Limit Alarms M-PAC

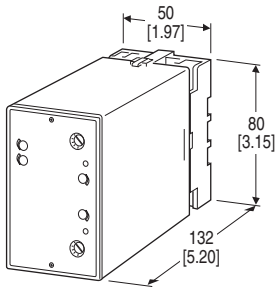
DC INPUT LIMIT ALARM

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



MODEL: MP10[1][2]-[3]-[4]/[5]

ORDERING INFORMATION

• Code number: MP10[1][2]-[3]-[4]/[5]
Specify a code from below for each of [1] through [5].
(e.g. MP1000-6-F/T/V)
• Special input and output ranges (For codes Z, U1, U2 & U3)

[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

Current

A: 4 – 20 mA DC (Input resistance 250 Ω)
B: 2 – 10 mA DC (Input resistance 500 Ω)
C: 1 – 5 mA DC (Input resistance 1000 Ω)
D: 0 – 20 mA DC (Input resistance 50 Ω)
E: 0 – 16 mA DC (Input resistance 62.5 Ω)
F: 0 – 10 mA DC (Input resistance 100 Ω)
G: 0 – 1 mA DC (Input resistance 1000 Ω)
H: 10 – 50 mA DC (Input resistance 100 Ω)
Z: Specify current (See INPUT SPECIFICATIONS)

Voltage

1: 0 – 10 mV DC (Input resistance 10 kΩ min.)
2: 0 – 100 mV DC (Input resistance 100 kΩ min.)
3: 0 – 1 V DC (Input resistance 1 MΩ min.)
4: 0 – 10 V DC (Input resistance 1 MΩ min.)
5: 0 – 5 V DC (Input resistance 1 MΩ min.)
6: 1 – 5 V DC (Input resistance 1 MΩ min.)
U1: Specify voltage (10 ≤ span < 100 mV)
(See INPUT SPECIFICATIONS)
U2: Specify voltage (0.1 ≤ span < 1 V)
(See INPUT SPECIFICATIONS)
U3: Specify voltage (1 ≤ span)
(See INPUT SPECIFICATIONS)

[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
Deadband adjustments: Front accessed single-turn

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screwdriver; 1 – 100 %
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

■ **DC Current**: Input resistor incorporated
Specify input resistance value for code Z.
■ **DC Voltage**: -300 – +300 V DC
Minimum span: 10 mV
Offset: Max. 1.5 times span
Input resistance
Span 10 – 100 mV : ≥ 10 kΩ
Span 0.1 – 1 V : ≥ 100 kΩ
Span ≥ 1 V : ≥ 1 MΩ
■ **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 %
Temp. coefficient: ±0.05 %/°C (±0.03 %/°F)
Response time: ≤ 0.5 sec. (0 – 100 % at 90 % setpoint)
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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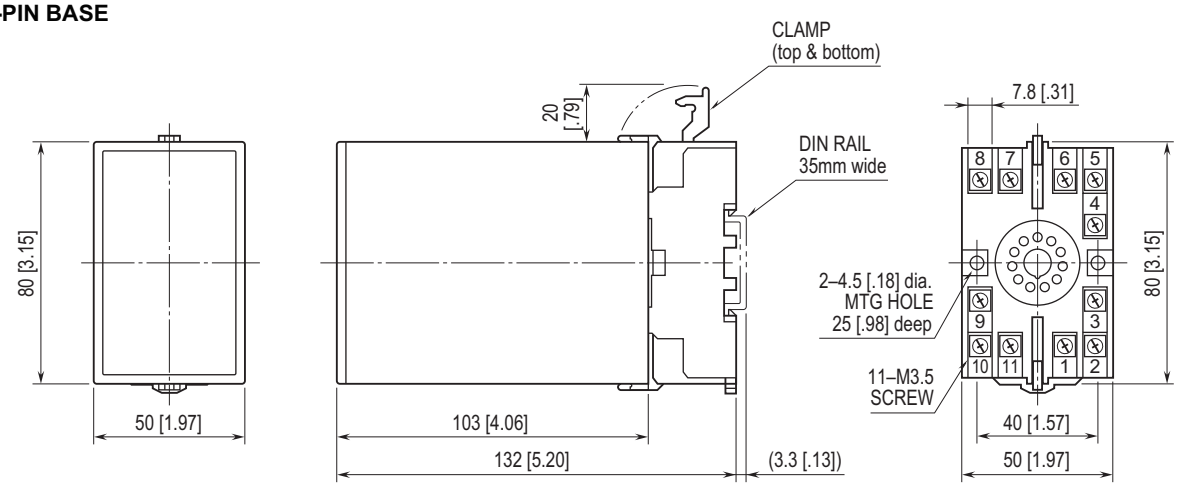
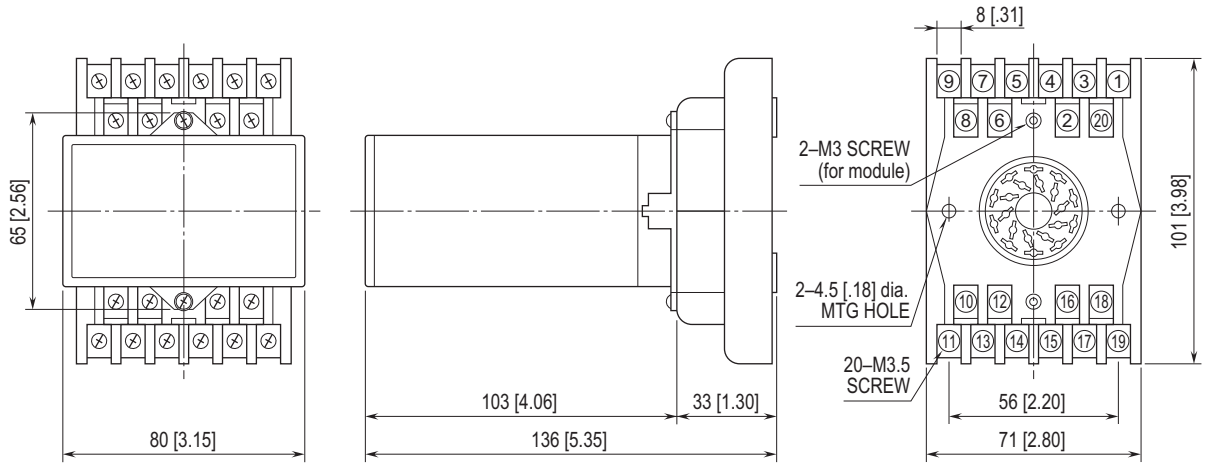
EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]

■11-PIN BASE

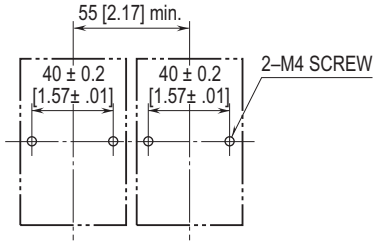


■20-PIN BASE

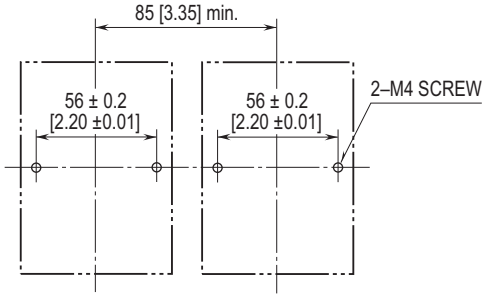


MOUNTING REQUIREMENTS unit: mm [inch]

■11-PIN BASE



■20-PIN BASE



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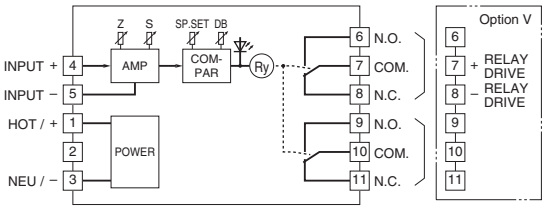
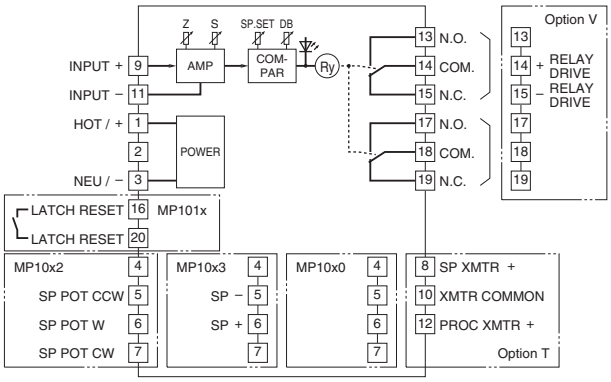
BLOCK DIAGRAM

■SINGLE / LATCHING OUTPUT

•11-pin Base

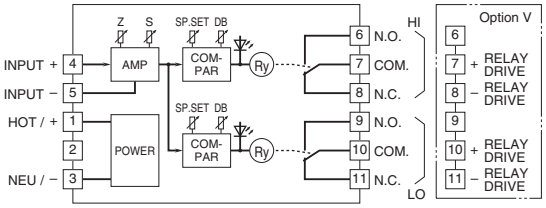


•20-pin Base

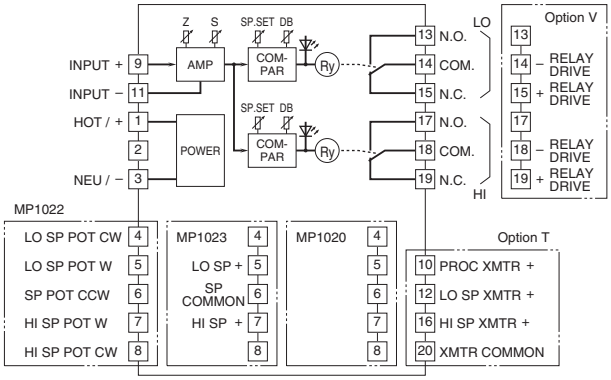


■DUAL OUTPUT

•11-pin Base



•20-pin Base



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I/O TERMINAL ASSIGNMENT

■SINGLE OUTPUT

PIN	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(–)

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⚠ Specifications are subject to change without notice.

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