

## Limit Alarms *M-PAC*

# FREQUENCY INPUT LIMIT ALARM

MODEL **MP1700-1723**

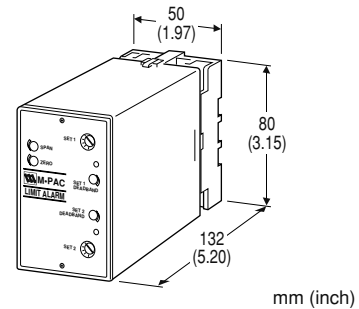
### MODEL & SUFFIX CODE SELECTION

MODEL	MP17	□	□	□	□	□
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 $\Omega$ ;  
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<sup>5</sup> cycles

**Mechanical:** 10<sup>7</sup> cycles

For maximum relay life with inductive  
loads, external protection is recommended.

■ **VOLTAGE OUTPUT (Option V):** 24V DC average;  
Drives 1.2k $\Omega$  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  $\pm 2$  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:** (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

**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

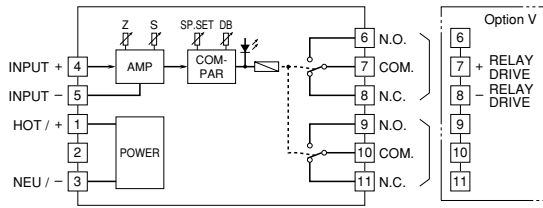
**Dielectric strength:** 1000V AC @1 minute  
(input to output to power)

2000V AC @1 minute (output to ground)

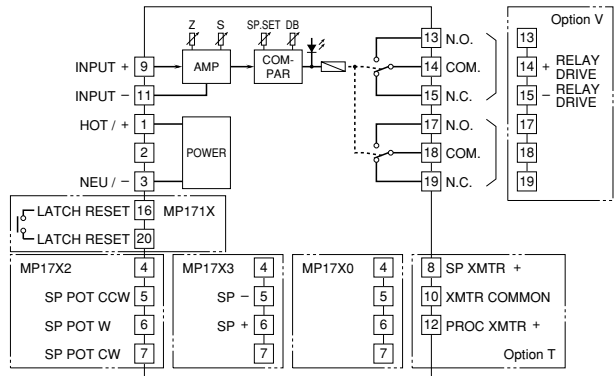
# BLOCK DIAGRAM

## ■ SINGLE / LATCHING OUTPUT

### •11-pin Base

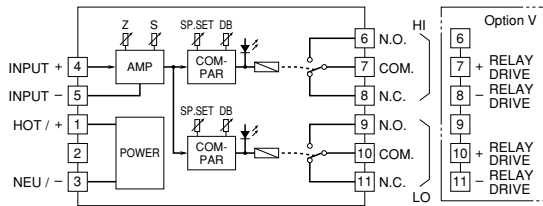


### •20-pin Base

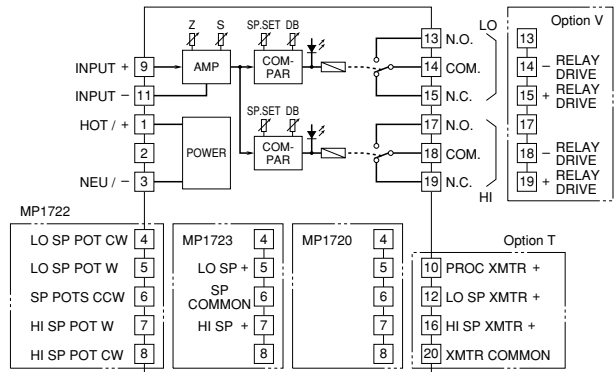


## ■ DUAL OUTPUT

### •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  
 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 * ]	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 * ]	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 * ]	COM * ]	COM * ]	COM * ]	COM * ]
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 * ]	COM * ]	COM * ]	COM * ]	COM * ]
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.