

# D-M-E Smart Series®

## Temperature Controls For Hot Runner Molding Systems



# Advanced Temperature Control for Hot Runner Systems

## Capability

D-M-E offers 2-, 5-, 8-, and 12-zone standard mainframes for 15A operation and 1-, 2-, 3-, and 5-zone standard mainframes for 30A operation. Components listed in this catalog satisfy all international compliances.

## Three - Year Warranty

All D-M-E temperature controllers are now covered by a three - year warranty, excluding fuses and triacs.

## Electrical Noise Immunity

To enhance immunity from electrical noise, power and thermocouple wires are harnessed in separate wire ways within the body of the frame. Additional noise immunity is provided through the use of shielded thermocouple wires.

The D-M-E Smart Series® is the result of intensive and dedicated research with a goal of designing today's most versatile and reliable line of temperature controllers. D-M-E achieved this goal by not only incorporating the latest technology, but by also making certain that each controller is easy to install and above all ... easy to operate.

## Heavy Duty Welded Construction

With years of experience behind its design, the Smart Series line is built to last under the most rigorous conditions. The mainframe's welded 16 gauge steel construction ensures long life and peak performance. Cooling fans in the frame are strategically located to increase air ventilation, maintain cooler running conditions, and promote control module reliability.



# CE COMPLIANT! D-M-E Mainframes and Modules Comply with Electromagnetic Compatibility and Low Voltage Directives

## Control Modules



SSM-15-02



DSS-15-02



CSS-15-02



SSH-10-12

**SSM (15 and 30 AMP):** The SSM module provides accurate temperature control, including Smart Start® heater dry out circuitry, thermocouple fault displays and auto/manual modes of operation. The SSM features automatic or manual bumpless transfer which, in the event of a thermocouple fault, provides switch over to manual mode at the proper power setting to continue molding until the fault can be corrected. This module can also trigger remote standby heat (idle), boost, off, and alarm functions when used with the TAS module.

**DSS (15 and 30 AMP):** For those who require independent dual displays for process and setpoint temperatures, the DSS is the ideal choice. The DSS module also features automatic or manual bumpless transfer. This module is also fully compatible with the TAS module for standby heat and alarm functions.

**CSS (15 and 30 AMP):** The top of the Smart Series line, the CSS module is full featured and provides excellent closed loop control. The CSS also works in conjunction with the CIM computer interface module. With an SPI protocol-compatible molding machine, setpoint temperatures can be set and system operation can be monitored via the machine control panel. The CSS module also has automatic or manual bumpless transfer and can be paired with the TAS module.

## Accessory Modules

**TAS:** The TAS module provides over/under visual and audible alarms, boost, and standby heat control with control modules as stated above. The TAS module can accommodate up to 63 zones of control. Alarm is activated at  $\pm 30^{\circ}$  F. See pages 33-34 for details.

**CIM:** The CIM Computer Interface Module is the communications link between CSS modules and a remote host system. The CIM module can accommodate up to 63 zones of control. See page 35.

**NOTE:** Both the TAS and CIM accessory modules require the use of "MFC" style communications mainframes. Non-communications frames may be upgraded on-site with installable kits.



## Simplified Power Hook-Up

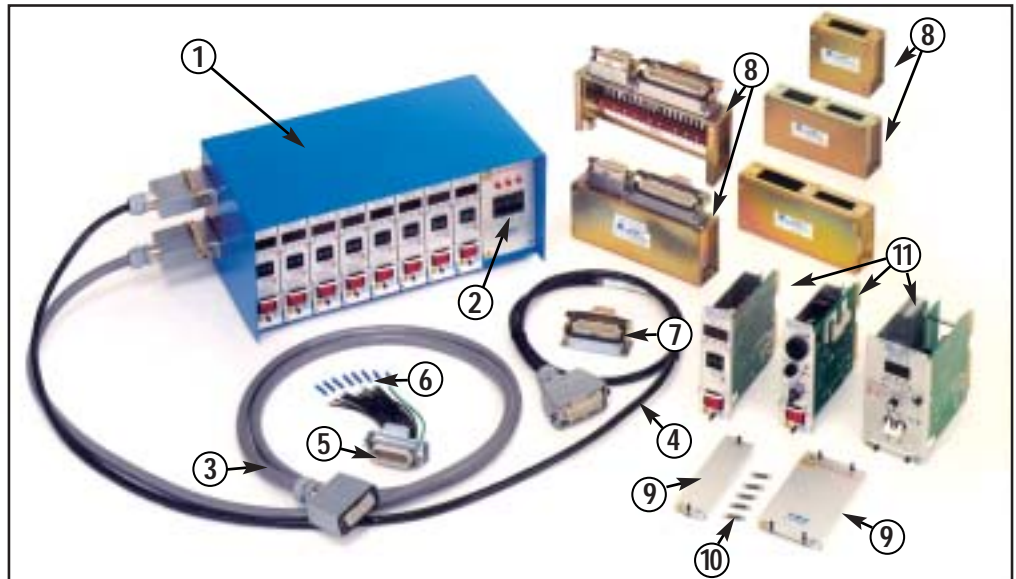
Concern for user convenience didn't stop with improved operation features. D-M-E went one step beyond to ensure that the power hook-up procedure goes smoothly as well. For this reason, detailed schematics for various hook-ups are provided directly on all mainframe back panels. If it is ever necessary to change the configuration, these diagrams will help ensure safe and proper connections. All wiring diagrams can be referenced at the end of this brochure.

## SSH Controller (10 AMP)

The SSH is a stand-alone single zone controller ideal for use with hot sprue bushings or machine nozzles.

# Smart Series® Temperature Control Systems

- ① Mainframe
- ② Circuit Breaker/Disconnect
- ③ Mold Power Cable
- ④ Thermocouple Cable
- ⑤ Mold Power Input Connector
- ⑥ Insulated Crimp Connectors
- ⑦ Thermocouple Connector
- ⑧ Terminal Mounting Boxes
- ⑨ Mainframe Blank Panels
- ⑩ Module Replacement Fuses
- ⑪ Control Modules



## TABLE OF CONTENTS

TABLE OF CONTENTS	PAGE
Introduction	1-2
Typical System Configuration	4
SSH Single Zone Controller	5-6
Single and Two-Zone Mainframes and Accessories	7-9
Single Zone High Power Mainframes	10
Smart Series Mainframes	11-13
Digital Current / Voltage Monitor	14
Smart Series Accessories	15
Standard Mainframe Connector Wiring	16
Wiring Diagram for Hot Runner Molding System and Smart Series / G-Series Mold Connectors	17
Wiring Diagram for Hot Runner Molding System and High Power Smart Series / G-Series Mold Connectors	18
Cables and Connector Kits	19-22
Mold Connector Pocket Layouts	23-24
Terminal Mounting Boxes	25-26
SSM Temperature Control Modules	27-28
DSS Temperature Control Modules	29-30
CSS Temperature Control Modules	31-32
TAS Temperature Alarm/Standby Heat Modules	33-34
CIM Microprocessor-Based Computer Interface Module	35
Replacement Parts and Service Items	36-38
Input Power Wiring Diagrams	39-42

# Typical System Configurations

SSM-15-02  
DSS-15-02  
CSS-15-02

## 5 Zones of Control (15 AMP)

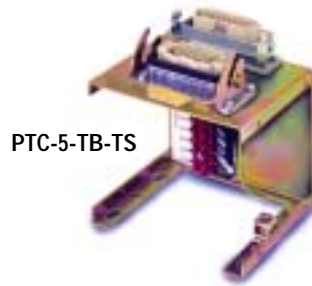


MFP-5-G



MPC-5-C10-G

TC-5-C10-G



PTC-5-TB-TS



MFS-512-G

X5

SSM-15-02  
DSS-15-02  
CSS-15-02

## 8 Zones of Control (15 AMP)

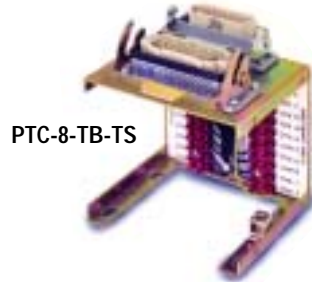


MFP-8-G



MPC-8-C10-G

TC-8-C10-G



PTC-8-TB-TS



MFS-512-G

X8

SSM-15-02  
DSS-15-02  
CSS-15-02

## 12 Zones of Control (15 AMP)

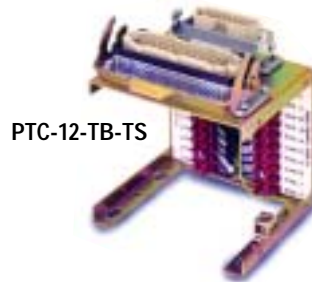


MFP-12-G



MPC-12-C10-G

TC-12-C10-G



PTC-12-TB-TS



MFS-512-G

X12

SSM-30-02  
DSS-30-02  
CSS-30-02

## 2 or 3 Zones of High Power Control (30 AMP)



MFHP-2-G  
MFHP-3-G



MPCH-23-C10-G

TC-5-C10-G



MTC-5-G-IDC

PICH-23-G



PTCH-23-TB-G

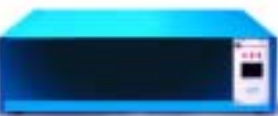


MFS-512-G

X2 or 3X

SSM-30-02  
DSS-30-02  
CSS-30-02

## 5 Zones of High Power Control (30 AMP)



MFHP-5-G



MPCH-5-C10-G

TC-5-C10-G



MTC-5-G-IDC

PICH-5-G



PTCH-5-TB-G



MFS-512-G

X5

# Smart Series® Single Zone Temperature Controller

- Compact
- Easy-to-use
- Includes new, improved and unique features
- Provides microprocessor-based PID control
- More accurate than analog or variac controllers
- Built-in thermocouple diagnostics
- Ideal for use with a hot sprue bushing or a machine nozzle

## SSH-10-12/11 (10 AMP)



### Key Features

- **Large Digital Display**
  - For easier readability of temperature, % power and faults
- **Setpoint Pushwheel**
  - For setting desired setpoint temperature
  - Allows adjustment of setpoint before turning power on
- **AUTO % Power Display**
  - Shows % power output while in AUTO mode
  - Indicates average % power requirement on thermocouple failure
  - A diagnostic tool for solving problems

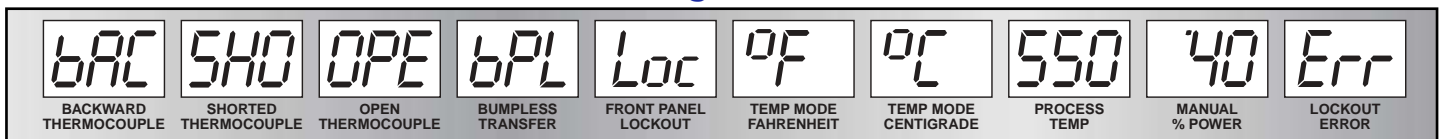
### Switchable Options

- **Shorted Thermocouple Sensitivity Adjustment**
  - Operation can be tailored to fast or slow reaction times
  - Sensitivity can be adjusted with internal switches
  - Very useful for zones with long startup times
- **Switchable °C/°F Operation**
  - Scale indicated at startup
- **K Type Thermocouple Support**

### Operational Refinements

- **Improved SmartStart®**
  - A more gradual temperature rise leads to a more effective heater dry out period, thereby extending heater life
  - SmartStart® now available as an option in manual mode
- **SelectiveCycle®**
  - A very high speed power output approach
  - Enables accurate temperature control and longer heater life
- **Bumpless Transfer**
  - When a thermocouple failure occurs, operation is automatically continued with a learned % power
  - Unique software accurately assigns percent power setting
- **Third Fuse**
  - Allows for display of low temperature alarm when the load fuses are blown

### Front Panel Digital LED Indicators



# Smart Series® Single Zone Temperature Controller

## SSH-10-12/11 (10 AMP)

Controller includes 19-foot power cord, mating mold power and thermocouple connector (CKPTM-1) and two spare fuses (ABC-10). Additional cables and/or connectors must be ordered separately. See Page 8 for detailed information on cables and connectors. Warranty: Three year (excluding triac and fuses).

CONTROLLER ITEM NUMBER	VOLTS (VAC)
SSH-10-12	240
SSH-10-11	120

CABLE* ITEM NUMBER	LENGTH (FEET)
MPTC-10	10
MPTC-20	20

See page 8

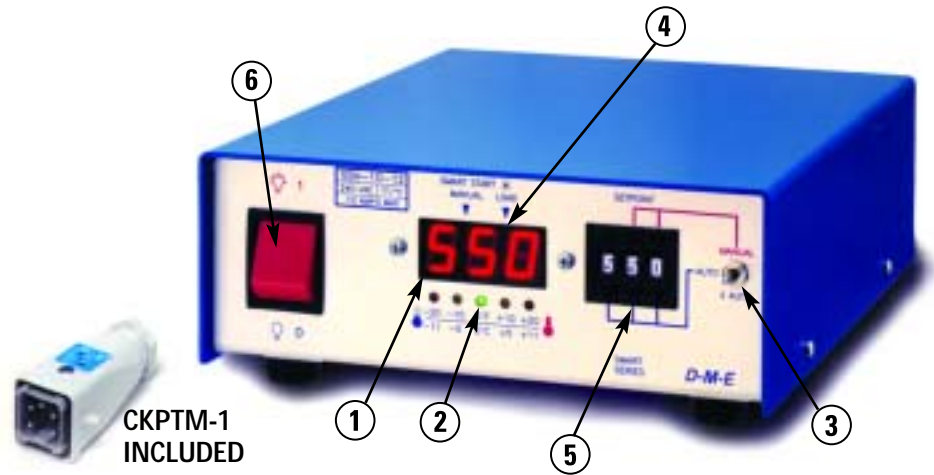


MOLD POWER AND THERMOCOUPLE CONNECTOR* ITEM NUMBER
CKPTIC-1

See page 8



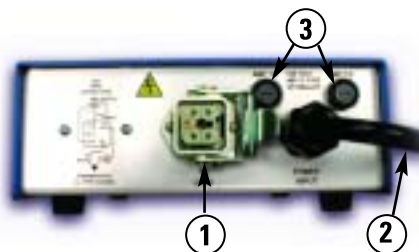
\* ITEMS ORDERED SEPARATELY



### Front Panel Controls and Indicators

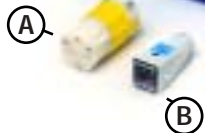
- Process Temperature Display:**  
Shows process temperature, thermocouple faults and other operational modes. Displays % power when switch (3) is pressed down.
- Temperature Deviation Lights:**  
Indicates deviation from setpoint. Outer lights blink at more than  $\pm 40^{\circ}\text{F}$  ( $22^{\circ}\text{C}$ ) from setpoint.
- Auto / Manual / % Auto Power Switch:**  
Selects AUTO or MANUAL control mode. Shows % power when pressed into “% AUTO” position.
- LED Mode Indicators:**  
Left LED illuminates during manual mode. Right LED illuminates when power is supplied to heater. Right LED blinks during SmartStart®.
- Setpoint Pushwheel:**  
Three digit switch programs setpoint in AUTO mode. Right two digits program % power in MANUAL mode.
- Power On/Off Switch:**  
Controls AC power to module.

### Rear Panel



- Mold Power and Thermocouple Output Connector:**  
CKPTOC1 connects to the heater and thermocouple. Mating connector CKPTM-1 is supplied with controller.
- Power Input Cord:**  
Nineteen foot cord supplies power to controller. Plug supplied with SSH-10-11 (120 VAC) units. No plug supplied with SSH-10-12.
- Load Fuse Receptacles:**  
Provides safe and easy replacement of load fuses.

# Smart Series® Single and Two-Zone Mainframes (10 AMP Max.)



**MFP-1G**  
**MFP-1G-1**

**A:** AC2024F (Power to Mainframe);  
AC1512F supplied with MFP-1G-1  
**B:** CKPTM-1 (Connector to heaters)

This single-zone controller is ideal for use with Straight-Shot and Gate-Mate hot sprue bushings.

## Single and Two-Zone 10 AMP Mainframes

The D-M-E Portable 10 AMP Mainframes are designed for use with 10 or 15 AMP\* Smart Series or G-Series Temperature Control Modules. Mainframe is supplied with power input and power-thermocouple output connectors. Circuit breaker provides safety for operation. Control modules and cables are to be ordered separately.

**NOTE:** Maximum safe operating amperage is 10 AMPS per zone when using 15 AMP modules. If application will draw more than 10 AMPS per zone, use 15 AMP Mainframe (MFFPR-2G).

\*User must install ABC10 (10 AMP) fuses in the 15 AMP control modules to protect the mainframe.

## Single and Two-Zone 10 AMP Mainframes (50-60 Hz, single phase)

ZONES	ITEM NUMBERS**	VOLTS	WATTS PER ZONE	CONNECTORS SUPPLIED
1	MFP-1G-1	120	1200	(1) AC1512F (POWER IN) (1) CKPTM-1 (POWER-T/C OUT)
1	MFP-1G	240	2400	(1) AC2024F (POWER IN) (1) CKPTM-1 (POWER-T/C OUT)
2	MFFPR-2G	240	2400	(1) AC2024F (POWER IN) (2) CKPTM-1 (POWER-T/C OUT)

\*\*Includes frame and connectors listed. Modules and cables ordered separately.

**NOTE:** Replacement power connectors in frame are also available on special order.



**MFPR-2G**

**A:** AC2024F (Power to Mainframe)  
**B:** CKPTM-1 (Connector to heaters)

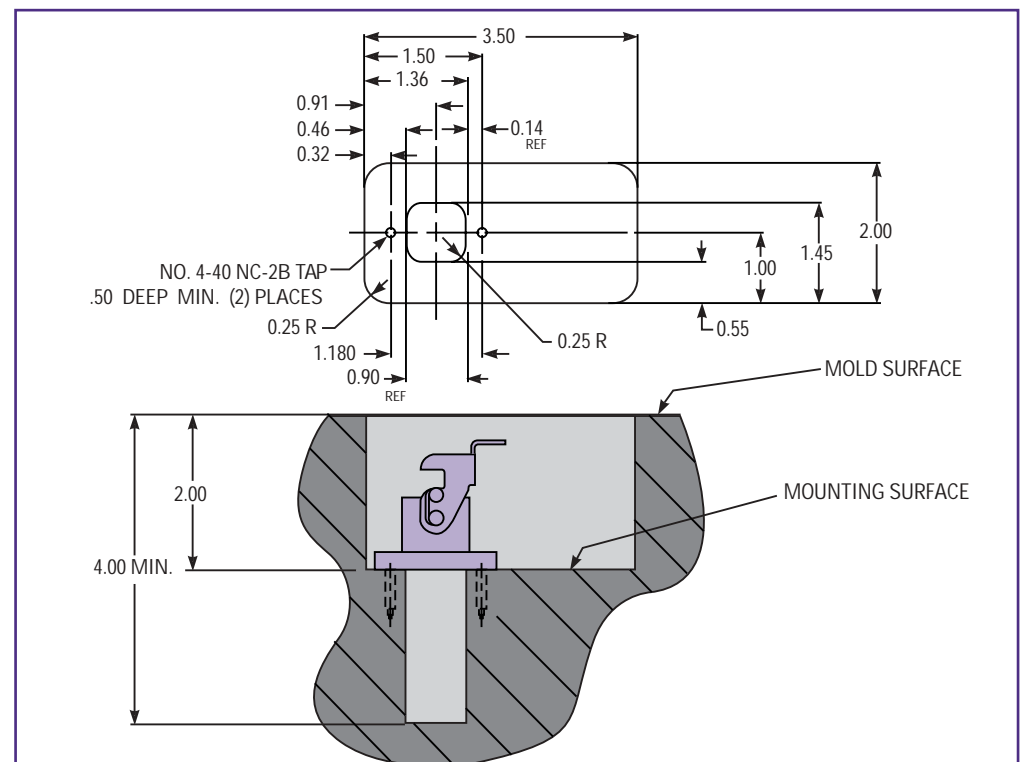
**Single zone, horizontal 10 amp controllers (SSH-10-12/11) also available. See page 5.**

### DIMENSIONS

(all frames)  
7"W x 9"H x 10"D  
(9"H dimension does not include connectors or handle)

## Recommended Mold Pocket Layout

(For Mold Power-Thermocouple Input Connector CKPTIC-1)





# Smart Series® Single and Two-Zone Mainframe Accessories (10 AMP)

For Use With MFP-1G, MFP-1G-1, MFPR-2-G, SSH-10-12 and SSH-10-11

## Mold Power-Thermocouple Input Connector

ITEM NUMBER
CKPTIC-1



A Single-Zone Power-Thermocouple Input Connector is available for mounting in or on the mold to accept the power-thermocouple cable from the mainframe. Water resistant, the connector has an integral retaining latch for a secure cable connection and numbered screw-type terminals for power and thermocouple lead wires.

\* Can be mounted on top of mold for use with D-M-E Straight Shot hot sprue bushings.

## Armored Mold Power-Thermocouple Cables

ITEM NUMBER
MPTC-10
MPTC-20



Single-Zone Mold Power-Thermocouple Cables are constructed of special lead wire for use in high temperature environments, and are available to connect the mainframe to the connector on the mold. Available in lengths of 10 or 20 feet. Integral retaining latches on the mainframe and mold connections provide secure cable connections. Connector configurations ensure proper insertion of cable.

## Replacement Connector Kits (for Controller and Cables)

Power Input Connectors  
For Mainframe

### MALE POWER-T/C CONNECTORS;

- CKPTM-1 is on MPTC-10/20 Cables; Mates with Frame or CKPTF-1L Only
- CKPTM-1L Mates With CKPTF-1 Only

### FEMALE POWER – T/C CONNECTORS;

- CKPTF-1 is on MPTC-10/20 Cables; Mates with Mold or CKPTM-1L Only
- CKPTF-1L Mates with CKPTM-1 Only



AC1512F

ITEM NUMBER	VOLTS
AC1512F	120
AC2024F	240



CKPTM-1

ITEM NUMBER
CKPTM-1
CKPTM-1L



CKPTF-1

ITEM NUMBER
CKPTF-1
CKPTF-1L



PTC-2-10

ITEM NUMBER
PTC-2-10



AC2024F



CKPTM-1L



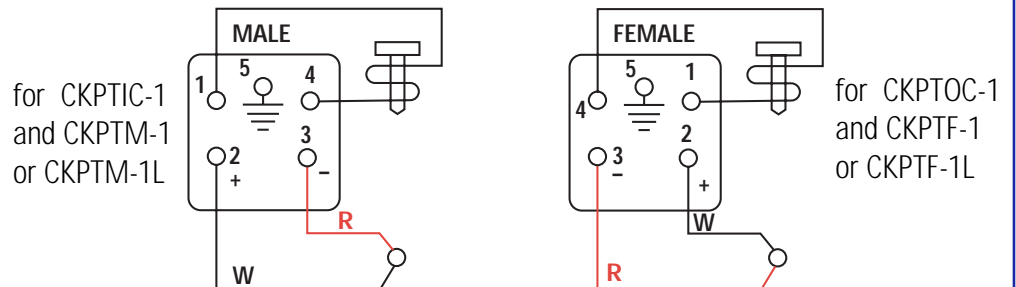
CKPTF-1L

Power-Thermocouple Output  
Connector (for Mainframe Bulkhead)

ITEM NUMBER
CKPTOC-1



## Wiring Diagrams



# Smart Series® Two-Zone Mainframe (15 AMP) and Accessories

## MFFPR-2G



AC1240F

AC1524M

M2MJ

### FRAME

#### DIMENSIONS:

7" W X 9" H X 10" D

(9" H dimension does not include connectors or handle)

## Two-Zone 15 AMP Mainframes

Provides 15 AMP (3600 watts) per zone. For use with Smart Series or G-Series modules. Supplied with built-in cooling fan, power input, power output and thermocouple input connectors. Control modules and cables are ordered separately.

### TWO-ZONE 15 AMP MAINFRAME (240 VAC, 50-60 Hz, SINGLE PHASE)

ITEM NUMBER	WATTS PER ZONE	CONNECTORS SUPPLIED
MFFPR-2G	3600	(1) AC1240F (POWER IN) (2) AC1524M (POWER OUT) (2) M2MJ (T / C IN)

Includes frame and connectors listed. Modules and cables ordered separately.

**NOTE:** Replacement parts in frame are also available by special order. See pages 36 and 37.

ITEM NUMBER	DESCRIPTION
AC1240F*	Female 240 VAC twist-lock power input connector (mates with male frame power input)
AC1524M*	Male 240 VAC power output connector (mates with female frame power outputs)
M2MJ*	Thermocouple mini-plug mates with frame as jack strip connector.
PTC-2-TBG-TS	2 zone, pre-wired terminal mounting box with terminal strip (mounts to mold; mates with PTC-0110 or PTC-0120 cables.)

\* Included with MFFPR-2G



### ITEM NUMBER

PTC0110

PTC0120

For use with MFFPR-2G only

## Armored Mold Power-Thermocouple Cables (15 AMP)

Single-Zone Mold Power-Thermocouple Cable is constructed of special lead wire for use in high temperature environments. This cable connects the mainframe to the connector on the mold. Available in lengths of 10 or 20 feet. Retaining latches on the mold connector provide secure cable connections.



### ITEM NUMBER

PTC-2-TBG-TS

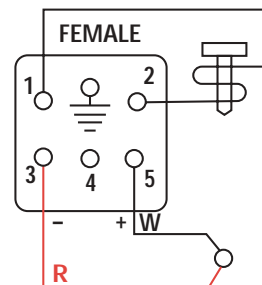
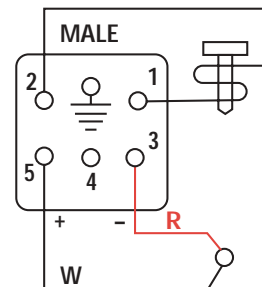
For use with MFFPR-2G only

## Terminal Mounting Boxes - Prewired (15 AMP)

Terminal Mounting Boxes provide the easiest and most economical method of mounting power and thermocouple connectors on the mold. Constructed of plated heavy gauge steel, each box is pre-cut and drilled for quick mounting of the box to the mold (2-zone, pre-wired terminal mounting box with terminal strip shown with cover plate removed)

**NOTE:** 5-pin connectors and pins are available as a special order only. These are crimp contacts. (See page Q-25 for mounting dimensions.)

## WIRING DIAGRAMS



# Smart Series® Single Zone High Power Mainframes (30 AMP Max.)

## MFHP-1G



The D-M-E Portable Single-Zone High Power Mainframe is designed for use with 30 AMP Smart Series or G-Series temperature control modules. Mainframe is supplied with built-in cooling fan, power input, power output, and thermocouple input connectors. Circuit breaker provides safety for the operator. Control modules and cables are ordered separately.

### Single Zone 30 AMP Mainframes (240 VAC, 50-60 Hz, Single Phase)

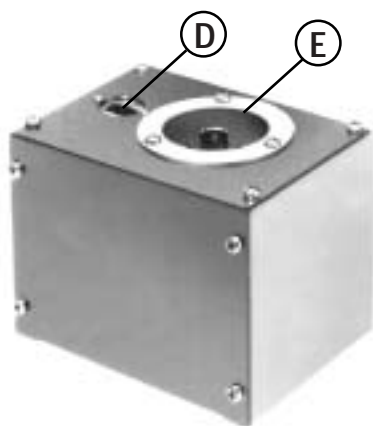
ITEM NUMBER	WATTS (OUTPUT)	CONNECTORS SUPPLIED
MFHP-1G	7200	(1) AC1240F (POWER IN) (1) AC1240M (POWER OUT) (1) M2MJ (T / C IN)

### Replacement Connectors and Accessories

ITEM NUMBER	DESCRIPTION
MPCH1-10	10 ft. mold power cable (240 VAC) (1 AC1240F twist-lock connector on mold end; 1 AC1240M twist-lock connector on frame end)
MPCH1-20	20 ft. mold power cable (240 VAC) (same connectors as MPCH1-10)
AC1240MI	1-Zone twist-lock mold power input connector (mounts in mold or terminal mounting box; accepts AC1240F twist-lock connector on MPCH1-10 or MPCH1-20 cable)
TC1-10	10 ft. thermocouple cable (1 M2MJ mini-plug each end)
TC1-20	20 ft. thermocouple cable (1 M2MJ mini-plug each end)
AC1240F*	240 VAC twist-lock power input connector (mates with frame power input)
AC1240M*	240 VAC twist-lock power output connector (mates with frame power output)
M2MJ*	thermocouple mini-plug (mates with frame or jack strip connector)
PTCH1-TBG	terminal mounting box (mounts to mold; accepts 1 AC1240MI and 1 TCS-1)
TCS-1	jack strip connector

AC1240F AC1240M M2MJ

**FRAME DIMENSIONS:**  
7"W x 9"H x 10"D  
(9"H dimension does not include connectors or handle)



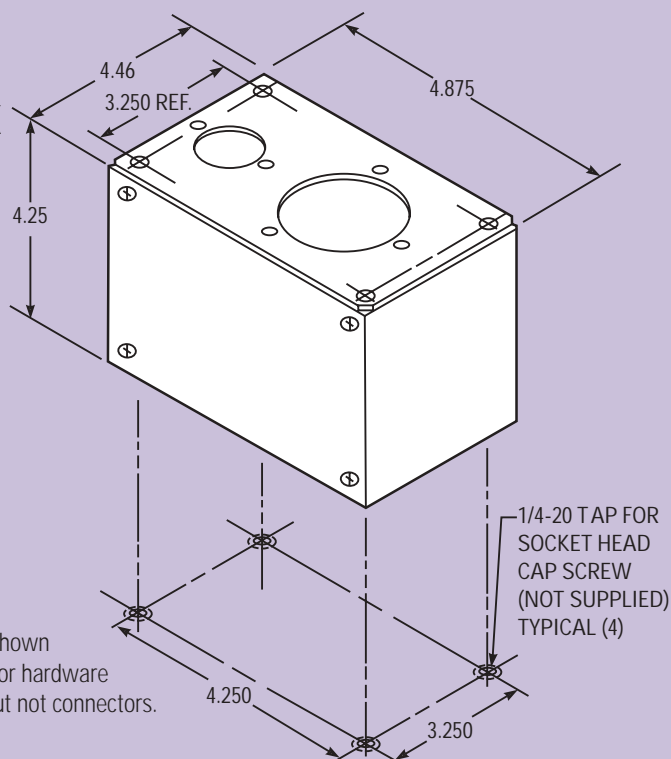
### TERMINAL MOUNTING BOX PTCH1-TBG

(Connectors shown are ordered separately)

**D:** TCS-1  
**E:** AC1240MI

\*Included with MFHP-1G mainframe

### TERMINAL MOUNTING BOX PTCH1-TBG



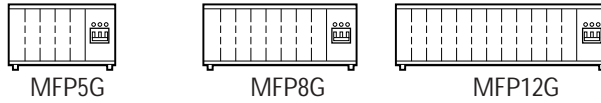
**NOTE:** Overall dimensions shown include allowances for hardware (assembly screws) but not connectors.

# Smart Series® Mainframes (15 AMP)

## D-M-E Smart Series® Mainframe (15 AMP Max.) Configurations

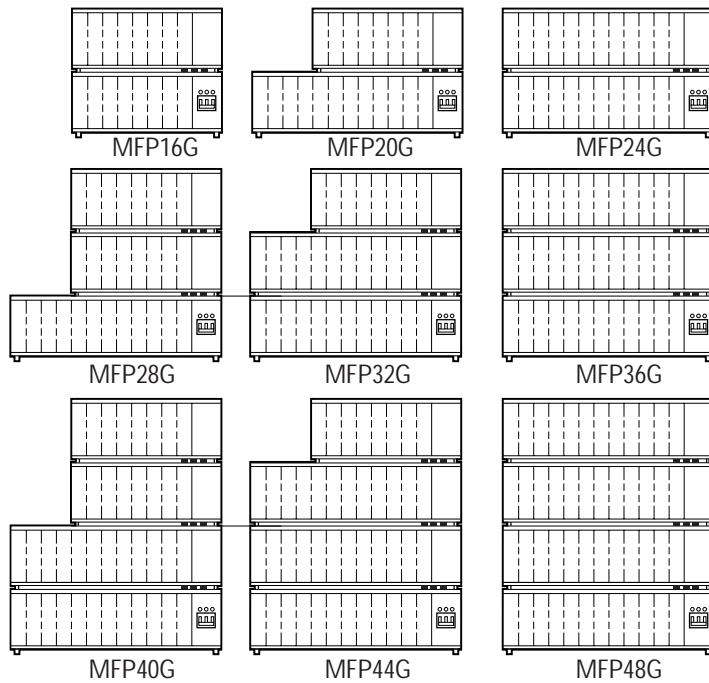
The 12 configurations illustrated below provide a wide selection of zone capacities to suit most control applications. The 5, 8 and 12 zone frames (MFP5, 8, and 12 G) use individual frame sections. The 16 thru 48 zone frames use 2, 3 or 4 frame sections rigidly fastened together into one prewired integral unit which requires only one main AC power input connection. The Current Voltage monitor option will be factory installed when ordered at same time as Mainframe. Control modules, cables, mold connectors and other accessories are ordered separately (see table on page Q12).

### MAINFRAMES ( Supplied with 50 AMP, 3-phase circuit breaker)



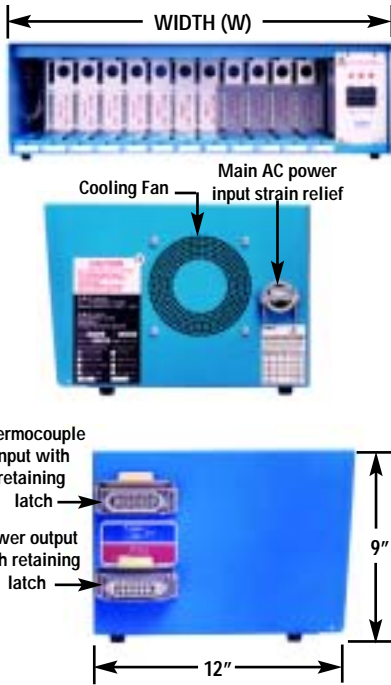
- Each frame section (MFP5G, MFP8G, and MFP12G) has its own cooling fan.

### STACK FRAMES ( Supplied with 70 AMP, 3-phase circuit breaker)



- Multi-section frame heights are multiples of 9" height shown (e.g. MFP32G is 27" high).

- Main AC input shown will always be in bottom frame section. For higher power requirements, individual power inputs and circuit breakers can be factory installed in each section of a stack frame on a special order basis.



## WORLDWIDE WIRING CAPABILITIES

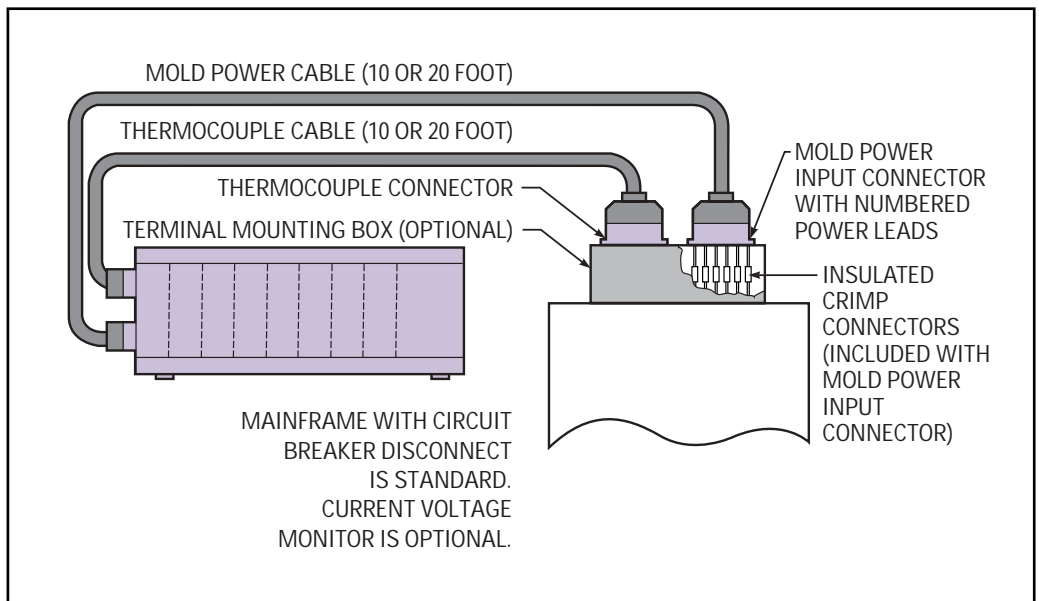
Unless otherwise specified, all Smart Series Mainframes will be supplied to accept 240 VAC, 3 phase, 4-wire, 50-60 Hz input power. Wiring diagram (included on the access cover) illustrates the variety of other voltage, phase and load balancing arrangements possible, such as: (380-415V, 3 phase, 5-wire, 50-60 Hz), (208-240V, single phase, 3-wire, 50-60 Hz) and (110-120V, single phase, 3-wire, 50-60 Hz).

**These wiring adjustments can be performed in the field to suit the requirements of the application. If specified at the time of original order, D-M-E will supply the Mainframe required.**

ITEM NUMBERS	W *
MFP5G	14 <sup>3</sup> / <sub>16</sub>
MFP8G	20 <sup>3</sup> / <sub>16</sub>
MFP12G	28 <sup>3</sup> / <sub>16</sub>

\* Dimension does not include connectors

**NOTE:** Combination frames to accommodate both 15 and 30 AMP modules (with or without communications) are available by special order.



# Smart Series® Mainframes (15 AMP)

SMART SERIES MAINFRAMES Optional Current Voltage Monitor is Factory Installed in CV-Style Frames					CABLES AND MOLD CONNECTORS REQUIRED (Not Included with Mainframes and Must Be Ordered Separately)							
ZONES	"MFP" TYPE FOR TEMPERATURE AND POWER CONTROL	"MFP" TYPE WITH CURRENT VOLTAGE MONITOR	"MFCP" TYPE FOR TEMP. CONTROL AND COMMUNICATIONS	"MFCP" TYPE WITH CURRENT VOLTAGE MONITOR	MOLD POWER CABLES C10 = 10 FT. C20 = 20 FT. (SELECT LENGTH DESIRED)		THERMOCOUPLE CABLES C10 = 10 FT. C20 = 20 FT. (SELECT LENGTH DESIRED)		MOLD POWER INPUT CONNECTORS (INCL. CRIMP CONNECTORS)		THERMOCOUPLE CONNECTORS	
	ITEM NUMBER	ITEM NUMBER (CV-STYLE)	ITEM NUMBER	ITEM NUMBER (CV-STYLE)	QTY.	ITEM NUMBER	QTY.	ITEM NUMBER	QTY.	ITEM NUMBER	QTY.	ITEM NUMBER
5	MFP5G	MFP5G-CV	MFCP5G	MFCP5G-CV	1	MPC5-C10 or C20-G	1	TC5-C10 or C20-G	1	PIC5G	1	MTC5G or MTC5GIDC
8	MFP8G	MFP8G-CV	MFCP8G	MFCP8G-CV	1	MPC8-C10 or C20-G	1	TC8-C10 or C20-G	1	PIC8G	1	MTC8G or MTC8GIDC
12	MFP12G	MFP12G-CV	MFCP12G	MFCP12G-CV	1	MPC12-C10 or C20-G	1	TC12-C10 or C20-G	1	PIC12G	1	MTC12G or MTC12GIDC
16	MFP16G	MFP16G-CV	MFCP16G	MFCP16G-CV	2	MPC8-C10 or C20-G	2	TC8-C10 or C20-G	2	PIC8G	2	MTC8G or MTC8GIDC
20	MFP20G	MFP20G-CV	MFCP20G	MFCP20G-CV	1	MPC8-C10 or C20-G and	1	TC8-C10 or C20-G and	1	PIC8G and	1	MTC8G or MTC8GIDC and
					1	MPC12-C10 or C20-G	1	TC12-C10 or C20-G	1	PIC12G	1	MTC12G or MTC12GIDC
24	MFP24G	MFP24G-CV	MFCP24G	MFCP24G-CV	2	MPC12-C10 or C20-G	2	TC12-C10 or C20-G	2	PIC12G	2	MTC12G or MTC12GIDC
28	MFP28G	MFP28G-CV	MFCP28G	MFCP28G-CV	2	MPC8-C10 or C20-G and	2	TC8-C10 or C20-G and	2	PIC8G and	2	MTC8G or MTC8GIDC and
					1	MPC12-C10 or C20-G	1	TC12-C10 or C20-G	1	PIC12G	1	MTC12G or MTC12GIDC
32	MFP32G	MFP32G-CV	MFCP32G	MFCP32G-CV	1	MPC8-C10 or C20-G and	1	TC8-C10 or C20-G and	1	PIC8G and	1	MTC8G or MTC8GIDC and
					2	MPC12-C10 or C20-G	2	TC12-C10 or C20-G	2	PIC12G	2	MTC12G or MTC12GIDC
36	MFP36G	MFP36G-CV	MFCP36G	MFCP36G-CV	3	MPC12-C10 or C20-G	3	TC12-C10 or C20-G	3	PIC12G	3	MTC12G or MTC12GIDC
40	MFP40G	MFP40G-CV	MFCP40G	MFCP40G-CV	2	MPC8-C10 or C20-G and	2	TC8-C10 or C20-G and	2	PIC8G and	2	MTC8G or MTC8GIDC and
					2	MPC12-C10 or C20-G	2	TC12-C10 or C20-G	2	PIC12G	2	MTC12G or MTC12GIDC
44	MFP44G	MFP44G-CV	MFCP44G	MFCP44G-CV	1	MPC8-C10 or C20-G and	1	TC8-C10 or C20-G and	1	PIC8G and	1	MTC8G or MTC8GIDC and
					3	MPC12-C10 or C20-G	3	TC12-C10 or C20-G	3	PIC12G	3	MTC12G or MTC12GIDC
48	MFP48G	MFP48G-CV	MFCP48G	MFCP48G-CV	4	MPC12-C10 or C20-G	4	TC12-C10 or C20-G	4	PIC12G	4	MTC12G or MTC12GIDC

NOTE: For details on cables and connectors, see pages Q19-22

## TERMINAL MOUNTING BOXES

ZONES	ORDER ITEMS A and B or C					
	(A) FOR POWER INPUT CONNECTORS		(B) FOR THERMOCOUPLE CONNECTORS		(C) COMBINATION POWER & TC	
	QTY.	CATALOG NUMBER	QTY.	CATALOG NUMBER	QTY.	CATALOG NUMBER
5	1	PIC512-TBG	1	MTC5-TBG	1	PTC5-TBG
8	1	PIC512-TBG	1	MTC8-TBG	1	PTC8-TBG
12	1	PIC512-TBG	1	MTC12-TBG	1	PTC12-TBG
16	2	PIC512-TBG	2	MTC8-TBG	2	PTC8-TBG
20	2	PIC512-TBG	1	MTC8-TBG and	1	PTC8-TBG and
			1	MTC12-TBG	1	PTC12-TBG
24	2	PIC512-TBG	2	MTC12-TBG	2	PTC12-TBG
28	3	PIC512-TBG	2	MTC8-TBG and	2	PTC8-TBG and
			1	MTC12-TBG	1	PTC12-TBG

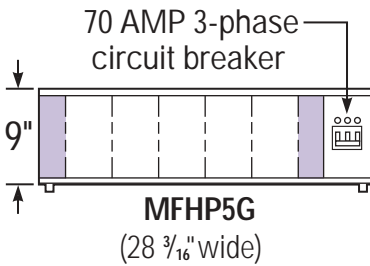
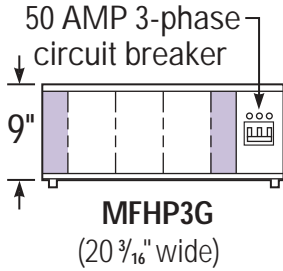
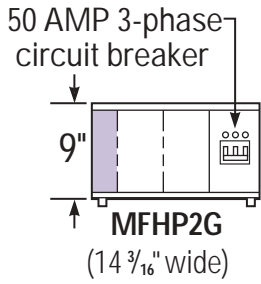
ZONES	ORDER ITEMS A and B or C					
	(A) FOR POWER INPUT CONNECTORS		(B) FOR THERMOCOUPLE CONNECTORS		(C) COMBINATION POWER & TC	
	QTY.	CATALOG NUMBER	QTY.	CATALOG NUMBER	QTY.	CATALOG NUMBER
32	3	PIC512-TBG	1	MTC8-TBG and	1	PTC8-TBG and
			2	MTC12-TBG	2	PTC12-TBG
36	3	PIC512-TBG	3	MTC12-TBG	3	PTC12-TBG
40	4	PIC512-TBG	2	MTC8-TBG and	2	PTC8-TBG and
			2	MTC12-TBG	2	PTC12-TBG
44	4	PIC512-TBG	1	MTC8-TBG and	1	PTC8-TBG and
			3	MTC12-TBG	3	PTC12-TBG
48	4	PIC512-TBG	4	MTC12-TBG	4	PTC12-TBG

NOTES: Combination terminal mounting boxes are available with connectors prewired to terminal strips. See Q-25 for details.

See page Q-26 for dimensional details. For below flush mounting of connectors, see mold pocket layouts on catalog pages Q23-24.

See page Q-14 for current voltage monitor.

# Smart Series® High Power Mainframes (30 AMP)

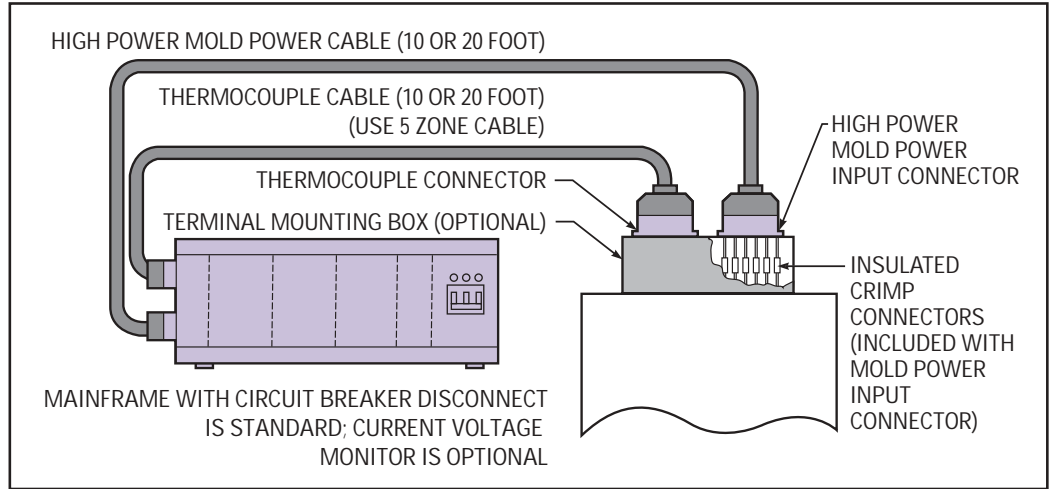


**DIMENSIONS ABOVE DO NOT INCLUDE CONNECTORS**  
all frames are 12" deep

**NOTE:** Blank panels cover unused zones in frames (shaded panels above). For communications (MFCHP) type frames, these zones may be used for communications modules.



**NOTE:** Combination frames to accommodate both 15 and 30 AMP modules (with or without communications) are available by special order.



The 3 configurations illustrated at left provide 2, 3 or 5 zones of 30 AMP control for higher wattage heater applications. The Current Voltage monitor option will be factory installed when ordered at the same time as Mainframe. Control modules, cables, mold connectors and other accessories are ordered separately.

ZONES	SMART SERIES HIGH POWER MAINFRAMES OPTIONAL CURRENT VOLTAGE MONITOR IS FACTORY INSTALLED IN CV-STYLE FRAMES			
	"MFHP" TYPE FOR TEMPERATURE CONTROL	"MFHP" TYPE WITH CURRENT VOLTAGE MONITOR	"MFCHP" TYPE FOR TEMP. CONTROL AND COMMUNICATIONS	"MFCHP" TYPE WITH CURRENT VOLTAGE MONITOR
	ITEM NUMBER	ITEM NUMBER (CV-STYLE)	ITEM NUMBER	ITEM NUMBER (CV-STYLE)
2	MFHP2G	MFHP2G-CV	MFCHP2G	MFCHP2G-CV
3	MFHP3G	MFHP3G-CV	MFCHP3G	MFCHP3G-CV
5	MFHP5G	MFHP5G-CV	MFCHP5G	MFCHP5G-CV

ZONES	CABLES AND MOLD CONNECTORS REQUIRED (NOT INCLUDED WITH MAINFRAMES)							
	MOLD POWER CABLES C10 = 10 FT. C20 = 20 FT. (SELECT LENGTH DESIRED)		THERMOCOUPLE CABLES C10 = 10 FT. C20 = 20 FT. (SELECT LENGTH DESIRED)		MOLD POWER INPUT CONNECTORS (INCL. CRIMP CONNECTORS)		THERMOCOUPLE CONNECTORS	
	QTY.	ITEM NUMBER	QTY.	ITEM NUMBER	QTY.	ITEM NUMBER	QTY.	ITEM NUMBER
2	1	MPCH23-C10 or C20-G	1	TC5-C10 or C20-G	1	PICH23G	1	MTC5G
3	1	MPCH23-C10 or C20-G	1	TC5-C10 or C20-G	1	PICH23G	1	MTC5G
5	1	MPCH5-C10 or C20-G	1	TC5-C10 or C20-G	1	PICH5G	1	MTC5G

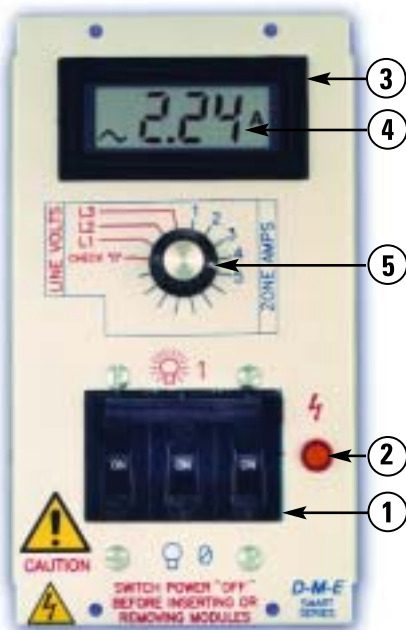
**NOTE:** For details on cables and connectors, see pages Q19-22.

## TERMINAL MOUNTING BOXES

ZONES	ORDER ITEMS A and B or C					
	(A) FOR POWER INPUT CONNECTORS		(B) FOR THERMOCOUPLE CONNECTORS		(C) COMBINATION POWER & TC	
	QTY.	ITEM NUMBER	QTY.	ITEM NUMBER	QTY.	ITEM NUMBER
2	1	PICH23-TBG	1	MTC5-TBG	1	PTCH23-TBG
3	1	PICH23-TBG	1	MTC5-TBG	1	PTCH23-TBG
5	1	PICH5-TBG	1	MTC5-TBG	1	PTCH5-TBG

**NOTE:** See page 25-26 for dimensional details. For below-flush mounting of connectors, see mold pocket layouts on pages 23-24.

## Smart Series® Digital Current/Voltage Monitor



### Streamlined Design For Improved Performance

The new Current/Voltage Monitor is simple to operate and features a large easy-to-read digital display. Ease of operation has been enhanced by streamlining the unit and eliminating unnecessary switches and controls. When setting the selector switch to the desired zone number, the 'AMPS' function is selected. The meter will then display the amount of current being delivered by the selected module. Input voltage to the system can be measured by rotating the selector switch to one of the three 'line voltage' positions. This will set the meter in the 'voltage' function and display the voltage of the selected phase.

### Current Supply To Each Zone

To monitor the current supply to each zone, simply set the rotary selector switch to the desired module zone number. The "AMPS" function is then automatically selected and is indicated by the letter 'A' just to the right of the numbers in the display window. The meter displays the current being delivered to the heater load in amperes.

### Input Voltage From Each Phase

Set the rotary selector to the desired phase voltage position. This automatically selects the 'volts' function which is indicated when the letter 'V' appears to the right of the numbers in the display window. The meter will display the line voltage of the selected phase.

1. **CIRCUIT BREAKER/DISCONNECT** – Applies or removes power to all modules in the frame.
2. **POWER ON LIGHT (amber)** – Illuminates when CIRCUIT BREAKER is in the ON position.
3. **AMPS/VOLTS METER** – Digital multi-scale meter provides accurate readings of zone current (AMPS) or input voltage (VOLTS).
4. **AMPS/VOLTS INDICATOR** – Appears automatically when either AMPS or VOLTS is selected.
5. **SELECTOR SWITCH** – Multi-position switch automatically selects zone current or phase line voltage to be monitored. For systems with more than 12 zones, additional meter and selector switch panels are supplied.

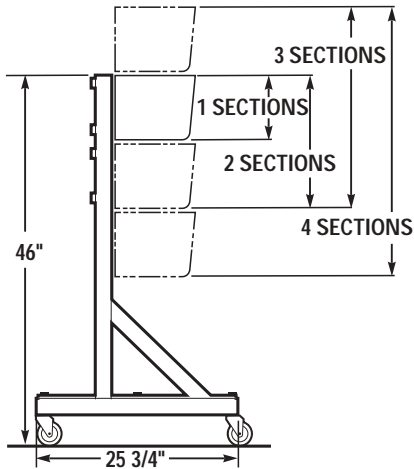
### Specifications

<b>Voltmeter Range</b>	190 to 290 VAC (for 240 volt systems) 90 to 145 VAC (for 120 volt systems)
<b>Voltmeter Accuracy</b>	± 3% of reading, 50 to 60 Hz
<b>Maximum Voltmeter Input</b>	400 VAC
<b>Input Voltage</b>	240/120 VAC, 50 to 60 Hz
<b>Ammeter Range</b>	0 to 2; 0 to 30; 0 to 40 Amperes
<b>Ammeter Accuracy</b>	± 2% @ 0 to 100% Duty Cycle, 50-60 Hz
<b>Maximum Ammeter Input</b>	30 Amperes

**NOTE: The Digital Current/Voltage Monitor is a factory installed option which replaces the standard circuit breaker/disconnect, and is supplied when "CV-style" mainframes are ordered.**

See pages 12 and 13 for appropriate mainframe catalog numbers.

## Smart Series® Accessories



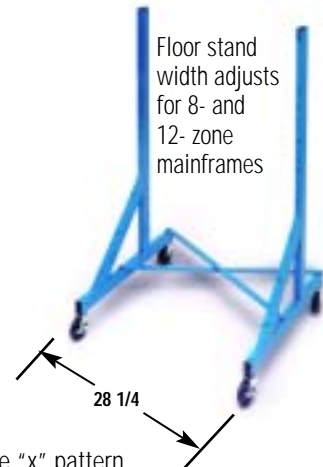
### Universal Floor Stand

The Universal Floor Stand will accommodate all 15 or 30 amp Mainframes from one to four sections high. Stand is made from heavy gauge steel and includes locking casters (400 lb. rating). All assembly and Mainframe mounting hardware is included. Heavy duty floor stand available for larger systems (1000 lb. rating).

ITEM NUMBER	RATING
MFS-512-G	400 LBS
MFS-512-G-HD*	1000 LBS

\*HD stand not shown.

Floor stand comes with plates for 5-zone frame mounting on 8-zone "x" pattern



### Step-Down Transformer Kits (from 480 VAC to 240 VAC)

Transformer Kits are pre-wired and include enclosed transformer (480 VAC input, 240 VAC output) with adjustable transformer voltage taps, one 10-foot cable for AC power-in (no connector), one 6-foot cable for mainframe (AC input), one safety switch, two extra fuses, floor stand (MFS-512-G) and all mounting brackets and hardware required. Shipped with instructions for easy assembly.

Single section frames mount to front or rear of stand.

ITEM NUMBER	POWER CAPACITY
TK6-1A-G	6 KVA
TK9-1A-G*	9 KVA
TK15-1A-G*	15 KVA
TK30-1A-G**	30 KVA

Mainframe not included.

Adapter plates for narrower frames available by special order.

\* Comes with plates for mounting 8 zone on 12 zone "x" pattern

\*\* Supplied with MFS-512-G-HD for this transformer size or large and transformers mounted flat.

**NOTE:** Power capacity needed depends on total load of system (i.e. number of zones and heater load per zone).

#### Also Available:

1. Transformer only
  2. Transformer and cables only
  3. Transformers with other voltage or current capacities
  4. Isolation Transformers
- Contact D-M-E for details and prices.



### Mainframe Blank Panels

Used to cover unused zones in mainframes. Push-pull fasteners included in panel. **MFBP10G** covers one 15 AMP zone; **MFBP30G** covers one 30 AMP zone (or two 15 AMP zones).

ITEM NUMBER
MFBP10G
MFBP30G

### Module Replacement Fuses (sold in packages of 5)

ITEM NUMBER	AMPS
ABC-1	1
ABC-15	15
ABC-10	10
13X-10	10
13X-15	15



### Insulated Crimp Connectors

For connection of mold power input connector leads to heater leads. (195°F / 90°C maximum temperature)

ITEM NUMBER	AMPS	WIRE GAUGE
HWCC-1 (Bag of 30)	10-15	16-22 RED
HWCC-3 (Bag of 30)	10-15	14-16 BLUE
HWCC-2 (Bag of 20)	15-30	10-12 YELLOW

**NOTE:** Initial supply is provided with mold power input connectors.

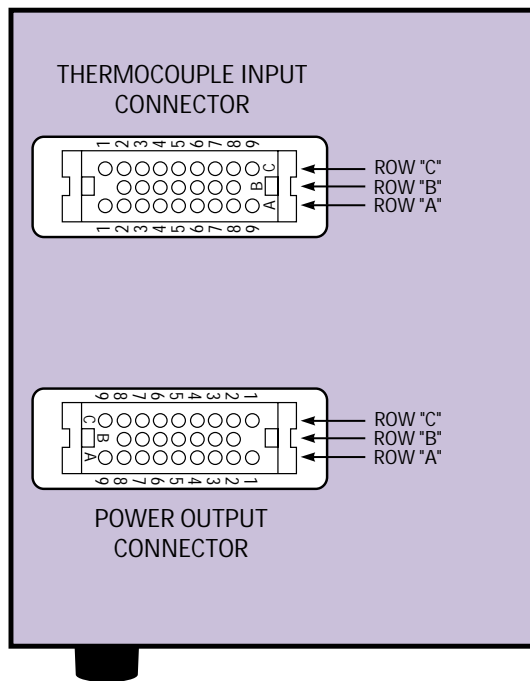




# Smart Series® Mainframe Connector Wiring

## STANDARD MAINFRAME CONNECTOR WIRING

Side of Mainframe



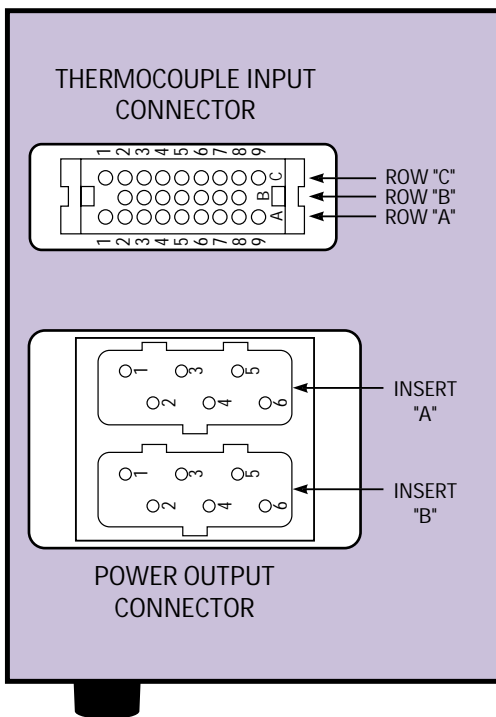
ZONE	THERMOCOUPLE INPUT
1	ROW "A" TERMINALS 1 (WHT) + 2 (RED)
2	ROW "A" TERMINALS 3 (WHT) + 4 (RED)
3	ROW "A" TERMINALS 5 (WHT) + 6 (RED)
4	ROW "A" TERMINALS 7 (WHT) + 8 (RED)
5	ROW "B" TERMINALS 2 (WHT) + 3 (RED)
6	ROW "B" TERMINALS 4 (WHT) + 5 (RED)
7	ROW "B" TERMINALS 6 (WHT) + 7 (RED)
8	ROW "C" TERMINALS 1 (WHT) + 2 (RED)
9	ROW "C" TERMINALS 3 (WHT) + 4 (RED)
10	ROW "C" TERMINALS 5 (WHT) + 6 (RED)
11	ROW "C" TERMINALS 7 (WHT) + 8 (RED)
12	ROW "A" TERM. 9 (WHT) ROW "C" TERM. 9 (RED)
ROW "B" TERMINAL 8 IS NOT USED	

ZONE	POWER OUTPUT
1	ROW "A" TERMINALS 1 + 2
2	ROW "A" TERMINALS 3 + 4
3	ROW "A" TERMINALS 5 + 6
4	ROW "A" TERMINALS 7 + 8
5	ROW "B" TERMINALS 2 + 3
6	ROW "B" TERMINALS 4 + 5
7	ROW "B" TERMINALS 6 + 7
8	ROW "C" TERMINALS 1 + 2
9	ROW "C" TERMINALS 3 + 4
10	ROW "C" TERMINALS 5 + 6
11	ROW "C" TERMINALS 7 + 8
12	ROW "A" + "C" TERMINALS 9
ROW "B" TERMINAL 8 IS NOT USED	

- NOTE:**
1. Mating cable connectors are wired the same as frame connectors shown.
  2. Wires in frames are color coded for reference when rewiring of frame connectors is necessary (see owner's manual).
  3. All grounds must be connected to ensure operator safety.

## HIGH POWER MAINFRAME CONNECTOR WIRING

Side of Mainframe



ZONE	THERMOCOUPLE INPUT
1	ROW "A" TERMINALS 1 (WHT) + 2 (RED)
2	ROW "A" TERMINALS 3 (WHT) + 4 (RED)
3	ROW "A" TERMINALS 5 (WHT) + 6 (RED)
4	ROW "A" TERMINALS 7 (WHT) + 8 (RED)
5	ROW "B" TERMINALS 2 (WHT) + 3 (RED)

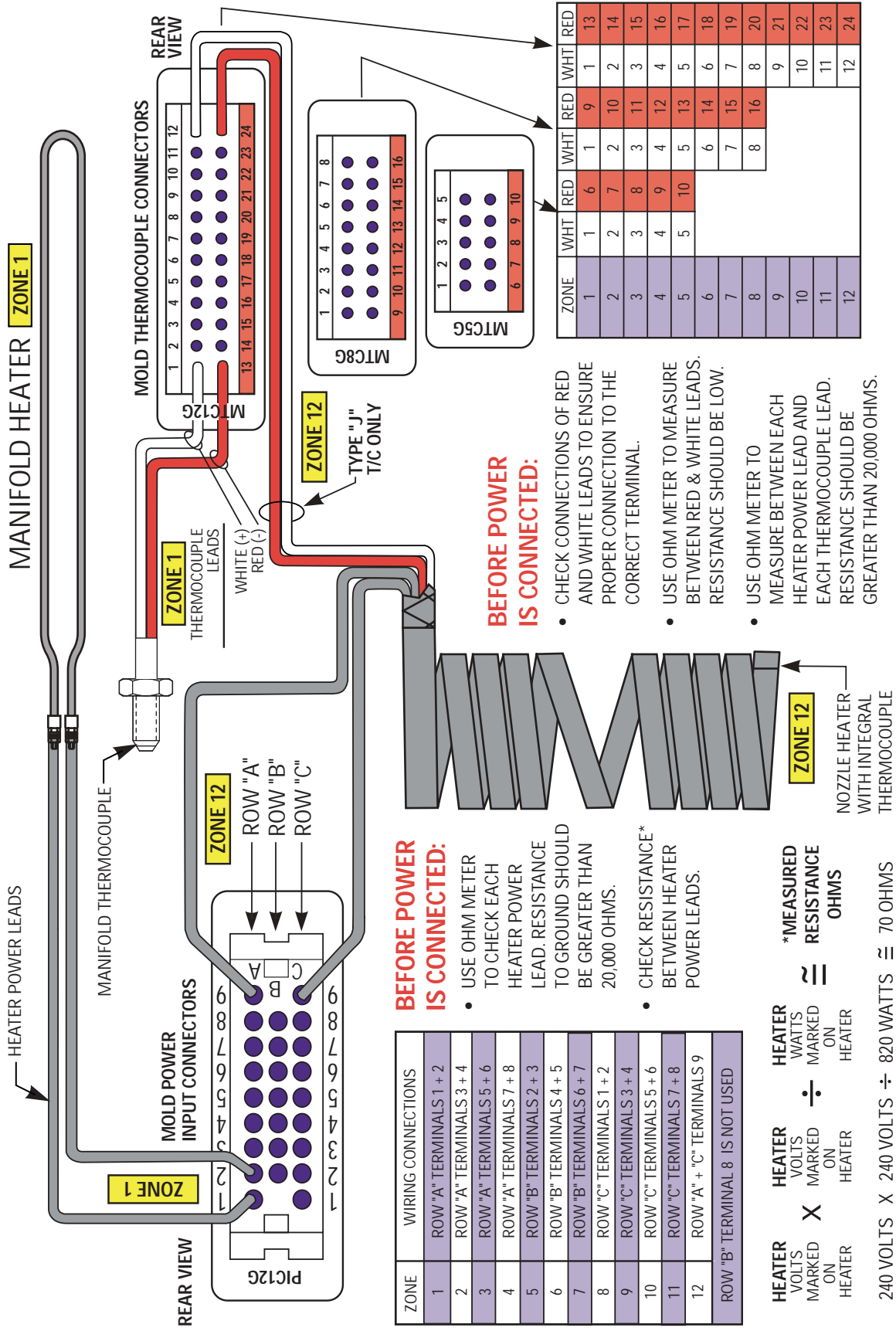
FOR 5 ZONE CONNECTOR (SHOWN)

ZONE	INSERT	TERM
1	INSERT "A"	1 + 2
2	INSERT "A"	3 + 4
3	INSERT "A"	5 + 6
4	INSERT "B"	1 + 2
5	INSERT "B"	3 + 4
NO CONNECTION "B"		5 + 6

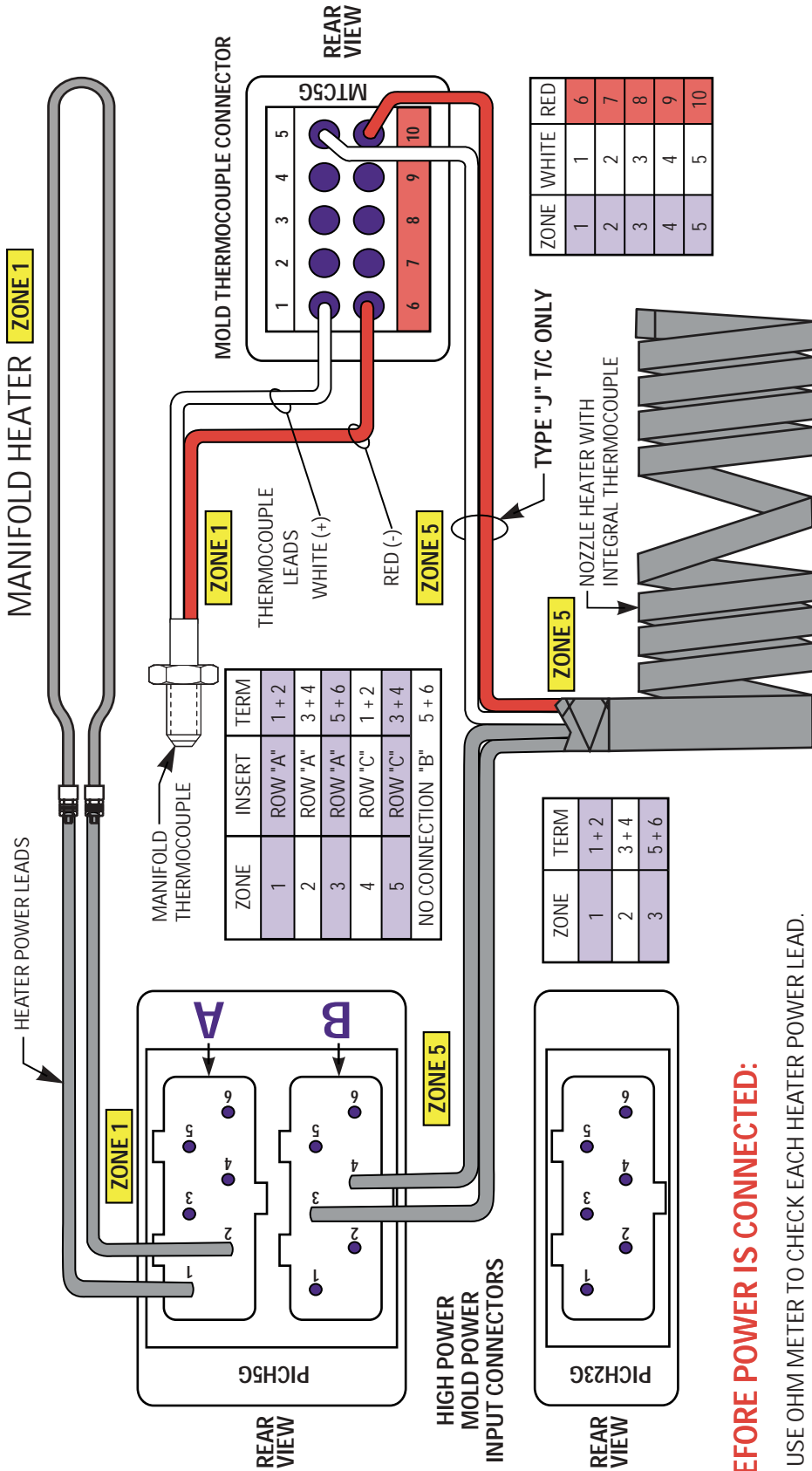
FOR 2 & 3 ZONE CONNECTOR (WITH INSERT "A" ONLY)

ZONE	INSERT	TERM
1	INSERT "A"	1 + 2
2	INSERT "A"	3 + 4
3	INSERT "A"	5 + 6

# Wiring Diagram For The D-M-E Hot Runner Molding System and Smart Series® Mold Connectors



# Wiring Diagram For The D-M-E Hot Runner Molding System and High Power Smart Series® Mold Connectors



### BEFORE POWER IS CONNECTED:

- CHECK CONNECTIONS OF RED AND WHITE LEADS TO ENSURE PROPER CONNECTION TO THE CORRECT TERMINAL.
- USE OHM METER TO MEASURE BETWEEN RED & WHITE LEADS. RESISTANCE SHOULD BE LOW.
- USE OHM METER TO MEASURE BETWEEN EACH HEATER POWER LEAD AND EACH THERMOCOUPLE LEAD. RESISTANCE SHOULD BE GREATER THAN 20,000 OHMS.

### BEFORE POWER IS CONNECTED:

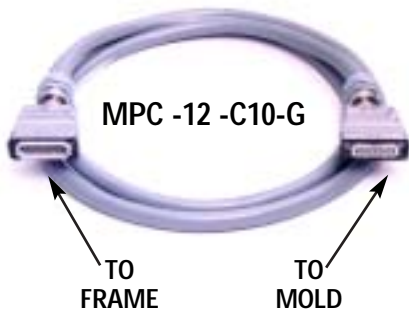
- USE OHM METER TO CHECK EACH HEATER POWER LEAD. RESISTANCE TO GROUND SHOULD BE GREATER THAN 20,000 OHMS.
- CHECK RESISTANCE\* BETWEEN HEATER POWER LEADS.

HEATER VOLTS MARKED ON HEATER	HEATER VOLTS MARKED ON HEATER	HEATER WATTS MARKED ON HEATER	*MEASURED RESISTANCE OHMS
X	240 VOLTS	820 WATTS	≈ 70 OHMS

### NOTES:

All grounds must be connected to mold to ensure operator safety. All crimp connections may be eliminated. Simply remove 6" leads from PIC connectors and wire directly.

## Smart Series® /Mold Power and Thermocouple Cables



Mold Power Cables are used to connect the Mainframe to the Power Input Connector on the mold. Available in lengths of 10 or 20 feet. Integral retaining latches on both the frame and mold connectors provide secure cable connections. Connector configurations ensure proper insertion of cable. Cables are wired for 5, 8 or 12 zones (15 AMP) and 3 or 5 zones (30 AMP) for use with the appropriate Smart Series Mainframes and Mold Power Input Connectors.

### Universal Mold Power Cable (15 AMP)

The MPC-12-C10 or 20-G Mold Power Cable also serves as a universal cable for connecting any 15 AMP Smart Series Mainframe to any 15 AMP Mold Power Input Connector. The maximum number of zones will be determined by the connector in the mold.

### Mold Power Cables (15 AMP Max)

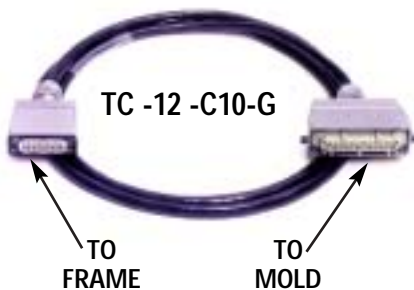
10 FOOT LONG ITEM NUMBER	20 FOOT LONG ITEM NUMBER	NUMBER OF ZONES (MAX.)	FOR CONNECTIONS	
			FROM 15 AMP FRAME (S)	TO POWER INPUT CONNECTOR
MPC-5-C10-G	MPC-5-C20-G	5	5, 8, 12 ZONE	PIC-5-G
MPC-8-C10-G	MPC-8-C20-G	8	8, 12 ZONE	PIC-8-G
MPC-12-C10-G	MPC-12-C20-G	12	12 ZONE	PIC-12-G

### Mold High Power Cables (30 AMP Max)

10 FOOT LONG ITEM NUMBER	20 FOOT LONG ITEM NUMBER	NUMBER OF ZONES (MAX.)	FOR CONNECTIONS	
			FROM 30 AMP FRAME (S)	TO POWER INPUT CONNECTOR
MPCH-23-C10-G	MPCH-23-C20-G	3	2-3 ZONE	PICH-23-G
MPCH-5-C10-G	MPCH-5-C20-G	5	5 ZONE	PICH-5-G

### SPECIAL CABLES

Virtually any type of Conversion or Special Cable configuration can be provided by special order.



Thermocouple Cables are used to connect the Mainframe to the Thermocouple Connector on the mold, and are available in lengths of 10 or 20 feet. Integral retaining latches on both the frame and mold connectors provide secure cable connections. Connector configurations ensure proper insertion of cable. Cables available are wired for 5, 8 or 12 zones for use with the appropriate Smart Series Mainframes and Thermocouple Connectors.

### Thermocouple Cables (for use with 15 or 30 AMP Mainframes)

These Thermocouple Cables serve as cables for connecting dissimilar Mainframes and Thermocouple Connectors. For example, the TC-8-C10-G could be used to connect a 12-zone frame to an 8-zone MTC-8-G connector. The maximum number of zones will be determined by the connector in the mold.

### Thermocouple Cables

10 FOOT LONG ITEM NUMBER	20 FOOT LONG ITEM NUMBER	NUMBER OF ZONES (MAX.)	FOR CONNECTIONS	
			FROM 15 AMP FRAME (S)	TO THERMOCOUPLE CONNECTOR
TC-5-C10-G*	TC-5-C20-G*	5	5, 8, 12 ZONE	MTC-5-G
TC-8-C10-G	TC-8-C20-G	8	8, 12 ZONE	MTC-8-G
TC-12-C10-G	TC-12-C20-G	12	12 ZONE	MTC-12-G

\* Used with all 30 AMP Mainframes.

# Smart Series® Mold Power Input Connectors

## For 15 AMP Applications



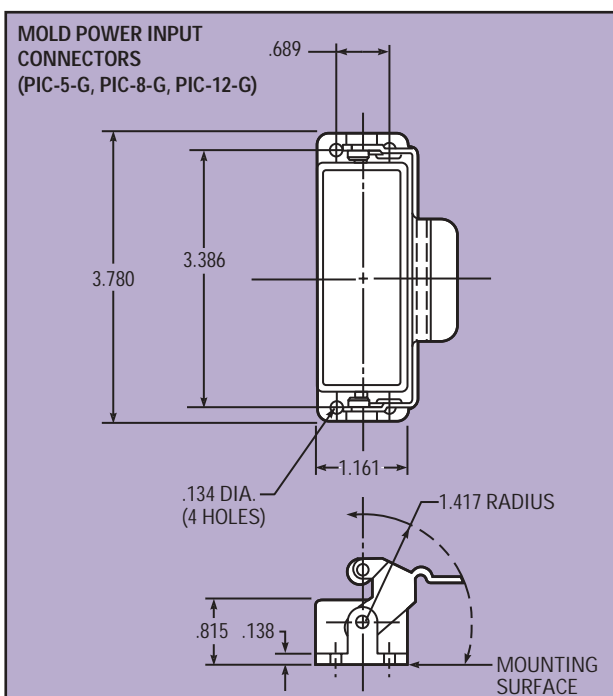
## For 30 AMP Applications



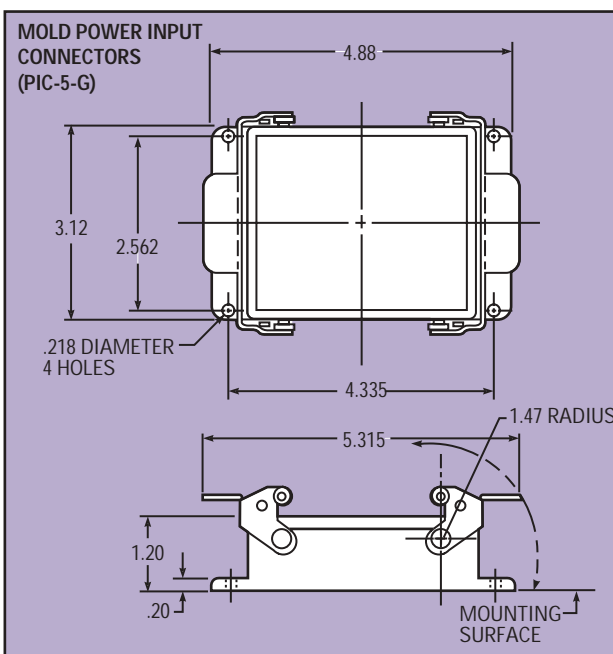
**NOTES:** Connector PICH-23-G is dimensionally identical to thermocouple connector MTC-8-G. See page 22.

For: PICH-23-G and PICH-5-G, direct wiring without crimp connectors is possible by removing 6" leads.

Mold Power Input Connectors are mounted on the mold to accept power cable(s) from the Mainframe. They are supplied with six inches of numbered leads and a ground wire. All three 15 AMP connectors are the same physical size and use 14-gauge wire. Only the number of active pins change. The 30 AMP connectors are supplied with 10-gauge leads and are attached to screw terminals. Each is equipped with an integral retaining latch to provide a secure cable connection. Connector configuration ensures proper insertion of cable. Splicing of 6" leads to heater power leads is easily accomplished with the Insulated Crimp Connectors supplied.



**NOTE:** Dimensions shown may vary slightly.



**NOTE:** Ground wire must be connected to mold to ensure operator safety.

## Mold Power Input Connectors

ITEM NUMBER	NUMBER OF ZONES (MAX.)	AMPS (MAX.) PER ZONE
PIC-5-G	5	15
PIC-8-G	8	15
PIC-12-G	12	15
PICH-23-G	3	30
PICH-5-G	5	30

**NOTE:** Replacement parts and extraction tools can be found on page 37

## Insulated Crimp Connectors

ITEM NUMBER	AMPS	FOR WIRE GAUGE
HWCC-1 30 PCS.	10-15	16-22
HWCC-3 30 PCS.	15	14-16
HWCC-2 20 PCS.	30	10-12

**NOTE:** Initial supply is provided with mold power input connectors. Also, see page 15



## Quick Connection System



MTC-5-G-IDC



MTC-8-G-IDC



MTC-12-G-IDC

### 10, 16 and 24 Position Insulation Displacement Connectors (IDC)

These connectors are plug compatible with D-M-E standard MTC5G, MTC8G, and MTC12G thermocouple connectors, and offer several advantages.

- No stripping of wire necessary
- No special tools required
- No screw terminals to tighten and no forgetting if wire is secured
- Saves time and reduces labor costs
- Cut wire to length, insert wire in the opening, push in tab, and the wire is terminated
- Easy wiring of thermocouples for new installation
- Easy repair of existing molds
- Can accept wires 20 - 16 AWG\*



Leverage screwdriver tip to force out orange actuator



Insert wire into hole as shown and push actuator with thumb  
Do Not Strip Wire!  
Use only 20 - 16 AWG wire

### Connector Supplied with Latched Base

ITEM NUMBER	NUMBER OF PINS	DIMENSION	
		M2	H
MTC-5-G-IDC	10	3.268	3.662
MTC-8-G-IDC	16	4.055	4.449
MTC-12-G-IDC	24	5.118	5.512



Wire is terminated when orange actuator tab is pushed in flush

\*Not suitable for wires larger than 16 AWG wire; stranded wire is preferred.

# Smart Series® Mold Thermocouple Connectors



MTC-5-G



MTC-8-G



MTC-12-G



TPC-0001

### Thermocouple / Mold Power Connectors

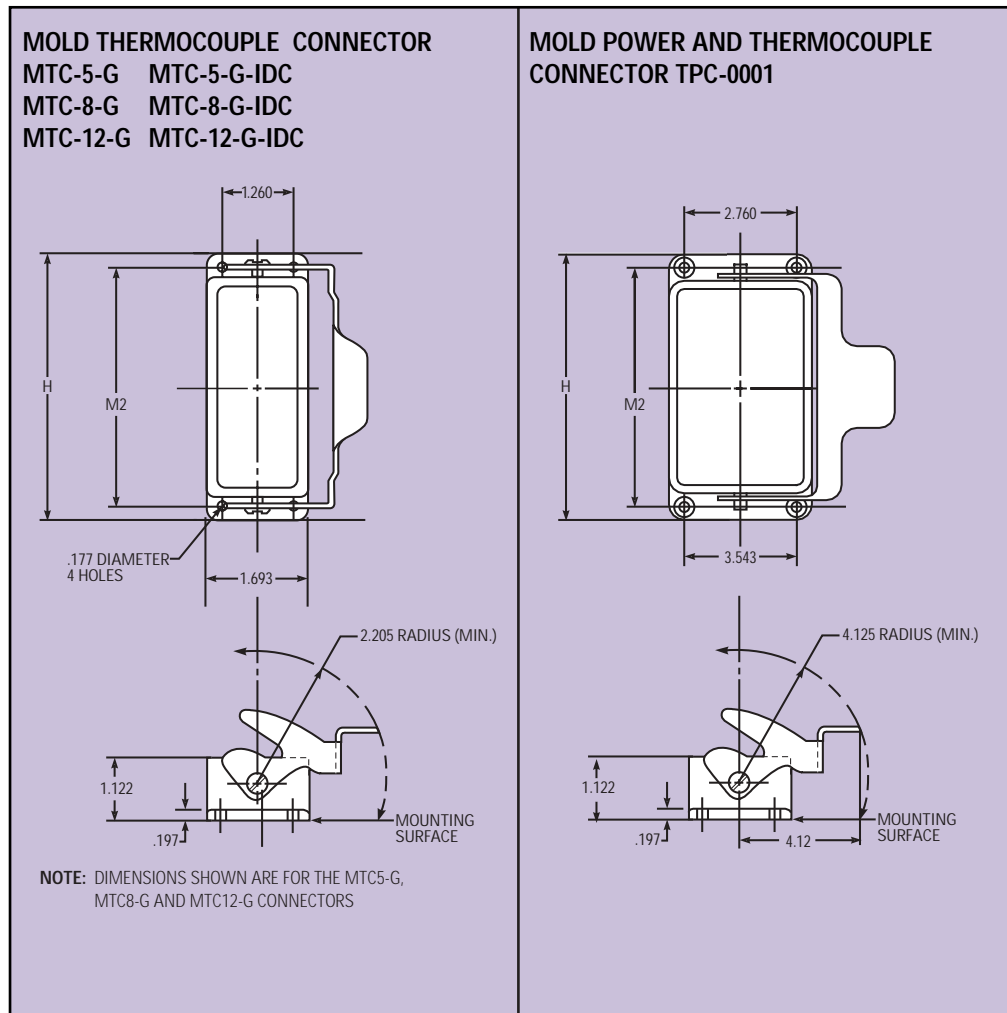
ITEM NUMBER	NUMBER OF ZONES (MAX.)
MTC-5-G*	5
MTC-8-G	8
MTC-12-G	12
TPC-0001	12

\* Use with 2, 3 and 5 zone, 30 AMP mainframes

Thermocouple Connectors are mounted on the mold to use with thermocouple cable(s) from the Mainframe. Screw type terminals for use with iron(+) and constantan(-) thermocouple leads are numbered and coded on the side and bottom of each connector. All three connectors are equipped with integral retaining latches to provide a secure cable connection. Connector configuration ensures proper insertion of cable. Pins are made of copper alloy and are silver plated. Experience has proven that iron and constantan are not required.

ITEM NUMBER	NUMBER OF PINS	DIMENSION	
		M2	H
MTC-5-G	10	3.268	3.662
MTC-8-G	16	4.055	4.449
MTC-12-G	24	5.118	5.512
TPC-0001	48	5.827	6.496

NOTE: MOLD POWER INPUT CONNECTOR PICH-23-G IS DIMENSIONALLY IDENTICAL TO MTC-8-G

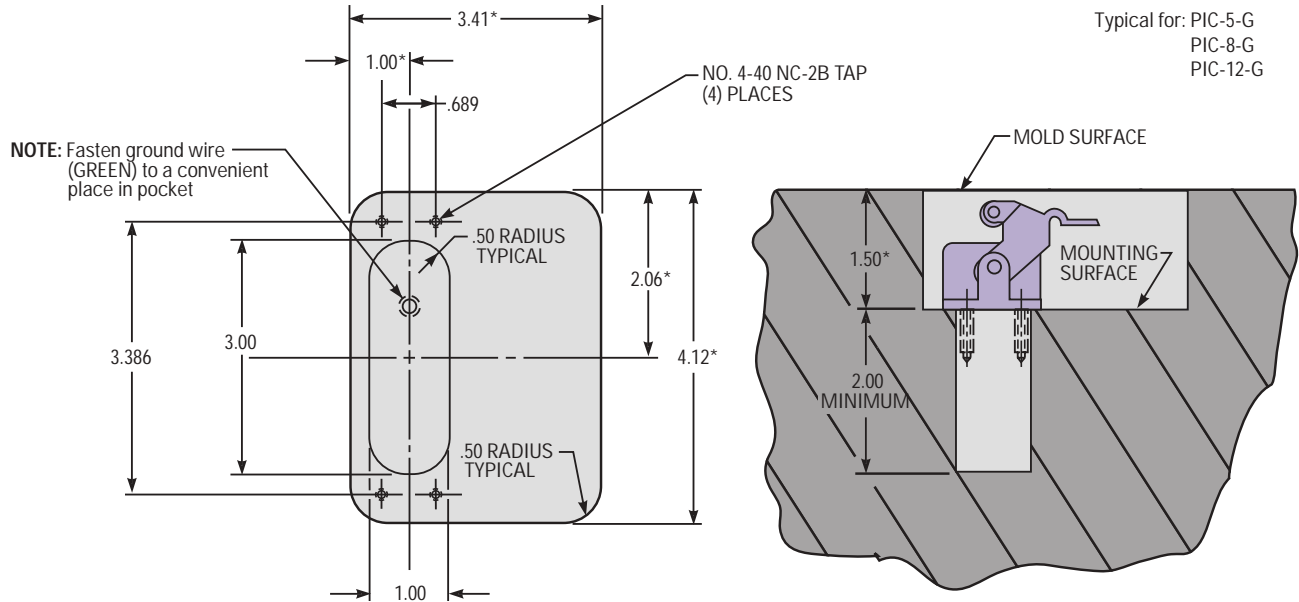


# Mold Connector Pocket Layouts

**NOTE:** Drawing depicts below-flush mounting. Disregard dimensions marked with \* for surface mounting.

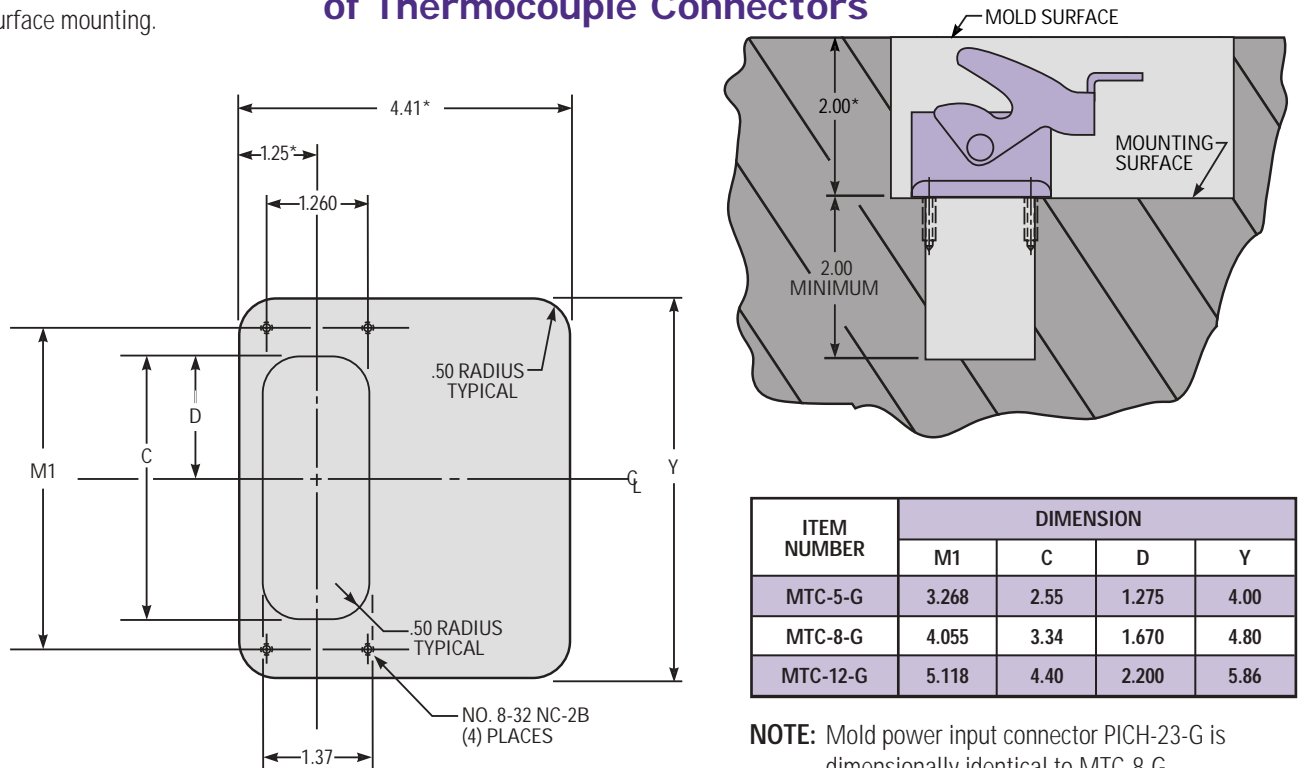
Where space or mold handling and storage requirements do not permit the use of Terminal Mounting Boxes, the connectors can be below-flush or surface mounted. See drawings below and page Q-24 for dimensions.

## Below-Flush and Surface Mounting of Mold Power Input Connectors (15 AMP)



**NOTE:** Disregard dimensions marked with \* for surface mounting.

## Below-Flush and Surface Mounting of Thermocouple Connectors



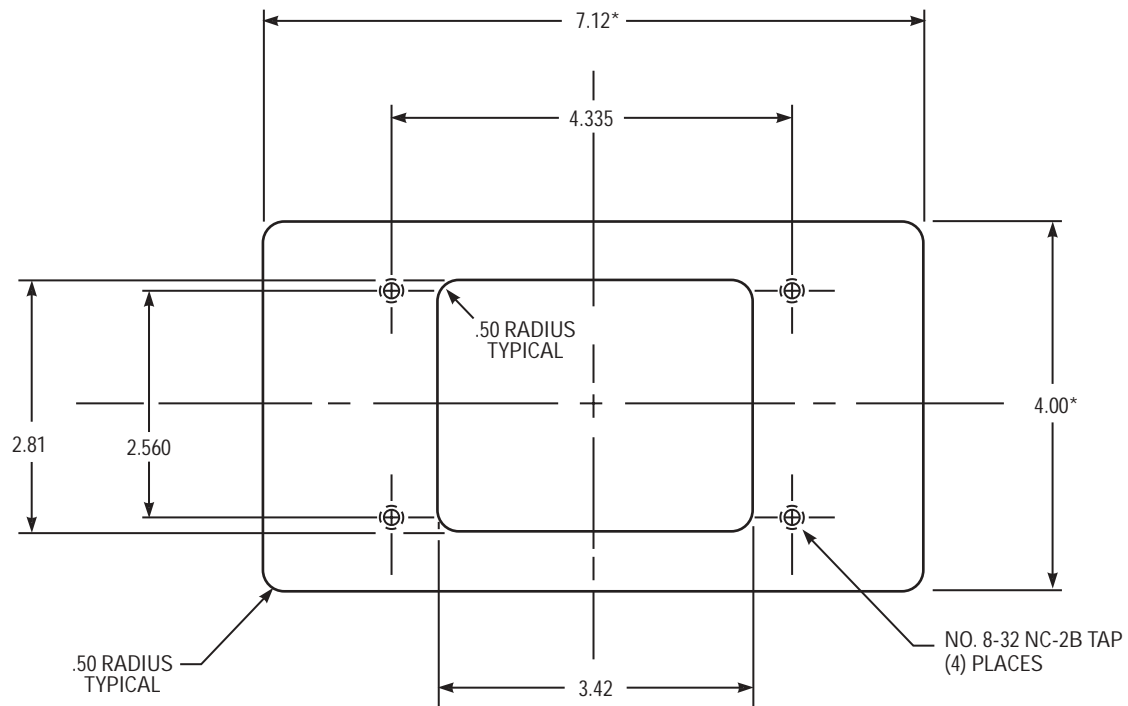
ITEM NUMBER	DIMENSION			
	M1	C	D	Y
MTC-5-G	3.268	2.55	1.275	4.00
MTC-8-G	4.055	3.34	1.670	4.80
MTC-12-G	5.118	4.40	2.200	5.86

**NOTE:** Mold power input connector PICH-23-G is dimensionally identical to MTC-8-G.



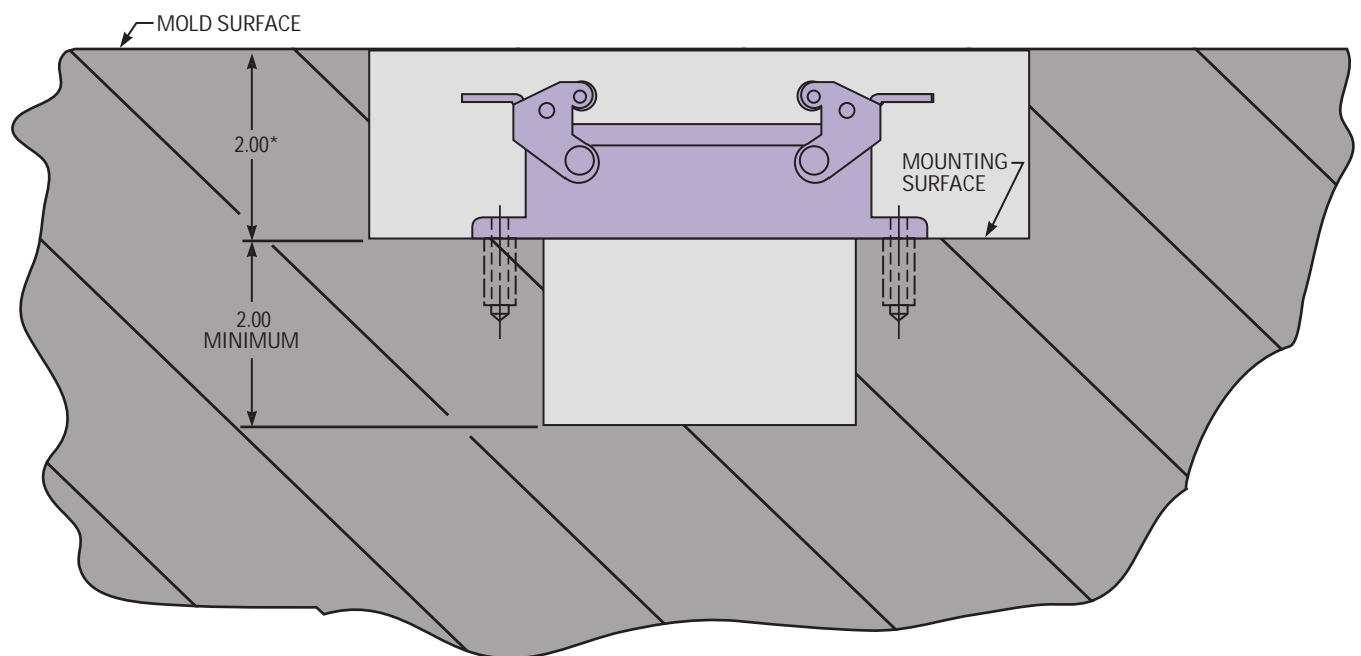
## Mold Connector Pocket Layouts (cont.)

### Below-Flush and Surface Mounting of Mold Power Input Connectors (30 AMP)



#### For PICH-5-G

**NOTE:** Drawing depicts below-flush mounting. Disregard dimensions marked with \* for surface mounting.



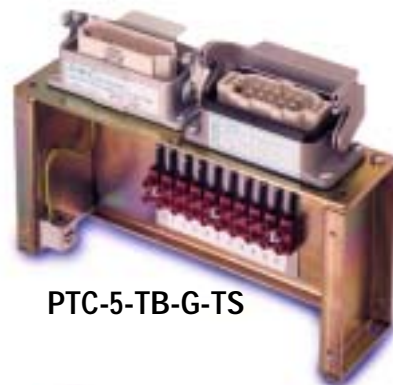
#### For PICH-23-G

(Use pocket dimensions shown on pages 22-23 as detailed for thermocouple connector MTC-8-G.)

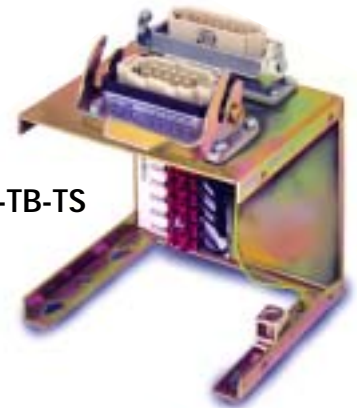
## Smart Series® Terminal Mounting Boxes

### Pre-wired Combination Terminal Mounting Boxes

Includes terminal strip for ease of wiring, all necessary connectors installed, and power connector pre-wired to a terminal strip. All units shown without covers.



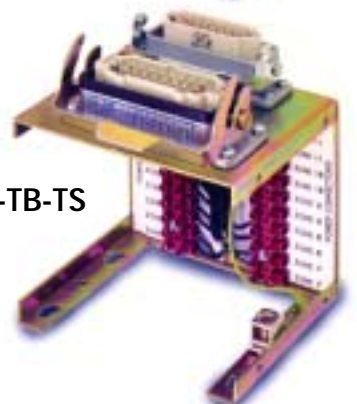
PTC-5-TB-G-TS



PTC-5-TB-TS

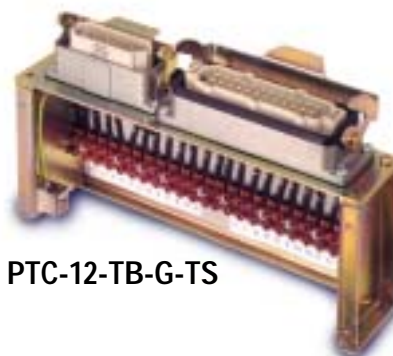


PTC-8-TB-TS

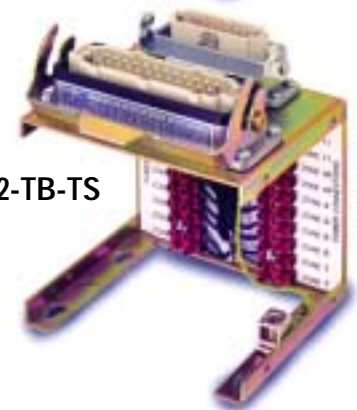


PTC-2-TB-G-TS is not to be used with SSH-10-12, SSH-10-11, MFP-1-G, MFP-1-G-1, MFP-2-G, MFPR-2-G controls & mainframes

For use with PTC-0110 or PTC-0120 Cables only. See page 4.



PTC-12-TB-G-TS



PTC-12-TB-TS



PTC-2-TB-G-TS

### Combination Terminal Mounting Boxes - with Terminal Strip

ITEM NUMBER	X	Y	H	M1	M2	ACCEPTS
PTC-2-TB-G-TS*	2.75	4.88	4.25	1.500	4.250	See page 9
PTC-5-TB-G-TS**	2.75	8.66	4.25	1.500	8.031	PIC-5-G, MTC-5-G**
PTC-8-TB-G-TS**	2.75	9.47	4.25	1.500	8.843	PIC-8-G, MTC-8-G**
PTC-12-TB-G-TS**	2.75	10.53	4.25	1.500	9.906	PIC-12-G, MTC-12-G**
PTC-5-TB-TS**	5.00	6.13	5.12	2.625	5.000	PIC-5-G, MTC-5-G**
PTC-8-TB-TS**	5.00	6.13	5.12	2.625	5.000	PIC-8-G, MTC-8-G**
PTC-12-TB-TS**	5.00	6.13	5.12	2.625	5.000	PIC-12-G, MTC-12-G**

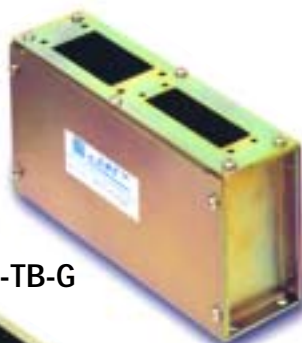
\*\*Comes with all necessary connectors installed and power connector pre-wired to a terminal strip.

\*Power & thermocouple connectors are pre-wired.

# Smart Series® Terminal Mounting Boxes



**PTC-8-TB-G**  
(Connectors  
ordered separately)



**PTC-5-TB-G**



**PTC-0012**



**PTC-512-TB-G**



**PTC-2-10**

Terminal Mounting Boxes provide the easiest and most economical method of mounting power and thermocouple connectors on the mold. Constructed of plated heavy gauge steel, each box is precut and drilled for quick mounting of the connector to the box, and box to the mold. Connector mounting hardware is supplied. Connectors are ordered separately.

## Terminal Mounting Boxes for Mold Power Input Connectors

ITEM NUMBER	X	Y	H	M1	M2	ACCEPTS
PIC-512-TB-G	2.75	4.875	4.25	1.500	4.250	PIC-5, 8 or 12-G
PICH-23-TB-G	2.75	5.614	4.25	1.500	4.990	PICH-23-G
PICH-5-TB-G	2.75	6.676	4.25	1.500	6.052	PICH-5-G

## Terminal Mounting Boxes for Thermocouple Connectors

ITEM NUMBER	X	Y	H	M1	M2	ACCEPTS
MTC-5-TB-G	2.75	4.875	4.25	1.500	4.250	MTC-5-G
MTC-8-TB-G	2.75	5.614	4.25	1.500	4.990	MTC-8-G
MTC-12-TB-G	2.75	6.676	4.25	1.500	6.052	MTC-12-G

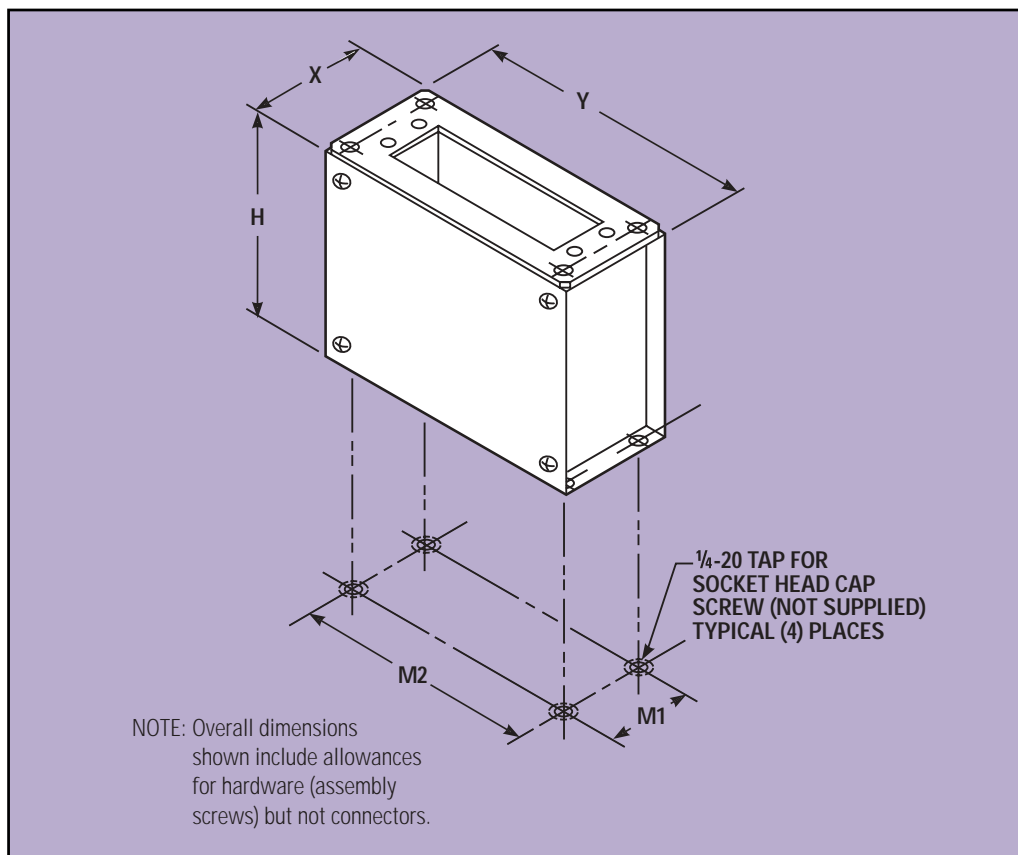
## Combination Terminal Mounting Boxes

ITEM NUMBER	X	Y	H	M1	M2	ACCEPTS
PTC-2-10	2.75	4.88	4.25	1.500	4.250	(2) CKPTIC-1
PTC-5-TB-G	2.75	8.66	4.25	1.500	8.031	PIC-5-G, MTC-5-G
PTC-8-TB-G	2.75	9.47	4.25	1.500	8.843	PIC-8-G, MTC-8-G
PTC-12-TB-G	2.75	10.53	4.25	1.500	9.906	PIC-12-G, MTC-12-G
PTCH-1-TB-G**	4.46	4.88	4.25	3.250	4.250	AC1240MI, TCS-1
PTCH-23-TB-G	2.75	10.53	4.25	1.500	9.906	PICH-23-G, MTC-5-G
PTCH-5-TB-G	4.46	11.06	4.25	3.250	10.431	PICH-5-G, MTC-5-G
PTC-0012	4.46	7.66	4.25	3.250	7.160	TPC-0001

\* Used with 2-zone, 15 AMP mainframe MFFPR-2G

\*\* Used with 1-zone, 30 AMP mainframe MFHP-1G

## Terminal Mounting Boxes



# Smart Series® Microprocessor-Based Temperature Control Modules with Digital Display and Setpoint Pushwheel

COMPATIBLE WITH TAS-05-12  
ALARM AND SYSTEM CONTROL  
FUNCTIONS. SEE PAGES 33-34.



**NOTE:** SSM-30-02 is twice as wide as above and has circuit breaker instead of power on/off switch.

## SSM-15-02/01 (15 AMP) & SSM-30-02 (30 AMP)

The SSM-15-02 is the second generation of the popular SSM-15G. This version maintains simplicity of operation with simultaneous display of setpoint and temperature. Other new, improved, and unique features include:

### Key Features

- **Large Digital Display**
  - For easier readability of temperature, % power and faults
- **Setpoint Pushwheel**
  - For setting desired setpoint temperature
  - Allows adjustment of setpoint before turning power on
- **Auto % Power Display**
  - Shows % power output while in AUTO mode
  - Indicates average % power requirement on thermocouple failure
  - Serves as a diagnostic tool for solving hot runner system problems

### Operational Refinements

- **Improved SmartStart®**
  - A more gradual temperature rise leads to a more effective heater dry-out period, thereby extending heater life
  - SmartStart® now available in MANUAL mode (optional)
- **SelectiveCycle®**
  - A very high speed power output approach
  - Enables accurate temperature control and longer heater life
- **Bumpless Transfer**
  - When a thermocouple failure occurs, operation is automatically continued with a learned % power
  - Unique software accurately assigns percent power setting
- **Third Fuse**
  - Allows for alarm output when the load fuses are blown
  - Protects module from application of excessive voltage
- **Anti-Arcing Feature**
  - Protects circuit board from damage when module is either inserted or removed under power

### Switchable Options

- **Boost, Idle and Power Off Features**
  - Provides system-wide adjustment of temperatures
  - Enables alarm audio/visual output and remote alarms
  - Requires TAS-05-12 module and communications mainframe (See pages Q33-34 for more information on these capabilities)
- **Unique AutoBoost Option**
  - Instantaneously opens frozen gates on startup
  - TAS module or mainframe communications are not required
- **Lights Out Feature**
  - After stabilizing at setpoint, display turns off; when a fault occurs, display is turned on and flashes
  - For easier detection of faults
- **Shorted Thermocouple Sensitivity Adjustment**
  - Operation can be tailored to fast or slow reaction times
  - Sensitivity can be adjusted with internal switches
  - Very useful for manifold zones with long startup times
- **Switchable °C/°F Operation**
  - Scale indicated at startup
- **K Type Thermocouple Support**

# Smart Series® Microprocessor-Based Temperature Control Modules with Digital Display and Setpoint Pushwheel

## SSM-15-02/01 (15 AMP) & SSM-30-02 (30 AMP)

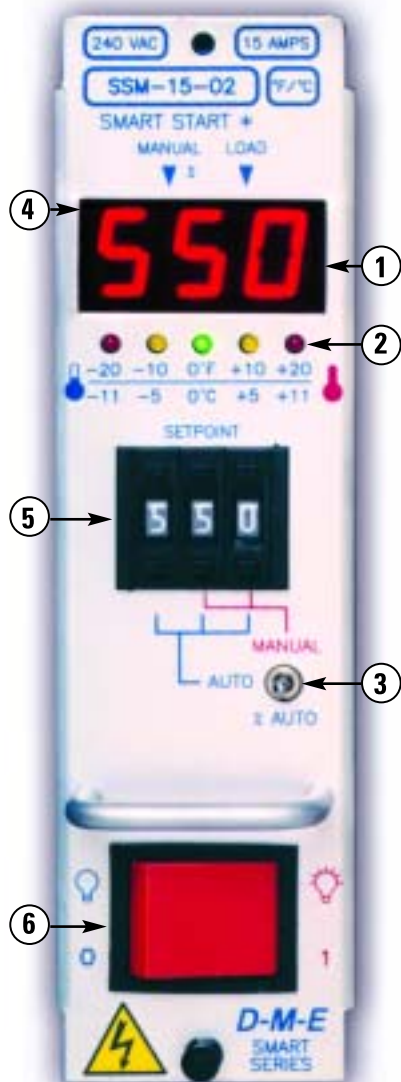
**Warranty:** Three years  
(excluding triac and fuses)

**Fuse Requirements (15 AMP only)**  
(2) ABC-15 fuses (Bussman only)  
(2) spare fuses included with module

MODULE ITEM NUMBER	VOLTAGE (VAC)	AMPS	WATTS
SSM-15-02	240	15	3600
SSM-15-01	120	15	1800
SSM-30-02	240	30	7200

**Note:** Standard (240 VAC) modules are compatible with mainframes wired for either 240 VAC three phase (standard) or 240 VAC single phase.

### Front Panel Controls and Indicators



#### 1. Process Temperature Display

Indicates process temperature, thermocouple faults and other operational modes. Displays % power when switch (3) is in "% Auto" position.

#### 2. Temperature Deviation Lights

Indicates deviation from setpoint. Outer lights blink when temperature is more than  $\pm 40^{\circ}\text{F}$  ( $22^{\circ}\text{C}$ ) from setpoint.

#### 3. Auto/Manual/Auto % Power Switch

Selects AUTO or MANUAL control mode. Shows % power when pressed into "% AUTO" position.

#### 4. LED Mode Indicators

Left LED illuminates during MANUAL mode.

Right LED illuminates when power is supplied to heater.

Right LED blinks on and off during SmartStart®.

#### 5. Setpoint Pushwheel

Three-digit switch programs setpoint in AUTO mode. Right two digits program % power in MANUAL mode.

#### 6. Power On/Off Switch

Controls AC power to module.

### Front Panel Digital LED Indicators

bAC	SHO	OPE	bPL	OFF	SBH	bST
BACKWARD THERMOCOUPLE	SHORTED THERMOCOUPLE	OPEN THERMOCOUPLE	BUMPLESS TRANSFER	POWER OFF	STANDBY HEAT	BOOST
OF	OC	550	40	Loc	Err	
TEMP MODE FAHRENHEIT	TEMP MODE CENTIGRADE	PROCESS TEMP	MANUAL % POWER	FRONT PANEL LOCKOUT	LOCKOUT ERROR	

# Smart Series® Microprocessor-Based Temperature Control Modules with Dual Digital Display

COMPATIBLE WITH TAS MODULE  
ALARM AND STANDBY HEAT  
FUNCTIONS. SEE PAGES Q33-34

## DSS-15-02/01 (15 AMP) & DSS-30-02 (30 AMP)

The DSS-15 Smart Series Module has dual digital displays providing readouts of both process and setpoint temperatures at a glance. Closed-loop, fuzzy logic PID control, and auto-tuning of PID parameters provide precise control even under the most adverse processing conditions.

In the event of a thermocouple failure, the DSS can automatically invoke bumpless transfer to a percent power mode based on the last valid percentage learned before the thermocouple failure. If desired, manual bumpless transfer may be selected, in which case a thermocouple fault will turn off power to the heater until the manual percent power mode is activated by the operator.

A unique feature of the DSS is a 100% power option. For a switch-selectable, interval of 15 or 30 seconds, full power can be immediately delivered to the heater to rapidly break through frozen gates to achieve quicker start-ups. The 100% power mode can be disengaged at any time by simply pressing any front panel button.

Indicator lights provide quick reference for module control modes, temperature deviation and blown fuses. The process temperature display also provides quick diagnostics of thermocouple faults, using the following abbreviated codes:

Shi = Shorted Thermocouple

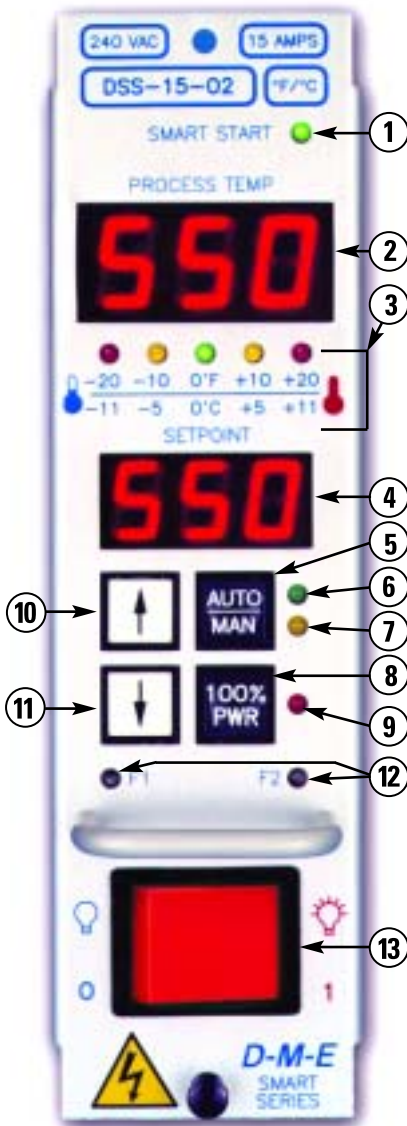
oPi = Open Thermocouple

bci = Reversed Thermocouple

The DSS module also includes a Smart Start® mode to safely bake out damaging internal heater moisture at system start-up and to prolong heater life. Fast or slow load modes may also be selected to protect smaller heaters or compensate for "slow" loads such as externally heated manifolds.

An accurate, durable and full-featured module, the DSS is fully compatible with all Smart Series or G-Series® 15 AMP mainframes.

### Front Panel Controls and Indicators



1. **SMART START LIGHT**  
Indicates Smart Start is on.
2. **PROCESS TEMPERATURE DISPLAY**  
Indicates process temperature and thermocouple faults as described above.
3. **TEMPERATURE DEVIATION LIGHTS**  
Indicates deviation from setpoint. Outer lights blink at more than  $\pm 30^{\circ}\text{F}$  from setpoint.
4. **SETPOINT DISPLAY**  
Indicates setpoint temperature or percent power, depending on controller mode.
5. **AUTO/MANUAL SWITCH**  
Selects auto or manual control mode.
6. **AUTO LIGHT**  
Indicates auto mode.
7. **MANUAL LIGHT**  
Indicates manual mode.
8. **100% POWER SWITCH**  
Indicates 100% power output for selectable interval of 15 or 30 seconds.
9. **100% POWER LIGHT**  
Indicates 100% power mode.
10. **UP ARROW**  
Increases desired setpoint value.
11. **DOWN ARROW**  
Decreases desired setpoint value.
12. **F1/F2 LIGHTS**  
Illuminate when fuse is blown.
13. **POWER ON/OFF SWITCH**

**NOTE:** DSS-30-02 is twice as wide as above; has circuit breaker instead of F1/F2 lights and power on/off switch.

### Front Panel Digital LED Indicators



# Smart Series® Microprocessor-Based Temperature Control Modules with Dual Digital Display

## DSS-15-02/01 (15 AMP) & DSS-30-02 (30 AMP)

### Performance Specifications

<b>Auto and Manual Control Modes:</b>	Time proportioning/Selective Cycle®
<b>Temperature Range:</b>	Ambient to 999°F (537°C)
<b>Control Accuracy:</b>	±1°F (0.5°C) dependent on the total thermal system
<b>Temperature Stability:</b>	± 0.5% of full scale over the ambient range of 32 to 120°F (0 to 50°C)
<b>Calibration Accuracy:</b>	Better than 0.2% of full scale
<b>Power Response Time:</b>	0.538 seconds.
<b>Manual Control:</b>	Adjustable from 0-100%, maintains output power to within 1% of set point.
<b>Smart Start®:</b>	Linear voltage ramping.
<b>Maximum Smart Start Duration:</b>	5 minutes
<b>Smart Start Override Temperature:</b>	256°F (124°C)
<b>100% Power:</b>	Applies 100% power to the output. Jumper selectable inhibit or S = 15, L = 30 seconds.
<b>Operational Mode Priority:</b>	<ul style="list-style-type: none"> <li>• Smart Start® precedes auto mode.</li> <li>• Thermocouple (T/C) break, reversed or shortened T/C overrides Smart Start and auto modes.</li> <li>• Manual control overrides auto mode, T/C breaks, reversed or shortened thermocouples.</li> <li>• Output is inhibited during all fault conditions</li> </ul>

### Input Specifications

<b>Thermocouple Sensor:</b>	Type J, grounded or ungrounded.
<b>External T/C Residence:</b>	Less than 0.1°F/Ω.
<b>T/C Isolation:</b>	Isolated by control circuit power supply
<b>Cold Junction Compensation:</b>	Automatic, better than 0.03°F/F (0.015°C/°C).
<b>T/C Break, Reversed &amp; Shorted Protection:</b>	Automatically inhibits power to heater unless bumpless transfer is invoked.
<b>Input Impedance:</b>	5.6 Megohms
<b>Input Amplifier Stability:</b>	Greater than 0.02°F/°F (0.01°C/°C).
<b>Common Mode Rejection Ratio:</b>	Greater than 120dB.
<b>Power Supply Rejection:</b>	Greater than 110dB.

### Output Specifications

<b>Voltage Power Capability:</b>	15 AMP: 240 nominal, single phase, 120 VAC available, 15 amperes, 3600 watts @ 240 VAC (1800 watts @ 120 VAC). 30 AMP: 30 amperes, 7200 watts @ 240 VAC
<b>Output Drive:</b>	Internal solid state triac, triggered by zero AC crossing pulses.
<b>Overload Protection:</b>	15 AMP: Fuses are provided on both sides of AC line. 30 AMP: Fast acting circuit breaker.
<b>Transient Protection:</b>	dv/dt and transient pulse suppression included.
<b>Power Line Isolation:</b>	Optically and transformer isolated from AC lines. Isolation voltage is greater than 2500 volts.

### Controls and Indicators

<b>Auto/Manual Selection:</b>	Push-button switch with LED indicators adjacent to switch.
<b>Setpoint Adjustment:</b>	Push-button up & down arrow keys.
<b>100% Power Selection:</b>	Push-button switch with LED indicator adjacent.
<b>Power On/Off:</b>	16 AMP rocker switch (15 AMP) or 30 AMP circuit breaker (30 amp). Both are UL, CSA, VDE approved.
<b>Setpoint Display:</b>	Three 0.4", seven segment digit display.
<b>Process Display:</b>	Three 0.56", seven segment digit display. Also displays alarm codes and flashing "100" for 100' power operation.
<b>100% Power Indication:</b>	Red LED adjacent to 100% power key flashes. Process display flashes "100."
<b>Auto Indication:</b>	Illuminates green LED adjacent to Auto/Man key.
<b>Manual Indication:</b>	Illuminates yellow LED adjacent to Auto/Man key.
<b>Smart Start Indication:</b>	Illuminates green LED above the process display.
<b>Shorted T/C Indication:</b>	Flashes "Shi" in process display.
<b>Opened T/C Indication:</b>	Flashes "oPi" in process display.
<b>Reversed T/C Indication:</b>	Flashes "bci" in process display.
<b>Temperature Deviation Indicators:</b>	Five separate LEDs: ±20°F/11°C = Red ±10°F/5°C = Yellow 0° = Green.
<b>Blown Fuse Indicators:</b>	2 neon indicators (15 AMP only)

### Electrical Power Specifications

<b>Input Voltage:</b>	240/120 VAC + 10% -15%
<b>Frequency:</b>	50/60 Hz
<b>DC Power Supplies:</b>	Internally generated, regulated and compensated
<b>Module Power Usage:</b>	Less than 6 watts, excluding load.
<b>Dimensions:</b>	15 AMP: 2"W x 7"H x 7 1/2 "D (5.08 x 17.78 x 19.05 cm) 30 AMP: 4"W x 7"H x 7 1/2 "D (10.06 x 17.78 x 19.05 cm)

**NOTE:** Standard (240 VAC) modules are compatible with mainframes wired for either 240 VAC three phase (standard) or 240 VAC single phase.

**FOR °C OPERATION:** Switch to °C on front panel.

**FUSE REQUIREMENTS (15 AMP ONLY):**  
(2) ABC-15 Fuses (Bussman only)

**NOTE:** (2) spare fuses included with module.

**WARRANTY:** Three years (excluding triac and fuses)

### Smart Series Microprocessor-Based Temperature Control Modules

#### (240 VAC, standard)

ITEM NUMBER	AMPS	WATTS
DSS-15-02	15	3600
DSS-30-02	30	7200

#### (120 VAC, optional)

ITEM NUMBER	AMPS	WATTS
DSS-15-01	15	1800

# Smart Series® /Microprocessor-Based Temperature Control Modules with Digital Display and Communications

COMPATIBLE WITH TAS MODULE  
ALARM AND STANDBY HEAT  
FUNCTIONS.  
SEE PAGES Q33-34

## CSS-15-02/01 (15 AMP) & CSS-30-02 (30 AMP)

The CSS-15 Communications Smart Series Module provides the molder with the first fully comprehensive temperature control module. This microprocessor-based unit incorporates the most complete list of control features while providing full SPI protocol communications capability with a D-M-E CIM (Computer Interface) Module (see page Q-35).

While the CSS module was designed with computer integrated manufacturing in mind, it also provides the highest level of performance as a stand-alone module. When operating independently the CSS offers these features: A multi-function display, advanced diagnostics, interactive Smart Start® and auto or manual bumpless transfer. A setpoint memory feature also allows the user to power up the module with the same setpoint as the day before. It is compatible with all Smart Series or G-Series® 15 amp main frames. The advanced diagnostics will automatically alert the user to unusual fault conditions. This is done by multiplexing the flowing fault codes with the normal display in three second intervals:

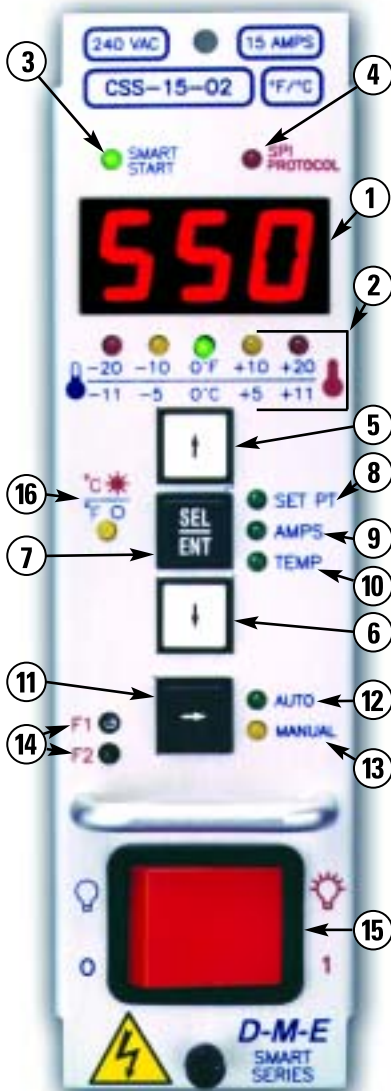
Shi = Shorted Thermocouple	oPO = Open Triac
bci = Reversed Thermocouple	ShO = Shorted Triac
oPi = Open Thermocouple	GFI = Ground Fault

Over and under temperature warnings are indicated by flashing LED's directly under the display.

With its unique Smart Start\* function, the CSS has the ability to dry out a heater which may have acquired moisture inside its case. Smart Start automatically applies low voltage to the heater after initial start-up. With this low voltage applied, the module analyzes the heater's conditions. If a ground leakage is sensed, the module will go into a bake-out procedure which drives moisture from the heater.

In the event of a thermocouple failure, the CSS can automatically invoke bumpless transfer to a percent power mode based on the last valid percentage learned before the thermocouple failure. If desired, manual bumpless transfer may be selected in which case a thermocouple fault will turn off power to the heater until the manual percent power mode is activated by the operator.

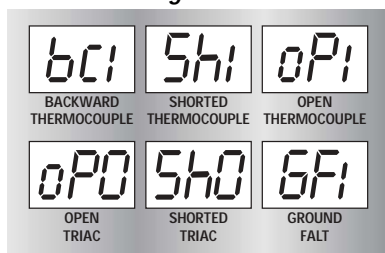
\*U.S. Patent No. 5,039,842



### Front Panel Controls and Indicators

- DIGITAL LED DISPLAY:** Indicates setpoint temp, percent power, process temp, load current, and fault conditions.
- TEMPERATURE DEVIATION INDICATORS:** Shows deviation from setpoint. Outer lights blink at more than  $\pm 30^{\circ}\text{F}$ . from setpoint.
- SMART START LIGHT:** Indicates Smart Start is on.
- SPI PROTOCOL LIGHT:** Indicates control is from a remote host system.
- UP ARROW KEY:** Increases the desired setpoint value.
- DOWN ARROW KEY:** Decreases the desired setpoint value.
- SELECT/ENTER KEY:** Selects either Setpoint (temperature/percent power), Amps (load current), or Process Temperature.
- SETPOINT LIGHT:** Indicates Setpoint is on display. Setpoint changed but not entered if flashing.
- AMPS LIGHT:** Indicates load current is on display.
- TEMP LIGHT:** Indicates process temperature is on display.
- SIDE ARROW KEY:** Auto/manual select.
- AUTO LIGHT:** Auto mode selected.
- MANUAL LIGHT:** Manual mode selected.
- F1/F2 LIGHTS:** Illuminate when fuse has blown.
- POWER ON/OFF SWITCH**
- °F/°C INDICATOR:** Illuminates when  $^{\circ}\text{C}$  mode is selected.

#### Front Panel Digital LED Indicators





# Smart Series®/Microprocessor-Based Temperature Control Modules with Digital Display and Communications

## CSS-15-02/01 (15 AMP) & CSS-30-02 (30 AMP)

### Output Specifications

<b>Voltage</b>		
<b>Power Capability:</b>	15 AMP: 240 nominal, single phase, 120 VAC available, 15 Amperes, 3600 watts @ 240 VAC (1800 watts @ 120 VAC). 30 AMP: 30 Amperes, 7200 watts @ 250 VAC	
<b>Output Drive:</b>		Internal solid state triac, triggered by zero AC crossing pulses.
<b>Overload Protection:</b>	15 AMP: Fuses are provided on both sides of AC line 30 AMP: Fast acting circuit breaker.	
<b>Transient Protection:</b>		dv/dt and transient pulse suppression included.
<b>Power Line Isolation:</b>		Optically and transformer isolated from AC lines. Isolation voltage is greater than 2500 volts.

### Controls and Indicators

<b>Setpoint Control:</b>	Two buttons up and down, one button used to enter setpoint. Range: 0 to 999° F (0 to 537°C) Resolution: 1° F (1°C)
<b>Manual (% Power) Control:</b>	Two buttons up and down, one button used to Enter setpoint Range: 0 to 99%
<b>Auto/Manual Selection:</b>	Push button switch toggles mode. LED indicates mode of operation.
<b>Power On-Off:</b>	16 amp rocker switch (15 amp) or 30 amp circuit breaker (30 amp). Both are UL, CSA, VDE approved.
<b>Process Temp Selection:</b>	One push button with one LED indicator. Selected by select/enter push button.
<b>Load Current Selection:</b>	One push button with one LED indicator. Selected by select/enter push button.
<b>Multi-Function Display:</b>	(3) 7-segment LED, 0.6 inch digital displays with decimal point used in load current display. Alarm characters also display.
<b>Smart Start Indicator:</b>	LED above display window illuminates.
<b>°F/°C Indicator:</b>	LED illuminates indicating °C mode.
<b>Blown Fuse Indicators:</b>	2 neon indicators (15 amp only)
<b>Shorted Thermocouple (T/C):</b>	(ShI) alternates with normal display.
<b>Shorted Output (Triac):</b>	(ShO) alternates with normal display.
<b>Open T/C:</b>	(oPI) alternates with normal display.
<b>Open Output (Triac):</b>	(oPO) alternates with normal display.
<b>Reversed T/C:</b>	(bcI) alternates with normal display.
<b>Ground Fault:</b>	(GFI) alternates with normal display.
<b>SPI Protocol Indicators:</b>	LED above display window illuminates.
<b>Temperature Deviation Indicators:</b>	Separate LEDs: ±30°F/11°C = (Blinking Red), ±10°F/5°C = (Yellow), 0F°/°OC = Green)

### Electrical Power Specifications

<b>Input Voltage:</b>	240/120 VAC + 10% -20%
<b>Frequency:</b>	50/60 Hz
<b>DC Power Supplies:</b>	Internally generated, regulated and compensated
<b>Module Power Usage:</b>	Less than 5 watts, excluding load
<b>Dimensions:</b>	15 AMP: 2" W x 7" H x 7" D (5.08 x 17.78 x 19.05 cm) 30 AMP: 4" W x 7" H x 7" D (10.06 x 17.78 x 19.05 cm)

### Performance Specifications

<b>Auto and Manual Control Modes:</b>	Time proportioning/Selective Cycle®
<b>Temperature Range:</b>	Ambient to 999°F (537°C)
<b>Control Accuracy:</b>	±0.5%(0.5C) dependent on the total thermal system
<b>Temperature Stability:</b>	±0.5% of full scale over the ambient range of 32 to 120°F (0 to 50°C)
<b>Calibration Accuracy:</b>	Better than 0.2% of full scale
<b>Cycle Time:</b>	0.0166 seconds at 60Hz, 0.020 at 50 Hz
<b>Power Response Time:</b>	0.0083 seconds at 60 Hz, 0.010 at 50 Hz
<b>Reset Automatic:</b>	Corrects reset to no more than ±2°F(1°C) at all settings
<b>Manual Control:</b>	Adjustable from 0-99%. Maintains output power to within 1% of setting using the selective cycle power drive.
<b>Advanced Diagnostics Indicators:</b>	EDS and 3-digit, 7-segment display
<b>Smart Start® (SS):</b>	Variable voltage steps from 0 to 240 volts repeatable over a 9-minute period. The module will escape from this mode if leakage falls below 120mA limit. If dry out is not required then a fast pass check of voltage is implemented over 30 seconds.
<b>SS Duration:</b>	30 seconds to 9 1/2 minutes
<b>SS Override Temperature:</b>	200°F (93°C)
<b>Operational Mode Priority:</b>	<ul style="list-style-type: none"> <li>Ground fault overrides all modes</li> <li>SS precedes auto mode</li> <li>Shorted output overrides SS and Auto mode</li> <li>Thermocouple (T/C) break overrides SS and Auto modes</li> <li>Open output overrides SS and Auto mode</li> <li>Manual control overrides T/C break, reversed T/C and auto modes</li> <li>The output is inhibited during all fault conditions</li> <li>Remote control overrides local control</li> </ul>

### Input Specifications

<b>Thermocouple (T/C) Sensor:</b>	Type "J" grounded or ungrounded
<b>External T/C Resistance:</b>	High impedance potentiometric input allows long distance T/C wiring
<b>T/C Isolation:</b>	Isolated by control circuit power supply
<b>Cold Junction Compensation:</b>	Automatic, better than 0.02 °F/F° (0.01 °C/C°)
<b>T/C Break, Reversed &amp; Shorted Protection:</b>	Automatically inhibits power to heater, unless automatic bumpless transfer is invoked
<b>Input Type:</b>	Potentiometric
<b>Input Impedance:</b>	22 Megohms
<b>Input Protection:</b>	Diode clamp, RC filter
<b>Input Amplifier Stability:</b>	Greater than 0.02°F/F° (0.01° C/C°)
<b>Input Dynamic Range:</b>	100°F (55°C)
<b>Common Mode Rejection Ratio:</b>	Greater than 100dB
<b>Power Supply Rejection Ratio:</b>	Greater than 90 dB
<b>Communication Inputs:</b>	Data alliance is optically coupled at 2500 volts isolation

**NOTE:** Standard (240 VAC) modules are compatible with main frames wired for either 240 VAC three phase (standard) or 240 VAC single phase.

**FOR °C OPERATION:**  
Switch to °C on circuit board.

**FUSE REQUIREMENTS (15 AMP ONLY):**  
(2) ABC-15 Fuses (Bussman only)

**NOTE:** (2) spare fuses included with module.

**WARRANTY:** Three years  
(excluding triac and fuses)

### SMART SERIES MICROPROCESSOR-BASED TEMPERATURE CONTROL MODULES

#### (240 VAC, standard)

ITEM NUMBER	AMPS	WATTS
CSS-15-02	15	3600
CSS-30-02	30	7200

#### (120 VAC, optional)

ITEM NUMBER	AMPS	WATTS
CSS-15-01	15	1800

# Smart Series® Temperature Alarm/System Control Modules



## TAS-05-12/11 Temperature Alarm Function

- Provides alarm for over or under temperature, or diagnostic error
- Provides visual and audible indications of an alarm
- The audible alarm (2) can be turned on or off with switch (4)
- Relay contacts (5) are provided to allow hook-up of remote equipment such as a light, a conveyor or a machine function
- Relay contacts are unaffected by the position switch (4)
- An infinite number of zones of control can be monitored as long as they are contained within the same communications-style mainframe as the TAS module

## System Control Functions

Up to 63 zones can be controlled remotely at one time. These zones must be contained within the same communications-style mainframe as the TAS module.

## ***NORMAL / IDLE***

- Rotary switch (6) provides remote control of DSS-15-02/01, CSS-15-02/01 and the new SSM-15-02/01
- Control modules can all be commanded to respond from NORMAL to IDLE (Standby Heat)
- In IDLE, the modules will adjust to a setting of 93°C (200°F)  
*Exception:* SSM-15-02/01 adjusts to a setting of 100°C (212°F)
- Moving the rotary switch back to NORMAL restores all modules to their established setpoints
- The user can select IDLE for temporary lowering of all zones to prevent material degradation
- This feature can be used to keep heaters warm enough to prevent absorption of moisture

## ***BOOST / OFF***

- The new SSM-15-02/01 can be placed into BOOST and OFF
- BOOST will raise the setpoint of the module by 10, 20, or 30%
- OFF shuts off power to the heater but allows the user to monitor cool down of the hot runner system
- Each SSM-15-02/01 can be individually programmed to respond to OFF, IDLE and BOOST commands
- The user can quickly drive all nozzle zones into BOOST to open frozen gates

## ***Front Panel Controls and Indicators***

- 1. POWER ON INDICATOR:** LED illuminates when power is applied to the module.
- 2. AUDIBLE ALARM:** Emits a loud audible alarm when the alarm switch (4) is placed in the "1" position (ON) and an alarm condition is sent by a compatible control module.
- 3. ALARM INDICATOR:** LED illuminates when an alarm condition is sent by a compatible module.
- 4. AUDIO ALARM ON/OFF SWITCH:** Turns the audio alarm (2) on or off.
- 5. ALARM RELAY CONNECTOR:** Provides relay contacts for use with remote equipment. Mating connector is supplied.
- 6. SYSTEM CONTROL SWITCH:** Activates the OFF, IDLE and BOOST mode in all compatible modules.
- 7. POWER ON/OFF SWITCH:** Controls AC power to the module.

## Smart Series® Temperature Alarm/System Control Modules

ITEM NUMBER	VOLTS
TAS-05-12	240 VAC
TAS-05-11	120 VAC

**NOTE:** Standard (240 VAC) modules are compatible with mainframes wired for either 240 VAC three-phase (standard) or 240 VAC single-phase. Use TAS-05-11 for 120 VAC operation.

**FUSE REQUIREMENTS:** (2) ABC-1 fuses. **NOTE:** (2) spare fuses included with module.

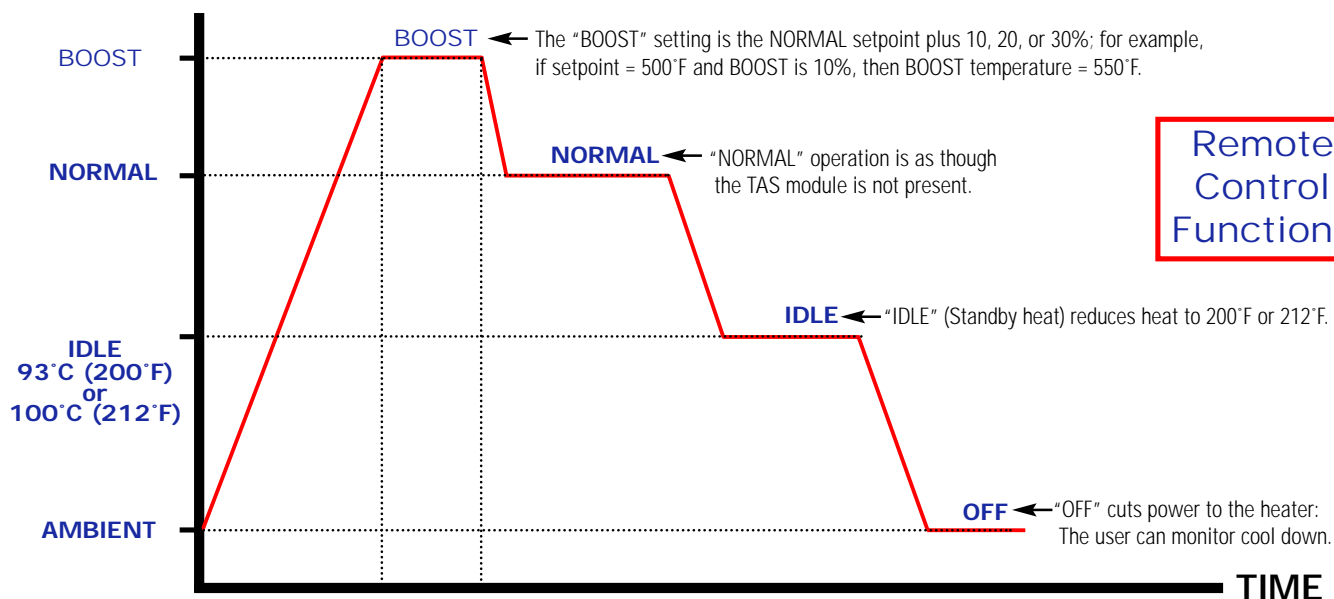
**WARRANTY:** Three years (excluding fuses).

### TAS Module Compatibility

MODULE	FUNCTIONS			
	ALARM	IDLE	BOOST	OFF
SSM-1502/01	✓	✓	✓	✓
SSM-3002	✓	✓	✓	✓
DSS-1502/01	✓	✓		
DSS-3002	✓	✓		

**Note:** TAS module is not compatible with older CSS-15G/30G or DSS-15G/30G modules

MODULE	FUNCTIONS			
	ALARM	IDLE	BOOST	OFF
CSS-1502/01	✓	✓		
CSS-3002	✓	✓		
SSM-15G	✓			
SSM-15G1	✓			
SSM-30G	✓			

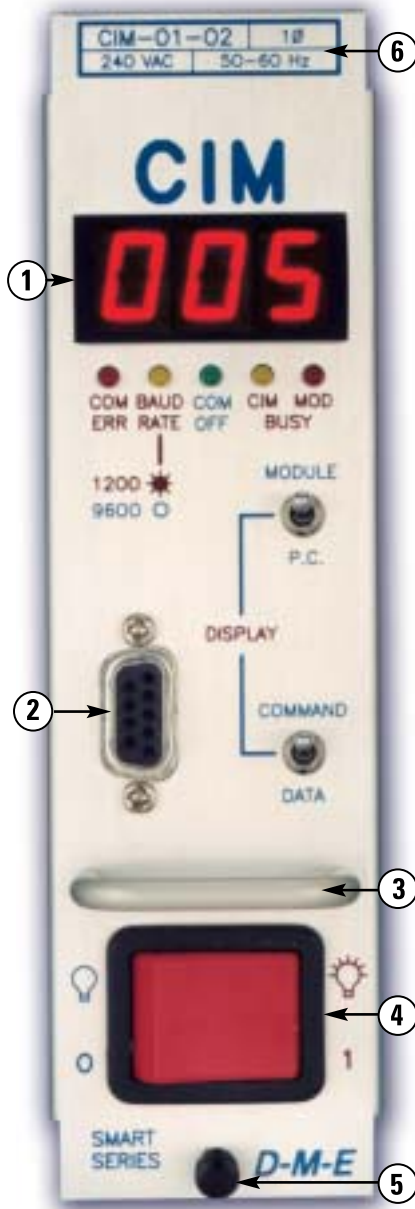


### Upgrade Kits For Converting to Communications Mainframes

ITEM NUMBER	MAIN FRAME
CIK-4	4-ZONE
CIK-5	5-ZONE
CIK-7	7-ZONE
CIK-8	8-ZONE
CIK-11	11-ZONE
CIK-12	12-ZONE
CIK-16	16-ZONE
CIK-20	20-ZONE
CIK-24	24-ZONE

ITEM NUMBER	MAIN FRAME
CIK-28	28-ZONE
CIK-32	32-ZONE
CIK-36	36-ZONE
CIK-40	40-ZONE
CIK-44	44-ZONE
CIK-48	48-ZONE
CIK-2HP	2-ZONE HIGH POWER
CIK-3HP	3-ZONE HIGH POWER
CIK-5HP	5-ZONE HIGH POWER

# Smart Series® Microprocessor-Based Computer Interface Module



## CIM-01-02/01

- ⑥ The CIM Computer Interface Module is the communications link between CSS modules and a remote host system. Using SPI protocol, it permits downloading of setpoints from any SPI protocol-compatible molding machine. Control system status can subsequently be monitored via the machine's control panel. Up to 63 zones of control can be accommodated with one CIM module. The CIM and CSS modules must all be installed in a communications-style mainframe.

## Features

- SPI protocol compatible
- Industry Standard Interfaces: EIA232, EIA485 multidrop, EIA422
- Simple to use – requires no special training
- 63-zone communications capability
- Compatible with both Smart Series and G-Series communications-style (MFCP) Mainframes\*

\*For use with CSS modules only.

**NOTE:** Non-communications style Mainframes (MFP) may be upgraded to communications style (MFCP) with easy-to-install Communications Interface Kits (CIK) See page 34.

## Compatible Interfaces (jumper selected on module)

RS232 (EIA232) DUPLEX . . . . .50 ft. max.

RS485 (EIA485) DIFFERENTIAL . . . . .4000 ft. max.  
multi-drop

RS422 (EIA422) DIFFERENTIAL . . . . .4000 ft. max.

## CIM - Computer Interface Module

ITEM NUMBER	VOLTS
CIM0102	240 VAC
CIM0101	120 VAC

**FUSE REQUIREMENTS:** (2) ABC-1 fuses

**WARRANTY:** Three years (excluding fuses)

## Contact D-M-E for Cable Quotes

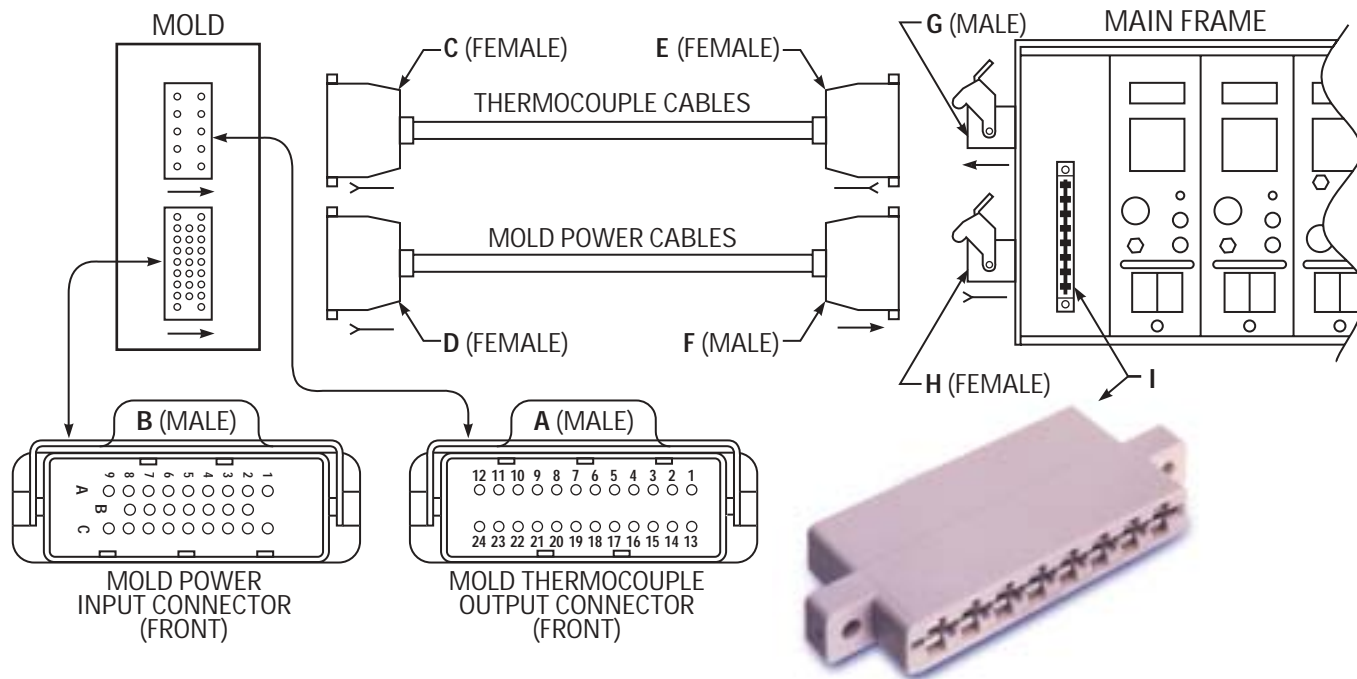
Cables for RS485, RS422, and RS232 available by special order.

**NOTE:** Standard (240 VAC) modules are compatible with mainframes wired for either 240 VAC three phase (standard) or 240 VAC single phase. Use CIM-01-01 for 120V operation.

## Front Panel Controls and Indicators:

1. **DIGITAL LED DISPLAY:** Multi-Function Display Indicates the Transmitted Data or Commands.
2. **COMMUNICATIONS CONNECTOR:** DB-9 style input/output connector.  
A duplicate of this connector is included at rear of module for those who prefer to route the computer interface wiring internally.
3. **HANDLE:** Assists in insertion or removal of module from mainframe.
4. **POWER ON/OFF SWITCH:** Controls AC power to the module.
5. **PUSH-PULL FASTENER:** Quickly locks module into mainframe. No tools required.
6. **IDENTIFICATION LABEL:** Lists module catalog number and power ratings for quick reference.

# Replacement Parts and Service Items for D-M-E Smart Series Temperature Control Systems



**NOTE:** For upper inside communications connectors, see page Q-34

## Connectors / Connector Kits (5 - 48 Zone, 15 Amp; 2 - 5 Zone, 30 Amp)

REFERENCE LETTER	DESCRIPTION	ITEM NUMBER
<b>A</b>	Mold Thermocouple Output Connectors	See pg. 21 & 22
<b>B</b>	Mold Power Input Connectors	See pg. 20
<b>C</b>	Mold End Kit for 5-Zone Thermocouple Cable (10, 15 or 30 AMP)	CKTF-15-G
	Mold End Kit for 8-Zone Thermocouple Cable (10 or 15 AMP)	CKTF-18-G
	Mold End Kit for 12-Zone Thermocouple Cable (10 or 15 AMP)	CKTF-112-G
<b>D</b>	Mold End Kit for all 10 or 15 AMP Power Cables	CKPF-112-BG
	Mold End Kit for 2 or 3-Zone 30 AMP Power Cables	CKPF-13-CG
	Mold End Kit for 5 Zone 30 AMP Power Cables	CKPF-15-CG
<b>E</b>	Frame End Kit for all Thermocouple Cables (10, 15 or 30 AMP)	CKTF-112-AG
<b>F</b>	Frame End Kit for all 10 or 15 AMP Power Cables	CKPM-112-BG
	Frame End Kit for 2 or 3-Zone, 30 AMP Power Cables	CKPM-13-CG
	Frame End Kit for 5-Zone, 30 AMP Power Cables	CKPM-15-CG
<b>G</b>	Thermocouple Input Kit for all Mainframes (10, 15 or 30 AMP)	CKTM-212-AG
<b>H</b>	Power Output Kit for all 10 or 15 AMP Mainframes	CKPF-212-BG
	Power Output Kit for 2-, or 3-Zone, 30 AMP Mainframes	CKPF-23-CG
	Power Output Kit for 5-Zone, 30 AMP Mainframes	CKPF-25-CG
<b>I</b>	Edge Card Connector Kit for all Mainframe PC Boards (10, 15 or 30 AMP)	CKF-312-G

# Replacement Parts and Service Items for Smart Series® Temperature Control Systems

## Mainframe, Cable Components, and Service Tools\*

CBD10M	10 AMP 2 POLE, CIRCUIT BREAKER USED IN MFP1G AND MFP1G1	
CBD20M	20 AMP 2 POLE, CIRCUIT BREAKER USED IN MFR2G	
CBD30M	30 AMP 2 POLE, CIRCUIT BREAKER USED IN MFFPR2G AND MFHP1G	
CBD50	50 AMP 3 POLE, CIRCUIT BREAKER USED IN 5 THROUGH 12 ZONE MAINFRAMES	
CBD70	70 AMP 3 POLE, CIRCUIT BREAKER USED IN 16 THROUGH 48 ZONE & HIGH POWER MAINFRAMES	
PIN-0114	14 GAUGE MALE PIN FOR "B" & "F" POWER CONNECTORS (PACKAGE OF 30)	SEE PAGE 36
PIN-0214	14 GAUGE FEMALE SOCKET FOR "D" & "H" POWER CONNECTORS (PACKAGE OF 30)	SEE PAGE 36
PIN-0120	20 GAUGE MALE PIN FOR "G" THERMOCOUPLE CONNECTOR (PACKAGE OF 30)	SEE PAGE 36
PIN-0220	20 GAUGE FEMALE PIN FOR "E" THERMOCOUPLE CONNECTOR (PACKAGE OF 30)	SEE PAGE 36
WHT-1919	CRIMP TOOL FOR ALL PIN-XXXX LISTED ABOVE	
RPM-0048	MALE/FEMALE EXTRACTION TOOL FOR ALL PIN-XXXX LISTED ABOVE	
RPM-0038	NEON INDICATORS USED ON 240 VAC MAINFRAME CIRCUIT BREAKER PANELS	
RPM-0044	CARD GUIDES FOR ALL MAINFRAMES	
RPM-0046	PINS FOR WHITE EDGE CARD CONNECTORS "I" (PACKAGE OF 20)	
RPM-0047	EXTRACTION TOOL FOR RPM-0046	
RPM-0059	PANEL MOUNT BASE & LATCH FOR 5 ZONE THERMOCOUPLE MOLD CONNECTION "A"	SEE PAGE 36
RPM-0060	PANEL MOUNT BASE & LATCH FOR 8 ZONE THERMOCOUPLE MOLD CONNECTION "A"	SEE PAGE 36
RPM-0061	PANEL MOUNT BASE & LATCH FOR 12 ZONE THERMOCOUPLE MOLD CONNECTION "A"	SEE PAGE 36
RPM-0062	MALE INSERT FOR 5 ZONE THERMOCOUPLE MOLD CONNECTION "A"	SEE PAGE 36
RPM-0063	MALE INSERT FOR 8 ZONE THERMOCOUPLE MOLD CONNECTION "A"	SEE PAGE 36
RPM-0064	MALE INSERT FOR 12 ZONE THERMOCOUPLE MOLD CONNECTION "A"	SEE PAGE 36
RPM-0065	FEMALE INSERT FOR 5 ZONE THERMOCOUPLE CABLE CONNECTOR "C"	SEE PAGE 36
RPM-0066	FEMALE INSERT FOR 8 ZONE THERMOCOUPLE CABLE CONNECTOR "C"	SEE PAGE 36
RPM-0067	FEMALE INSERT FOR 12 ZONE THERMOCOUPLE CABLE CONNECTOR "C"	SEE PAGE 36
RPM-0068	HOOD FOR 5 ZONE THERMOCOUPLE CABLE CONNECTOR "C"	SEE PAGE 36
RPM-0069	HOOD FOR 8 ZONE THERMOCOUPLE CABLE CONNECTOR "C"	SEE PAGE 36
RPM-0070	HOOD FOR 12 ZONE THERMOCOUPLE CABLE CONNECTOR "C"	SEE PAGE 36
RPM-0071	HOOD FOR 5, 8 & 12 POWER & THERMOCOUPLE CABLE CONNECTIONS "D", "E" & "F"	SEE PAGE 36
RPM-0072	MALE INSERT FOR "B", "F" & "G" (15 AMP CONNECTOR RATING IS EXCLUSIVE TO D-M-E)	SEE PAGE 36
RPM-0073	FEMALE INSERT FOR "D", "E" & "H" (15 AMP CONNECTOR RATING IS EXCLUSIVE TO D-M-E)	SEE PAGE 36

\* (Reference page 22-36 for Letter Designations)

## All Smart Series Modules

ABC-1	1 AMP 250 VAC FUSE
ABC-3	3 AMP 250 VAC FUSE - NOTE: THESE LOWER POWER FUSES ARE RECOMMENDED FOR NOZZLES
ABC-5	5 AMP 250 VAC FUSE - NOTE: THESE LOWER POWER FUSES ARE RECOMMENDED FOR NOZZLES
ABC-10	10 AMP 250 VAC FUSE - NOTE: REQUIRED FOR 15 AMP MODULES USED IN 10 AMP FRAMES
ABC-15	15 AMP 250 VAC FUSE
NYL-0001	"NYLATCH" MODULE RETENTION PLUNGER AND GROMMET (10/PKG) - NOTE: AT THE BOTTOM OF EACH MODULE
RPM-0008	POWER ROCKER SWITCH FOR ALL MODULES EXCEPT DSS AND CSS-1524
RPM-0009	TRANSFORMER TYPE DST-4-16 FOR ALL MODULES EXCEPT DSS & TAS
RPM-0027	ALUMINUM HANDLE FOR 15 AMP MODULES
RPM-0039	30 AMP 2 POLE, CIRCUIT BREAKER FOR MODULES
RPM-0023	TRIAC - TYPE Q6040P 40 AMP 600 VOLT FOR USE ON ALL MODULES
RPM-0054	TRIAC - TYPE BTA40-800B 40 AMP 800 VOLT FOR USE ON ALL MODULES EXCEPT CSS
RPM-0050	2200 OHM FLAME PROOF FUSIBLE LINK RESISTOR USED IN THERMOCOUPLE CIRCUIT (10/PKG) USED ON ALL MODULES
RPM-0088	A/D CONVERTER FOR SSM-15G, SSM15G1, SSM-30G, SSH-1001, SSH-1002 AND ALL CSS MODULES

## Replacement Parts and Service Items for Smart Series® Temp Control Systems (Cont.)

### CSS-15G, CSS-30G, CSS-1502, CSS-3002

CSS-0001	MICROPROCESSOR FOR CSS-15G
CSS-0002	MICROPROCESSOR FOR CSS-1502
RPM-0011	TRIAC DRIVER U14
RPM-0012	OPTOCOUPLER U9 & U11
RPM-0013	OPERATIONAL AMPLIFIER U8 & U13
RPM-0014	OPERATIONAL AMPLIFIER U3

### DSS-15G, DSS-30G, DSS-1502, DSS-3002

DSS-0001	MICROPROCESSOR FOR DSS-15G, DSS-15G1 & DSS-30G
DSS-0002	MICROPROCESSOR FOR DSS-1501, DSS-1502 & DSS-3002
RPM-0020	TRANSFORMER
RPM-0022	TRIAC DRIVER Q1
RPM-0024	POWER ROCKER SWITCH
RPM-0086	315 MA TIME LAG FUSE F3 (USED IN DSS-1501, 1502, & 3002 MODULES ONLY); CHECK YOUR MODULE!
RPM-0089	200 MA TIME LAG FUSE F3 (USED IN DSS-1501, 1502, & 3002 MODULES ONLY); CHECK YOUR MODULE!

### SSM-15G, SSM-30G, SSH-1002, ESH-1012

SSM-0001	MICROPROCESSOR
RPM-0010	TRIAC DRIVER U5
RPM-0012	OPTOCOUPLER U6 & U7
RPM-0013	OPERATIONAL AMPLIFIER U2
RPM-0014	OPERATIONAL AMPLIFIER U8
RPM-0015	SETPOINT POTENTIOMETER (FRONT PANEL)

### SSM-1501, SSM-1502, SSM-3002, SSH-1011, SSH-1012, ESH-1012

SSM-0002	MICROPROCESSOR
RPM-0010	TRIAC DRIVER U5
RPM-0014	OPERATIONAL AMPLIFIER U3 & U8
RPM-0053	PUSHWHEEL ASSEMBLY, WITH CABLE
RPM-0055	AUTO/MANUAL/AUTO% SWITCH FOR FRONT PANEL (SSM ONLY) (FRONT PANEL)
RPM-0056	AUTO/MANUAL/AUTO% SWITCH FOR FRONT PANEL (SSH & ESH) (FRONT PANEL)
RPM-0087	250 MA TIME LAG FUSE F3; CHECK YOUR MODULE!
RPM-0090	160 MA TIME LAG FUSE F3; CHECK YOUR MODULE!

### TAS-0501, TAS-0502, TAS-0511, TAS-0512

RPM-0025	BEEPER
RPM-0026	TRANSFORMER
RPM-0028	SWITCH STANDBY HEAT (TAS-0501, TAS-0502, ONLY) & ALARM (ALL UNITS) (FRONT PANEL)
RPM-0057	ROTARY SWITCH FOR OFF, STANDBY HEAT, NORMAL, BOOST (TAS-0511, TAS-0512, ONLY)
RPM-0058	KNOB FOR RPM-0057
RPM-0029	RECEPTACLE CONNECTOR FOR FRONT PANEL
RPM-0030	MATING CONNECTOR (PLUG) FOR RPM-0029
RPM-0031	PINS FOR RPM-0030
RPM-0032	SOCKETS FOR RPM-0029
RPM-0033	RELAY #1 - ALARM OUTPUT CONNECTOR
RPM-0034	RELAY #2 - BEEPER CONTACTS

## Input Power Wiring Diagrams (Option A)

The diagrams on pages 39 through 42 are printed on the back panels of the mainframes. For your convenience, they are depicted here along with additional information.

For information on input wiring for 30 AMP mainframes, contact D-M-E.

Standard input wiring for mainframes, unless specified otherwise at time of order, is 240 VAC, three-phase, 4-wire, 50/60 Hz. (OPTION A). If it becomes necessary to change to another configuration, refer to the appropriate diagram and information on the following pages:

Page 39: (OPTION A) 208-240 VAC, 3-phase, 4-wire

Page 40: (OPTION B) 380-415 VAC, 3-phase, 5-wire

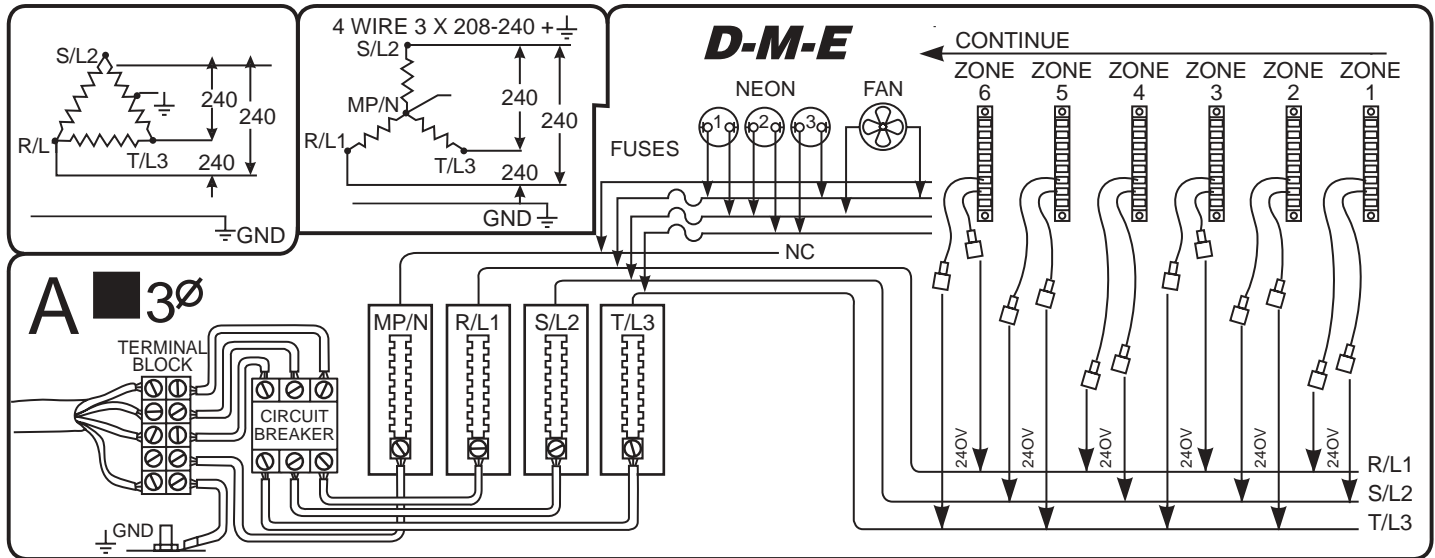
Page 41: (OPTION C) 240 VAC, single-phase, 4-wire

Page 42: (OPTION D) 208-240 VAC, single phase, 3-wire  
120 VAC, single-phase, 4-wire

NOTE: For mold power and thermocouple connector wiring information, see pages 16-18.

### OPTION A (Standard)

### 208 - 240 VAC, 3-Phase, 4-Wire Delta or "Y" Power Distribution System



As shown above, each module is powered from one of the three phases. Zone (1), for example, is powered from Phase 1, which is supplied by R/L1 and S/L2. Zone (2) is powered by Phase 2, which is supplied by S/L2 and T/L3. Zone (3) is powered by Phase 3, which is supplied by R/L1 and T/L3.

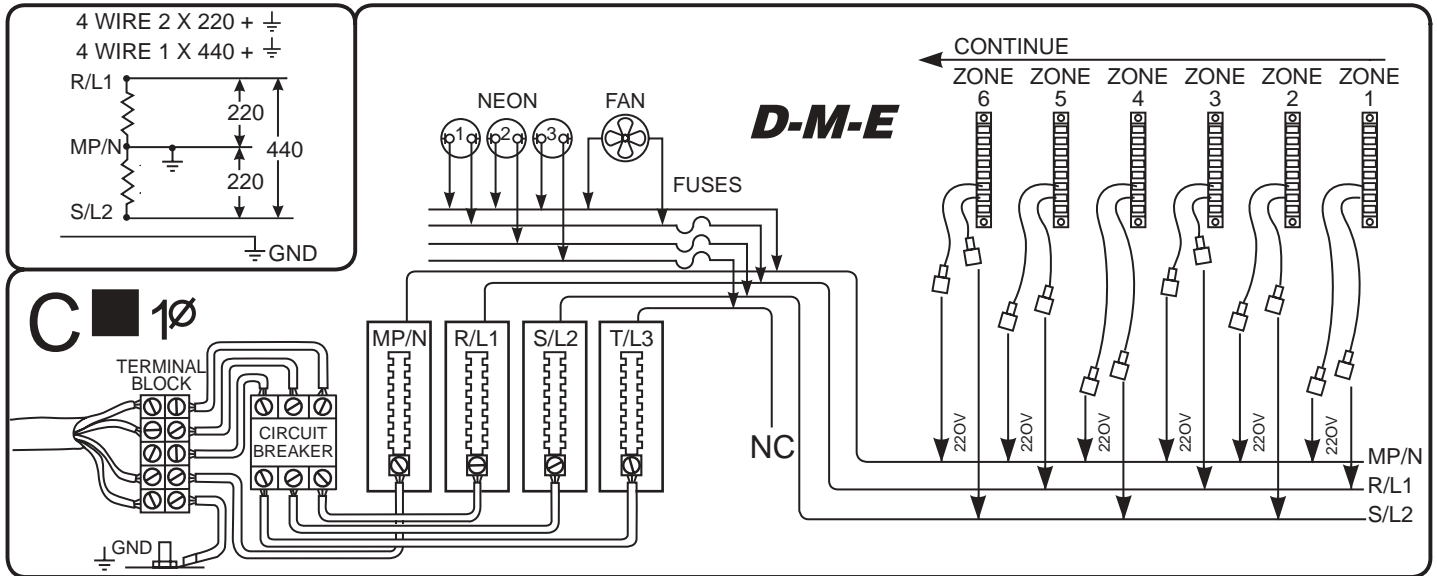
NOTE: At this point, the sequence repeats itself. For example, Zone (4) is connected the same as Zone (1) to R/L1 and S/L2 and Zone (5) is connected the same as Zone (2) to S/L2 and T/L3 and Zone (6) is connected the same as Zone (3) to R/L1 and T/L3. Zone (7) is then connected to the same phase as Zone (1) and (4), etc. This method of connection assures the greatest likelihood of line balance.





# Input Power Wiring Diagrams (Option C)

## 240 VAC, "Two-Phase", 4-Wire



The 240 volt single-phase connection only uses two power lines plus ground.

**CAUTION:** Only power conductors should be connected through the circuit breaker. Never make ground connections through a circuit breaker. Notice that the output of the circuit breaker is connected to terminal strips R/L1 and S/L2. Also notice that ground is common with MP/N in this system. All zones in this system have to be connected to MP/N and either R/L1 or S/L2.

Line balance is achieved by alternating between R/L1 and S/L2.

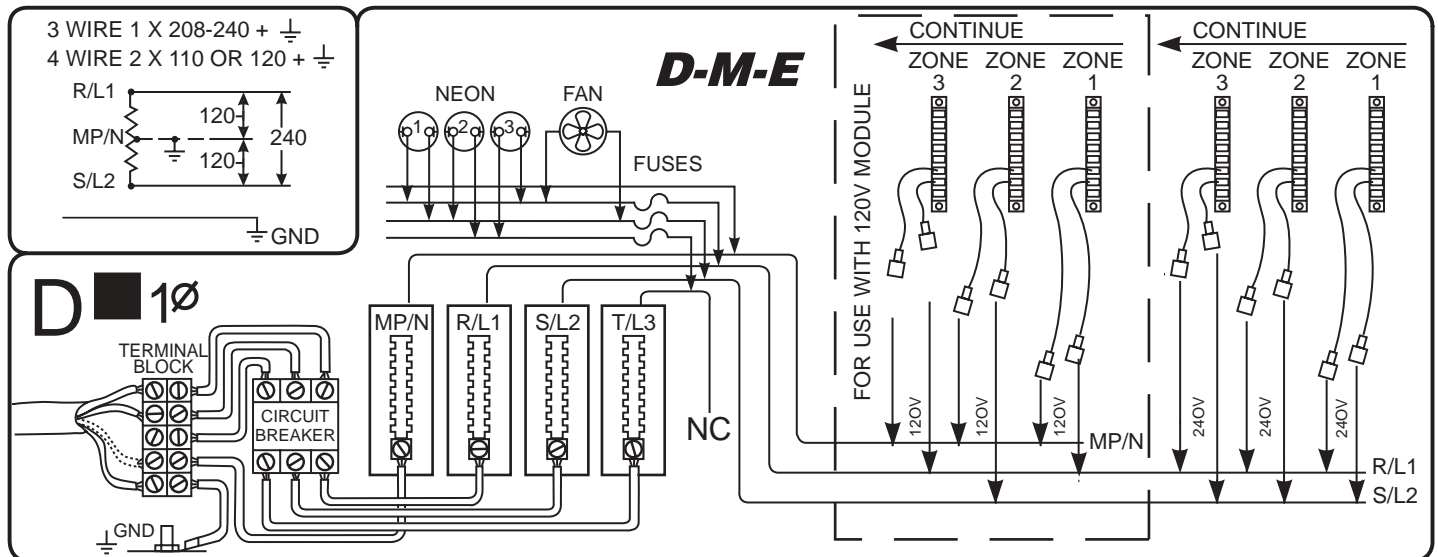
**Example:** Zone (1) is connected to MP/N and R/L1.

Zone (2) is connected to MP/N and S/L2, etc.

Zone (3) starts the sequence over again. It is connected to MP/N and R/L2, same as zone (1).

# Input Power Wiring Diagrams (Option D)

## 208 - 240 VAC, Single-Phase, 3-Wire or 120 VAC, Two Phase, 4-Wire



Above diagram depicts two different wiring configurations. One is 208-240 volt, single-phase, 3-wire. Note that lines R/L1 and S/L2 are connected through the circuit breaker to the appropriate terminal strips. All zones will be connected between R/L1 and S/L2. MP/N is common with ground and is not connected through the circuit breaker.

In the 120 volt connection (zone connections shown within the dashed-line area), the 120 volts is developed between R/L1 and MP/N and S/L2 and MP/N. Again, ground and MP/N are not connected through the circuit breaker. Each zone in this system will be connected to MP/N and either R/L1 or S/L2. Line balance is achieved by alternating between R/L1 and S/L2.

**Example:** Zone (1) is connected to MP/N and R/L1.

Zone (2) is connected to MP/N and S/L2, etc.

Zone (3) starts the sequence over again. It is connected to MP/N and R/L2, same as zone (1).



**D-M-E Company**  
**World Headquarters**  
 29111 Stephenson Highway  
 Madison Heights, MI 48071  
 800-626-6653 *toll free*  
 248-398-6000 *tel*  
 888-808-4363 *toll free fax*  
 info@dme.net *e-mail*  
 www.dme.net *web*

**D-M-E of Canada, Ltd.**  
 6210 Northwest Drive  
 Mississauga, Ontario, L4V 1J6  
 800-387-6600 *toll free*  
 905-677-6370 *tel*  
 800-461-9965 *toll free fax*  
 info@dme.net *e-mail*  
 www.dme.net *web*

**D-M-E Europe**  
**D-M-E Belgium C.V.B.A.**  
 Industriepark Noord  
 B-2800 Mechelen, Belgium  
 32-15-215011 *tel*  
 32-15-218235 *fax*  
 dme\_europe@dmeeu.com *email*