TEMPERATURE CONTROLLERS

DME

M1 - Intelligent Temperature Control System

5

MT Series

9

DME Smart Series Temperature Controllers

15

27/09/2016

MILACRON®

M1 - Intelligent Temperature Control System

DME

27/09/2016

M1 - Intelligent Temperature Control System

Benefits

Intelligent user-friendly performance
- Intuitive, leading edge touch screen display with adjustable viewing angle
- Automatically employed diagnostics to ensure optimal hardware configuration and performance
- Advanced micro controller technology
- Continuous ground fault and current measurement

Plug-and-play system architecture
- Patented "all-in-one" control card designed for reliability
- Modular 6-zone cards; 15 amps per zone
- Field calibration mode
- Universal power supply

Optimizes performance for all hot runner systems
- Unique low voltage soft-start feature maximizes heater life
- Uniform startup feature reduces scrap and energy usage
- Proprietary adaptive auto-tuning control algorithm
- Phase angle or burst firing modes (time proportional, zero-crossing)

Robust, high-quality design
- Compact solid metal enclosure with heavy-duty industrial connectors
- Mold and controller protection features
- On-board heater and thermocouple fuses
- Portable stand available

M1 Plus *model features a larger 7" high resolution screen with enhanced features including leak detection, larger tool stores and sequential tool start up.*

M1 - Intelligent™ Temperature Control System Specifications

User Interface	Full-color LCD touch screen on all HMI models
Display Size	5.7" QVGA
Calibration Accuracy	0.5°C / 1°F
Control Accuracy	+/- 0.5°C / 1°F
Power Response Time	8.3 ms at 60 Hz
Control Algorithm	Adaptive PID^2 with auto-tuning
Degree (F or C)	Software selectable
Thermocouple	J- or K-Type, software selectable
Operating Range	0 - 472°C or 32 - 882°F
Output Voltage	Maximum 264 VAC
Supply Voltage	200/240V Delta or 380/440V 3Ø Star
Supply Breaker	40A 3 Phase breaker for 6 and 12 zone control units 63A 3 Phase breaker for 18 and 48 zone control units
Frequency	50 - 60 Hz automatic switching
Ambient Temperature Range	5 - 45°C (41 - 113°F)
Humidity Range	Up to 95% non-condensing
Ground Fault Detection	40mA per zone
Power Control	Phase angle or burst firing modes (time proportional, zero-crossing)
Overload Protection	Semi-conductor fuses on both heater legs
Control Modes	Closed loop (auto), open loop (manual), standby, boost mode and slave mode
Alarm Output	Closing contact relay, max. 5A, 230V
T/C and Power Connector	HAN 24e or 3
LED Indicators	Fault, Scan
Soft-Start with Auto-Tune	Unique low voltage method for heater safety
Input Protection	Plug-in nano fuses on both TC legs
Port (optional)	USB

CAD reference point

27/09/2016

How to order your Temperature Control System

How to order: Controller + Wiring

Suffix

Order example:

M1 - Intelligent 30-zone with standard cable: **INT3048** + **MC**

M1 - Intelligent Controllers

incl. cabinet, touch-screen HMI, 15A control card and 5m cable.

REF	Zones	REF		
		No Cable	MoldMaster cable	Standard DME Cable
INT0612	6 x 15A	INT0612 NC	INT0612 MC	INT0612 SC
INT1212	12 x 15A	INT1212 NC	INT1212 MC	INT1212 SC
INT1824	18 x 15A	INT1824 NC	INT1824 MC	INT1824 SC
INT2424	24 x 15A	INT2424 NC	INT2424 MC	INT2424 SC
INT3048	30 x 15A	INT3048 NC	INT3048 MC	INT3048 SC
INT3648	36 x 15A	INT3648 NC	INT3648 MC	INT3648 SC
INT4248	42 x 15A	INT4248 NC	INT4248 MC	INT4248 SC
INT4848	48 x 15A	INT4848 NC	INT4848 MC	INT4848 SC

Main Wiring Options

STANDARD Suffix **MC**

Standard Cable Tool Ends

All cables have a top-entry hood with four pins for double lever housings. For 12 zones or more the standard connector is HAN24E and the tool end has female PWR and male T/C.
Variants such as side-entry or 2-pin can be easily provided. For tools having other than HAN24E connectors please view some options shown overleaf.



M1 - Intelligent 12/24/48 Std

Has two HAN24E connectors per 12 zones, one PWR and one T/C with wiring at controller and tool as detailed below.

HAN24E		Zone											
		1	2	3	4	5	6	7	8	9	10	11	12
POWER	(L)	1	2	3	4	5	6	7	8	9	10	11	12
	(N)	13	14	15	16	17	18	19	20	21	22	23	24
T/C	(+)	1	2	3	4	5	6	7	8	9	10	11	12
	(-)	13	14	15	16	17	18	19	20	21	22	23	24

DME Suffix **SC**

DME Standard Tool Ends

All cables have A side-entry hood with two pins for single lever housings. The standard PWR connector is PIC-24-G and the T/C connectors are either MTC-5-G, MTC-8-G or MTC-12-G depending on the number of zones used. All are female gender at the tool end of the cable. For tools having other connectors please view some options shown overleaf.




M1 - Intelligent 12/24/48 DME

Wired as Smart Series II 12 Std at controller, and DME standard at tool as detailed below (one PWR and one T/C per 12 zones).

		Zone											
		1	2	3	4	5	6	7	8	9	10	11	12
PIC-24-G	(L)	A1	A3	B1	B3	A5	C1	C3	D1	D3	C5	E1	E4
	(N)	A2	A4	B2	B4	B5	C2	C4	D2	D4	D5	E2	E4
MTC-12-G	(+)	1	2	3	4	5	6	7	8	9	10	11	12
	(-)	13	14	15	16	17	18	19	20	21	22	23	24

Beacon (for M1 - Intelligent 48)

REF
INT48beacon

Trolley (for M1 - Intelligent 48)

REF
INT48TROLLEY

CAD reference point

27/09/2016

MILACRON®

MT Series
Temperature Control System

DME

27/09/2016

MT Temperature Control System

Benefits

Out-of-the-box user friendly
- Intuitive touch screen interface
- Modular design with 2-zone control cards
- Cable set included
- Quick start guide for easy start-up

Optimizes the performance of any hot runner system
- Unique low voltage soft-start method
- Proprietary adaptive auto-tuning control algorithm
- Phase angle or burst firing modes (time proportional, zero-crossing)
- Wide range of user settings

Plug-and-play system architecture
- Patented "all-in-one" control card designed for reliability
- Cabinets are fully wired for maximum expansion
- No special setting required for start-up
- 15A per zone

Future now technology
- State of the art color touch screen display
- Most advanced micro controller technology
- Switch mode poser supply
- Infield calibration mode
- Continuous ground fault and current measurement

High quality, robust design
- Compact solid metal enclosure
- Heavy duty industrial connectors
- Mold and controller protection features
- On-board load and thermocouple fuses

MT Temperature Control System Specifications

User Interface	Full-color LCD touch screen
Display Size	2 inches (176 x 200 pixels)
Calibration Accuracy	0.5°C / 1°F
Control Accuracy	+/- 0.5°C / 1°F
Power Response Time	8.3 ms at 60 Hz
Control Algorithm	Self tuning PID
Degree (F or C)	Software selectable
Thermocouple	J- or K-Type, software selectable
Operating Range	0 - 472°C or 32 - 882°F
Output Voltage	Maximum 264 VAC
Supply Voltage	95-265 Vac
Frequency	50 - 60 Hz automatic switching
Ambient Temperature Range	5 - 45°C (41 - 113°F)
Humidity Range	Up to 95% non-condensing
Ground Fault Detection	40mA per zone
Power Control	Phase angle or burst firing modes (time proportional, zero-crossing)
Overload Protection	Semi-conductor fuses on both heater legs
Control Modes	Closed loop (auto), open loop (manual)
Alarm Output	Closing contact relay, max. 5A, 230V
T/C and Power Connector	Various options available
Soft-Start with Auto-Tune	Unique low voltage method for heater safety
Input Protection	Plug-in nano fuses on both TC legs

CAD reference point

27/09/2016

How to order your Temperature Control System

How to order: Controller + Wiring

Suffix

Order examples:

MT 10-zone with HAN48E connector on tool side — STEP1012 + SC

MT Controllers

incl. cabinet, 2-zone touch-screen, 15A control card and 5m cable.

REF	Zones	REF		
		No Cable	MoldMaster cable	Standard DME Cable
STEP0204	2 x 15A	STEP0204 NC	STEP0204 MC	STEP0204 SC
STEP0404	4 x 15A	STEP0404 NC	STEP0404 MC	STEP0404 SC
STEP0606	6 x 15A	STEP0606 NC	STEP0606 MC	STEP0606 SC
STEP0812	8 x 15A	STEP0812 NC	STEP0812 MC	STEP0812 SC
STEP1012	10 x 15A	STEP1012 NC	STEP1012 MC	STEP1012 SC
STEP1212	12 x 15A	STEP1212 NC	STEP1212 MC	STEP1212 SC
STEP1418	14 x 15A	STEP1418 NC	STEP1418 MC	STEP1418 SC
STEP1618	16 x 15A	STEP1618 NC	STEP1618 MC	STEP1618 SC
STEP1818	18 x 15A	STEP1818 NC	STEP1818 MC	STEP1818 SC

Benefits

Out-of-the-box user friendly
- Intuitive color touch screen interface
- (2) 15A control zones
- Mold and controller protection features
- Quick start guide for easy start-up
- Heavy duty industrial connector included
- Boost, standby and slave mode

Optimizes performance
- Unique low voltage soft start method
- Proprietary adaptive auto-tuning control algorithm
- Phase angle and burst firing modes (time proportional, zero-crossing)
- Continuous display of % power and current

Two Zone
STEP0202H10A

MT Temperature 2-zone Controller Specifications

Calibration Accuracy	1°F / 0.5°C
Thermocouple	J or K-Type, software selectable
Operating Range	0 - 472°C or 32 - 882°F
Supply Voltage	95-265Vac
Frequency	50 - 60 Hz automatic switching
Ground Fault Detection	40mA per zone
Power Control	Phase angle and burst firing modes (time proportional, zero-crossing)
Overload Protection	Semi-conductor fuses on both legs
Control Modes	Closed loop (Auto), open loop (Manual)
Soft-Start with Auto Tune	Using unique low voltage method for heater safety
Input Protection	Plug in nano fuses on both T/C legs
Dimensions	15 x 25 x 8.5 cm

CAD reference point

27/09/2016

STANDARD — Suffix MC

Standard Cable Tool Ends

All cables have a top-entry hood with four pins for double lever housings. For 12 zones or more the standard connector is HAN24E and the tool end has female PWR and male T/C.
Variants such as side-entry or 2-pin can be easily provided. For tools having other than HAN24E connectors please view some options shown overleaf.



MT Series 04 Std

Has one HAN16E with wiring at controller and tool as detailed below.

HAN16E		Zone			
		1	2	3	4
POWER & T/C	(L)	9	11	13	15
	(N)	10	12	14	16
	(+)	1	3	5	7
	(-)	2	4	6	8

MT Series 06 Std

Has one HAN24E with wiring at controller and tool as detailed below.

HAN24E		Zone					
		1	2	3	4	5	6
POWER & T/C	(L)	1	3	5	7	9	11
	(N)	2	4	6	8	10	12
	(+)	13	15	17	19	21	23
	(-)	14	16	18	20	22	24

MT Series 12 Std

Has two HAN24E connectors per 12 zones, one PWR and one T/C with wiring at controller and tool as detailed below.

HAN24E		Zone											
		1	2	3	4	5	6	7	8	9	10	11	12
POWER	(L)	1	2	3	4	5	6	7	8	9	10	11	12
	(N)	13	14	15	16	17	18	19	20	21	22	23	24
T/C	(+)	1	2	3	4	5	6	7	8	9	10	11	12
	(-)	13	14	15	16	17	18	19	20	21	22	23	24

MT Series 18 Std

Has four HAN24E connectors, two PWR and two T/C with wiring at controller and tool as detailed below.

HAN24E	POWER		T/C	
	(L)	(N)	(+)	(-)
Zone 1	1	13	1	13
Zone 2	2	14	2	14
Zone 3	3	15	3	15
Zone 4	4	16	4	16
Zone 5	5	17	5	17
Zone 6	6	18	6	18
Zone 7	7	19	7	19
Zone 8	8	20	8	20
Zone 9	9	21	9	21
Zone 10	10	22	10	22
Zone 11	11	23	11	23
Zone 12	12	24	12	24
Zone 13	1	13	1	13
Zone 14	2	14	2	14
Zone 15	3	15	3	15
Zone 16	4	16	4	16
Zone 17	5	17	5	17
Zone 18	6	18	6	18
not used	7	19	7	19
not used	8	20	8	20
not used	9	21	9	21
not used	10	22	10	22
not used	11	23	11	23
not used	12	24	12	24

DME — Suffix SC

DME Standard Tool Ends

All cables have A side-entry hood with two pins for single lever housings. The standard PWR connector is PIC24G and the T/C connectors are either MTC5G, MTC8G or MTC12G depending on the number of zones used. All are female gender at the tool end of the cable. For tools having other connectors please view some options shown overleaf.




MT Series 04 DME

Wired as StepUp 04 Std at controller, and DME standard at tool as detailed below.

		Zone				
		1	2	3	4	*
PIC24G	(L)	A1	A3	B1	B3	A5
	(N)	A2	A4	B2	B4	B5
MTC5G	(+)	1	2	3	4	5
	(-)	6	7	8	9	10

* not used

MT Series 06 DME

Wired as MT Series 06 Std at controller, and DME standard at tool as detailed below.

		Zone							
		1	2	3	4	5	6	*	*
PIC24G	(L)	A1	A3	B1	B3	A5	C1	C3	D1
	(N)	A2	A4	B2	B4	B5	C2	C4	D2
MTC8G	(+)	1	2	3	4	5	6	7	8
	(-)	9	10	11	12	13	14	15	16

* not used

MT Series 12 DME

Wired as MT Series 12 Std at controller, and DME standard at tool as detailed below (one PWR and one T/C per 12 zones).

		Zone											
		1	2	3	4	5	6	7	8	9	10	11	12
PIC24G	(L)	A1	A3	B1	B3	A5	C1	C3	D1	D3	C5	E1	E4
	(N)	A2	A4	B2	B4	B5	C2	C4	D2	D4	D5	E2	E4
MTC12G	(+)	1	2	3	4	5	6	7	8	9	10	11	12
	(-)	13	14	15	16	17	18	19	20	21	22	23	24

MT Series 18 DME

Wired as MT Series 18 Std at controller, and DME standard at tool as detailed below.

	PIC24G		MTC12G	
	(L)	(N)	(+)	(-)
Zone 1	A1	A2	1	13
Zone 2	A3	A4	2	14
Zone 3	B1	B2	3	15
Zone 4	B3	B4	4	16
Zone 5	A5	B5	5	17
Zone 6	C1	C2	6	18
Zone 7	C3	C4	7	19
Zone 8	D1	D2	8	20
Zone 9	D3	D4	9	21
Zone 10	C5	D5	10	22
Zone 11	E1	E2	11	23
Zone 12	E3	E4	12	24
Zone 13	A1	A2	1	13
Zone 14	A3	A4	2	14
Zone 15	B1	B2	3	15
Zone 16	B3	B4	4	16
Zone 17	A5	B5	5	17
Zone 18	C1	C2	6	18
not used	C3	C4	7	19
not used	D1	D2	8	20
not used	D3	D4	9	21
not used	C5	D5	10	22
not used	E1	E2	11	23
not used	E3	E4	12	24

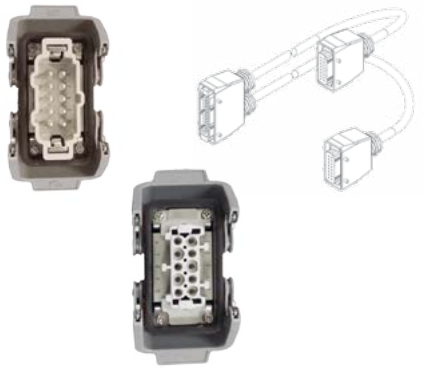
CAD reference point

27/09/2016

Option-HAN10E

Suffix **H10E**

For MT Series 4 Std & MT Series 6 Std at controller with separate PWR and T/C connectors at the tool as detailed below.



HAN10E	POWER		HAN10E	T/C	
	(L)	(N)		(+)	(-)
Zone 1	1	9	Zone 1	1	9
Zone 2	2	10	Zone 2	2	10
Zone 3	3	11	Zone 3	3	11
Zone 4	4	12	Zone 4	4	12
Zone 5	5	13	Zone 5	5	13

Allows maximum of 5 zones

Option-Combi

Suffix **CC**

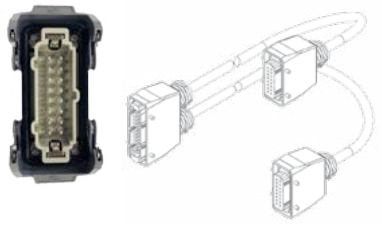
Re-wire any MT Series or Intelligent controllers to provide all of the connectors wired in PWR and T/C combined Combi style as detailed below. For controllers with 6 zones or more a 10% charge is added.

HAN24E	POWER		T/C	
	(L)	(N)	(+)	(-)
Zone 1	1	2	13	14
Zone 2	3	4	15	16
Zone 3	5	6	17	18
Zone 4	7	8	19	20
Zone 5	9	10	21	22
Zone 6	11	12	23	24
Zone 7	1	2	13	14
Zone 8	3	4	15	16
Zone 9	5	6	17	18
Zone 10	7	8	19	20
Zone 11	9	10	21	22
Zone 12	11	12	23	24

Option-HAN16E

Suffix **H16E**

Tool uses smaller HAN16E connectors. Wired as standard at controller.
Provide Y-Cables with HAN24E at controller for each pair of smaller HAN16E at tool.

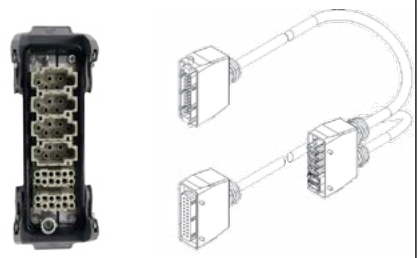


HAN16E	POWER		HAN16E	POWER	
	(L)	(N)		(L)	(N)
Zone 1	1	9	Zone 7	1	9
Zone 2	2	10	Zone 8	2	10
Zone 3	3	11	Zone 9	3	11
Zone 4	4	12	Zone 10	4	12
Zone 5	5	13	Zone 11	5	13
Zone 6	6	14	Zone 12	6	14
not used	7	15	not used	7	15
not used	8	16	not used	8	16

Option-HANMOD

Suffix **HMOD**

Tool-end has HAN Modular connector with combined PWR and T/C as detailed below. Wired as standard at controller. Provide Y-Cables with two HAN24E at controller for each HanMOD at tool.

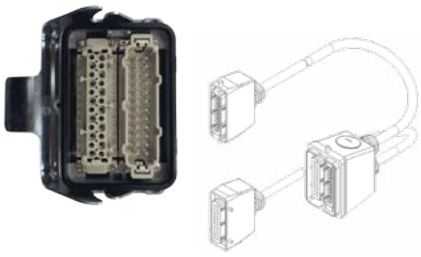


HanMOD	POWER & T/C			
	(L)	(N)	(+)	(-)
Zone 1	C1	C2	A1	A7
Zone 2	C3	C4	A2	A8
Zone 3	C5	C6	A3	A9
Zone 4	D1	D2	A4	A10
Zone 5	D3	D4	A5	A11
Zone 6	D5	D6	A6	A12
Zone 7	E1	E2	B1	B7
Zone 8	E3	E4	B2	B8
Zone 9	E5	E6	B3	B9
Zone10	F1	F2	B4	B10
Zone11	F3	F4	B5	B11
Zone12	F5	F6	B6	B12

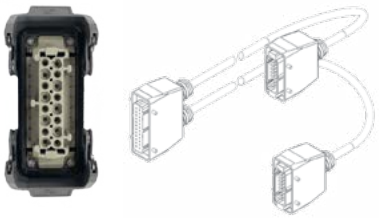
Option-HAN48E

Suffix **H48E**

Tool-end has single HAN48E with Male PWR and Female T/C as detailed below. Wired as standard at controller. Provide Y-cable with two HAN24E at controller for each HAN48E at tool.



HAN48E	POWER & T/C			
	(L)	(N)	(+)	(-)
Zone 1	1	13	1	13
Zone 2	2	14	2	14
Zone 3	3	15	3	15
Zone 4	4	16	4	16
Zone 5	5	17	5	17
Zone 6	6	18	6	18
Zone 7	7	19	7	19
Zone 8	8	20	8	20
Zone 9	9	21	9	21
Zone 10	10	22	10	22
Zone 11	11	23	11	23
Zone 12	12	24	12	24



HAN16E	T/C		HAN16E	T/C	
	(+)	(-)		(+)	(-)
Zone 1	1	9	Zone 7	1	9
Zone 2	2	10	Zone 8	2	10
Zone 3	3	11	Zone 9	3	11
Zone 4	4	12	Zone 10	4	12
Zone 5	5	13	Zone 11	5	13
Zone 6	6	14	Zone 12	6	14
not used	7	15	not used	7	15
not used	8	16	not used	8	16

Other Options?

We can accommodate any other wiring standard not detailed here.
However, any change request, that needs a change to the connectors or wiring within the controller, does attract a 10% surcharge.

CAD reference point

27/09/2016

Create your own cabling option here

If you require non-standard cables and/or connectors not previously listed then please provide the following information (if available, please supply a tool drawing as well).

Company .....

Address .....

.....

.....

Contact .....

Tel: .....

Fax: .....

Email: .....

DME Contact .....

Controller Type	MT Series	M1 -Intelligent
Maximum No. of zones	4	
	6	12
	12	24
	18	48
Cable Length (Standard is 15ft)		
Are Code pins required	Yes/No	

	PWR Cable	T/C Cable	Combined PWR & T/C
Controller End Connector (Standard is HAN24E)			
Top or Side Entry Hood? (Standard is Top Entry)			
Tool End Connector (Standard is HAN24E)			
Top or Side Entry Hood (Standard is Side Entry)			
Pins for SIngle or Double Lever (Standard is Double Lever)			
Are Mould Plugs Required?	Yes/No	Yes/No	Yes/No

How are Zones Wired?

CAD reference point

27/09/2016

MILACRON®

DME Smart Series
Temperature Controllers

DME

27/09/2016

Info

Main frames for temperature control

***DME* Smart Series® main frames**

DME's 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. Completely wired and ready for use, these frames are available in standard configuration for 5, 8 and 12 zones.

Features

1. Heavy duty construction. All welded 16 gauge steel construction insures long life and peak performance.
2. Simple AC input power connections permit selection of voltage, phase and load balancing to suit the application. All Smart Series® main frames are supplied to accept 380/420 VAC, 3 phase, 5 wire, 50-60 Hz input power. A variety of other voltage, phase and load balancing arrangements possible:
   3 x 380 VAC + Np + ground
   220-240 V, 3 phase, 50-60 Hz
   208-240 V, single phase, 50-60 Hz
   110-120 V, single phase, 50-60 Hz (for 110 VAC heaters)
   The 16 thru 48 zone frames use 2, 3 and 4 frame sections rigidly fastened together into one prewired integral stack unit which requires only one main AC power input connection.
3. Heavy duty, in-line circuit board connectors for module power and thermocouple connectors. Large contact area for added reliability. Exclusive dual grounding system for safety (modules are grounded before contact is made and grounded again when fully inserted).
4. Main AC disconnect switch (Electronic circuit breaker / disconnect) with 3 power on indicator lights.
5. Cooling fan in the main frame is strategically located to increase air ventilation and maintain cooler running condition.
6. Upper and lower guides to simplify module insertion and removal.
7. Push-pull fasteners to quickly and easily lock modules and blank panels in position. No tools required.
8. Heavy duty connectors with integral retaining latches for power and thermocouple cables.
9. International symbols and installation drawings have been printed directly on the main frame back panel for quick availability and reference whenever needed.
10. Numbered write-on areas for zone information.
11. Tapped inserts to simplify mounting frame to floor stand.
12. Reduced electrical noise and heat levels.

27/09/2016

Single zone microprocessor temperature controllers — ESH1022

REF
ESH1022

Included:
- **ABC10**
- **C1460A0040024**
- **C14610G0032004**

Specifications

T/C input

Thermocouple (T/C) sensor:	Type 'J', grounded or ungrounded
External T/C resistance:	High impedance potentiometric input allows long distance T/C wiring
T/C isolation:	Isolated by control circuit power supply
Cold junction compensation:	Automatic, better than 0,01 °C/°C
Input impedance:	22 Megohms
Input protection:	Diode clamps, RC filter and fuse
Input amplifier stability:	0,01 °C/°C
Input dynamic range:	537 °C
Common mode rejection ratio:	Better than 100 db
Power supply rejection ratio:	Better than 90 db

Output

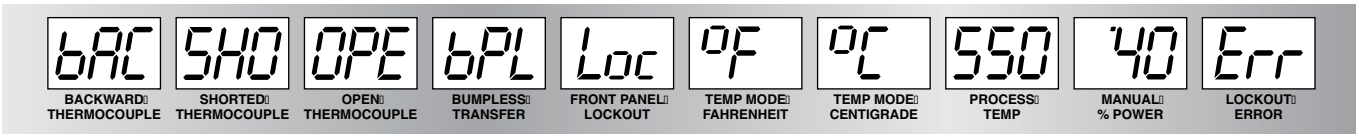
Voltage/Power capability:	10 Amp., 240 VAC nominal, single phase, 2400 watts @ 240 VAC
Output drive:	Internal solid state triac, triggered by zero AC crossing pulses
Overload protection:	10 A: fuses provided on both sides of AC line
Transient protection:	Dv/Dt and transient pulse suppression incl.
Power line isolation:	Optically and transformer isolated from AC lines, isolation voltage > 2500 volts

Electrical power

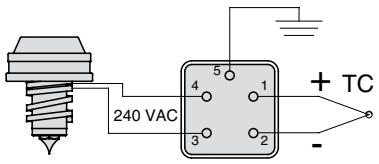
Input voltage:	240 VAC + 10%-20%, 50-60 Hz
DC power supplies:	Internally generated, regulated and compensated
Unit power usage:	Less than 5 watts, excluding load
Dimensions:	W: 18,29 cm, H: 6,86 cm, D: 21,84 cm
Fuse requirements:	2 ABC-10 fuses included with unit

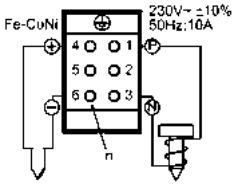
Diagnostics

The ESH diagnostics automatically alert the user to a fault condition.



ESH1012 — Replacement parts





	REF	Description
	**ABC10**	Fuses
	**C14610A0040024**	Male inserts
	**C14610G0032004**	Hood top entry
	**C14610F0030004**	Housing bulkhead mounting
	**MCC0001**	Power- & TC cables
	**C14610B0040024**	Female insert

	REF	Description
	**AGST6**	Male inserts
	**AGS3106**	Housing bulkhead mounting
	**AGL3106**	Hood top entry
	**MCC0002**	Power- & TC cables
	**MCC0002**	AGBU6

27/09/2016

MFPX

Main frames for temperature control

5-Zone : MFPX5C4-5G (kit)
Specifications

Zones:	Max. 5, main frame with fan
Line voltage:	Max. 240 VAC Δ/420 VAC λ, 50-60 Hz.
Max. load current:	35 Amp., Main AC disconnect switch with overload protection 50 Amp./phase
Dimensions and weight:	L = 360 mm, W = 290 mm, H = 229 mm (L doesn't include connectors), 9 kg

5-Zone main frame package is supplied with:
- 1 Set supplementary fuses: ABC15
- 1 Set crimp connectors: HWCC1
- 1 Mold power input connector: PIC24G
- 1 Thermocouple connector: MTC5G
- 1 Mold power cable: MPC244-5G (4,5 m long)
- 1 Thermocouple cable : TC54-5G (4,5 m long)
- 1 Cover shield: MPS0005

How to order seperately:

MFPX5G mainframe (without cable) incl.
- 1 Set supplementary fuses: ABC15
- 1 Set crimp connectors: HWCC1

modules to be chosen

Optional:

- Mold power input connector: PIC24G
- Thermocouple connector: MTC5G
- Mold power cable: MPC244-5G (4,5 m long)
- Thermocouple cable : TC54-5G (4,5 m long)
- Cover shield: MPS0005

8-Zone : MFPX8C4-5G (kit)
Specifications

Zones:	Max. 8, main frame with fan
Line voltage:	Max. 240 VAC Δ/420 VAC λ, 50-60 Hz.
Max. load current:	50 Amp., Main AC disconnect switch with overload protection 50 Amp./phase
Dimensions and weight:	L = 513 mm, W = 290 mm, H = 229 mm (L doesn't include connectors), 11,4 kg

8-Zone main frame package is supplied with:
- 1 Set supplementary fuses: ABC15
- 1 Set crimp connectors: HWCC1
- 1 Mold power input connector: PIC24G
- 1 Thermocouple connector: MTC8G
- 1 Mold power cable: MPC244-5G (4,5 m long)
- 1 Thermocouple cable: TC84-5G (4,5 m long)
- 1 Cover shield: MPS0008

How to order seperately:

MFPX 8 G mainframe (without cable) incl.
- 1 Set supplementary fuses: ABC15
- 1 Set crimp connectors: HWCC1

modules to be chosen

Optional:

- Mold power input connector: PIC24G
- Thermocouple connector: MTC8G
- Mold power cable: MPC244-5G (4,5 m long)
- Thermocouple cable : TC84-5G (4,5 m long)
- Cover shield: MPS0008

12-Zone : MFPX12C4-5G (kit)
Specifications

Zones:	Max. 12, main frame with fan
Line voltage:	Max. 240 VAC Δ/420 VAC λ, 50-60 Hz.
Max. load current:	70 Amp., Main AC disconnect switch with overload protection 50 Amp./phase
Dimensions and weight:	L = 716 mm, W = 290 mm, H = 229 mm (L doesn't include connectors), 16 kg

12-Zone main frame package is supplied with:
- 1 Set supplementary fuses: ABC15
- 1 Set crimp connectors: HWCC1
- 1 Mold power input connector: PIC24G
- 1 Thermocouple connector: MTC12G
- 1 Mold power cable: MPC244-5G (4,5 m long)
- 1 Thermocouple cable: TC124-5G (4,5 m long)
- 1 Cover shield: MSP0012

How to order seperately:

MFPX12G mainframe (without cable) incl.
- 1 Set supplementary fuses: ABC15
- 1 Set crimp connectors: HWCC1

modules to be chosen

Optional:

- Mold power input connector: PIC24G
- Thermocouple connector: MTC12G
- Mold power cable: MPC244-5G (4,5 m long)
- Thermocouple cable : TC124-5G (4,5 m long)
- Cover shield: MSP0012

Main frames with 4,5 m connector cables

27/09/2016

Modules

Info

DME Smart Series® modules are human engineered to provide the essential and popular control functions in a straightforward manner that is easy for the operator to understand and use. Accurate and reliable, they reflect the latest electronic and mechanical state-of-the-art. Features listed below apply to both the modules.

SSM1512
Microprocessor-based temperature control module with digital display, (15A)

DSS1512
Self-tuning microprocessor-based temperature control module with dual display (15A)

TSM1512
Color touch screen digital display providing readouts for Actual Temperature, Current Mode, Percentage Power and Current Reading. Closed-loop, fuzzy logic PID control, and auto-tuning of PID parameters provide precise control even under the most adverse processing conditions.

MFBP10G
Blank panel

Electronic features

1. 100% solid state - no relays or other moving parts.
2. Zero crossing triac triggering for minimum RFI.
3. Transient and Dv/Dt suppression circuitry.
4. Self contained triacs and power supplies. Power supplies are regulated and temperature compensated.
5. Dual fuse protection for triac circuitry and AC power supply.
6. 240 VAC ± 20%, single phase, standard.
7. Dual grounding protection for operator safety.
8. New: anti-arc circuit protects modules and mainframes

Mechanical features

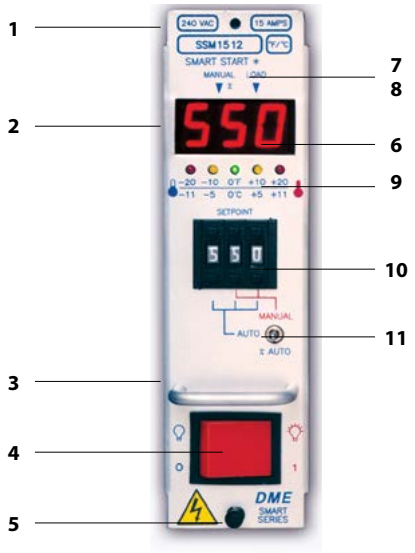
1. All 15 Amp. modules are dimensionally identical (W 50,8 x H 177,8 x D 190,5 mm) to permit interchangeability.
2. Sturdy 'box type' construction provides added strength and circuitry protection.
3. Fuses are easily accessible for quick replacement.
4. Large heat sink and circuit board improve heat dissipation and module reliability.
5. Integral handle, dual guides and push-pull fastener permit easy insertion and locking of module in frame.
6. Module identification and power ratings are shown on front panel for quick reference.
7. Front panel controls are easy to understand and use - indicator lights show operating functions at a glance.
8. No internal adjustments need to be made by the operator.

27/09/2016

SSM1512

Microprocessor-based control modules

1. **Identification label**
2. **Digital LED display**
3. **Handle**
4. **Power On/Off switch**
5. **Push-pull fastener**
6. **Process temperature light**
7. **Manual percentage-of-power light**
8. **Power-to-load light**
9. **Temperature deviation lights**
10. **Process temperature/setpoint button**
11. **Setpoint/percentage-of-power control**
12. **Auto/manual switch**



Performance specifications

Control modes auto/manual:	Time proportioning
Temperature range:	Ambient to 537 °C / 999° F
Control accuracy:	±0,5 °C dependent on the total thermal system
Temperature stability:	±0,5% of full scale over the ambient range of 0 to 50 °C
Calibration accuracy:	Better than 0,2% of full scale
Cycle time:	0,33 sec.
Power response time:	Less than 0,13 sec.
Automatic reset:	Corrects reset to no more than ±1 °C at all settings
Manual control:	Adjustable from 0-99%. Maintains output power to within 1% of setting.
Smart Start® (SS):	Linear ramp from initial temperature to setpoint
Smart Start® duration:	4,5 minutes
Smart Start® override temperature:	93 °C
Operational mode priority:	- SS precedes auto mode - T/C break overrides SS and auto modes - Reversed or shorted T/C overrides SS and auto modes - Manual control overrides T/C break, reversed T/C and auto modes - The output is inhibited during all fault conditions

Input specifications

Thermocouple sensor:	Type 'J' grounded or ungrounded
External T/C resistance:	High impedance potentiometric input allows long distance T/C wiring
T/C isolation:	Isolated by control circuit power supply
Cold junction compensation:	Automatic, better than 0,01 °C/°C
Input type:	BCD selector
Input impedance:	22 Megohms
Input protection:	Diode clamp, RC filter
Input amplifier stability:	0,01 °C/°C
Input dynamic range:	537 °C
Common mode rejection ratio:	Better than 100 db
Power supply rejection ratio:	Better than 90 db

Output specifications

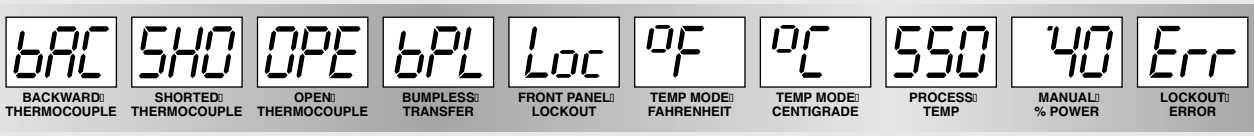
Power capability:	15 Amp.: 15 Amp., 3600 Watts @ 240 VAC Output drive: Internal solid state triac, triggered by zero AC crossing pulses
Overload protection:	15 Amp.: Fuses provided on both sides of AC line Transient protection: Dv/Dt and transient pulse suppression included
Power line isolation:	Optically and transformer isolated from AC lines. Isolation voltage is greater than 2500.

Controls and indicators

Power On/Off:	16 Amp. rocker switch (15 Amp.) . VDE approved
Multi-function display:	(3) 7-segment LEDs
Load/Smart Start® indicator:	LED in display window blinks during Smart Start®
Shorted thermocouple:	'Sho' alternates with normal display, automatically inhibits power to heater
Open thermocouple:	'oPE' alternates with normal display, automatically inhibits power to heater
Reversed thermocouple:	'bAC' alternates with normal display, automatically inhibits power to heater
Temperature deviation indicators:	Separate LEDs: ±11 °C (Red), ±5 °C (Yellow), 0 °C (Green)

Electrical power specifications

Input voltage:	240 VAC + 10%-20%
Frequency:	50/60 Hz
DC power supplies:	Internally generated, regulated and compensated
Unit power usage:	Less than 5 watts, excluding load
Dimensions:	15 Amp.: W 5,08 x H 17,78 x D 19,05 cm
Fuse requirements:	15 Amp. only: (2) ABC-15 fuses (2 spare fuses included with module) 50 mA TC input 315 mA Transformer



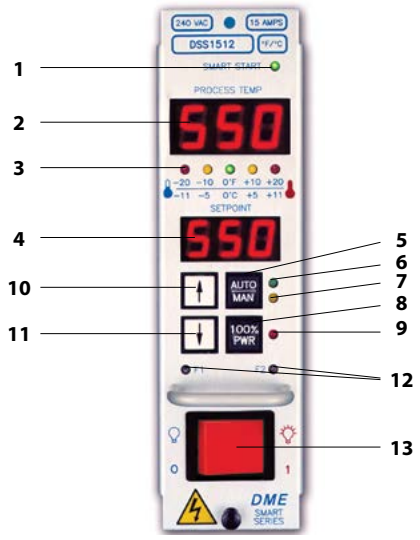
REF	Amp.	Watt
SSM1512	**15**	3600

27/09/2016

Microprocessor control modules - Auto tuning P.I.D.

DSS1512

1. **Smart Start® light**
2. **Process temperature display**
3. **Temperature deviation lights**
4. **Setpoint display**
5. **Auto/manual switch**
6. **Auto light**
7. **Manual light**
8. **100% power switch**
9. **100% power light**
10. **Setpoint - up button**
11. **Setpoint - down button**
12. **F1/F2 lights**
13. **Power ON/OFF switch**



Performance specifications

Control modes auto/manual:	Time proportioning / Selective Cycle®
Temperature range:	Ambient to 537 °C
Control Accuracy:	± 0,5 °C dependent on the total thermal system
Calibration Accuracy:	Better than 0,2% of the full scale
Manual Control:	Adjustable from 0-100%. Maintains output power to within 1% of set point.
Smart Start®:	Linear voltage ramping/5 min. max.
Smart Start® override temperature:	124 °C
100% power:	Applies 100% power to the output Jumper selectable inhibit or S = 15, L = 30 sec.
Operational mode priority:	- Smart Start® precedes auto mode - T/C break, reversed or shorted T/C overrides Smart Start® and auto modes - Manual control overrides the auto mode, T/C breaks, reversed or shorted thermocouples - Output is inhibited during all fault conditions

Input specifications

Thermocouple sensor:	Type 'J' grounded or ungrounded
External T/C resistance:	Less than 0,05 °C/W
T/C isolation:	Isolated by control circuit power supply
Cold junction compensation:	Automatic, better than 0,015 °C/°C
T/C break, reversed & shorted protection:	Automatically inhibits power to heater, unless bumpless transfer is invoked
Input impedance:	5,6 Megohms
Input amplifier stability:	Greater than 0,01 °C/°C
Common mode rejection ratio:	Better than 120 dB
Power supply rejection ratio:	Better than 110 dB

Output specifications

Power capability:	15 Amp.: 15 Amp., 3600 Watts @ 240 VAC
Output drive:	Internal solid state triac, triggered by zero AC crossing pulses
Overload protection:	15 Amp.: Fuses are provided on both sides of AC line
Transient protection:	Dv/Dt and transient pulse suppression included
Power line isolation:	Optically and transformer isolated from AC lines. Isolation voltage is greater than 2500 Volts.

Controls and Indicators

Setpoint adjustment:	Push-button up & down arrow keys
Auto/manual selection:	Push-button switch with LED indicators
100% power selection:	Push-button switch with LED indicator adjacent to switch
Power On/Off:	15 Amp rocker switch
100% power indication:	Red LED adjacent to 100% power key flashes Process display flashes '100'
Auto indication:	Illuminates green LED adjacent to Auto/Man key
Manual indication:	Illuminates yellow LED adjacent to Auto/Man key
Smart Start® indication:	Illuminates green LED above the process display
Blown fuse indication:	2 neon indicators (15 Amp. only)
Shorted thermocouple:	Flashes 'Shi' in process display
Open thermocouple:	Flashes 'oPi' in process display
Reversed thermocouple:	Flashes 'bci' in process display
Temperature deviation indication:	Separate LEDs: > + or - 17 °C = Red, flashing > + or - 11 °C = Red > + or - 5 °C = Yellow 0 °C = Green

Electrical power specifications

Input voltage:	240 VAC + 10%/-15%
Frequency:	50/60 Hz.
DC power supplies:	Internally generated, regulated, and compensated
Module power usage:	Less than 6 watts, excluding load
Dimensions:	15 Amp.: W 5,08 x H 17,78 x D 19,05 cm
Fuse requirements:	15 Amp. only: (2) ABC-15 fuses (2 spare fuses included with module) 315 mA: Transformer

REF	Amp.	Watt
DSS1512	**15**	3600

27/09/2016

TSM1512

Microprocessor-based temperature control modules with color touch screen display

The TSM15 Smart Series Module has a color touch screen digital display providing readouts for Actual Temperature, Current Mode, Percentage Power and Current Reading. 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 TSM 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.

The TSM boost level option limits boosting of the temperature by 75°C or 135°F to limit the degradation of material.

The TSM 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 TSM is fully compatible with all Smart Series or G-Series® 15 AMP mainframes.

Leak Detection capabilities (reference TSM1512 User Manual)

TSM15 SmartSeries® Controller with Default Settings (Factory Settings)

Zone temperature	260ºC or 500ºF
Standby level	100ºC or 180ºF
Boost level	75ºC or 135ºF
Over temperature range	10ºC or 18ºF
Under temperature range	
Ramp	On
Auto-Manual	On
Extended alarms for Manual, Standby and Boost	Off

When reconfiguring your controller for a new tool or environment, this chapter of the manual shows how to alter controller default settings to your preferred values and afterward to save them.

Should anything seem wrong with your new settings then it is possible to restore the default settings at any time.

1. Actual temperature (and scale)
2. Current mode shows set-point
3. Percentage power applied
4. Current reading

Front Panel Controls and Indicators

REF
TSM1512

27/09/2016

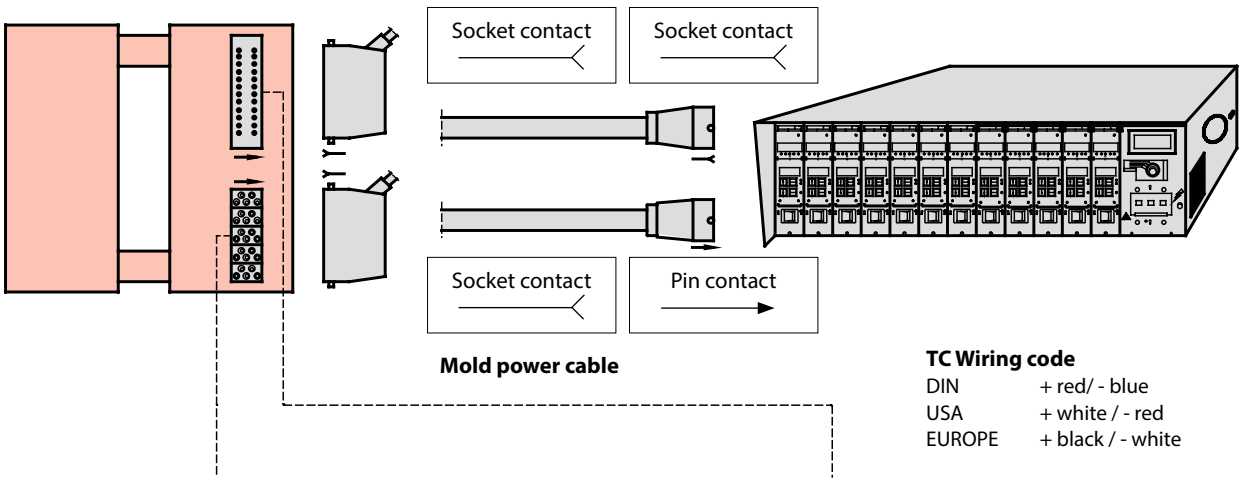
Wiring instructions

Info

Wiring instructions for DME heaters

1. Power wires can only be extended with crimp connectors (HWCC-1,2 and 5) and power wires of the same cross-section area (total length max. 8 m).
2. Fe-Co thermocouple wires can only be extended with Fe-Co wires. With the exception of the polarity of the extension cable (US standards: red = negative, white = positive; European standards: red = positive, blue = negative). One must take care that the thermocouple wires are in good contact with the cable joint.
3. Mold power input connector (PIC-24-G) and terminal mounting box (PTCX, PICX, PTC) must be connected with the protective conductor to the mold.
4. Take care that wiring is correct to the position of the modules.
5. Use Ohm-meter to check each heater for proper function prior to starting the ***DME*** Hot Runnerless System.

Wiring diagram



TC Wiring code

DIN	+ red/ - blue
USA	+ white / - red
EUROPE	+ black / - white

Mold power input connector

REF	PIC24G Zone	Contr. No.
	1	A1, A2
	2	A3, A4
	3	B1, B2
	4	B3, B4
5-zone MF	5	A5, B5
	6	C1, C2
	7	C3, C4
8-zone MF	8	D1, D2
	9	D3, D4
	10	C5, D5
	11	E1, E2
12-zone MF	12	E3, E4

Thermocouple connector

REF MTC5G

Zone	Contr. No. +	–
1	1,	6
2	2,	7
3	3,	8
4	4,	9
5	5,	10

REF MTC8G

Zone	Contr. No. +	–
1	1,	9
2	2,	10
3	3,	11
4	4,	12
5	5,	13
6	6,	14
7	7,	15
8	8,	16

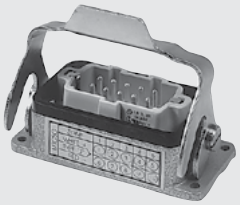
REF MTC12G

Zone	Contr. No. +	–
1	1,	13
2	2,	14
3	3,	15
4	4,	16
5	5,	17
6	6,	18
7	7,	19
8	8,	20
9	9,	21
10	10,	22
11	11,	23
12	12,	24

27/09/2016

MTC

Thermocouple connectors



REF	Zones
MTC5G	5
MTC8G	8
MTC12G	12

TC

Thermocouple cables

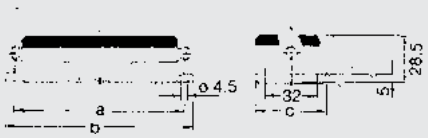
❶ to mold — to frame ❷

REF	Zones	Cable length
TC54-5G	5	4,5 m
TC84-5G	8	4,5 m
TC124-5G	12	4,5 m

REF	Zones	Cable length
TC5DE	5	0,5 m
TC8DE	8	0,5 m
TC12DE	12	0,5 m

C14610F

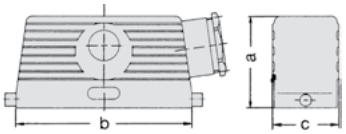
Thermocouple cables



REF	a	b	c	contacts
C14610F0100011	83	93	43	10+
C14610F0160011	103	113	43	16+
C14610F0240011	130	140	43	24+

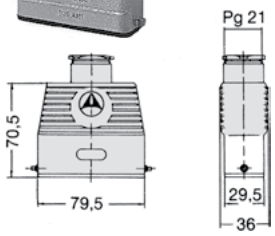
C14610G

❶ Hoods end entry



REF	a	b	c	contacts
C14610G0101061	51	73	43	10+
C14610G0161061	61	93	43	16+
C14610G0241061	61	119,5	43	24+

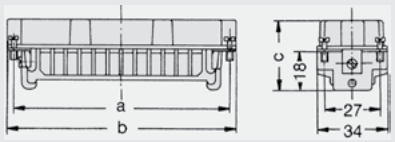
❷ Hoods top entry



REF
C14610G0252002

C14610A

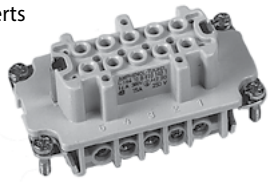
Male inserts

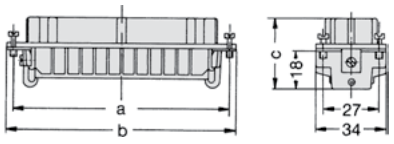


REF	a	b	c	contacts
C14610A0101021	57	64	34	10+
C14610A0161021	77,5	84,5	34	16+
C14610A0241021	104	111	34	24+

C14610B

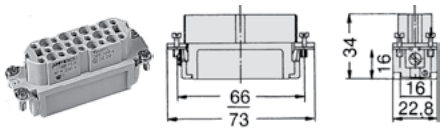
❶ Female inserts





REF	a	b	c	contacts
C14610B0101021	57	64	34	10+
C14610B0161021	77,5	84,5	34	16+
C14610B0241021	104	111	34	24+

❷ Female inserts (without contacts)



REF
C14610B0250002

VN02

❷ Female socket contacts

REF
VN02

OE...

Thermocouples cables

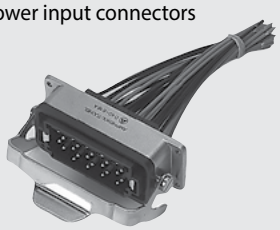
REF	Identification	
Oe160-5	**FeCo** Thermocouplescables(**tobeorderedperm.)	16poles0,5mm2(FeCo)
Oe240-5		24poles0,5mm2(FeCo)

CAD reference point

27/09/2016

PIC

Mold power input connectors



REF	Amp.
PIC24G	15

MPC

Mold power cables

❶ to mold

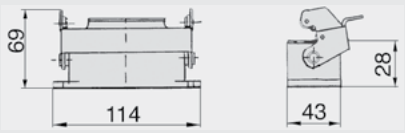
to frame ❷

REF	Amp.	Cable length
MPC244-5G	15	4,5 m

Conversion table			
REF	Cable length	Male	Female
MPC2524	0,5 m	24	25
MPC2425	0,5 m	25	24

C14610P

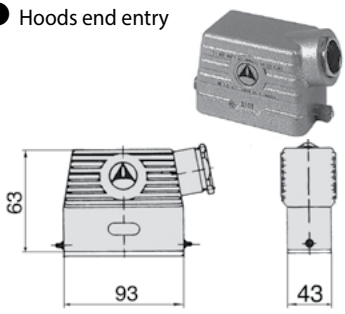
Housing bulkhead mountings



REF
C14610FBA24P

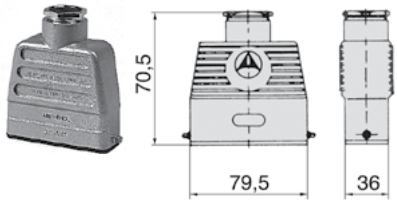
C14610G

❶ Hoods end entry



REF
C14610GHL24P

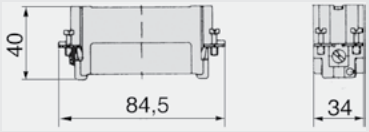
❷ Hoods top entry



REF
C14610G0252002

C14610A

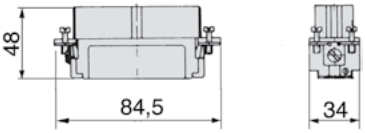
Male inserts (without contacts)



REF
C14610A2416

C14610B

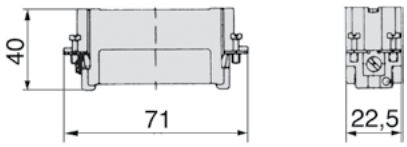
❶ Female inserts (without contacts)



REF
C14610B2416

C14610A

❷ Male inserts (without contacts)



REF
C14610A0250002

VN01

Male pin contacts

REF	
VN012416	1,5mm²
VN012420	2,0mm²

VN02

❶ Female socket contacts

REF	
VN022416	1,5 mm²
VN022420	2,0 mm²

VN01

❷ Male pin contacts

REF
VN01

Powercabels (1,5 mm², 25 poles)

Oe...

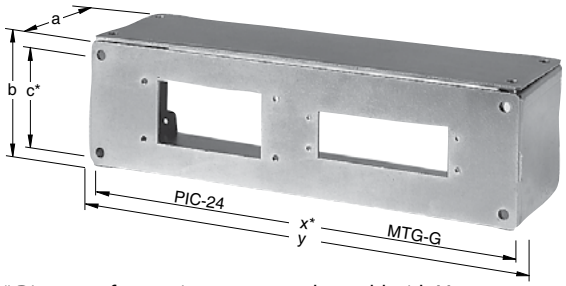
REF	Identification	
Oe251-5	Powercabels (**to be ordered per m.)	25 poles 1,5 mm2

CAD reference point

27/09/2016

PTCX

Terminal mounting boxes for power and thermocouple connectors

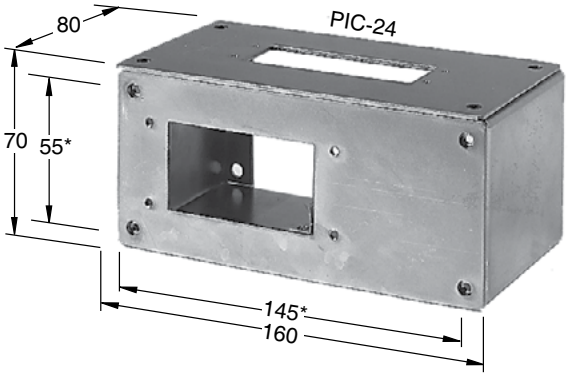


REF	a	b	c	x	y	Installation possibilities for
PTCX5K	70	70	55	243	258	PIC24G / MTC5G
PTCX8K						PIC24G / MTC8G
PTCX12K						PIC24G / MTC12G

* Distance of mounting screws on the mold with M5 x 15.

PICX

Terminal mounting boxes for power and thermocouple connectors



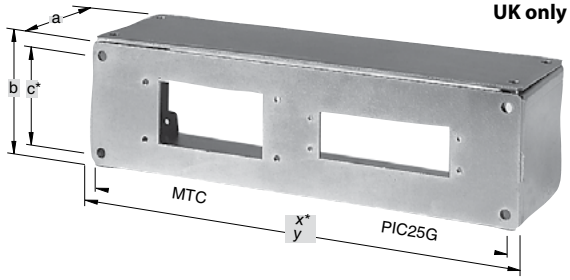
REF	Installation possibilities for
PICX245K	PIC24G / MTC5G
PICX248K	PIC24G / MTC8G
PICX2412K	PIC24G / MTC12G

* Distance of mounting screws on the mold with M5 x 15.

PTC

Terminal mounting boxes for power and thermocouple connectors

UK only



REF	a	b	c	x	y	Installation possibilities for
PTC5TBG	105	60	38	205	220	PIC5G / MTC5G
PTC8TBG	105	60	38	225	240	PIC8G / MTC8G
PTC12TBG	105	60	38	253	265	PIC12G / MTC12G

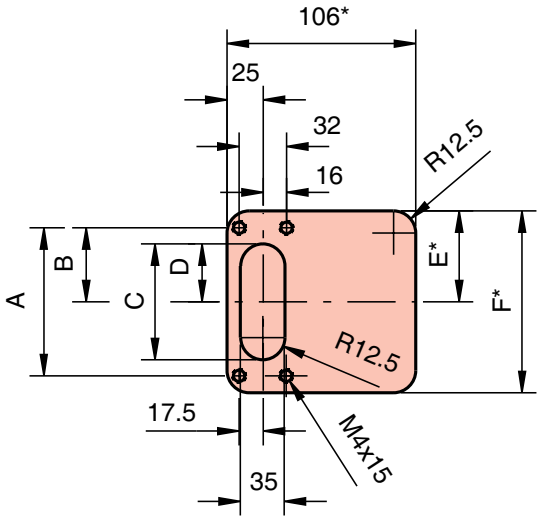
* Distance of mounting screws on the mold with M5 x 15.

CAD reference point

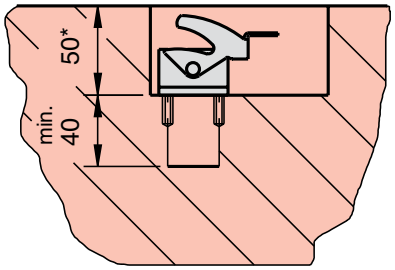
27/09/2016

Mounting without Boxes

Pocket for thermocouple connectors MTC...G

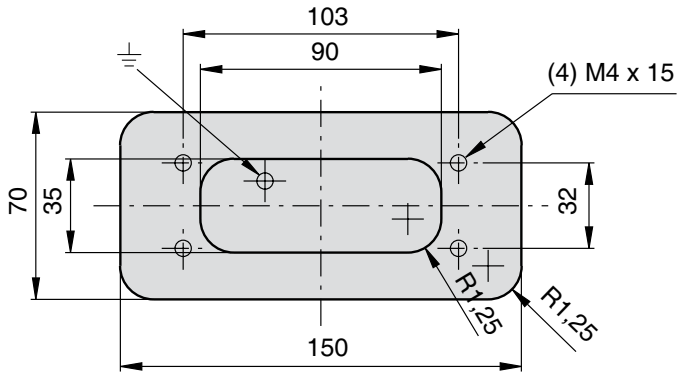


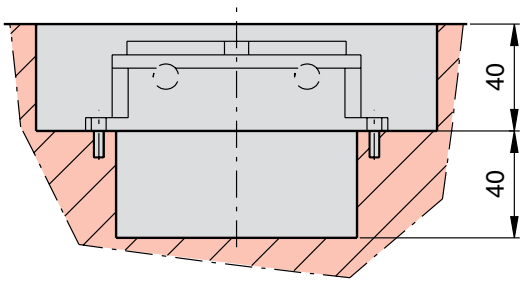
Note: Drawing depicts below flush mounting.
For surface mounting, disregard dimensions marked with *.



Dimensions	For connector		
	MTC5G	MTC8G	MTC12G
A	83	103	130
B	41,5	51,5	65
C	65	85	112
D	32,5	42,5	56
E	51	61	74,5
F	102	122	149

Pocket for mold power input connectors PIC24G





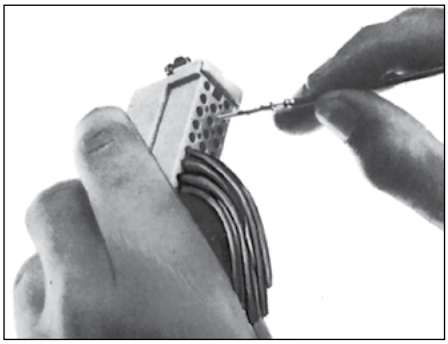
Note: Drawing depicts below flush mounting.
For surface mounting, disregard dimensions marked with *.

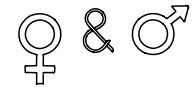
CAD reference point

27/09/2016

FG / FGN

Removal tools for pin contacts VN-01 and socket contacts VN 02





REF	for
FGN2416	VN012416 / VN022416

Rear insertion

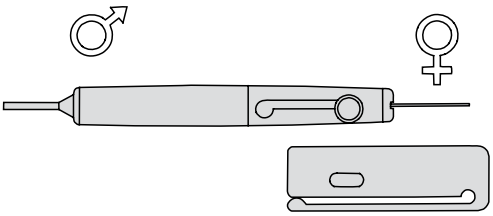
Contact to snap in audibly

Check longitudinal clearance of 0,2 mm

Front release

Female contact

Male contact



REF	for
FG0300146	VN01 / VN02

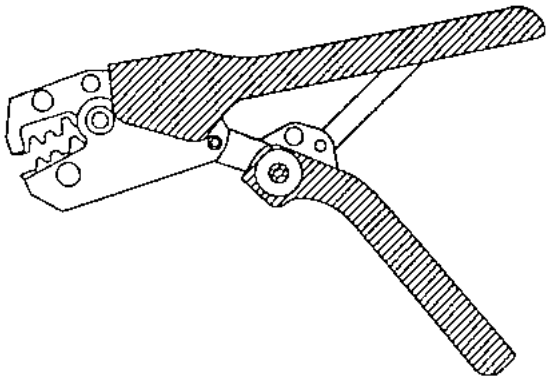
TA

Contact crimp tools

REF	for
TA0100146	VN01
	VN02

FAN

Contact crimp tools



REF	for
FAN2416	VN01241620
	VN02241620

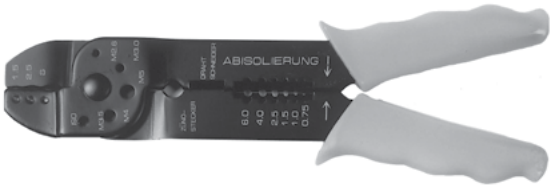
CAD reference point

27/09/2016

Crimptools

KT

REF	for
KT9500014	HWCC1



Crimp connectors

HWCC

REF	AMPS	Rating
HWCC1 (Cool-One)	10-15	16-22 RED
HWCC2 (Cool-One)	10-15	14-16 BLUE
HWCC5 (Hot-One)	15-30	10-12 YELLOW

Fuses for SSMX and DSS

ABC

REF	Amp.
ABC1	1
ABC5	5
ABC10	10
ABC15	15

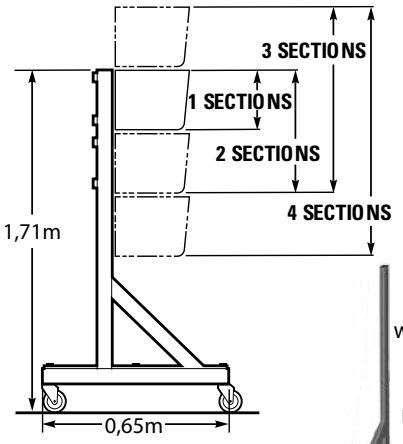
Universal Floor Stand

MFS...

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 (181 kg rating). All assembly and Mainframe mounting hardware is included. Heavy duty floor stand available for larger systems (453 kg rating).

REF	RATING (kg)
MFS512G	181
MFS512GHD*	453

* HD stand not shown.
Floor stand comes with plates for 5-zone frame mounting on 8-zone “x” pattern



CAD reference point

27/09/2016

DME Europe C.V.B.A.
Schaliënhoevedreef 20-D
RPR - RPM Mechelen
BE-2800 Mechelen, Belgium
VAT ID: BE0456932455

P +32 15 28 87 30
F +32 15 40 51 17
W www.milacron.com

www.milacron.com