Limit Alarms M-PAC

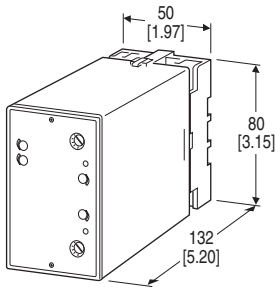
RTD INPUT LIMIT ALARM

Functions & Features

• Accepting standard thermocouple inputs and providing relay contact closure(s) at a preset input level
• Cold junction compensation and upscale burnout protection as standard
• Downscale or no burnout optional
• Single, latching or dual setpoint
• Failsafe operation available
• Deadband adjustable from 1 to 100%
• Indicator LED provided

Typical Applications

• Annunciator
• Various alarm applications



mm [inch]

MODEL: MP12[1][2]-[3]-[4]/[5]

ORDERING INFORMATION

• Code number: MP12[1][2]-[3]-[4]/[5]
Specify a code from below for each of [1] through [5].
(e.g. MP1200-2-F/T/V)
• Temperature range (e.g. 0 – 800°C)

[1] RELAY CONTACT OUTPUT

0: Single (Hi) trip, non-latching
1: Single (Hi) trip, latching
2: Dual (Hi/Lo) trip, non-latching

[2] SETPOINT CONTROL

0: Front-accessed three-turn screwdriver adjust
2: Remote dial connections (total resistance 1 k – 100 kΩ)
3: DC programmable (0 – 1 V DC)

[3] INPUT THERMOCOUPLE

Srandard Span (10 mV ≤ EMF)
1: (PR)
2: K (CA)
3: E (CRC)
4: J (IC)
5: T (CC)
6: B (RH)
7: R
8: S
0: Specify
Narrow Span (3 mV ≤ EMF < 10 mV)
1L: (PR)
2L: K (CA)
3L: E (CRC)
4L: J (IC)
5L: T (CC)
6L: B (RH)
7L: R
8L: S
0L: Specify

[4] POWER INPUT

AC Power
F: 120 V AC
J: 240 V AC
DC Power
S: 12 V DC
R: 24 V DC

[5] OPTIONS

H: Latching operation for dual trip;
reset at power off (5 seconds min.)
(dual trip type only)
R: Reversed relay sense
T: Transmitter output (0 – 1 V DC)
V: Relay drive voltage output
X: Lo-trip sense for single trip; Lo/Lo for dual trip
Y: Hi/Hi-trip sense for dual trip (dual trip type only)

GENERAL SPECIFICATIONS

Construction: Plug-in
Connection: M3.5 screw terminals
Screw terminal: Chromated steel
Housing material: Flame-resistant resin (black)
Isolation: Input to output to power
(non-isolated between I/O with Option V)
Zero adjustment: -5 to +5 % (front)
Span adjustment: 95 to 105 % (front)
Setpoint adjustments: Front accessed three-turn screwdriver, remote dial potentiometer or DC input

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Deadband adjustments: Front accessed single-turn screwdriver; 1 – 100 %
Burnout: Upscale standard; downscale or no burnout optional
Cold junction compensation: CJC sensor attached to the input terminals
Front LEDs: Red LED turns on at a tripped condition
Power ON timer: Relays de-energized for approx. 2 seconds after power is turned on.

INPUT SPECIFICATIONS

■ **Input:** Thermocouples
Minimum span: Standard span 10 mV min., narrow span 3 mV min.
Offset: Max. 1.5 times span
Input resistance: 10 kΩ min.
Burnout sensing: 0.1 μA
Minimum span requirement*
STANDARD (≥ 10 mV)
K (CA): 247°C, 445°F
E (CRC): 153°C, 282°F
J (IC): 186°C, 339°F
T (CC): 214°C, 394°F
R: 962°C, 1751°F
S: 1036°C, 1883°F
Others: Consult factory or representatives.

NARROW (< 10 mV)
K (CA): 74°C, 135°F
E (CRC): 50°C, 92°F
J (IC): 58°C, 106°F
T (CC): 73°C, 135°F
R: 361°C, 665°F
S: 373°C, 686°F
Others: Consult factory or representatives.
*Approximate values to obtain minimum e.m.f. span for your reference. Consult thermocouple reference tables, factory or representatives for confirmation.
■ **Setpoint Control**
• **Remote dial connections**
Potentiometer: Total resistance 1 k – 100 kΩ
Excitation: 4 V DC
• **DC programmable**: 0 – 1 V DC

OUTPUT SPECIFICATIONS

■ **Relay Contact**
• **Single / Latching**: Isolated DPDT relay; de-energized at trip
• **Dual**: Isolated SPDT relay; energized at trip
Rating: 120 V AC @ 3 A (cosø=1)
30 V DC @ 3 A (resistive load)
Electrical life: 10^5 cycles
Mechanical life: 10^7 cycles
For maximum relay life with inductive loads, external protection is recommended.
■ **Relay Drive Voltage Output (option V)**: 24 V DC average; drives 1.2 kΩ or greater coil impedance
■ **Transmitter Output (option T)**: 0 – 1 V DC; 1 mA max. (setpoint and process input)

INSTALLATION

Power input
• **AC**: Operational voltage range: rating ±10 %, 50/60 ±2 Hz, approx. 2 VA
• **DC**: Operational voltage range: rating ±10 % ripple 10 %p-p max.
80 mA at 24 V
160 mA at 12 V
Operating temperature: -5 to +60°C (23 to 140°F)
Storage temperature: -20 to +85°C (-4 to +185°F)
Operating humidity: 30 to 90 %RH (non-condensing)
Mounting: Surface (DIN rail available for 11-pin base)
Weight: 400 g (0.88 lb)

PERFORMANCE in percentage of span

Repeatability: ±0.2 %
Cold junction compensation error: (at 20°C ±10°C or 68°F ±18°F)
K, E, J & T: ±0.5°C or ±0.9°F
S, R & PR: ±1°C or ±1.8°F
Temp. coefficient: ±0.05 %/°C (±0.03 %/°F)
Response time: ≤ 0.5 sec. (0 – 100 % at 90 % setpoint)
Burnout response: 1 sec.
Line voltage effect: ±0.1 % over voltage range
Insulation resistance: ≥ 100 MΩ with 500 V DC
Dielectric strength: 1000 V AC @ 1 minute (input to output to power)
2000 V AC @ 1 minute (output to ground)
Common mode noise rejection:
60 Hz: Greater than 120 dB
DC: Greater than 140 dB

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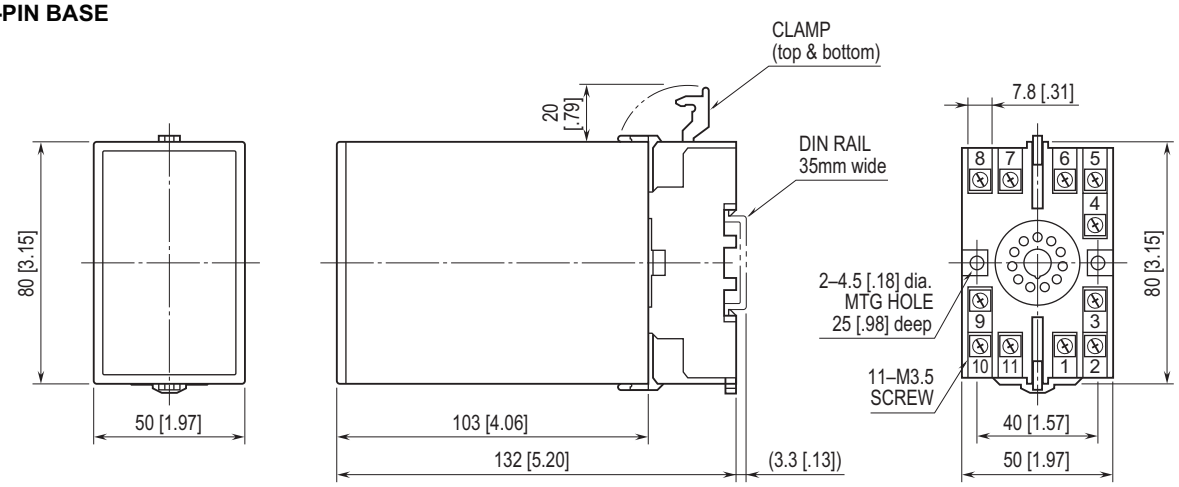
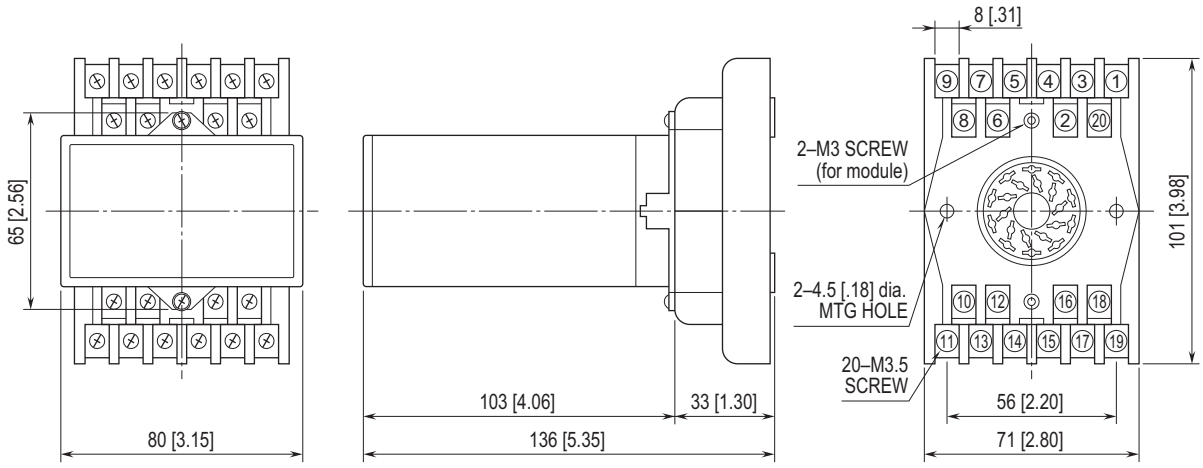
EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]

■11-PIN BASE

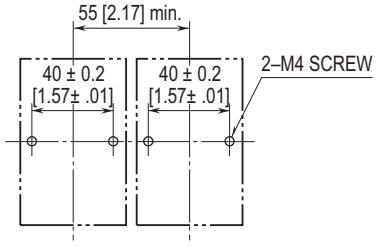


■20-PIN BASE

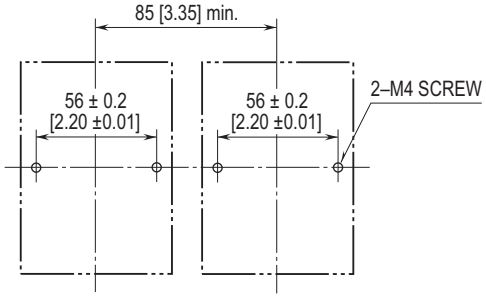


MOUNTING REQUIREMENTS unit: mm [inch]

■11-PIN BASE



■20-PIN BASE



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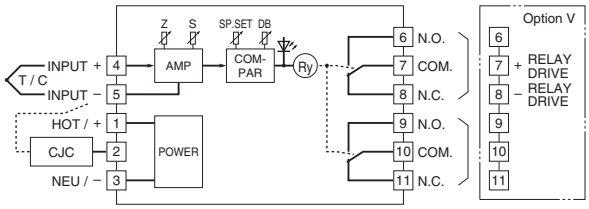
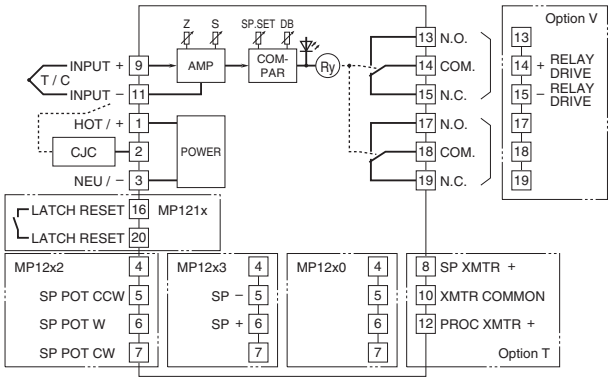
BLOCK DIAGRAM

■SINGLE / LATCHING OUTPUT

•11-pin Base

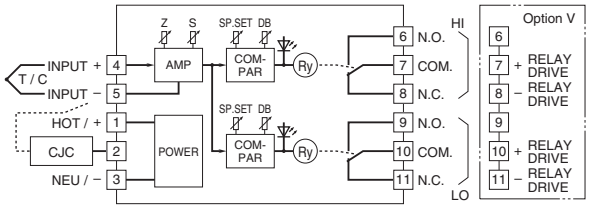


•20-pin Base

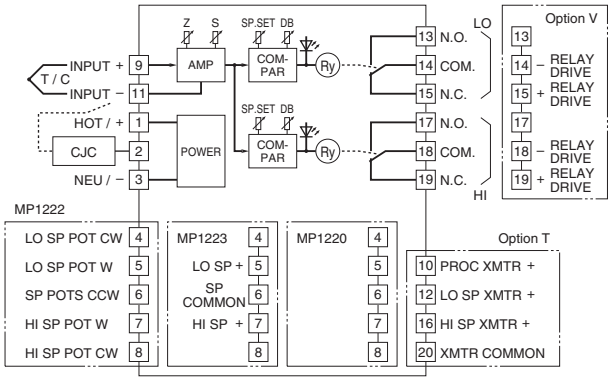


■DUAL OUTPUT

•11-pin Base



•20-pin Base



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I/O TERMINAL ASSIGNMENT

■SINGLE OUTPUT

PIN	MP1200	MP1200 w/Option T	MP1202	MP1202 w/Option T	MP1203	MP1203 w/Option T
1	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)
2	CJC	CJC	CJC	CJC	CJC	CJC
3	POWER (Neu/–)	POWER (Neu/–)	POWER (Neu/–)	POWER (Neu/–)	POWER (Neu/–)	POWER (Neu/–)
4	INPUT +	No Connection	No Connection	No Connection	No Connection	No Connection
5	INPUT –	No Connection	SP Pot CCW	SP Pot CCW	SP –	SP –
6	N.O. ┐	No Connection	SP Pot W	SP Pot W	SP +	SP +
7	COM * ┤	No Connection	SP Pot CW	SP Pot CW	No Connection	No Connection
8	N.C. * ┘	SP Xmtr +	No Connection	SP Xmtr +	No Connection	SP Xmtr +
9	N.O. ┐	INPUT +	INPUT +	INPUT +	INPUT +	INPUT +
10	COM ┤	Xmtr Common	No Connection	Xmtr Common	No Connection	Xmtr Common
11	N.C. ┘	INPUT –	INPUT –	INPUT –	INPUT –	INPUT –
12		Proc Xmtr +	No Connection	Proc Xmtr +	No Connection	Proc Xmtr +
13		N.O. ┐	N.O. ┐	N.O. ┐	N.O. ┐	N.O. ┐
14		COM * ┤	COM * ┤	COM * ┤	COM * ┤	COM * ┤
15		N.C. * ┘	N.C. * ┘	N.C. * ┘	N.C. * ┘	N.C. * ┘
16		No Connection	No Connection	No Connection	No Connection	No Connection
17		N.O. ┐	N.O. ┐	N.O. ┐	N.O. ┐	N.O. ┐
18		COM ┤	COM ┤	COM ┤	COM ┤	COM ┤
19		N.C. ┘	N.C. ┘	N.C. ┘	N.C. ┘	N.C. ┘
20		No Connection	No Connection	No Connection	No Connection	No Connection

KEYS
N.O. = Normally Open
COM = Common
N.C. = Normally Closed
Proc = Process
Xmtr = Transmitter
SP = Setpoint
W = Wiper
CW = Clockwise
CCW = Counterclockwise

***Pins used for Option V**
20-pin = 14(+) - 15(–)
11-pin = 7(+) - 8(–)

■LATCHING OUTPUT

PIN	MP1210	MP1210 w/Option T	MP1212	MP1212 w/Option T	MP1213	MP1213 w/Option T
1	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)
2	CJC	CJC	CJC	CJC	CJC	CJC
3	POWER (Neu/–)	POWER (Neu/–)	POWER (Neu/–)	POWER (Neu/–)	POWER (Neu/–)	POWER (Neu/–)
4	No Connection	No Connection	No Connection	No Connection	No Connection	No Connection
5	No Connection	No Connection	SP Pot CCW	SP Pot CCW	SP –	SP –
6	No Connection	No Connection	SP Pot W	SP Pot W	SP +	SP +
7	No Connection	No Connection	SP Pot CW	SP Pot CW	No Connection	No Connection
8	No Connection	SP Xmtr +	No Connection	SP Xmtr +	No Connection	SP Xmtr +
9	INPUT +	INPUT +	INPUT +	INPUT +	INPUT +	INPUT +
10	No Connection	Xmtr Common	No Connection	Xmtr Common	No Connection	Xmtr Common
11	INPUT –	INPUT –	INPUT –	INPUT –	INPUT –	INPUT –
12	No Connection	Proc Xmtr +	No Connection	Proc Xmtr +	No Connection	Proc Xmtr +
13	N.O. ┐	N.O. ┐	N.O. ┐	N.O. ┐	N.O. ┐	N.O. ┐
14	COM * ┤	COM * ┤	COM * ┤	COM * ┤	COM * ┤	COM * ┤
15	N.C. * ┘	N.C. * ┘	N.C. * ┘	N.C. * ┘	N.C. * ┘	N.C. * ┘
16	Latch Reset	Latch Reset	Latch Reset	Latch Reset	Latch Reset	Latch Reset
17	N.O. ┐	N.O. ┐	N.O. ┐	N.O. ┐	N.O. ┐	N.O. ┐
18	COM ┤	COM ┤	COM ┤	COM ┤	COM ┤	COM ┤
19	N.C. ┘	N.C. ┘	N.C. ┘	N.C. ┘	N.C. ┘	N.C. ┘
20	Latch Reset	Latch Reset	Latch Reset	Latch Reset	Latch Reset	Latch Reset

KEYS
N.O. = Normally Open
COM = Common
N.C. = Normally Closed
Proc = Process
Xmtr = Transmitter
SP = Setpoint
W = Wiper
CW = Clockwise
CCW = Counterclockwise

***Pins used for Option V**
20-pin = 14(+) - 15(–)

■DUAL OUTPUT

PIN	MP1220	MP1220 w/Option T	MP1222	MP1222 w/Option T	MP1223	MP1223 w/Option T
1	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)
2	CJC	CJC	CJC	CJC	CJC	CJC
3	POWER (Neu/–)	POWER (Neu/–)	POWER (Neu/–)	POWER (Neu/–)	POWER (Neu/–)	POWER (Neu/–)
4	INPUT +	No Connection	Lo SP Pot CW	Lo SP Pot CW	No Connection	No Connection
5	INPUT –	No Connection	Lo SP Pot W	Lo SP Pot W	Lo SP +	Lo SP +
6	N.O.	No Connection	SP Pots CCW	SP Pots CCW	SP Common	SP Common
7	COM * ┤ Hi Set	No Connection	Hi SP Pot W	Hi SP Pot W	Hi SP +	Hi SP +
8	N.C. * ┘	No Connection	Hi SP Pot CW	Hi SP Pot CW	No Connection	No Connection
9	N.O.	INPUT +	INPUT +	INPUT +	INPUT +	INPUT +
10	COM * ┤ Lo Set	Proc Xmtr +	No Connection	Proc Xmtr +	No Connection	Proc Xmtr +
11	N.C. * ┘	INPUT –	INPUT –	INPUT –	INPUT –	INPUT –
12		Lo SP Xmtr +	No Connection	Lo SP Xmtr +	No Connection	Lo SP Xmtr +
13		N.O.	N.O.	N.O.	N.O.	N.O.
14		COM * ┤ Lo Set	COM * ┤ Lo Set	COM * ┤ Lo Set	COM * ┤ Lo Set	COM * ┤ Lo Set
15		N.C. * ┘	N.C. * ┘	N.C. * ┘	N.C. * ┘	N.C. * ┘
16		Hi SP Xmtr +	No Connection	Hi SP Xmtr +	No Connection	Hi SP Xmtr +
17		N.O.	N.O.	N.O.	N.O.	N.O.
18		COM * ┤ Hi Set	COM * ┤ Hi Set	COM * ┤ Hi Set	COM * ┤ Hi Set	COM * ┤ Hi Set
19		N.C. * ┘	N.C. * ┘	N.C. * ┘	N.C. * ┘	N.C. * ┘
20		Xmtr Common	No Connection	Xmtr Common	No Connection	Xmtr Common

KEYS
N.O. = Normally Open
COM = Common
N.C. = Normally Closed
Proc = Process
Xmtr = Transmitter
SP = Setpoint
W = Wiper
CW = Clockwise
CCW = Counterclockwise

***Pins used for Option V**
20-pin:
Hi Set = 19(+) - 18(–)
Lo Set = 15(+) - 14(–)
11-pin:
Hi Set = 7(+) - 8(–)
Lo Set = 10(+) - 11(–)

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⚠ Specifications are subject to change without notice.

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