

## Limit Alarms *M-PAC*

# THERMOCOUPLE INPUT LIMIT ALARM

# MODEL MP1200-1223

### MODEL & SUFFIX CODE SELECTION

MP12□□-□□/□

**MODEL** \_\_\_\_\_

**INPUT TYPE** \_\_\_\_\_

**2** : Thermocouple

**RELAY CONTACT OUTPUT** \_\_\_\_\_

**0** : Single (Hi) trip, non-latching

**1** : Single (Hi) trip, latching

**2** : Dual (Hi/Lo) trip, non-latching

**SETPOINT CONTROL** \_\_\_\_\_

**0** : Front-accessed three-turn screwdriver adjust.

**2** : Remote dial connections (total resistance 1k – 100kΩ)

**3** : DC programmable (0 – 1V)

**INPUT THERMOCOUPLE** \_\_\_\_\_

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

**POWER INPUT** \_\_\_\_\_

**F** : 120V AC

**J** : 240V AC

**R** : 24V DC

**S** : 12V DC

**OPTIONS** \_\_\_\_\_

**H** : Latching operation for dual trip (122X only);  
Reset at power off (5 seconds min.)

**R** : Reversed relay sense

**T** : Transmitter output (0 – 1V DC)

**V** : Relay drive voltage output

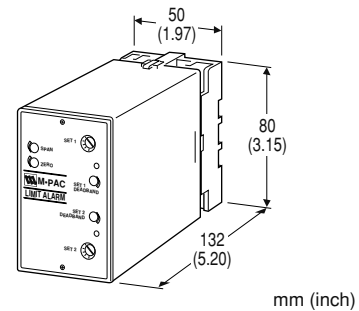
**X** : Lo-trip sense for single trip; Lo/Lo for dual trip

**Y** : Hi/Hi-trip sense for dual trip (122X only)

### ORDERING INFORMATION

Specify code number and variables.

- **Code number** (e.g. MP1200-2-F/T/V)
- **Temperature range** (e.g. 0 – 800°C)



### 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

### GENERAL SPECIFICATIONS

**Construction:** plug-in

**Connection:** M3.5 screw terminals on base socket

**Housing material:** flame-resistant resin (black)

**Isolation:** input to output to power  
(non-isolated between I/O with Option V)

**Zero/span adjustments:** ±5% (front)

**Setpoint adjustments:** front accessed three-turn screwdriver, remote dial potentiometer or DC input

**Deadband adjustments:** front accessed single-turn screwdriver; 1 – 100%

**Front LEDs:** red lights turn on at a tripped condition

**Burnout protection:** upscale standard; downscale or no burnout optional

**Cold junction compensation:** CJC sensor attached to the input terminals

**Power ON timer:** relays de-energized for approx. 2 seconds after power is turned on.

**INPUT & OUTPUT**

■**INPUT:** thermocouples  
**Span:** standard span 10mV min., narrow span 3mV min.

**Zero suppression/elevation:** max. 1.5 times span

**Input resistance:** 10kΩ minimum

**Burnout sensing:** 0.1μA

**Minimum span requirement\***

T/C	STANDARD (≥10mV)		NARROW (<10mV)	
	°C	°F	°C	°F
R	962	1751	361	665
S	1036	1883	373	686
K (CA)	247	445	74	135
E (CRC)	153	282	50	92
J (IC)	186	339	58	106
T (CC)	214	394	73	135
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.

**■REMOTE SETPOINT INPUT**

**MP12X2:** potentiometer; any value of 1k – 100kΩ; excitation 4V

**MP12X3:** 0 – 1V DC

**■RELAY CONTACT OUTPUT**

•**Single/Latching:** isolated DPDT relay; de-energized at trip

•**Dual:** isolated SPDT relay; energized at trip

**Rating:** 120V AC @3A (cosφ=1)  
30V DC @3A (resistive load)

**Relay life**

**Electrical:** 10<sup>5</sup> cycles

**Mechanical:** 10<sup>7</sup> cycles

For maximum relay life with inductive loads, external protection is recommended.

■**VOLTAGE OUTPUT (Option V):** 24V DC average;  
Drives 1.2kΩ or greater coil impedance

■**TRANSMITTER OUTPUT (Option T):** 0 – 1V DC;  
1mA max. (setpoint and process input)

**INSTALLATION****Power input**

**AC:** rating ±10%, 50/60 ±2 Hz, approx. 2VA

**DC:** rating ±10% (ripple 10% p-p max.)  
80mA at 24V, 160mA at 12V

**Operating temperature:** -5 to +60°C (23 to 140°F)

**Storage temperature:** -20 to +85°C (-5 to +185°F)

**Operating humidity:** 30 to 90% RH (non-condensing)

**Mounting:** surface (DIN rail available for 11-pin base)

**Dimensions**

**11-pin base:** W50×H80×D132 mm  
(1.97"×3.15"×5.20")

See General Spec. Sheet Figure A.

**20-pin base:** W80×H101×D136 mm  
(3.15"×3.98"×5.35")

See General Spec. Sheet Figure B.

**Weight:** 400 g (0.88 lbs)

**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 maximum

**S, R & PR:** ±1°C or ±1.8°F maximum

**Temp. coefficient:** ±0.05%/°C (±0.027%/°F)

**Response time:** ≤0.5 sec. (0 – 100% at 90% setpoint)

**Burnout response:** 1 second

**Common mode rejection**

**60 Hz:** greater than 120 dB

**DC:** greater than 140 dB

**Line voltage effect:** ±0.1% over voltage range

**Insulation resistance:** ≥100MΩ with 500V DC

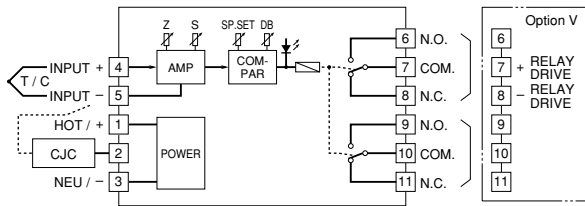
**Dielectric strength:** 1000V AC @1 minute

(input to output to power)

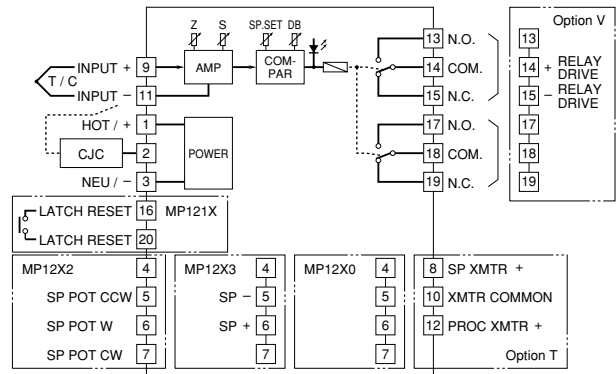
2000V AC @1 minute (output to ground)

# BLOCK DIAGRAM

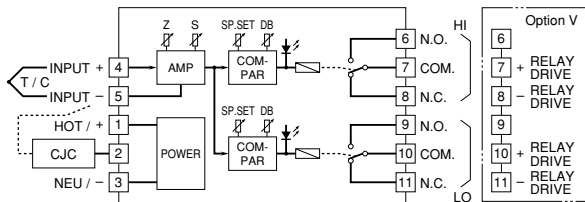
## ■ SINGLE / LATCHING OUTPUT •11-pin Base



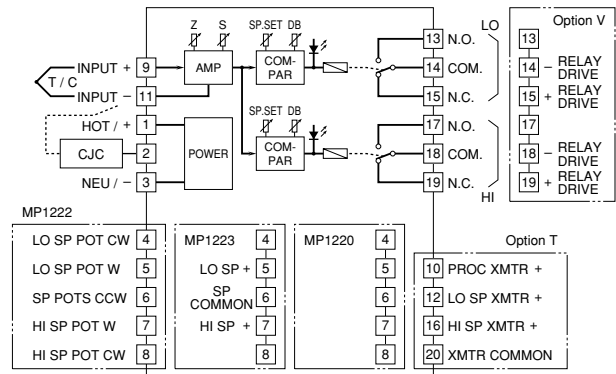
## •20-pin Base



## ■ DUAL OUTPUT •11-pin Base



## •20-pin Base



**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  
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 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	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 +	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
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
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  
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 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(-)

Specifications subject to change without notice.