VDC
Solid-State Aux. Outputs: Maximum Switched Current: Reset Function Key-switch (factory installed): Remote:	n/a n/a n/a n/a user supplied, Key-switch, or Pushb	utton	0.625 A @ 24 VDC 1 Current Sourcing (PNP) and 1 Current Sinking (NPN) Current Sourcing Max: 0.5 A @ 24 VDC Current Sinking Max: 0.1 A @ 24 VDC
Solid-State Aux. Outputs: Maximum Switched Current: Reset Function Key-switch (factory installed): Remote: Mat Input Connectors: Power Input and Safety Output	n/a n/a n/a n/a user supplied, Key-switch, or Pushb n/a	utton Up to six quick-disconnect connect	0.625 A @ 24 VDC 1 Current Sourcing (PNP) and 1 Current Sinking (NPN) Current Sourcing Max: 0.5 A @ 24 VDC Current Sinking Max: 0.1 A @ 24 VDC
Solid-State Aux. Outputs: Maximum Switched Current: Reset Function Key-switch (factory installed): Remote: Mat Input Connectors: Power Input and Safety Output Connector:	n/a n/a n/a n/a user supplied, Key-switch, or Pushb n/a n/a	utton Up to six quick-disconnect connect Yes	0.625 A @ 24 VDC 1 Current Sourcing (PNP) and 1 Current Sinking (NPN) Current Sourcing Max: 0.5 A @ 24 VDC Current Sinking Max: 0.1 A @ 24 VDC
Solid-State Aux. Outputs: Maximum Switched Current: Reset Function Key-switch (factory installed): Remote: Mat Input Connectors: Power Input and Safety Output Connector: Enclosure:	n/a n/a n/a n/a user supplied, Key-switch, or Pushb n/a n/a Polycarbonate	utton Up to six quick-disconnect connect Yes Polyurethane-painted 14 ga. steel	0.625 A @ 24 VDC 1 Current Sourcing (PNP) and 1 Current Sinking (NPN) Current Sourcing Max: 0.5 A @ 24 VDC Current Sinking Max: 0.1 A @ 24 VDC
Solid-State Aux. Outputs: Maximum Switched Current: Reset Function Key-switch (factory installed): Remote: Mat Input Connectors: Power Input and Safety Output Connector: Enclosure: Mounting:	n/a n/a n/a n/a user supplied, Key-switch, or Pushb n/a n/a Polycarbonate	utton Up to six quick-disconnect connect Yes Polyurethane-painted 14 ga. steel	0.625 A @ 24 VDC 1 Current Sourcing (PNP) and 1 Current Sinking (NPN) Current Sourcing Max: 0.5 A @ 24 VDC Current Sinking Max: 0.1 A @ 24 VDC
Solid-State Aux. Outputs: Maximum Switched Current: Reset Function Key-switch (factory installed): Remote: Mat Input Connectors: Power Input and Safety Output Connector: Enclosure: Mounting: Environmental	n/a n/a n/a user supplied, Key-switch, or Pushb n/a n/a Polycarbonate 35 mm DIN rail	utton Up to six quick-disconnect connect Yes Polyurethane-painted 14 ga. steel Surface Mount	0.625 A @ 24 VDC 1 Current Sourcing (PNP) and 1 Current Sinking (NPN) Current Sourcing Max: 0.5 A @ 24 VDC Current Sinking Max: 0.1 A @ 24 VDC
Solid-State Aux. Outputs: Maximum Switched Current: Reset Function Key-switch (factory installed): Remote: Mat Input Connectors: Power Input and Safety Output Connector: Enclosure: Mounting: Environmental Protection Rating:	n/a n/a n/a user supplied, Key-switch, or Pushb n/a n/a Polycarbonate 35 mm DIN rail	utton Up to six quick-disconnect connect Yes Polyurethane-painted 14 ga. steel Surface Mount IP65/NEMA 4, 12	0.625 A @ 24 VDC 1 Current Sourcing (PNP) and 1 Current Sinking (NPN) Current Sourcing Max: 0.5 A @ 24 VDC Current Sinking Max: 0.1 A @ 24 VDC
Solid-State Aux. Outputs: Maximum Switched Current: Reset Function Key-switch (factory installed): Remote: Mat Input Connectors: Power Input and Safety Output Connector: Enclosure: Mounting: Environmental Protection Rating: Operating Temperature:	n/a n/a n/a user supplied, Key-switch, or Pushb n/a n/a Polycarbonate 35 mm DIN rail IP20 0 to 55°C (32 to 131° F)	utton Up to six quick-disconnect connect Yes Polyurethane-painted 14 ga. steel Surface Mount IP65/NEMA 4, 12	0.625 A @ 24 VDC 1 Current Sourcing (PNP) and 1 Current Sinking (NPN) Current Sourcing Max: 0.5 A @ 24 VDC Current Sinking Max: 0.1 A @ 24 VDC
Solid-State Aux. Outputs: Maximum Switched Current: Reset Function Key-switch (factory installed): Remote: Mat Input Connectors: Power Input and Safety Output Connector: Enclosure: Mounting: Environmental Protection Rating: Operating Temperature: Relative Humidity:	n/a n/a n/a user supplied, Key-switch, or Pushb n/a n/a Polycarbonate 35 mm DIN rail IP20 0 to 55°C (32 to 131° F) 90%	utton Up to six quick-disconnect connect Yes Polyurethane-painted 14 ga. steel Surface Mount IP65/NEMA 4, 12 0 to 55°C (32 to 131°F) 10-55 Hz at 5 g max on three axis	0.625 A @ 24 VDC 1 Current Sourcing (PNP) and 1 Current Sinking (NPN) Current Sourcing Max: 0.5 A @ 24 VDC Current Sinking Max: 0.1 A @ 24 VDC
Solid-State Aux. Outputs: Maximum Switched Current: Reset Function Key-switch (factory installed): Remote: Mat Input Connectors: Power Input and Safety Output Connector: Enclosure: Mounting: Environmental Protection Rating: Operating Temperature: Relative Humidity: Vibration:	n/a n/a n/a user supplied, Key-switch, or Pushb n/a n/a Polycarbonate 35 mm DIN rail IP20 0 to 55°C (32 to 131° F) 90% 5-60 Hz at 5 g max on three axis	utton Up to six quick-disconnect connect Yes Polyurethane-painted 14 ga. steel Surface Mount IP65/NEMA 4, 12 0 to 55°C (32 to 131°F) 10-55 Hz at 5 g max on three axis	0.625 A @ 24 VDC 1 Current Sourcing (PNP) and 1 Current Sinking (NPN) Current Sourcing Max: 0.5 A @ 24 VDC Current Sinking Max: 0.1 A @ 24 VDC
Solid-State Aux. Outputs: Maximum Switched Current: Reset Function Key-switch (factory installed): Remote: Mat Input Connectors: Power Input and Safety Output Connector: Enclosure: Mounting: Environmental Protection Rating: Operating Temperature: Relative Humidity: Vibration: Shock:	n/a n/a n/a user supplied, Key-switch, or Pushb n/a n/a Polycarbonate 35 mm DIN rail IP20 0 to 55°C (32 to 131° F) 90% 5-60 Hz at 5 g max on three axis	utton Up to six quick-disconnect connect Yes Polyurethane-painted 14 ga. steel Surface Mount IP65/NEMA 4, 12 0 to 55°C (32 to 131°F) 10-55 Hz at 5 g max on three axis each axis on 3 axis	0.625 A @ 24 VDC 1 Current Sourcing (PNP) and 1 Current Sinking (NPN) Current Sourcing Max: 0.5 A @ 24 VDC Current Sinking Max: 0.1 A @ 24 VDC
Solid-State Aux. Outputs: Maximum Switched Current: Reset Function Key-switch (factory installed): Remote: Mat Input Connectors: Power Input and Safety Output Connector: Enclosure: Mounting: Environmental Protection Rating: Operating Temperature: Relative Humidity: Vibration: Shock: Electromagnetic Compatibility (EMC)	n/a n/a n/a user supplied, Key-switch, or Pushb n/a n/a Polycarbonate 35 mm DIN rail IP20 0 to 55°C (32 to 131° F) 90% 5-60 Hz at 5 g max on three axis 10 g for 0.016 sec., 1000 shocks for	utton Up to six quick-disconnect connect Yes Polyurethane-painted 14 ga. steel Surface Mount IP65/NEMA 4, 12 0 to 55°C (32 to 131°F) 10-55 Hz at 5 g max on three axis each axis on 3 axis	0.625 A @ 24 VDC 1 Current Sourcing (PNP) and 1 Current Sinking (NPN) Current Sourcing Max: 0.5 A @ 24 VDC Current Sinking Max: 0.1 A @ 24 VDC
Solid-State Aux. Outputs: Maximum Switched Current: Reset Function Key-switch (factory installed): Remote: Mat Input Connectors: Power Input and Safety Output Connector: Enclosure: Mounting: Environmental Protection Rating: Operating Temperature: Relative Humidity: Vibration: Shock: Electromagnetic Compatibility (EMC) Electrostatic Discharge (ESD): Radiated RF Field: Electrical Fast Transients (EFT):	n/a n/a user supplied, Key-switch, or Pushb n/a Polycarbonate 35 mm DIN rail IP20 0 to 55°C (32 to 131° F) 90% 5-60 Hz at 5 g max on three axis 10 g for 0.016 sec., 1000 shocks for ±8 kV (air discharge), ±6 kV (contact 10 V/m, 80 to 1,000 MHz ±2 kV (all power and I/O ports)	utton Up to six quick-disconnect connect Yes Polyurethane-painted 14 ga. steel Surface Mount IP65/NEMA 4, 12 0 to 55°C (32 to 131°F) 10-55 Hz at 5 g max on three axis each axis on 3 axis	0.625 A @ 24 VDC 1 Current Sourcing (PNP) and 1 Current Sinking (NPN) Current Sourcing Max: 0.5 A @ 24 VDC Current Sinking Max: 0.1 A @ 24 VDC
Solid-State Aux. Outputs: Maximum Switched Current: Reset Function Key-switch (factory installed): Remote: Mat Input Connectors: Power Input and Safety Output Connector: Enclosure: Mounting: Environmental Protection Rating: Operating Temperature: Relative Humidity: Vibration: Shock: Electromagnetic Compatibility (EMC) Electrostatic Discharge (ESD): Radiated RF Field: Electrical Fast Transients (EFT): Surge:	n/a n/a n/a n/a user supplied, Key-switch, or Pushb n/a n/a Polycarbonate 35 mm DIN rail IP20 0 to 55°C (32 to 131° F) 90% 5-60 Hz at 5 g max on three axis 10 g for 0.016 sec., 1000 shocks for ±8 kV (air discharge), ±6 kV (contact 10 V/m, 80 to 1,000 MHz ±2 kV (all power and I/O ports) ± 2 kV (all power and I/O ports)	utton Up to six quick-disconnect connect Yes Polyurethane-painted 14 ga. steel Surface Mount IP65/NEMA 4, 12 0 to 55°C (32 to 131°F) 10-55 Hz at 5 g max on three axis each axis on 3 axis tt discharge)	0.625 A @ 24 VDC 1 Current Sourcing (PNP) and 1 Current Sinking (NPN) Current Sourcing Max: 0.5 A @ 24 VDC Current Sinking Max: 0.1 A @ 24 VDC
Solid-State Aux. Outputs: Maximum Switched Current: Reset Function Key-switch (factory installed): Remote: Mat Input Connectors: Power Input and Safety Output Connector: Enclosure: Mounting: Environmental Protection Rating: Operating Temperature: Relative Humidity: Vibration: Shock: Electromagnetic Compatibility (EMC) Electrostatic Discharge (ESD): Radiated RF Field: Electrical Fast Transients (EFT): Surge: Shipping Wt.:	n/a n/a n/a n/a user supplied, Key-switch, or Pushb n/a n/a Polycarbonate 35 mm DIN rail IP20 0 to 55°C (32 to 131° F) 90% 5-60 Hz at 5 g max on three axis 10 g for 0.016 sec., 1000 shocks for ±8 kV (air discharge), ±6 kV (contact 10 V/m, 80 to 1,000 MHz ±2 kV (all power and I/O ports) ± 2 kV (all power and I/O ports) 0.22 kg (0.8 lbs.)	utton Up to six quick-disconnect connect Yes Polyurethane-painted 14 ga. steel Surface Mount IP65/NEMA 4, 12 0 to 55°C (32 to 131°F) 10-55 Hz at 5 g max on three axis each axis on 3 axis It discharge) Approx 4 kg (9.0 lbs.)	0.625 A @ 24 VDC 1 Current Sourcing (PNP) and 1 Current Sinking (NPN) Current Sourcing Max: 0.5 A @ 24 VDC Current Sinking Max: 0.1 A @ 24 VDC
Solid-State Aux. Outputs: Maximum Switched Current: Reset Function Key-switch (factory installed): Remote: Mat Input Connectors: Power Input and Safety Output Connector: Enclosure: Mounting: Environmental Protection Rating: Operating Temperature: Relative Humidity: Vibration: Shock: Electromagnetic Compatibility (EMC) Electrostatic Discharge (ESD): Radiated RF Field: Electrical Fast Transients (EFT): Surge:	n/a n/a n/a n/a user supplied, Key-switch, or Pushb n/a n/a Polycarbonate 35 mm DIN rail IP20 0 to 55°C (32 to 131° F) 90% 5-60 Hz at 5 g max on three axis 10 g for 0.016 sec., 1000 shocks for ±8 kV (air discharge), ±6 kV (contact 10 V/m, 80 to 1,000 MHz ±2 kV (all power and I/O ports) ± 2 kV (all power and I/O ports)	utton Up to six quick-disconnect connect Yes Polyurethane-painted 14 ga. steel Surface Mount IP65/NEMA 4, 12 0 to 55°C (32 to 131°F) 10-55 Hz at 5 g max on three axis each axis on 3 axis tt discharge)	0.625 A @ 24 VDC 1 Current Sourcing (PNP) and 1 Current Sinking (NPN) Current Sourcing Max: 0.5 A @ 24 VDC Current Sinking Max: 0.1 A @ 24 VDC

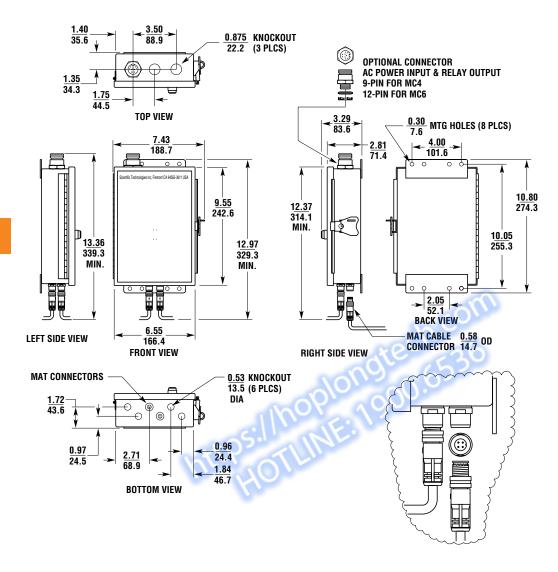
Specifications are subject to change without notice.





Dimensions (in./mm)

MC4, MC6

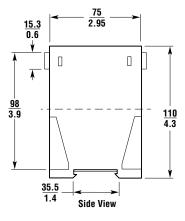


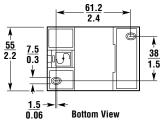




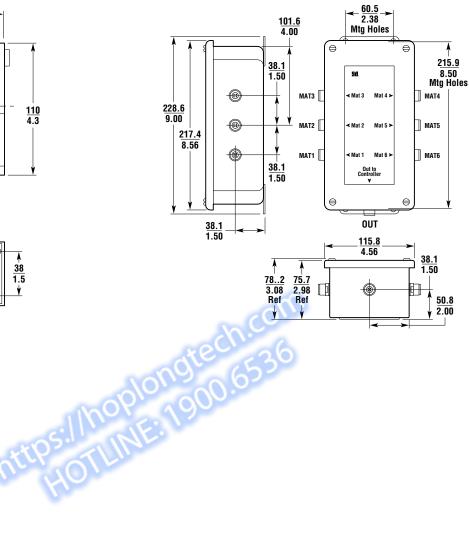


MC3





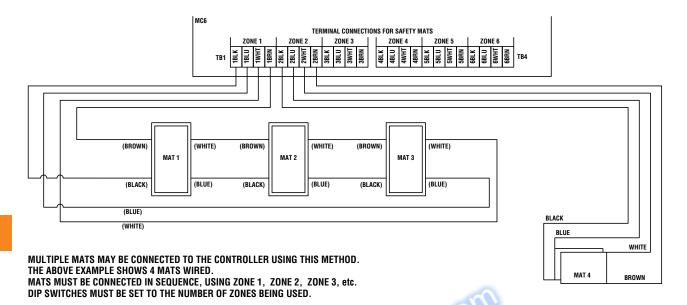
UMDB-6





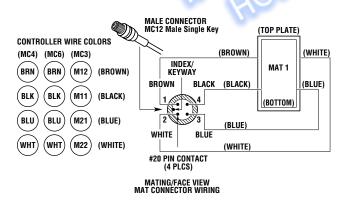


MC6 with Multiple Mats Connected to One Zone

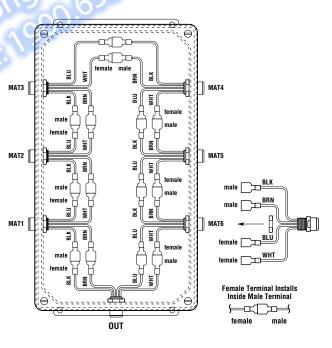


Mat Connections for Listed Controllers

- The MC4 and MC6 controllers may be ordered with up to 6 mat connectors (part #60477) installed.
- When using the MC3 controller, part #60477 may be ordered for mounting in customer enclosure.



UMDB-6



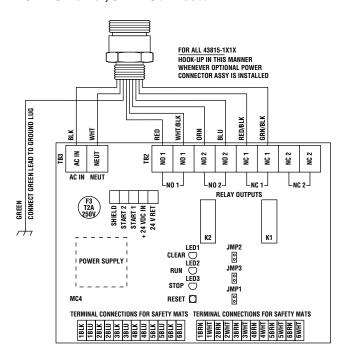


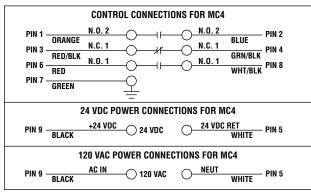


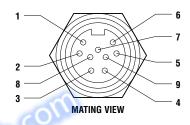


Wiring (continued)

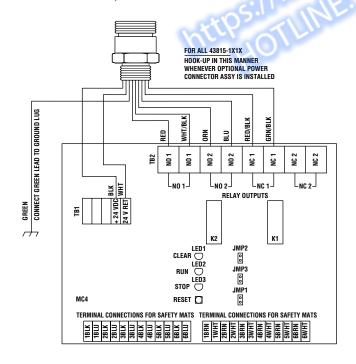
MC4 AC Power, 9-Pin Connector

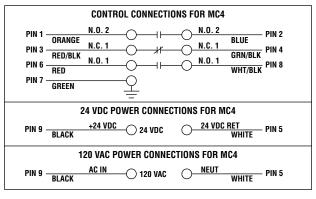


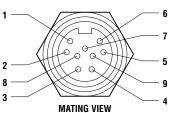




MC4 DC Power, 9-Pin Connector





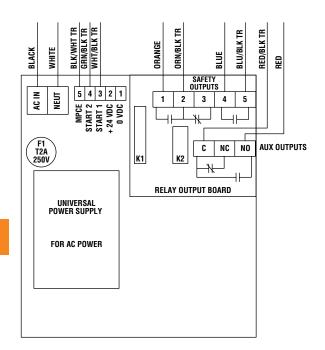


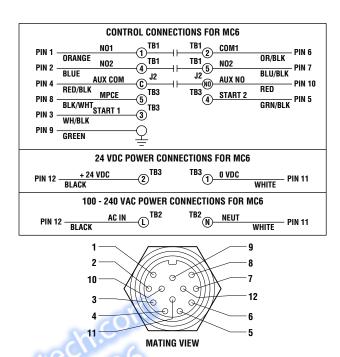




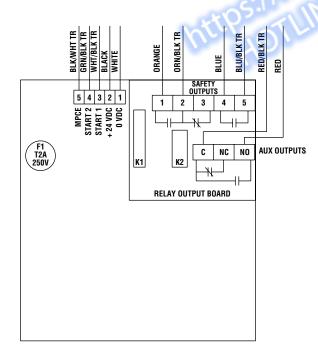


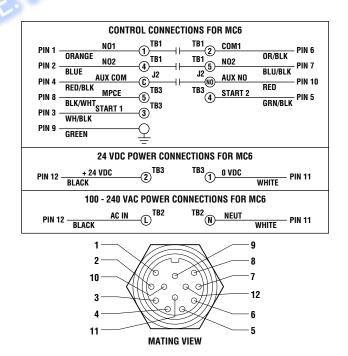
MC6 AC Power, 12-Pin Connector





MC6 DC Power, 12-Pin Connector





Select models are available for Rapid Delivery.

Visit this product on www.sti.com for details.

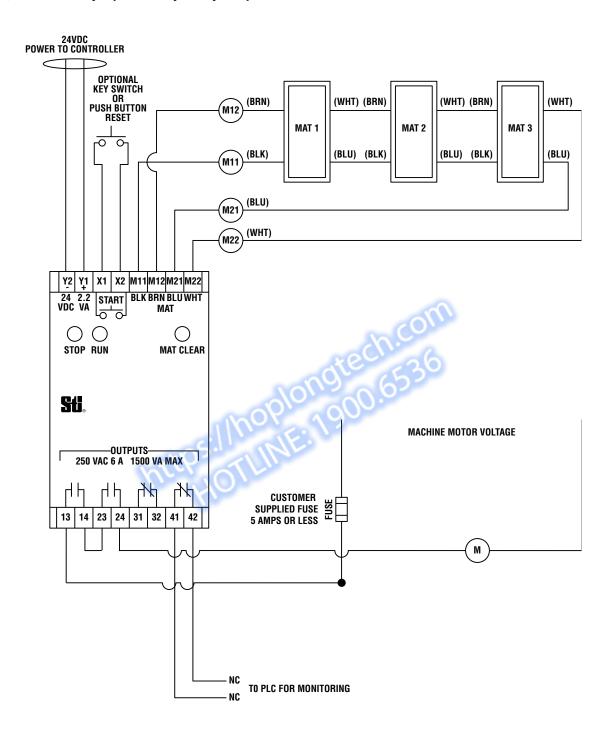


F-18



Suggested Machine and PLC Connections

MC3, Two Normally Open Safety Relay Outputs

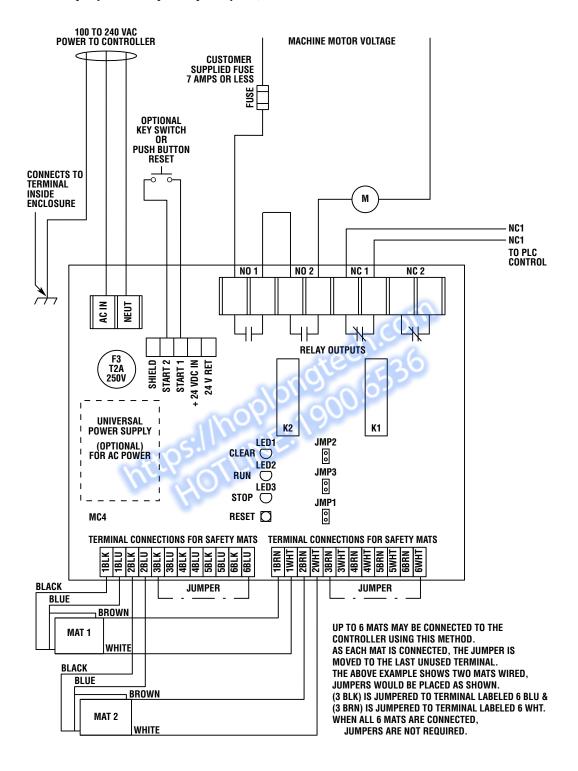








MC4, Two Normally Open Safety Relay Outputs, 100 to 240 VAC Power

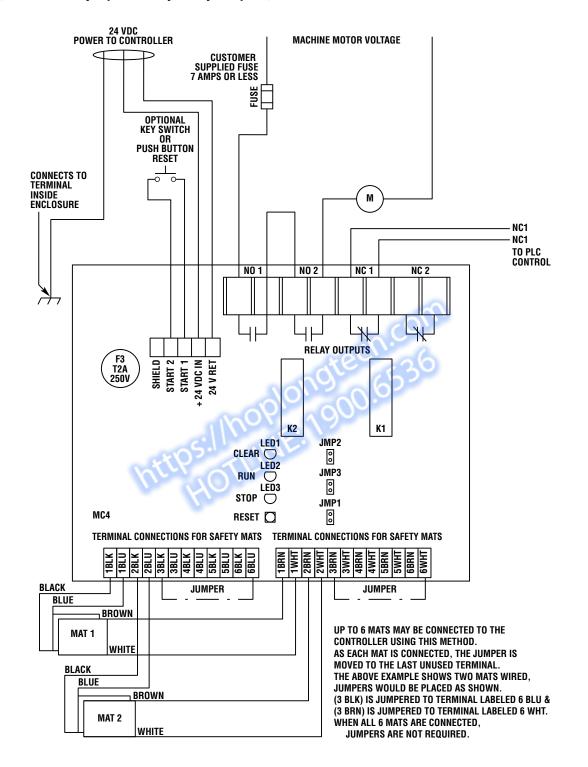








MC4, Two Normally Open Safety Relay Outputs, 24 VDC Power

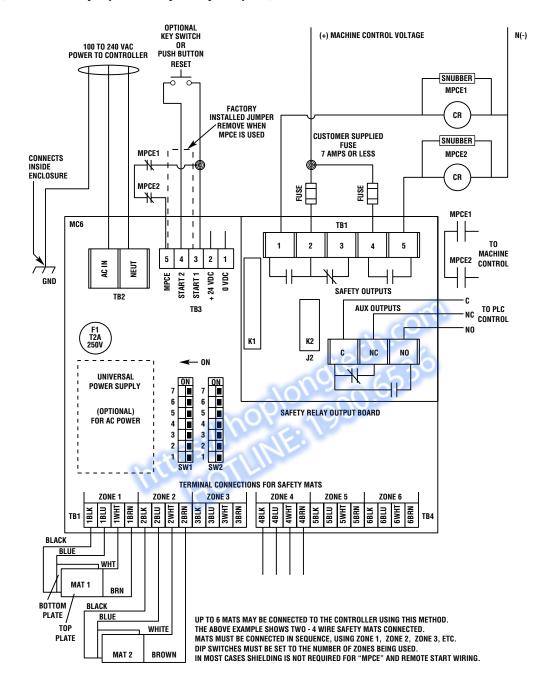








MC6, Two Normally Open Safety Relay Outputs, 100 to 240 VAC Power

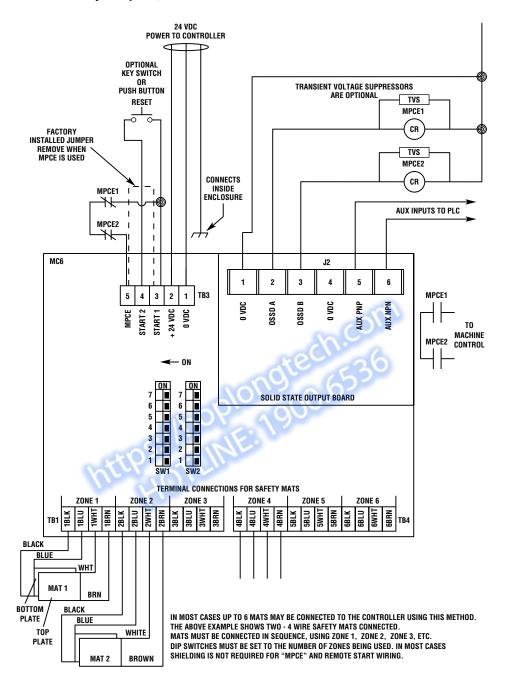








MC6, Two Solid-State Safety Outputs, 24 VDC Power





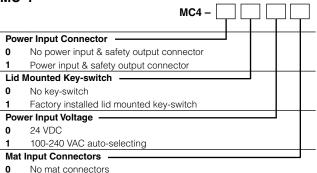




Ordering

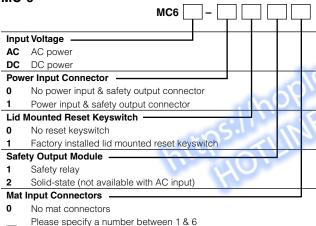
MC3 MC3 Series Safety Mat Controller No options are available

MC-4



Please specify a number between 1 & 6

MC-6



For information on STI safety mats, see page F-2

Safety Standards and Precautions

A Safety Mat controller is a general purpose, safety mat control device and is not designed for any specific type, model or brand of machine. All safety-related functions of the guarded machine controls including pneumatic, electric, logic or hydraulic controls must be control reliable.

A Safety Mat controller when combined with a four-wire safety mat meets ANSI/RIA R15.06-1999 (R2009), ANSI B11.19-2010 and the following applicable OSHA standards. When used with mechanical power presses, OSHA standard 1910.217(c) applies. For other applications the requirements of section 1910.212 apply.

Only use a Safety Mat controller and four-wire safety mat system on machinery that stops consistently and immediately anywhere in its cycle or stroke. Never use a Safety Mat controller and four-wire safety mat system on a full-revolution clutched press or machine. Access to the point of operation or hazardous machine area not protected by the Safety Mat controller and four-wire safety mat system must be guarded by fencing, barriers or other appropriate methods.

The purchaser, installer and employer are responsible for meeting all local state and federal government laws, rules, codes or regulations relating to the proper use, installation, operation and maintenance of this control and the guarded machine. See Installation and Operation Manual for details.

All application examples described are for illustration purposes only. Actual installations may differ from those indicated.

900.653







Terms and Conditions of Sale

- Offer; Acceptance. These terms and conditions (these "Terms") are deemed Oner, Acceptance: These terms and containts (these relims) are deemed part of all quotes, agreements, purchase orders, acknowledgments, price lists, catalogs, manuals, brochures and other documents, whether electronic or in writing, relating to the sale of products or services (collectively, the "Products") by Omron Electronics LLC and its subsidiary companies ("Omron"). Omron objects to any terms or conditions proposed in Buyer's purchase order or other documents which are inconsistent with, or in addition to, these Terms.
- <u>Prices; Payment Terms.</u> All prices stated are current, subject to change without notice by Omron. Omron reserves the right to increase or decrease prices on any unshipped portions of outstanding orders. Payments for Products are due net 30 days unless otherwise stated in the invoice.
- Discounts. Cash discounts, if any, will apply only on the net amount of invoices sent to Buyer after deducting transportation charges, taxes and duties, and will be allowed only if (i) the invoice is paid according to Omron's payment terms and (ii) Buyer has no past due amounts.
- Interest. Omron, at its option, may charge Buyer 1-1/2% interest per month or the maximum legal rate, whichever is less, on any balance not paid within the stated terms.
- Orders. Omron will accept no order less than \$200 net billing.

 Governmental Approvals. Buyer shall be responsible for, and shall bear all costs involved in, obtaining any government approvals required for the important tation or sale of the Products.
- Taxes. All taxes, duties and other governmental charges (other than general real property and income taxes), including any interest or penalties thereon, imposed directly or indirectly on Omron or required to be collected directly or indirectly by Omron for the manufacture, production, sale, delivery, importation, consumption or use of the Products sold hereunder (including customs duties and sales, excise, use, turnover and license taxes) shall be charged to and remitted by Buyer to Omron.

 Financial. If the financial position of Buyer at any time becomes unsatisfactory
- to Omron, Omron reserves the right to stop shipments or require satisfactory security or payment in advance. If Buyer fails to make payment or otherwise comply with these Terms or any related agreement, Omron may (without liability and in addition to other remedies) cancel any unshipped portion of Products sold hereunder and stop any Products in transit until Buyer pays all amounts, including amounts payable hereunder, whether or not then due, which are owing to it by Buyer. Buyer shall in any event remain liable for all
- <u>Cancellation</u>: <u>Etc.</u> Orders are not subject to rescheduling or cancellation unless Buyer indemnifies Omron against all related costs or expenses.
- Force Majeure. Omron shall not be liable for any delay or failure in delivery resulting from causes beyond its control, including earthquakes, fires, floods, strikes or other labor disputes, shortage of labor or materials, accidents to machinery, acts of sabotage, riots, delay in or lack of transportation or the requirements of any government authority.

 11. Shipping: Delivery. Unless otherwise expressly agreed in writing by Omron:
 a. Shipments shall be by a carrier selected by Omron; Omron will not drop ship except in "break down" situations.
- - b. Such carrier shall act as the agent of Buyer and delivery to such carrier shall constitute delivery to Buyer;
 c. All sales and shipments of Products shall be FOB shipping point (unless oth-
 - erwise stated in writing by Omron), at which point title and risk of loss shall pass from Omron to Buyer; provided that Omron shall retain a security interest in the Products until the full purchase price is paid; d. Delivery and shipping dates are estimates only; and e. Omron will package Products as it deems proper for protection against nor-
- mal handling and extra charges apply to special conditions.

 12. <u>Claims.</u> Any claim by Buyer against Omron for shortage or damage to the
- Products occurring before delivery to the carrier must be presented in writing to Omron within 30 days of receipt of shipment and include the original transportation bill signed by the carrier noting that the carrier received the Products
- from Omron in the condition claimed.

 13. <u>Warranties</u>. (a) <u>Exclusive Warranty</u>. Omron's exclusive warranty is that the roducts will be free from defects in materials and workmanship for a period of Products will be free from delects in indicentals and working in the apends of welve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied.

 (b) <u>Limitations</u>. OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABIL-

ITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) <u>Buyer Remedy</u>. Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty. See http://www.omron247.com or contact your Omron representative for published information.

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- the any action brought against such Companies to the extent based on a claim that any Product made to Buyer specifications infringed intellectual property rights of another party.

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- <u>Export Coctosure</u> to any third party.

 <u>Export Controls.</u> Buyer shall comply with all applicable laws, regulations and licenses regarding (i) export of products or information; (iii) sale of products to "forbidden" or other proscribed persons; and (ii) disclosure to non-citizens of regulated technology or information.

 <u>Miscellaneous.</u> (a) <u>Waiver.</u> No failure or delay by Omron in exercising any right
- miscellaneous (a) <u>walver</u>. No latiture of delay by Offiron in exercising any right and no course of dealing between Buyer and Omron shall operate as a waiver of rights by Omron. (b) <u>Assignment</u>. Buyer may not assign its rights hereunder without Omron's written consent. (c) <u>Law</u>. These Terms are governed by the law of the jurisdiction of the home office of the Omron company from which Buyer is purchasing the Products (without regard to conflict of law principles). (d) <u>Amendment</u>. These Terms constitute the entire agreement between Buyer and Omron relating to the Products, and no provision may be changed or waived unless in writing signed by the parties. (e) <u>Severability</u>. If any provision hereof is rendered ineffective or invalid, such provision shall not invalidate any other provision. (f) <u>Setoff</u>. Buyer shall have no right to set off any amounts against the amount owing in respect of this invoice. (g) <u>Definitions</u>. As used herein, "including" means "including without limitation"; and "<u>Omron Companies</u>" (or similar words) mean Omron Corporation and any direct or indirect subsidiary or affiliate thereof.

Certain Precautions on Specifications and Use

- Suitability of Use. Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the application with the product of the product o uct in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases but the following is a non-exhaustive list of applications for which particular attention must be given: (i) Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this document.

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Note: Specifications are subject to change.

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