

### Overview



MFA 4p motion failure alarm controller is a highly sensitive single setpoint motion sensor system, used with Milltronics MSP and XPP probes.

### Application

The MFA 4p detects changes in the motion and speed of rotating, reciprocating or conveying equipment. It warns of equipment malfunction and signals through contacts to shut down machinery in case of a slowdown or failure. Its reliability makes it a cost-effective way to protect valuable process equipment.

The single setpoint system suits most industrial applications. This versatile unit can be used on tail pulley shafts, driven pulleys, motor shaft sensing, belt or drag conveyors, screw conveyor flights, bucket elevators, fans and pumps.

A special feature is the adjustable 0 to 60 second time delay, allowing the monitored device to accelerate to normal running speed before monitoring begins. A wide range of probes are available to suit specific needs, including high temperatures, corrosive, and Class I, II and III installations. The CE approval allows the MFA 4p to consistently meet the needs of the mining aggregate, cement and other primary and secondary industries.

- Key Applications: tail pulleys, motor shaft sensing, screw conveyor flights, bucket elevators

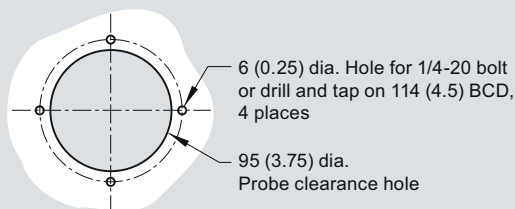
### Benefits

- Up to 100 mm (4") gap between target and probe
- Switch selectable overspeed or underspeed detection
- Setpoint adjustment 0.15 to 3000 PPM (pulses/minute)
- Adjustable start-up time delay
- Visual indication of probe operation and relay status
- General purpose, suitable for majority of industrial applications; rugged probe designs provide unmatched reliability

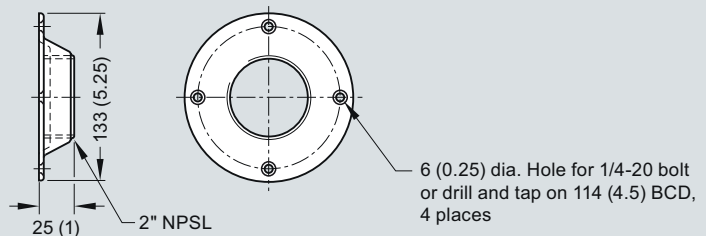
### Design

#### Mounting

##### Mounting for Milltronics MSP-12, MSP-3, XPP-5

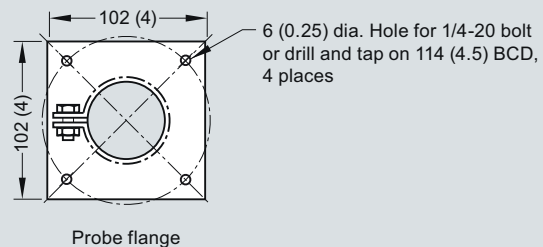
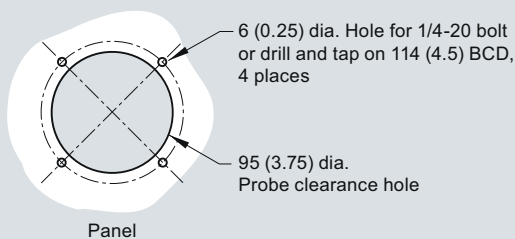


**Note:** For MSP-1 1.125" (29 mm) clearance hole required.



**Note:** Mounting flange supplied with probe.

##### Mounting for Milltronics MSP-9



MSP-1, MSP-12, MSP-3, MSP-9, XPP-5 mounting, dimensions in mm (inch)

# Process Protection

## Motion sensors

### Milltronics MFA 4p

#### Probes



#### Standard Milltronics MSP-12

- Heavy-duty general purpose motion probe
- Long lasting phenolic body with internal amplifier
- Convenient mounting flange and locknut for fast installation and setup
- Temperature rating: -40 to 60 °C (-40 to 140 °F)
- Enclosure rating: Type/NEMA 4X, 6, IP67



#### High temperature Milltronics MSP-3

- Heavy-duty, high temperature aluminum probe designed to withstand operating temperatures to 260 °C (500 °F)
- Cast aluminum probe with convenient mounting flange and locknut
- 1.5 m (5 ft) of high temperature PTFE cable provided. Up to 30 m (100 ft) may be used.
- Amplifier remote mounted in enclosure 140 x 140 x 100 mm (5.5 x 5.5 x 4"), available in cast aluminum (½" NPT conduit entry), painted steel (Type/NEMA 4, IP65 rating), or stainless steel (Type/NEMA 4X, IP65 rating)
- Amplifier temperature rating -40 to 60 °C (-40 to 140 °F)
- Enclosure rating: Type/NEMA 4X, 6, IP67



#### Stainless high temperature Milltronics MSP-9

- Heavy-duty, high temperature 304 stainless steel probe
- Special construction allows operation of probe in environment up to 260 °C (500 °F)
- 1.5 m (5 ft) special high temperature PTFE cable provided. Up to 30 m (100 ft) may be used.
- Amplifier remote mounted in enclosure 140 x 140 x 100 mm (5.5 x 5.5 x 4"), available in cast aluminum (½" NPT conduit entry), painted steel (Type/NEMA 4, IP65 rating), or stainless steel (Type/NEMA 4X, IP65 rating)
- Enclosure rating: Type/NEMA 4X, 6, IP67
- Amplifier temperature rating -40 to 60 °C (-40 to 140 °F)



#### Miniature Milltronics MSP-1

- Miniature probe for installations with limited mounting space
- CPVC probe body complete with locknuts
- 1.8 m (6 ft) cable provided. Up to 30 m (100 ft) may be used.
- Amplifier remote mounted in enclosure 140 x 140 x 100 mm (5.5 x 5.5 x 4"), available in cast aluminum (½" NPT conduit entry), painted steel (Type/NEMA 4, IP65 rating), or stainless steel (Type/NEMA 4X, IP65 rating)
- Enclosure rating: Type/NEMA 4X, 6, IP67
- Due to smaller size, probe sensitivity is reduced, gap max. 13 mm (0.5")



#### Milltronics XPP-5

- CSA hazardous approval (Class I, Div. 1, Groups A, B, C & D; Class II, Div. 1, Groups E, F & G; Class III)
- Phenolic / aluminum body that is fully potted
- Convenient mounting flange and locknut
- 3/4" NPT male hub connection
- Operating temp. from -40 to 60 °C (-40 to 140 °F)
- Enclosure rating: Type/NEMA 4X, 6, IP67



#### Milltronics RMA (Remote Mounted Amplifier)

- Available for internal mounting within Probe, or in enclosure for remote mounting
- Enclosures available in cast aluminum (½" NPT entry), painted steel (Type/NEMA 4 rating) or stainless steel (Type/NEMA 4X, IP65 rating)
- Operating temp. from -40 to 60 °C (-40 to 140 °F)
- Enclosure rating: Type/NEMA 4X, 6, IP67

MFA 4p motion probes

#### Technical specifications

##### Mode of operation

Measuring principle

Motion monitor and alarm

Typical application

Monitoring loss of motion in tail pulley, screw flights, bucket elevators

##### Features

- Switch selectable overspeed or underspeed detection
- Setpoint adjustment: 0.15 ... 3000 PPM
- Adjustable start-up time delay: 0 ... 60 seconds
- Visual indication of probe operation and relay status

##### Output

2 relays working in unison, each providing 1 SPDT Form C relay contact, rated 8 A @ 250 V AC resistive

##### Performance

Repeatability

± 1 %

Dead band

± 0.25 %

##### Dynamic Range

0 ... 7200 PPM

##### Ambient Temperature Range

-20 ... +50 °C (-5 ... +122 °F)

##### Design

Enclosure rating

Type 4X/NEMA 4X/IP65 (standard and optional stainless steel)

Enclosure dimensions

Type 4/NEMA 4/IP65 (optional mild steel)

160 x 240 x 82 mm (6.3 x 9.5 x 3.2")  
optional: mild steel or 304 (1.4301) stainless steel  
203 x 254 x 102 mm (8 x 10 x 4")

Enclosure material

Polycarbonate  
optional: mild steel or stainless steel

##### Power Supply

100/115/200/230 V AC switch selectable, 50/60 Hz, 15 VA ± 10 % of rated voltage

##### Certificates and approvals

CE, C-TICK, CSA<sub>US/C</sub>, FM

Selection and Ordering data	Order No.
<b>MFA 4P Motion Failure Alarm Controller</b> A highly sensitive single setpoint motion sensor system, used with MSP and XPP probes.	C) <b>7MH7144-</b>
<b>Enclosure</b> NEMA 4X, polycarbonate enclosure NEMA 4, painted mild steel enclosure NEMA 4X, 304 (1.4301) stainless steel enclosure	1 2 3
<b>Input Voltage</b> 100/115/200/230 V AC, 50/60 Hz, switch selectable	A
<b>Speed detection version</b> Standard, underspeed (U/S) or overspeed (O/S), switch selectable Slow speed (S/S), U/S or O/S detection, switch selectable (limit of 15 ppm)	A B
<b>Approvals</b> CE, C-TICK, CSA <sub>USIC</sub> , FM	2

Selection and Ordering data	Order code
<b>Further designs</b> Please add "-Z" to Order No. and specify Order code(s).	
Manufacturer's test certificate M to DIN 55 350, Part 18 and to ISO 9000	<b>C11</b>
Acrylic coated, stainless steel tag [69 x 50 mm (2.7 x 1.97")]: Measuring-point number/identification (max. 16 characters), specify in plain text	<b>Y15</b>
Painted mild steel, heated enclosure with viewing window for use down to -50 °C (-58 °F) (finished unit is mounted inside enclosure) 483 X 584 X 203 mm (19 X 23 X 8")	<b>A35</b>
<b>Operating Instructions</b> English French Spanish German Note: The operating instructions should be ordered as a separate item on the order.	Order No. C) <b>7ML1998-5FM01</b> C) <b>7ML1998-5FM11</b> C) <b>7ML1998-5FM21</b> C) <b>7ML1998-5FM31</b>
<b>Spare Parts</b> Relay Transformer Circuit Card, standard Circuit Card, Slow speed Lid with overlay for MFA 4p	<b>7MH7723-1DW</b> <b>7MH7723-1DX</b> C) <b>7MH7723-1DU</b> C) <b>7MH7723-1DV</b> C) <b>7MH7723-1GY</b>

C) Subject to export regulations AL: N, ECCN: EAR99.

Selection and Ordering data	Order No.
<b>Milltronics RMA Remote Mounted Amplifier</b> Remote mounted amplifier for Milltronics MSP-1, MSP-3 and MSP-9 motion sensing probes.	C) <b>7MH7145-</b>
<b>Enclosure</b> Aluminum enclosure, Type/NEMA 4X, IP65/1/2" NPT entry Painted steel, Type/NEMA 4, IP65 rating 304 (1.4301) stainless steel enclosure, Type/NEMA 4X, IP65 rating	0 A C D

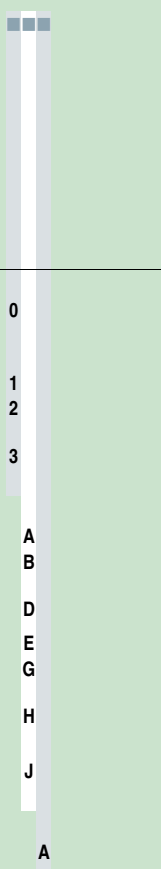
Selection and Ordering data	Order code
<b>Further designs</b> Please add "-Z" to Order No. and specify Order code(s).	
Manufacturer's test certificate M to DIN 55 350, Part 18 and to ISO 9000	<b>C11</b>
Acrylic coated, stainless steel tag [38 x 51 mm (1.5 x 2")]: Measuring-point number/identification (max. 16 characters), specify in plain text	<b>Y18</b>
<b>Operating Instructions</b> English French Spanish German Note: The operating instructions should be ordered as a separate item on the order. This device is shipped with the Siemens Milltronics manual CD containing the complete operating instructions library.	Order No. C) <b>7ML1998-5FM01</b> C) <b>7ML1998-5FM11</b> C) <b>7ML1998-5FM21</b> C) <b>7ML1998-5FM31</b>
<b>Spare Parts</b> Card, RMA	C) <b>7MH7723-1DT</b>

C) Subject to export regulations AL: N, ECCN: EAR99.

# Process Protection

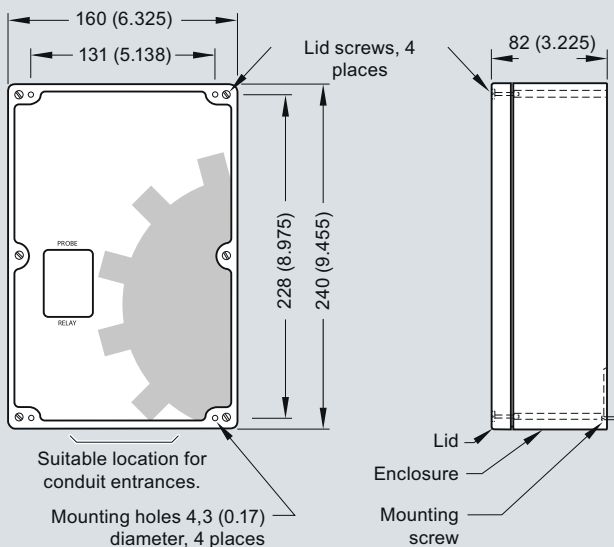
## Motion sensors

### Milltronics MFA 4p

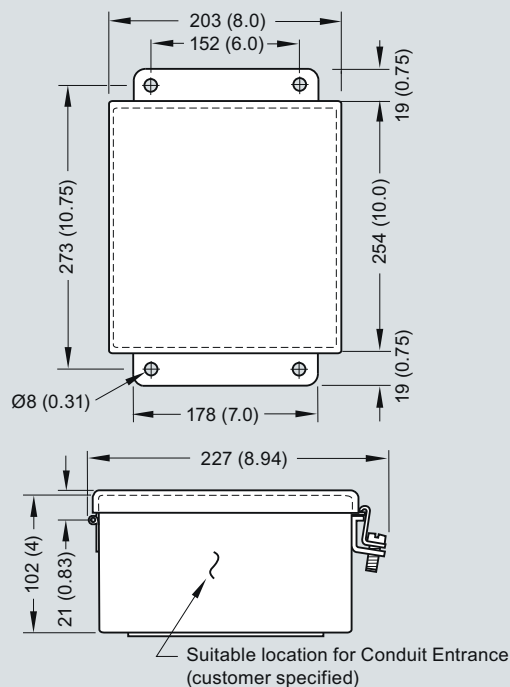
Selection and Ordering data	Order No.	Selection and Ordering data	Order code
<b>Milltronics Motion Sensing Probes</b> A series of motion sensing probes used with the MFA 4p. Milltronics MSP-1: miniature motion sensing probe Milltronics MSP-3: heavy-duty, high temperature aluminum Milltronics MSP-9: heavy-duty, high temperature stainless steel Milltronics MSP-12: heavy-duty, general purpose Milltronics XPP-5: hazardous rated Note: Milltronics MSP-1, MSP-3 and MSP-9 probes require the use of Milltronics RMA (amplifier)	C) <b>7MH7146-</b> 	<b>Further designs</b> Please add "-Z" to Order No. and specify Order code(s). Total cable length: enter the total cable length in plain text description Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75")]: Measuring-point number/identification (max. 16 characters), specify in plain text Cable gland kit Manufacturer's test certificate M to DIN 55 350, Part 18 and to ISO 9000	 <b>Y01</b>  <b>Y17</b>  <b>A57</b> <b>C11</b>
<b>Cable Length</b> Standard length (as described in Model options) <sup>1)</sup> Add order code Y01 and plain text: "Total cable length ... m" Extended cable length 2 ... 30 m (6.6 ... 98.4 ft) Extended cable length 31 ... 50 m (101.7 ... 164 ft) <sup>2)</sup> Extended cable length 51 ... 100 m (167.3 ... 328.1 ft) <sup>2)</sup>	0 1 2 3	<b>Operating Instructions</b> English French Spanish German Note: The operating instructions should be ordered as a separate item on the order. This device is shipped with the Siemens Milltronics manual CD containing the complete operating instructions library.	Order No. C) <b>7ML1998-5FM01</b> C) <b>7ML1998-5FM11</b> C) <b>7ML1998-5FM21</b> C) <b>7ML1998-5FM31</b>
<b>Model [standard cable length/type]</b> MSP-1 [1.8 m (6 ft)] MSP-3, 1/2" NPT cable inlet [1.5 m (5 ft) high temperature cable] MSP-9 [1.5 m (5 ft) high temperature cable] MSP-12, 1/2" NPT cable inlet XPP-5 [1.5 m (5 ft) cable, (CSA Class I, Group A, B, C and D; Class II Group E, F and G)] XPP-5 [10 m (32.8 ft) cable, (CSA Class I, Group A, B, C and D; Class II Group E, F and G)] XPP-5 [15 m (49.2 ft) cable, (CSA Class I, Group A, B, C and D; Class II Group E, F and G)]	A B D E G H J	<b>Spare Parts</b> Locknut, for MSP-1 Locknut, for MSP-3, MSP-4, MSP-12, XPP-5 Mounting flange, for MSP-3, MSP-4, MSP-12, XPP-5 Mounting bracket for MSP-9 Lid, 1/2" NPT cable inlet, for MSP-3, MSP-12 Lid for MSP-9 Lid gasket, for MSP-3, MSP-9 Lid gasket, for MSP-12 Cable gland kit	<b>7MH7723-1CQ</b> C) <b>7MH7723-1CR</b> <b>7MH7723-1CS</b> <b>7MH7723-1CT</b> <b>7MH7723-1CU</b> <b>7MH7723-1CV</b> F) <b>7MH7723-1CW</b> F) <b>7MH7723-1CX</b> <b>7MH7723-1JN</b>
<b>Approvals</b> CE, C-TICK	A	C) Subject to export regulations AL: N, ECCN: EAR99. F) Subject to export regulations AL: 91999, ECCN: N.	

### Dimensional drawings

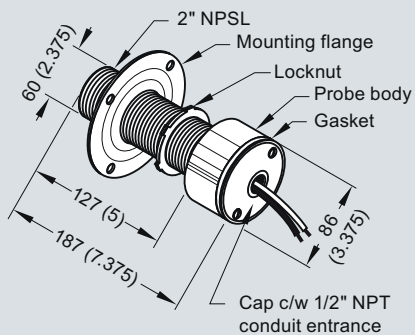
**Type 4X/NEMA 4X/IP65 Polycarbonate Enclosure**



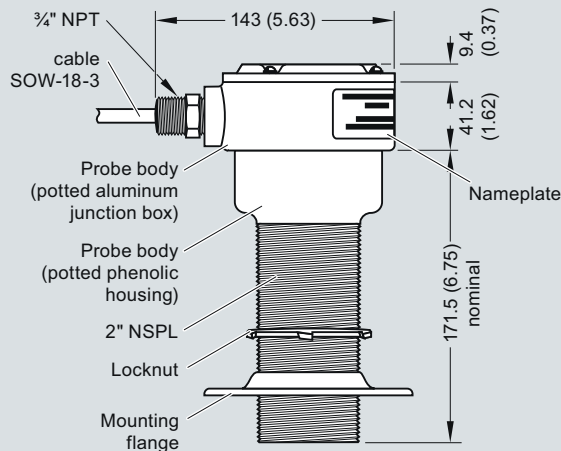
**Type 4/NEMA 4/IP65 Painted Steel Enclosure & Type 4X/NEMA 4X/IP65 Stainless Steel Enclosure**



**Standard Probe MSP-12**



**Hazardous Locations XPP-5**



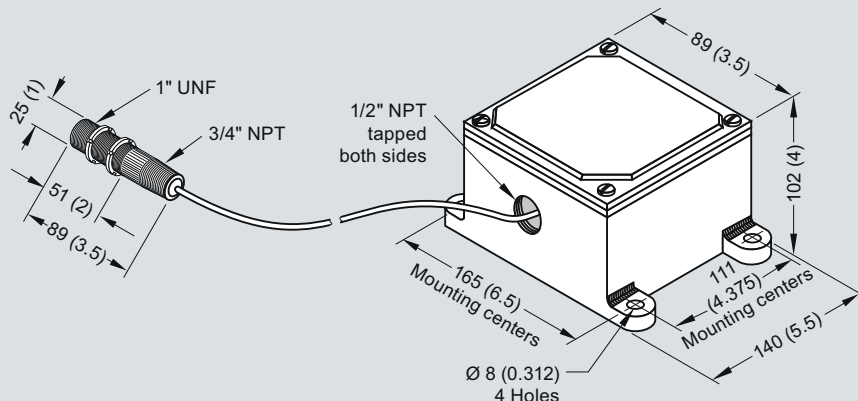
MFA 4p and probe, dimensions in mm (inch)

# Process Protection

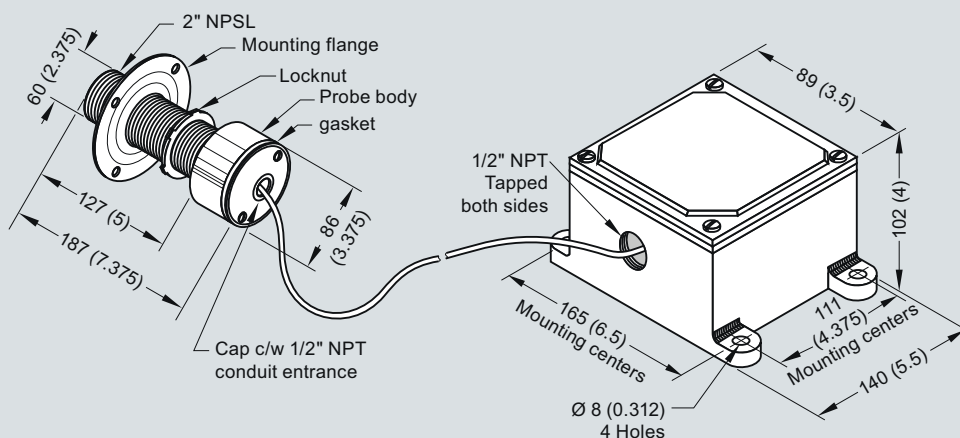
## Motion sensors

### Milltronics MFA 4p

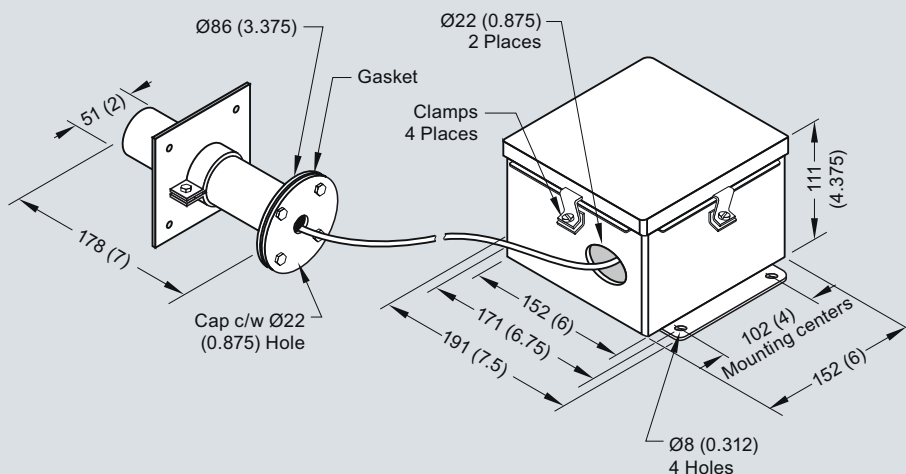
#### Mini Sensing Probe MSP-1



#### High Temperature Probe MSP-3



#### High Temperature Stainless Steel Probe MSP-9



Probe, dimensions in mm (inch)