

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

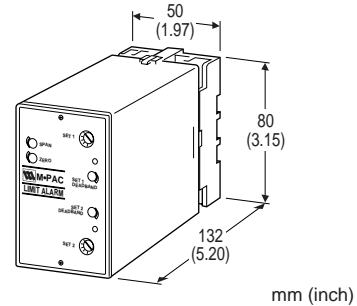
X : Lo-trip sense for single trip; Lo/Lo for dual trip

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: 10⁵ cycles

Mechanical: 10⁷ 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

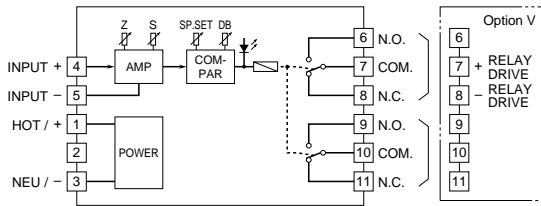
Dielectric strength: 1000V AC @1 minute
(input to output to power)

2000V AC @1 minute (output to ground)

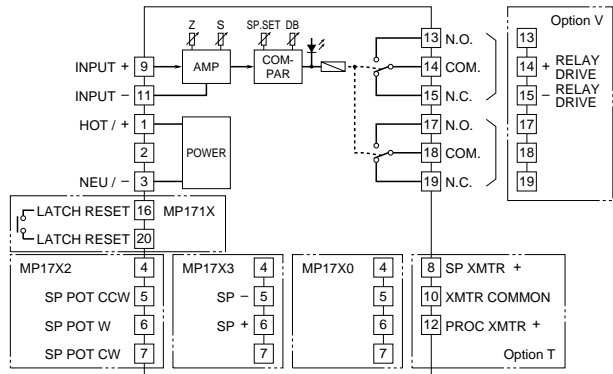
BLOCK DIAGRAM

■ SINGLE / LATCHING OUTPUT

•11-pin Base

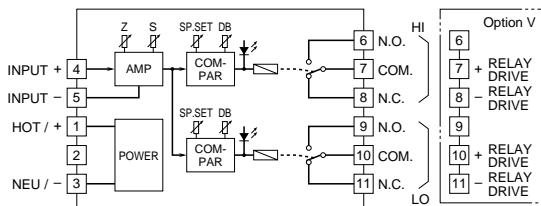


•20-pin Base

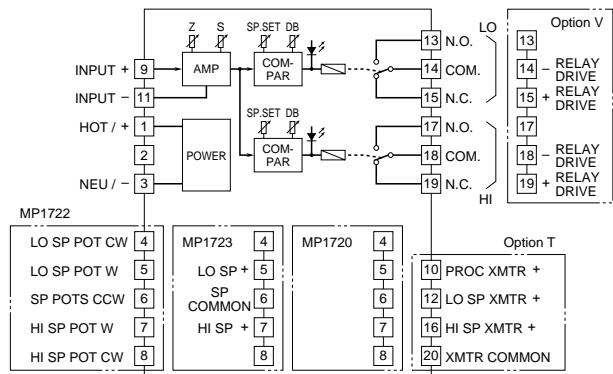


■ DUAL OUTPUT

•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
 N.O. = Normally Open
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 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	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 *
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
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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(-)