Overview

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

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

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

Design

Mounting

Mounting for Milltronics MSP-1, MSP-9

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.

Panel

Probe flange

MSP-1, MSP-12, MSP-3, MSP-9, XPP-5 mounting, dimensions in mm (inch)
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")
  - 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 280 °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")
  - Temperature rating: -40 to 60 °C (-40 to 140 °F)
  - Enclosure rating: Type/NEMA 4X, 6, IP67

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

- **Enclosure dimensions**
  - 160 x 240 x 82 mm (6.3 x 9.5 x 3.2")
  - 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, FM
### Selection and Ordering data

**Order No.**

<table>
<thead>
<tr>
<th>MFA 4P Motion Failure Alarm Controller</th>
<th>7MH7144-</th>
</tr>
</thead>
<tbody>
<tr>
<td>A highly sensitive single setpoint motion sensor system, used with MSP and XPP probes.</td>
<td></td>
</tr>
</tbody>
</table>

**Enclosure**

| 1 | NEMA 4X, polycarbonate enclosure |
| 2 | NEMA 4, painted mild steel enclosure |
| 3 | NEMA 4X, 304 (1.4301) stainless steel enclosure |

**Input Voltage**

100/115/200/230 V AC, 50/60 Hz, switch selectable

**Speed detection version**

| A | Standard, underspeed (U/S) or overspeed (O/S), switch selectable |
| B | Slow speed (S/S), U/S or O/S detection, switch selectable (limit of 15 ppm) |

**Approvals**

| CE, C-TICK, CSA, FM |

### Selection and Ordering data

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<table>
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<th>Milltronics RMA Remote Mounted Amplifier</th>
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<tr>
<td>Remote mounted amplifier for Milltronics MSP-1, MSP-3 and MSP-9 motion sensing probes.</td>
<td></td>
</tr>
</tbody>
</table>

**Enclosure**

| A | Aluminum enclosure, Type/NEMA 4X, IP65 1/2" NPT entry |
| C | Painted steel, Type/NEMA 4, IP65 rating |
| D | 304 (1.4301) stainless steel enclosure, Type/NEMA 4X, IP65 rating |

**Order code**

<table>
<thead>
<tr>
<th>Further designs</th>
</tr>
</thead>
</table>

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**

| C11 |

**Acrylic coated, stainless steel tag [38 x 51 mm (1.5 x 2")]: Measuring-point number/identification (max. 16 characters), specify in plain text**

| Y18 |

**Operating Instructions**

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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.

**Spare Parts**

<table>
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<tr>
<th>Card, RMA</th>
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C) Subject to export regulations AL: N, ECCN: EAR99.

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

## Milltronics MFA 4p

### Selection and Ordering data

<table>
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<tr>
<th>Order No.</th>
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</thead>
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<tr>
<td>C) 7MH7 14 6 -</td>
<td></td>
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</table>

### Milltronics Motion Sensing Probes

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)
- Available with Model options G, H, and J only

#### Cable Length

<table>
<thead>
<tr>
<th>Standard length (as described in Model options)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add order code Y01 and plain text:</td>
</tr>
<tr>
<td>Total cable length: enter the total cable length in plain text description</td>
</tr>
<tr>
<td>Acrylic coated, stainless steel tag</td>
</tr>
<tr>
<td>Measuring-point number/identification (max. 16 characters), specify in plain text</td>
</tr>
<tr>
<td>Cable gland kit</td>
</tr>
<tr>
<td>Manufacturer’s test certificate M to DIN 55 350, Part 18 and to ISO 9000</td>
</tr>
</tbody>
</table>

#### Model [standard cable length/type]

- **MSP-1** [1.8 m (6 ft)]
  - 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)]

#### Approvals

- CE, C-TICK

1) No Y01 needed in order code for standard length

### Spare Parts

- **Locknut, for MSP-1**: 7MH7723-1CQ
- **Locknut, for MSP-3, MSP-4, MSP-12, XPP-5**: 7MH7723-1CR
- **Mounting flange, for MSP-3, MSP-4, MSP-12, XPP-5**: 7MH7723-1CS
- **Mounting bracket for MSP-9**: 7MH7723-1CT
- **Lid, 1/2" NPT cable inlet, for MSP-3, MSP-12**: 7MH7723-1CU
- **Lid for MSP-9**: 7MH7723-1CV
- **Lid gasket, for MSP-3, MSP-9**: 7MH7723-1CW
- **Lid gasket, for MSP-12**: 7MH7723-1CX
- **Cable gland kit**: 7MH7723-1JN

C) Subject to export regulations AL: N, ECCN: EAR99.
F) Subject to export regulations AL: 9I999, ECCN: N.
**Dimensional drawings**

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

- Lid screws, 4 places
- Suitable location for conduit entrances.
- Mounting holes 4.3 (0.17) diameter, 4 places

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

- Suitable location for Conduit Entrance (customer specified)

**Standard Probe MSP-12**

- Mounting flange
- Locknut
- Probe body
- Gasket
- Cap c/w 1/2" NPT conduit entrance

**Hazardous Locations XPP-5**

- 5/8" NPT cable SOW-19-3
- Probe body (potted aluminum junction box)
- Probe body (potted phenolic housing)
- 2" NSPL
- Locknut
- Mounting flange

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)