



**TEMPERATURE  
CONTROLLERS**





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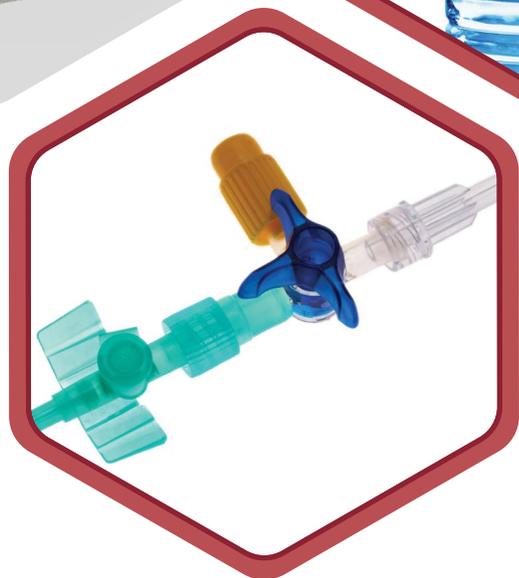
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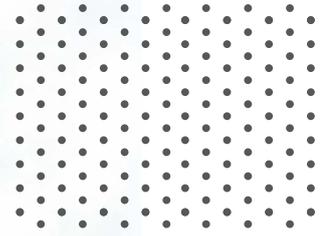
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# THE POWER OF POSSIBILITIES.



At **DME** - a Milacron company - we see ourselves as problem solvers. A global integrated team that is driven by the desire to help each customer's "what ifs" come to life.





“We want customers calling us with their toughest problems and wildest ideas. We are in the business of creating solutions and realizing aspirations – of building what used to be impossible.”

Tom Goeke  
CEO, MILACRON

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**Milacron** has a global perspective on what matters in manufacturing. With over 15 manufacturing facilities in six countries, we sell our plastics processing solutions in over 100 countries across six continents. We have an installed base of 40,000 machines, 153,000 hot runners and over 3.5 million square feet of manufacturing space. We put this know-how to work every day to improve productivity, cut costs, increase energy efficiency, eliminate scrap, and reduce cycle times across a diverse range of industries. Behind it all is our people – caring, committed and creative – who build long-term relationships with our customers.

From automobiles and appliances to milk jugs and toothbrushes, **DME** technologies and services help the

world’s leading companies make your favorite products.

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Today, **DME** is proud to be able to provide complete turnkey solutions, partnering with fellow **Milacron** companies such as **Mold-Masters** runnerless systems, **Tirad** high precision custom plates (including **DME** Standard components) and **Ferromatik** machines.





MILACRON®

# M1 - Intelligent Temperature Control System



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

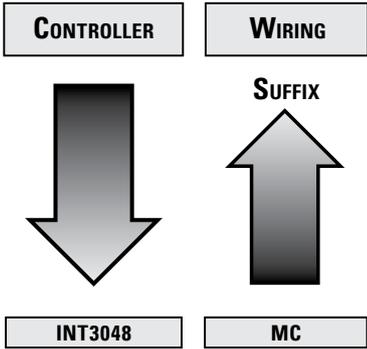
**M1 Plus** model features a larger 7" high resolution screen with enhanced features including leak detection, larger tool stores and sequential tool start up.

## 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 <sup>2</sup> 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

## How to order your Temperature Control System

HOW TO ORDER:



ORDER EXAMPLE:

M1 - Intelligent 30-zone with standard cable



### 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	Zone											
		1	2	3	4	5	6	7	8	9	10	11	12
POWER (L)	(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).

PIC-24-G	Zone	Zone											
		1	2	3	4	5	6	7	8	9	10	11	12
(L)	(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

CAD reference point



Beacon (for M1 - Intelligent 48)

REF  
INT48beacon



Trolley (for M1 - Intelligent 48)

REF  
INT48TROLLEY





MILACRON®

# MT Series Temperature Control System



## 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 power 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

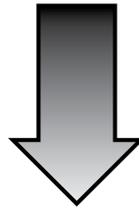


## How to order your Temperature Control System

HOW TO ORDER:

CONTROLLER

WIRING



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

## 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.



#### 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.

HAN24E	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

## Other Wiring Options\*

\* available for the whole range

### 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.



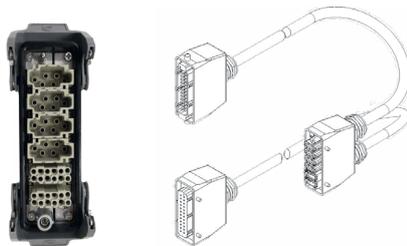
HAN10E	POWER		HAN10E	T/C	
	(L)	(N)		(+)	(-)
Zone 1	1	9	Zone 1	1	9
Zone 2	2	10	Zone 2	2	10
Zone 3	3	11	Zone 3	3	11
Zone 4	4	12	Zone 4	4	12
Zone 5	5	13	Zone 5	5	13

Allows maximum of 5 zones

### OPTION-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-COMBI

Suffix **CC**

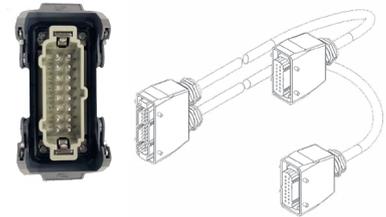
Re-wire any MT Series or Intelligent controllers to provide all of the connectors wired in PWR and T/C combined Combi style as detailed below. For controllers with 6 zones or more a 10% charge is added.

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.

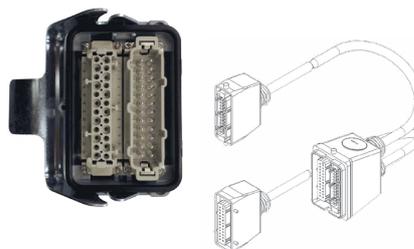


HAN16E	POWER		HAN16E	POWER	
	(L)	(N)		(L)	(N)
Zone 1	1	9	Zone 7	1	9
Zone 2	2	10	Zone 8	2	10
Zone 3	3	11	Zone 9	3	11
Zone 4	4	12	Zone 10	4	12
Zone 5	5	13	Zone 11	5	13
Zone 6	6	14	Zone 12	6	14
not used	7	15	not used	7	15
not used	8	16	not used	8	16

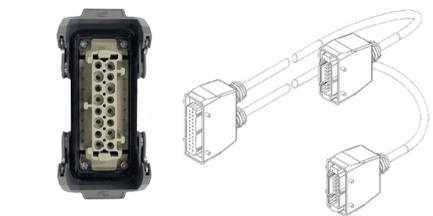
### OPTION-HAN48E

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.

## 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	<input type="checkbox"/> 4	<input type="checkbox"/>
	<input type="checkbox"/> 6	<input type="checkbox"/> 12
	<input type="checkbox"/> 12	<input type="checkbox"/> 24
	<input type="checkbox"/> 18	<input type="checkbox"/> 48

Cable Length   
(Standard is 15ft)

Are Code pins required  Yes/No

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?

PWR Cable	T/C Cable
<input type="text"/>	<input type="text"/>
<input type="checkbox"/> Yes/No	<input type="checkbox"/> Yes/No

Combined PWR & T/C
<input type="text"/>
<input type="checkbox"/> Yes/No

How are Zones Wired?



MILACRON®

# DME Smart Series Temperature Controllers





## 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.

Single zone microprocessor temperature controllers

ESH1022



REF
<b>ESH1022</b>

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

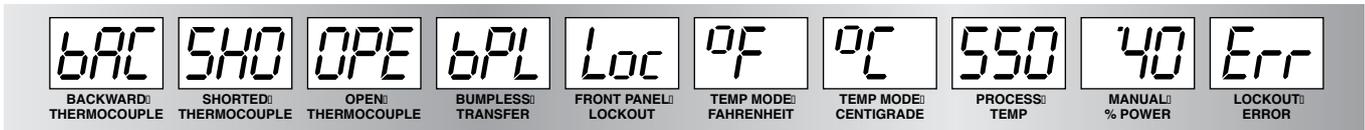
Overload protection: 10 A: fuses provided on both sides of AC line  
 Transient protection: Dv/Dt and transient pulse suppression incl.  
 Power line isolation: Optically and transformer isolated from AC lines, isolation voltage > 2500 volts

#### 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

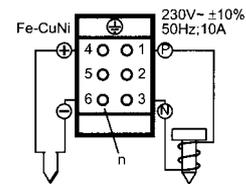
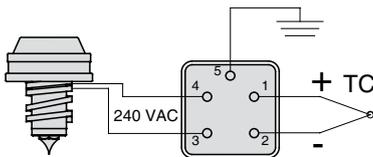
#### Diagnostics

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



ESH1012

Replacement parts



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

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

MFPX

Main frames for temperature control



The kit MFPX includes all accessories needed to use the controller. You only have to add the modules you need (see next page).

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

#### Specifications

Zones: Max. 5, main frame with fan  
 Line voltage: Max. 240 VAC  $\Delta$ /420 VAC  $\lambda$ , 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)

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

#### Specifications

Zones: Max. 8, main frame with fan  
 Line voltage: Max. 240 VAC  $\Delta$ /420 VAC  $\lambda$ , 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)

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

#### Specifications

Zones: Max. 12, main frame with fan  
 Line voltage: Max. 240 VAC  $\Delta$ /420 VAC  $\lambda$ , 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)

#### How to order separately:

**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)

#### How to order separately:

**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)

#### How to order separately:

**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)

**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  $\pm$  20%, single phase, standard.
7. Dual grounding protection for operator safety.
8. New: anti-arc circuit protects modules and mainframes

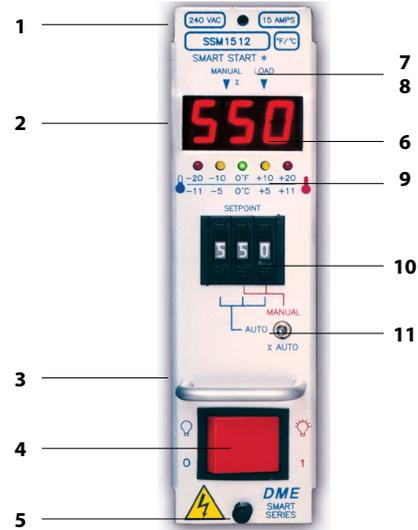
### Mechanical features

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.

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:  
 Temperature range:  
 Control accuracy:  
 Temperature stability:  
 Calibration accuracy:  
 Cycle time:  
 Power response time:  
 Automatic reset:  
 Manual control:

Time proportioning  
 Ambient to 537 °C / 999° F  
 ±0,5 °C dependent on the total thermal system  
 ±0,5% of full scale over the ambient range of 0 to 50 °C  
 Better than 0,2% of full scale  
 0,33 sec.  
 Less than 0,13 sec.  
 Corrects reset to no more than ±1 °C at all settings  
 Adjustable from 0-99%. Maintains output power to within 1% of setting.

**Smart Start® (SS):**

Linear ramp from initial temperature to setpoint  
 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:  
 External T/C resistance:  
 T/C isolation:  
 Cold junction compensation:  
 Input type:  
 Input impedance:  
 Input protection:  
 Input amplifier stability:  
 Input dynamic range:  
 Common mode rejection ratio:  
 Power supply rejection ratio:

Type 'J' grounded or ungrounded  
 High impedance potentiometric input allows long distance T/C wiring  
 Isolated by control circuit power supply  
 Automatic, better than 0,01 °C/°C  
 BCD selector  
 22 Megohms  
 Diode clamp, RC filter  
 0,01 °C/°C  
 537 °C  
 Better than 100 db  
 Better than 90 db

**Output specifications**

Power capability:  
 Overload protection:  
 Power line isolation:

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

**Controls and indicators**

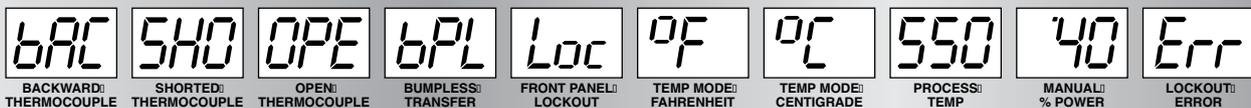
Power On/Off:  
 Multi-function display:  
 Load/Smart Start® indicator:  
 Shorted thermocouple:  
 Open thermocouple:  
 Reversed thermocouple:  
 Temperature deviation indicators:

16 Amp. rocker switch (15 Amp.) . VDE approved  
 (3) 7-segment LEDs  
 LED in display window blinks during Smart Start®  
 'Sho' alternates with normal display, automatically inhibits power to heater  
 'oPE' alternates with normal display, automatically inhibits power to heater  
 'bAC' alternates with normal display, automatically inhibits power to heater  
 Separate LEDs: ±11 °C (Red), ±5 °C (Yellow), 0 °C (Green)

**Electrical power specifications**

Input voltage:  
 Frequency:  
 DC power supplies:  
 Unit power usage:  
 Dimensions:  
 Fuse requirements:

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

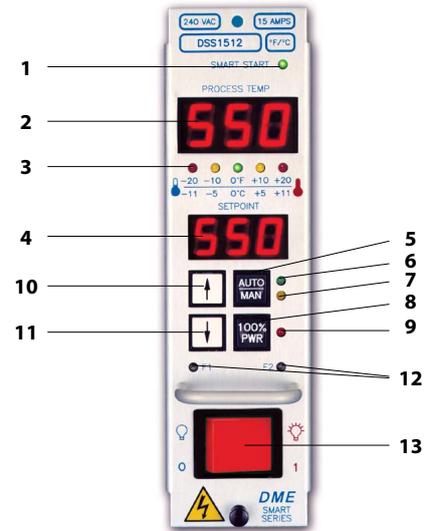


REF	Amp.	Watt
SSM1512	15	3600

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

DSS1512

- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>1. <b>Smart Start® light</b></li> <li>2. <b>Process temperature display</b></li> <li>3. <b>Temperature deviation lights</b></li> <li>4. <b>Setpoint display</b></li> <li>5. <b>Auto/manual switch</b></li> <li>6. <b>Auto light</b></li> <li>7. <b>Manual light</b></li> <li>8. <b>100% power switch</b></li> <li>9. <b>100% power light</b></li> <li>10. <b>Setpoint - up button</b></li> <li>11. <b>Setpoint - down button</b></li> <li>12. <b>F1/F2 lights</b></li> </ol> | <ol style="list-style-type: none"> <li>13. <b>Power ON/OFF switch</b></li> </ol> |
|---|--|



### 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
Auto indication:	Process display flashes '100' 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

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	260°C or 500°F
Standby level	100°C or 180°F
Boost level	75°C or 135°F
Over temperature range	10°C or 18°F
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

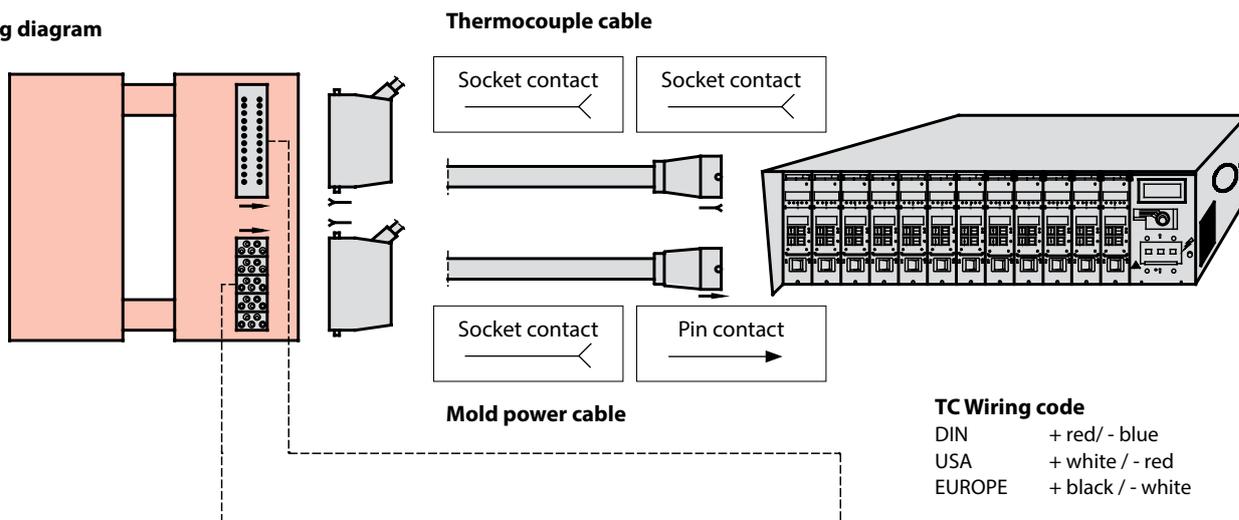
**Front Panel Controls and Indicators**

REF
TSM1512

### 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



### Mold power input connector

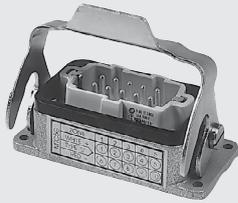
REF	PIC24G Zone	Contr. No.
	1 .....	A1, A2
	2 .....	A3, A4
	3 .....	B1, B2
	4 .....	B3, B4
5-zone MF	5 .....	A5, B5
	6 .....	C1, C2
	7 .....	C3, C4
8-zone MF	8 .....	D1, D2
	9 .....	D3, D4
	10 .....	C5, D5
	11 .....	E1, E2
12-zone MF	12 .....	E3, E4

### Thermocouple connector

REF MTC5G		REF MTC8G		REF MTC12G	
Zone	Contr. No.	Zone	Contr. No.	Zone	Contr. No.
	+ -		+ -		+ -
1.....	1, 6	1.....	1, 9	1.....	1, 13
2.....	2, 7	2.....	2, 10	2.....	2, 14
3.....	3, 8	3.....	3, 11	3.....	3, 15
4.....	4, 9	4.....	4, 12	4.....	4, 16
5.....	5, 10	5.....	5, 13	5.....	5, 17
		6.....	6, 14	6.....	6, 18
		7.....	7, 15	7.....	7, 19
		8.....	8, 16	8.....	8, 20
				9.....	9, 21
				10.....	10, 22
				11.....	11, 23
				12.....	12, 24

## MTC

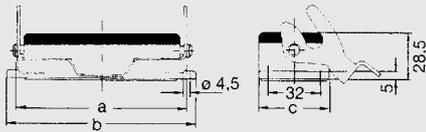
Thermocouple connectors



REF	Zones
<b>MTC5G</b>	5
<b>MTC8G</b>	8
<b>MTC12G</b>	12

## C14610F

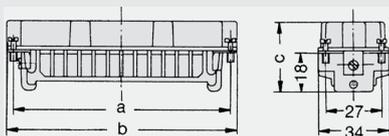
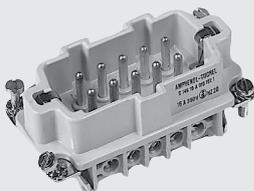
Thermocouple cables



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

## C14610A

Male inserts



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

## Oe...

Thermocouples cables

REF	Identification
<b>Oe160-5</b>	FeCo Thermocouples cables (**to be ordered perm.)
<b>Oe240-5</b>	
	16 poles, 0,5mm <sup>2</sup> (FeCo)
	24 poles, 0,5mm <sup>2</sup> (FeCo)

## TC

Thermocouple cables



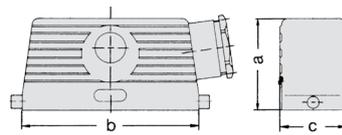
① to mold

to frame ②

REF	Zones	Cable length
<b>TC54-5G</b>	5	4,5 m
<b>TC84-5G</b>	8	4,5 m
<b>TC124-5G</b>	12	4,5 m

REF	Zones	Cable length
<b>TC5DE</b>	5	0,5 m
<b>TC8DE</b>	8	0,5 m
<b>TC12DE</b>	12	0,5 m

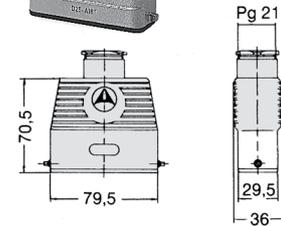
① Hoods end entry



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

## C14610G

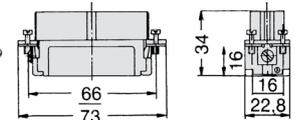
② Hoods top entry



REF
<b>C14610G0252002</b>

## C14610B

② Female inserts (without contacts)



REF
<b>C14610B0250002</b>

## VN02



② Female socket contacts

REF
<b>VN02</b>

## PIC

Mold power input connectors



REF	Amp.
<b>PIC24G</b>	15

## MPC

Mold power cables

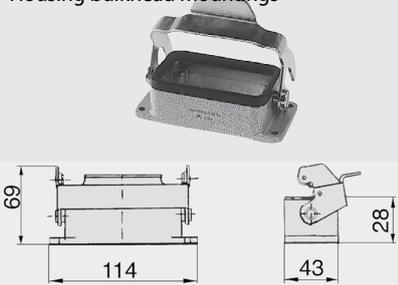


REF	Amp.	Cable length
<b>MPC244-5G</b>	15	4,5 m

Conversion table			
REF	Cable length	Male	Female
<b>MPC2524</b>	0,5 m	24	25
<b>MPC2425</b>	0,5 m	25	24

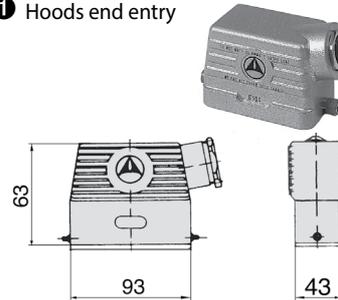
## C14610P

Housing bulkhead mountings



REF
<b>C14610FBA24P</b>

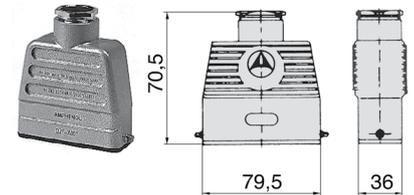
1 Hoods end entry



REF
<b>C14610GH24P</b>

## C14610G

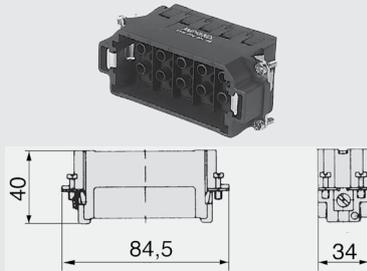
2 Hoods top entry



REF
<b>C14610G0252002</b>

## C14610A

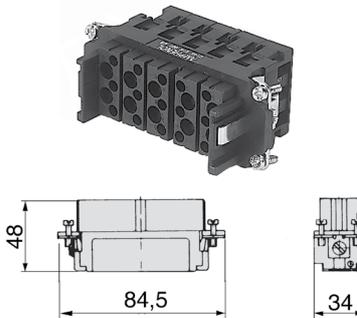
Male inserts (without contacts)



REF
<b>C14610A2416</b>

## C14610B

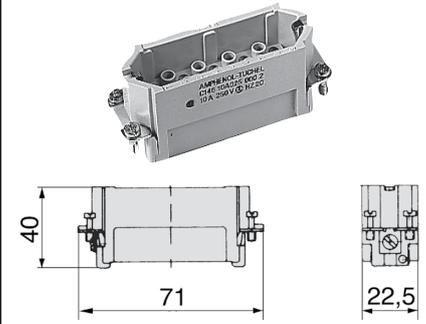
1 Female inserts (without contacts)



REF
<b>C14610B2416</b>

## C14610A

2 Male inserts (without contacts)



REF
<b>C14610A0250002</b>

## VN01

Male pin contacts



REF	
<b>VN012416</b>	1,5mm <sup>2</sup>
<b>VN012420</b>	2,0mm <sup>2</sup>

## VN02

1 Female socket contacts



REF	
<b>VN022416</b>	1,5 mm <sup>2</sup>
<b>VN022420</b>	2,0 mm <sup>2</sup>

## VN01

2 Male pin contacts



REF
<b>VN01</b>

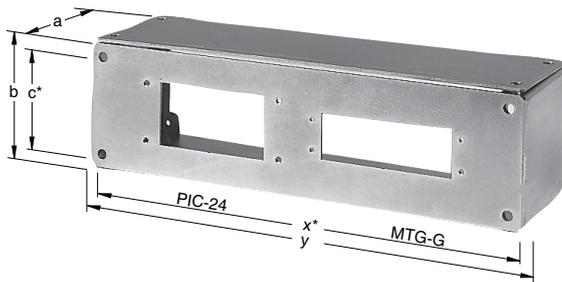
Powercables (1,5 mm<sup>2</sup>, 25 poles)

Oe...

REF	Identification
<b>Oe251-5</b>	Powercables (**to be ordered per m.) 25 poles 1,5 mm <sup>2</sup>

## PTCX

Terminal mounting boxes for power and thermocouple connectors

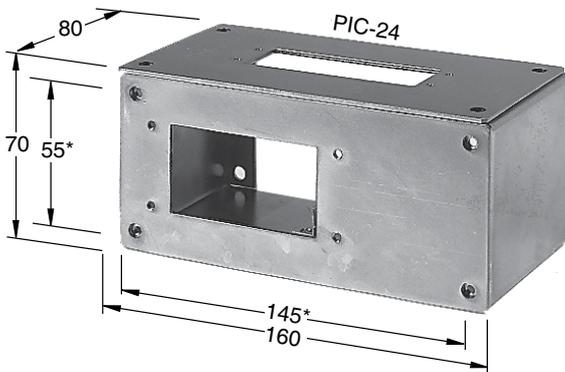


REF	a	b	c	x	y	Installation possibilities for
<b>PTCX5K</b>	70	70	55	243	258	PIC24G / MTC5G
<b>PTCX8K</b>						PIC24G / MTC8G
<b>PTCX12K</b>						PIC24G / MTC12G

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

## PICX

Terminal mounting boxes for power and thermocouple connectors

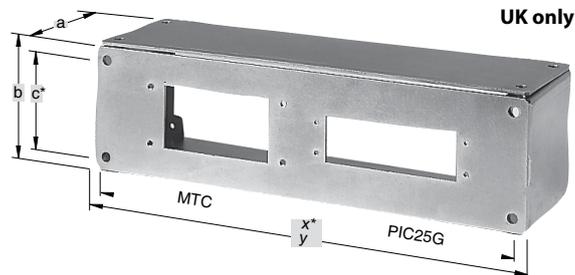


REF	Installation possibilities for
<b>PICX245K</b>	PIC24G / MTC5G
<b>PICX248K</b>	PIC24G / MTC8G
<b>PICX2412K</b>	PIC24G / MTC12G

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

## PTC

Terminal mounting boxes for power and thermocouple connectors

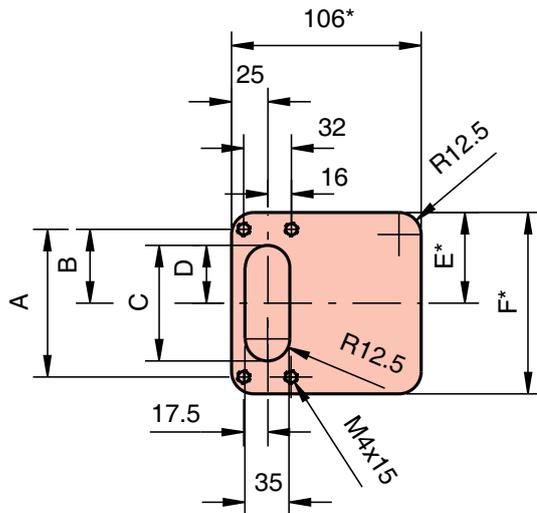


REF	a	b	c	x	y	Installation possibilities for
<b>PTC5TBG</b>	105	60	38	205	220	PIC5G / MTC5G
<b>PTC8TBG</b>	105	60	38	225	240	PIC8G / MTC8G
<b>PTC12TBG</b>	105	60	38	253	265	PIC12G / MTC12G

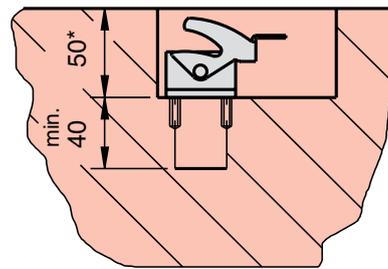
\* Distance of mounting screws on the mold with M5 x 15.

## Mounting without Boxes

### Pocket for thermocouple connectors MTC...G

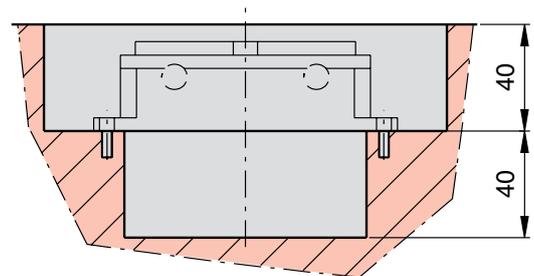
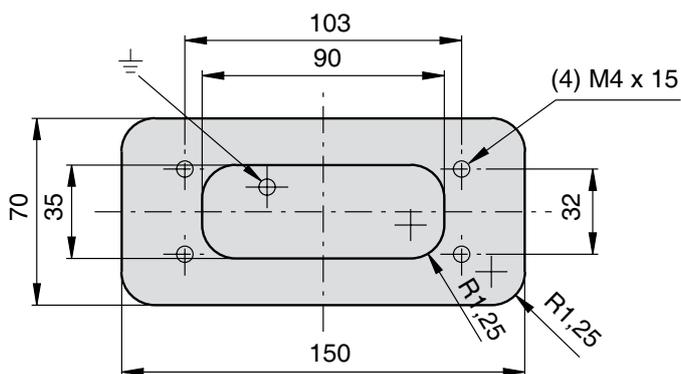


Note: Drawing depicts below flush mounting.  
For surface mounting, disregard dimensions marked with \*.



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

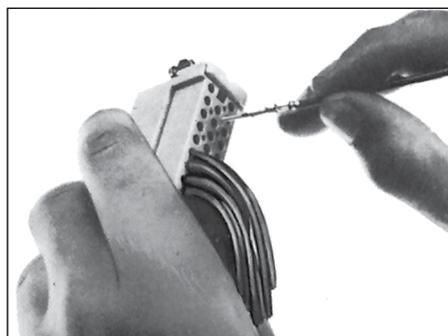
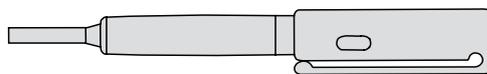
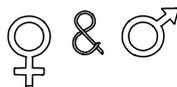
### Pocket for mold power input connectors PIC24G



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

FG / FGN

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



Rear insertion

Contact to snap in audibly

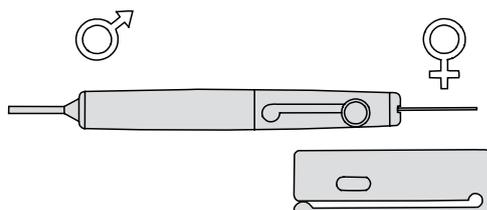
Check longitudinal clearance of 0,2 mm

Front release

Female contact

Male contact

REF	for
<b>FGN2416</b>	VN012416 / VN022416



REF	for
<b>FG0300146</b>	VN01 / VN02

TA

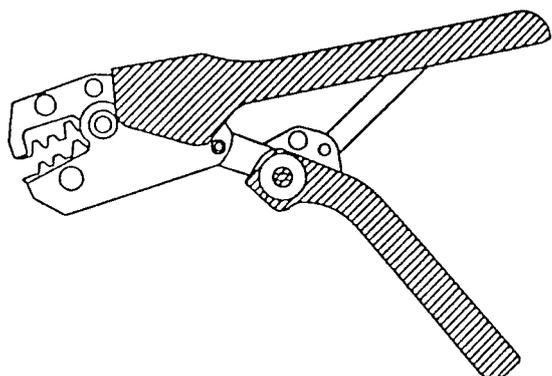
Contact crimp tools



REF	for
<b>TA0100146</b>	VN01
	VN02

FAN

Contact crimp tools

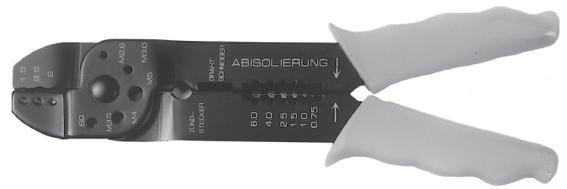


REF	for
<b>FAN2416</b>	VN01241620
	VN02241620

Crimptools

KT

REF	for
<b>KT9500014</b>	HWCC1



Crimp connectors

HWCC

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



Fuses for SSMX and DSS

ABC

REF	Amp.
<b>ABC1</b>	1
<b>ABC5</b>	5
<b>ABC10</b>	10
<b>ABC15</b>	15



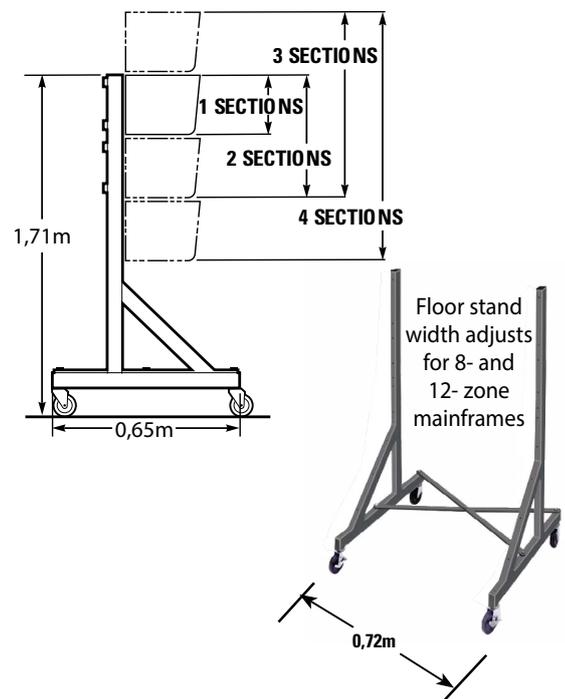
Universal Floor Stand

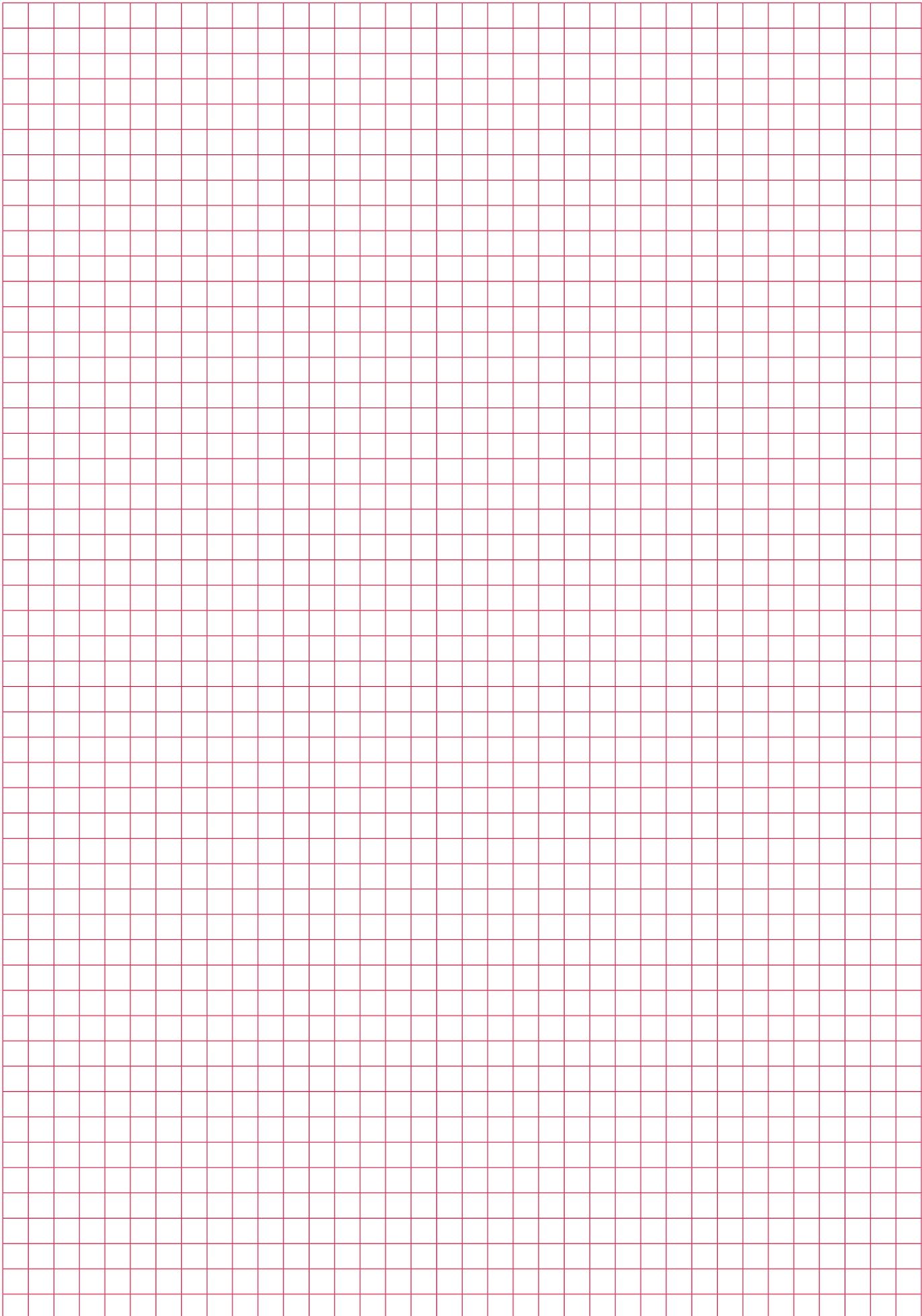
MFS...

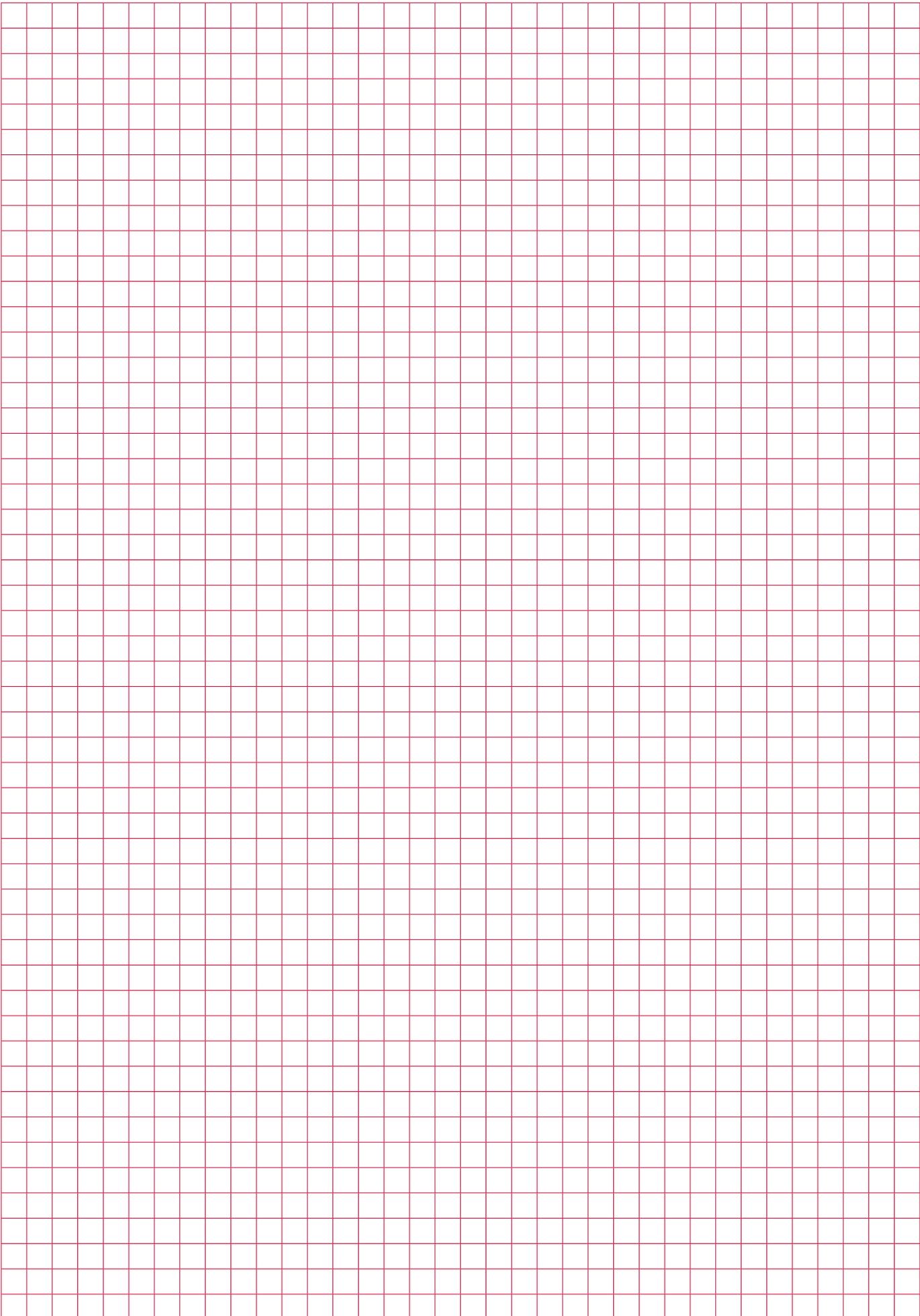
The Universal Floor Stand will accommodate all 15 or 30 amp Mainframes from one to four sections high. Stand is made from heavy gauge steel and includes locking casters (181 kg rating). All assembly and Mainframe mounting hardware is included. Heavy duty floor stand available for larger systems (453 kg rating).

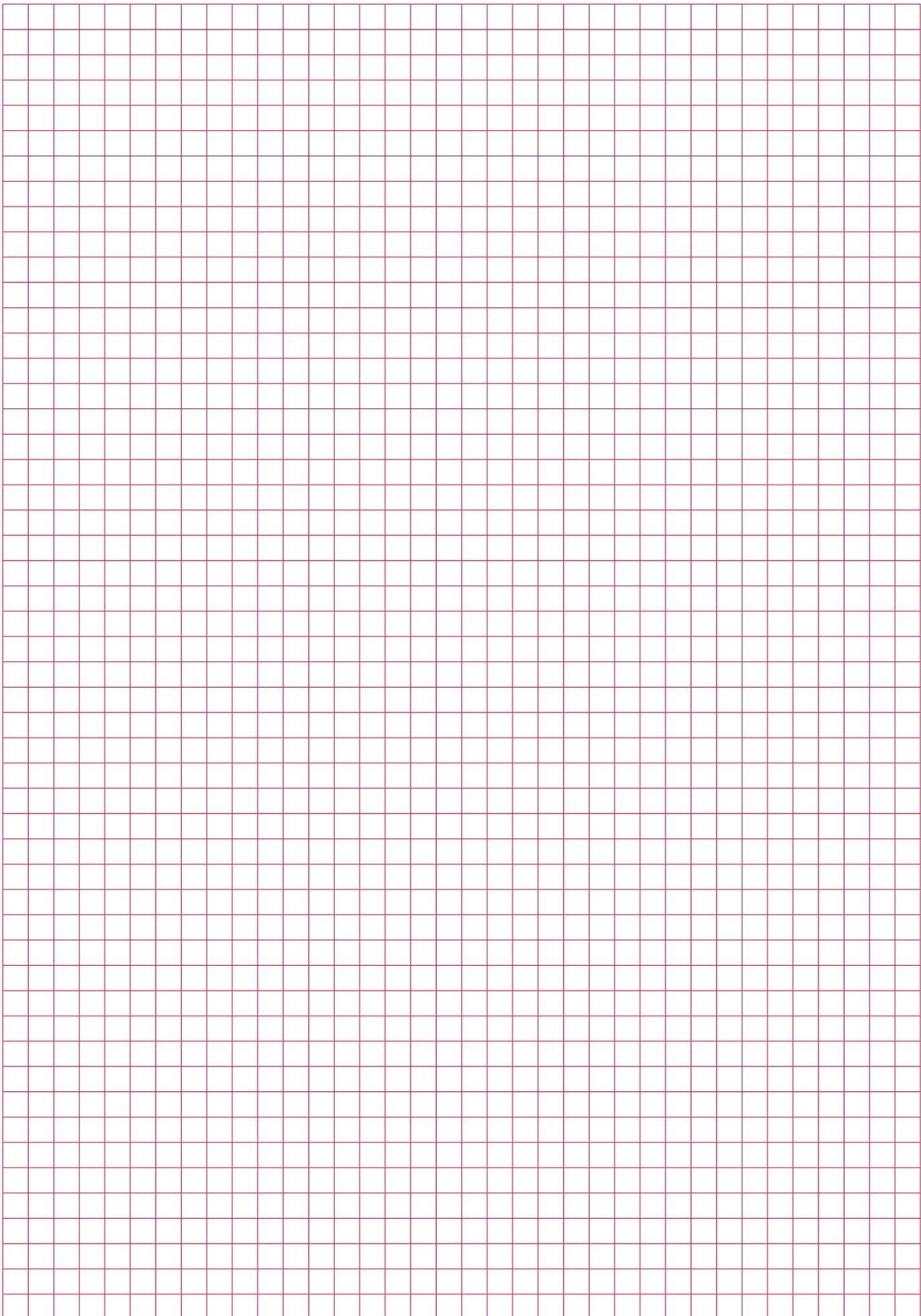
REF	RATING (kg)
<b>MFS512G</b>	181
<b>MFS512GHD*</b>	453

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









## GENERAL CONDITIONS OF SALE DME EUROPE

### 1. CONCLUSION OF CONTRACT - APPLICATION

The contract is validly entered into and the order is accepted after written confirmation by seller. These sales conditions apply to the exclusion of any other terms or conditions, unless expressly accepted in writing beforehand by the vendor.

Seller has 30 (thirty) days since the reception of the order to accept or to refuse it. During this period, buyer shall not withdraw his order.

Absence of any written confirmation of the order shall only be interpreted as being an implicit acceptance in case of performance of the order by seller.

### 2. PAYMENT

Unless otherwise agreed in writing, invoices are payable in the stated currency within 30 (thirty) days after invoice date to the bank designated by seller. Transfer charges are for account of buyer.

If buyer does not pay within this term, seller shall automatically have ipso jure and without any prior formal notice, the right to charge legal interest plus 2 % from due date of the invoice. Moreover, in case of late payment, a fixed indemnity corresponding to 10 % of the payable amount shall automatically be due from the first day following the due date, without prejudice to seller's right to prove higher damage and ask for corresponding indemnity. Should payment be in foreign currency, seller has the right to adapt the foreign currency in case of depreciation-of this foreign currency in regard of the euro.

Should payment of the delivered goods be in instalments, the non-payment of one of the instalments gives seller the right to terminate the contract. The payments, which were done until then, shall remain property of seller as indemnity, without prejudice to the right to claim further damages or to the right to require the performance of the contract.

Payment of advance shall not give buyer the right to terminate the contract upon reimbursement of the paid advance. If payment is done by bill of exchange or check, payment is deemed satisfied only when the bill of exchange or the check is honoured.

Place of payment is always Mechelen even if payment is done with bill of exchange.

### 3. RETENTION OF TITLE

Delivered goods remain property of seller until full payment has been received by seller. The sale of an unpaid item by buyer to a third party results in automatic assignment of the debt due by the third party to buyer, inclusively the retention of title, to seller. Seller has then the authority to take any necessary means in order to validly assign towards the third party. Seller may retake unpaid goods at any time and he may inform any client and/or any subcontractor of buyer about the fact that seller is and remains the only owner of the concerned goods until full payment.

The purchaser undertakes to carefully keep the goods that have not been paid for, and undertakes not to pledge them or use them in any other way as a guarantee or security. The purchaser shall inform third parties who may apply any security rights over his assets (such as, but not limited to, the lessor of the premises occupied by the purchaser) that the products are and shall remain the property of the vendor until full payment of all sums owed by the purchaser to the vendor, and in the event of an attachment or other measures taken by third parties that apply to products for which full payment has not yet been made the purchaser undertakes to immediately inform the vendor of this to enable him to apply his rights.

### 4. RISKS

Notwithstanding the preceding provisions, the risk transfers to buyer as soon as he has the goods at his disposal.

### 5. DISPATCHING OF INSIGNIFICANT VALUE

Each dispatch of less than € 50 will be increased with costs of payments and may, at sellers option, be sent cash on delivery (COD).

### 6. PRICE OFFERS AND PRICE LISTS

Price offers and price lists are without obligation and are subject to change without any previous notice.

Any information released by seller is delivered in good faith and seller shall not be responsible for the choice of material and goods.

### 7. PRICE AND DISPATCHING

All prices are ex works. Transportation, duties and taxes for account of buyer, unless seller's previous and express written specification to the contrary. Seller shall send goods by the fastest and most economic way at the risks of buyer. Goods may be insured by seller at buyer's option, the insurance premiums are for buyer. Seller is not responsible for the choice of packing.

### 8. DELIVERY

Date of delivery is the date when the goods are ready for inspection at the indicated place. Place of origin is Mechelen, Belgium, or any other place indicated by seller. Seller is not responsible for any late delivery, except those delays due to his own fault or gross negligence.

### 9. RETURNING OF GOODS

No goods can be returned without seller's previous, express and written consent. If buyer commits an error in ordering, the retaking of goods is possible only for inventory standard items. Goods must be returned within 15 (fifteen) days after invoice date and all goods must be in original conditions; all costs of transport are for buyer, as well as insurance and repacking costs. Special-order goods, marked or used items are non-returnable.

### 10. DEFECTS

Seller warrants defects in material and/or workmanship. Warranty is limited to the replacement or repair, at seller's option, of any merchandise found defective during 1 month. This warranty does not include defects due to buyer's fault or to abnormal use, bad maintenance, imperfect installation, buyer's inadequate repair, unforeseeable circumstances or in case changes were brought to material without previous and express written approval of seller.

Notice of conspicuous defects must be given to seller by registered letter sent within 10 (ten) working days following date of delivery.

Notice of hidden defects must be given to seller by registered letter with in 10 (ten) working days after date of discovery, and in any case, within a 10-month term following date of delivery.

Seller is not responsible for any damage and in particular salary and material costs, losses, loss of profit or loss of a chance incurred by buyer, unless it is demonstrated that defect is due to seller's gross or intentional fault. If seller is responsible for defect, seller has the right either to terminate the contract and to pay back all the invoiced prices or to replace the delivered product within a reasonable term. If goods for repair must be transported, costs and risks of this transport are for buyer.

In case seller is responsible for any damage, this will be limited to the foreseeable damage with a maximum amount corresponding to the amount of the product's invoiced price.

Should a third party lodge a claim against seller to obtain payment of an indemnity for a damage for which seller is not responsible in accordance with the present conditions or for a higher amount than the one seller is responsible for, buyer will warrant seller against those claims.

### 11. DESCRIPTION

Only product descriptions used in seller's latest literature and correspondence with buyer, are binding for description of goods.

Buyer is responsible for using items in conformity with all regulations, including but not limited to, the safety regulations in force at the place of use.

### 12. SPECIFIC ORDERS

For the performance of a special work, the project signed by buyer is binding to the extent it has been accepted by seller.

For the performance of such work, special conditions may be required. In case of any inconsistency between general conditions and special conditions, the special conditions shall apply. Should special conditions be unclear, they shall be interpreted in light of the general conditions.

### 13. ACT OF GOD

Seller shall not pay any damage for non-performance or late performance of his undertakings due to Act of God. Act of God includes in particular and without being limited thereto, strike, lock-out, and the non-performance by seller's suppliers of their undertakings.

### 14. VALIDITY AND INDIVIDUAL CLAUSES

If one or more provisions of these present general conditions are held to be invalid, the remaining provisions will continue to be valid and enforceable, and parties will agree upon other provisions having an economic effect that corresponds closest to the economic effect of the invalid provision(s).

### 15. WAIVER

In case seller does not exercise one of his rights in accordance with the present conditions, this shall not be interpreted as a waiver of these rights.

### 16. APPLICABLE LAW – COMPETENT COURTS

This sales contract will be governed by Belgian law. The competent court is the Commercial Court of Mechelen, without prejudice to seller's right to introduce the case before another competent court.



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