Limit Alarms *M-PAC*

DC INPUT LIMIT ALARM

MODEL **MP1000-1023**

MODEL & SUFFIX CODE SELECTION

MP10❑❑–❑–❑/❑

MODEL

INPUT TYPE

0 : DC current or voltage

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 RANGE

Current	Voltage
A : 4 – 20mA DC	**1** : 0 – 10mV DC
B : 2 – 10mA DC	**2** : 0 – 100mV DC
C : 1 – 5mA DC	**3** : 0 – 1V DC
D : 0 – 20mA DC	**4** : 0 – 10V DC
E : 0 – 16mA DC	**5** : 0 – 5V DC
F : 0 – 10mA DC	**6** : 1 – 5V DC
G : 0 – 1mA DC	**U1** : Specify voltage (10≤span<100mV)
H : 10 – 50mA DC	**U2** : Specify voltage (0.1≤span<1V)
Z : Specify current	**U3** : Specify voltage (1V≤span)

POWER INPUT

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

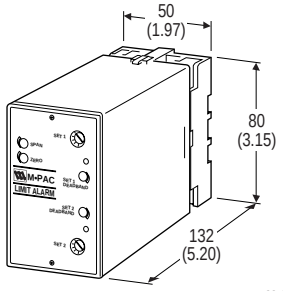
OPTIONS

H : Latching operation for dual trip (102X 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 (102X only)

ORDERING INFORMATION

Specify code number and variables.

- **Code number** (e.g. MP1000-6-F/T/V)
- **Special input range** (For codes Z, U1, U2 & U3)



mm (inch)

Functions & Features

• Accepting a large variety of DC inputs and providing relay contact closure(s) at a preset input level • 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
Power ON timer: relays de-energized for approx. 2 seconds after power is turned on.

INPUT & OUTPUT

■INPUT

•**DC Current**: input resistor incorporated

Input resistance: For resistance values other than listed below, specify when ordering.

Input	Input Resistance
4 – 20mA	: 250 (Ω)
2 – 10mA	: 500
1 – 5mA	: 1000
0 – 20mA	: 50
0 – 16mA	: 62.5
0 – 10mA	: 100
0 – 1mA	: 1000
10 – 50mA	: 100

•**DC Voltage**: -300 – +300V DC

Minimum span: 10mV

Zero suppression/elevation: max. 1.5 times span

Input resistance

Input Span	Input Resistance
10 – 100mV	: 10k (Ω minimum)
0.1 – 1V	: 100k
≥1V	: 1M

■REMOTE SETPOINT INPUT

MP10X2: potentiometer; any value of 1k – 100kΩ; excitation 4V

MP10X3: 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 (cosø=1)
30V DC @3A (resistive load)

Relay life

Electrical: 10^5 cycles

Mechanical: 10^7 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%

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

Response time: 100 milliseconds, typical

Common mode rejection

60 Hz: greater than 120 dB

DC: greater than 140 dB

Line voltage effect: ±0.1% over voltage range

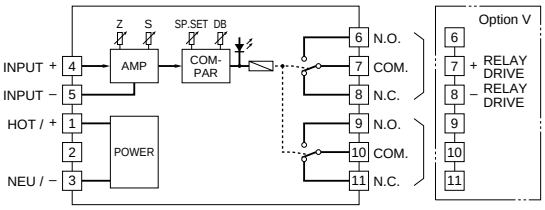
Insulation resistance: ≥100MΩ with 500V DC

Dielectric strength: 1000V AC @1 minute
(input to output to power)
2000V AC @1 minute (output to ground)

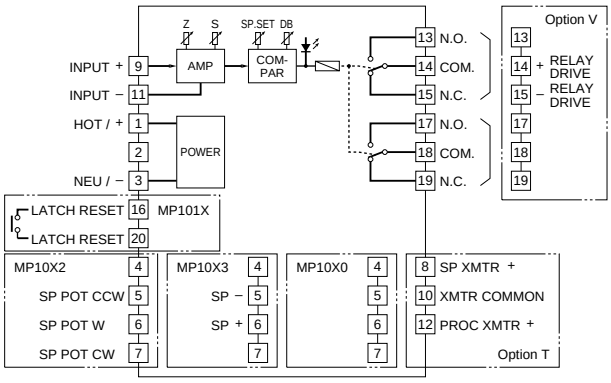
BLOCK DIAGRAM

■SINGLE / LATCHING OUTPUT

•11-pin Base

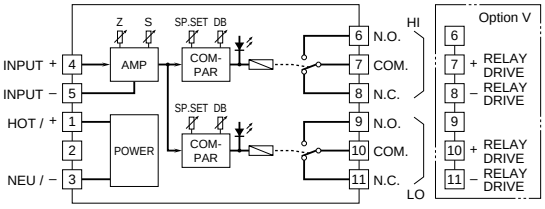


•20-pin Base

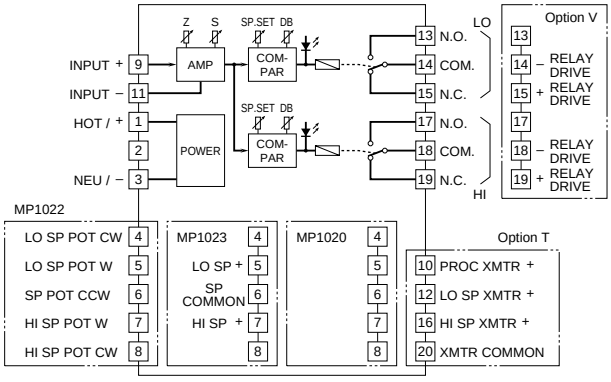


■DUAL OUTPUT

•11-pin Base



•20-pin Base



TERMINAL ASSIGNMENT

■SINGLE OUTPUT

PIN	MP1000	MP1000 w/Option T	MP1002	MP1002 w/Option T	MP1003	MP1003 w/Option T
1	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)
2	No Connection	No Connection	No Connection	No Connection	No Connection	No Connection
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	MP1010	MP1010 w/Option T	MP1012	MP1012 w/Option T	MP1013	MP1013 w/Option T
1	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)
2	No Connection	No Connection	No Connection	No Connection	No Connection	No Connection
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	MP1020	MP1020 w/Option T	MP1022	MP1022 w/Option T	MP1023	MP1023 w/Option T
1	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)	POWER (Hot/+)
2	No Connection	No Connection	No Connection	No Connection	No Connection	No Connection
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(–)

Specifications subject to change without notice.