Limit Alarms M-PAC

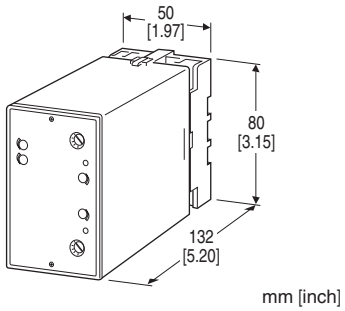
FREQUENCY INPUT LIMIT ALARM

Functions & Features

• Accepting pulse input from turbine meters, positive displacement flowmeters and other frequency generating devices
• 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: MP17[1][2]-[3]-[4]/[5]

ORDERING INFORMATION

• Code number: MP17[1][2]-[3]-[4]/[5]
Specify a code from below for each of [1] through [5].
(e.g. MP1700-2-F/T/V)
• Frequency range (e.g. 0 – 500 Hz)

[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

1: ON-OFF pulse (dry contact or open collector)
2: Voltage pulse

[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 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.
Low-end cutout: Approx. 5 %

INPUT SPECIFICATIONS

■ Input
Frequency range: 0 – 50 Hz through 10 kHz
Pulse width (time) requirement: Duty ratio 20 – 80 % at 100 % input
• **ON-OFF Pulse:** Dry contact or open collector
Sensing: Approx. 7.5 V DC @1 mA
• **Voltage Pulse**: Square or sine waveforms
Input amplitude: 2 – 50 Vp-p
■ Setpoint Control
• **Remote dial connections**
Potentiometer: Total resistance 1 k – 100 kΩ
Excitation: 4 V DC
• **DC programmable**: 0 – 1 V DC

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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 – 100 % at 90 % setpoint)
approx. 2 seconds for 0 – 50 Hz
approx. 1 second for 0 – 100 Hz
approx. 0.5 seconds for 0 – 500 Hz
approx. 0.5 seconds for 0 – 10 kHz

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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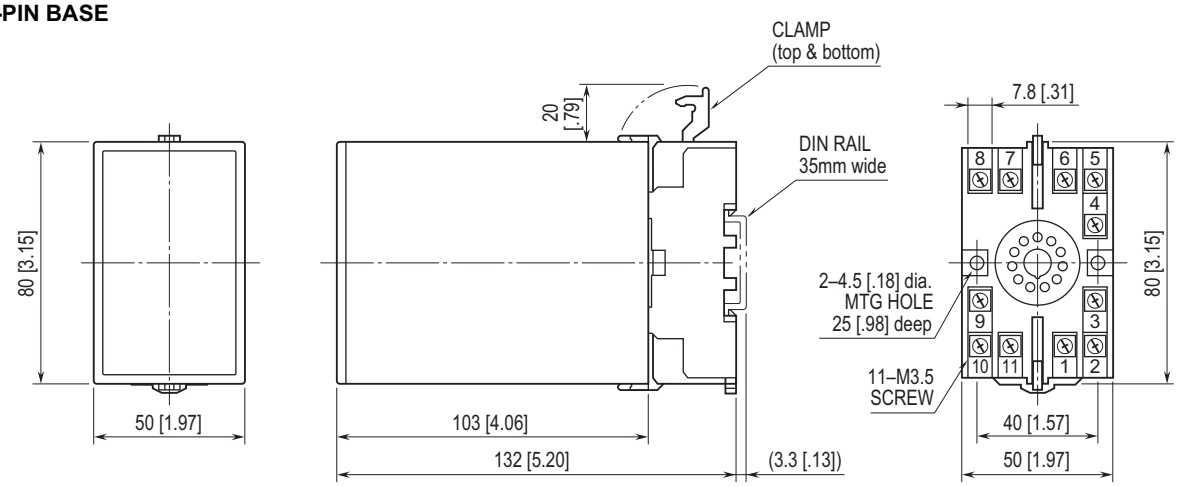
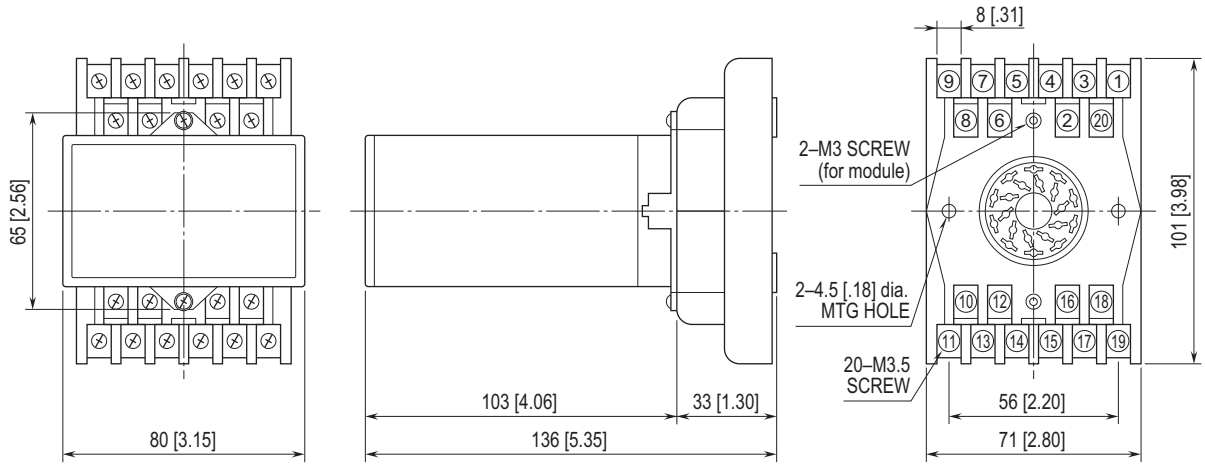
EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]

■11-PIN BASE

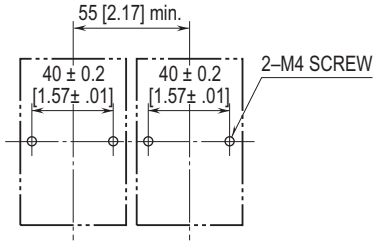


■20-PIN BASE

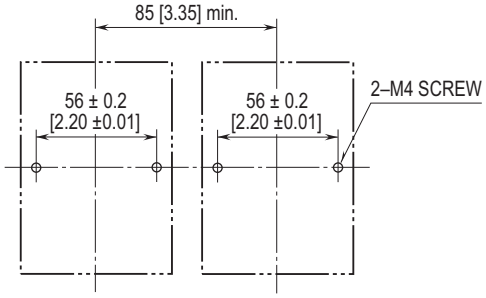


MOUNTING REQUIREMENTS unit: mm [inch]

■11-PIN BASE



■20-PIN BASE



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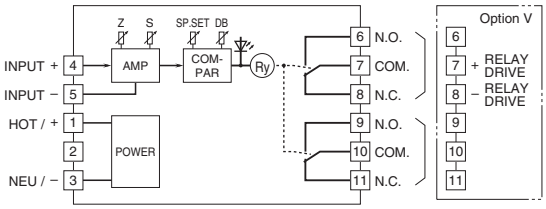
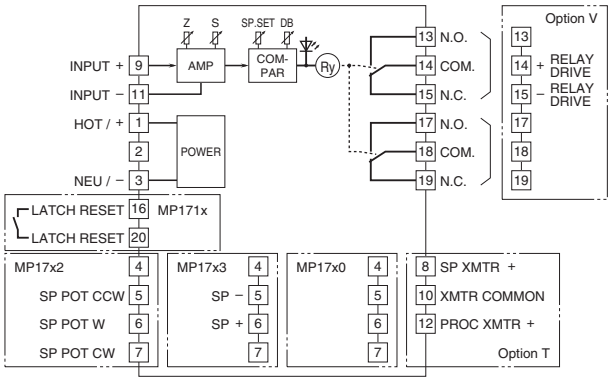
BLOCK DIAGRAM

■SINGLE / LATCHING OUTPUT

•11-pin Base

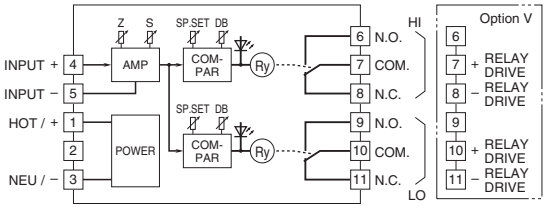


•20-pin Base

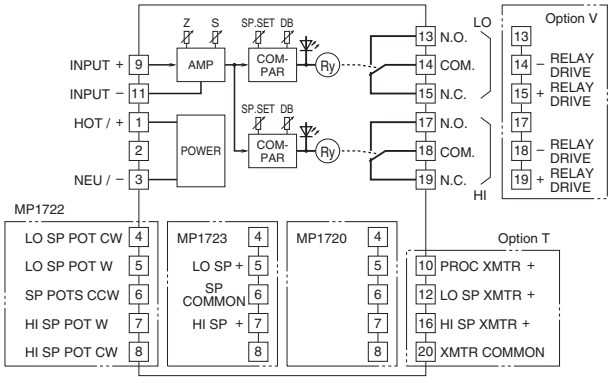


■DUAL OUTPUT

•11-pin Base



•20-pin Base



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I/O TERMINAL ASSIGNMENT

■SINGLE OUTPUT

PIN	MP1700	MP1700 w/Option T	MP1702	MP1702 w/Option T	MP1703	MP1703 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	MP1710	MP1710 w/Option T	MP1712	MP1712 w/Option T	MP1713	MP1713 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	MP1720	MP1720 w/Option T	MP1722	MP1722 w/Option T	MP1723	MP1723 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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