

Limit Alarms M-PAC
FREQUENCY INPUT LIMIT ALARM
MODEL MP1700-1723
MODEL & SUFFIX CODE SELECTION
MP17
MODEL
INPUT TYPE
7 : Frequency

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
1 : ON-OFF pulse

(dry contact or open collector)

2 : Voltage pulse

POWER INPUT
F : 120V AC

J : 240V AC

R : 24V DC

S : 12V DC

OPTIONS
H : Latching operation for dual trip (172X only);
Reset at power off (5 seconds min.)

R : Reversed relay sense

T : Transmitter output (0 – 1V DC)

V : Relay drive voltage output

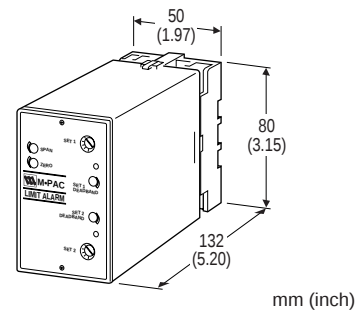
X : Lo-trip sense for single trip; Lo/Lo for dual trip

Y : Hi/Hi-trip sense for dual trip (172X only)

ORDERING INFORMATION

Specify code number and variables.

• **Code number** (e.g. MP1700-2-F/T/V)

• **Frequency range** (e.g. 0 – 500 Hz)

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

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

Low-end cutout: approx. 5%

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

INPUT & OUTPUT**■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. 7.5V DC @1mA

• **Voltage Pulse:** square or sine waveforms

Input amplitude: 2 – 50V p-p

■REMOTE SETPOINT INPUT

MP17X2: potentiometer; any value of 1k – 100k Ω ;
excitation 4V

MP17X3: 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 ($\cos\phi=1$)
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 1.2k Ω or greater coil impedance

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

INSTALLATION**Power input**

AC: rating $\pm 10\%$, 50/60 ± 2 Hz, approx. 2VA

DC: rating $\pm 10\%$ (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: $\leq \pm 0.2\%$

Temp. coefficient: $\pm 0.05\%/^{\circ}\text{C}$ ($\pm 0.027\%/^{\circ}\text{F}$)

Response time: 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

Common mode rejection

60 Hz: greater than 120 dB

DC: greater than 140 dB

Line voltage effect: $\pm 0.1\%$ over voltage range

Insulation resistance: $\geq 100\text{M}\Omega$ with 500V DC

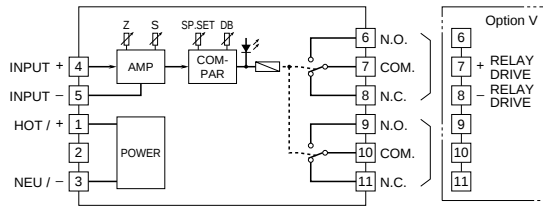
Dielectric strength: 1000V AC @1 minute
(input to output to power)

2000V AC @1 minute (output to ground)

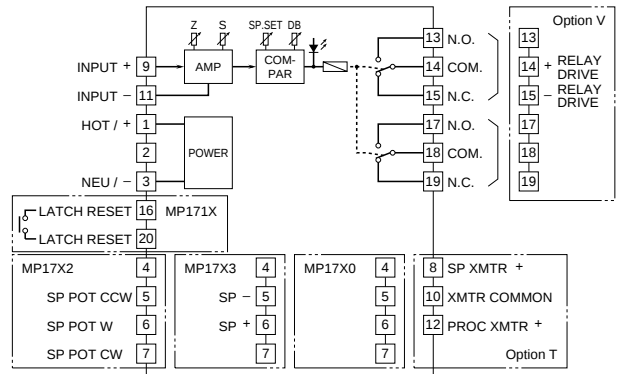
BLOCK DIAGRAM

■SINGLE / LATCHING OUTPUT

•11-pin Base

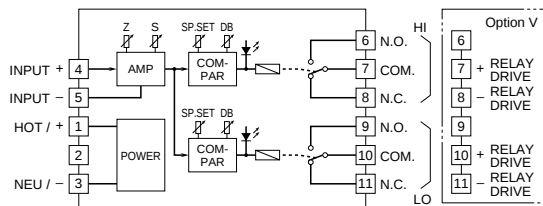


•20-pin Base

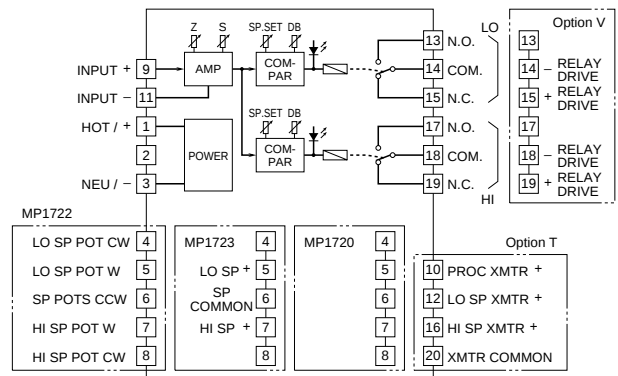


■DUAL OUTPUT

•11-pin Base



•20-pin Base



TERMINAL ASSIGNMENT**■SINGLE OUTPUT**

PIN	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

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***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	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	No Connection	Proc Xmtr +	No Connection	Proc Xmtr +
11	N.C. *]	Lo Set	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 *]
15		N.C. *]	Lo Set	N.C. *]	Lo Set	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 *]
19		N.C. *]	Hi Set	N.C. *]	Hi Set	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(-)