

Solids Flowmeters

Sensing heads

SITRANS WFS300 series sensing heads

Overview



SITRANS WFS300 and WFS320 sensing heads are out-of-the-process sensing elements for SITRANS WF300 series solids flowmeters.

Benefits

- Easy installation with modular assembly
- $\pm 1\%$ accuracy (or better) with high repeatability
- Totally enclosed, dust-tight, flow metering of bulk solids
- Sensing mechanism is outside the process, protected from contamination
- No zero drift, due to unique sensing mechanism
- Low maintenance; only the sensing plate is in the process
- No restriction of product flow

Application

SITRANS WFS300 and WFS320 sensing heads are used in applications such as product rationing, batch load-out, and process feed rate control, the WFS series of sensing heads has been field-proven in thousands of applications with some units providing over a quarter century of reliable performance. The WFS sensing heads use only the horizontal force created by impact of product upon the sensing plate and then apply the horizontal deflection to a highly reliable linear variable differential transformer (LVDT).

Friction-less pivots exclude the vertical force from the sensing process and the LVDT travel range is controlled by a coil spring selected for the specified full-scale flow rate. A viscous fluid damper provides mechanical damping in the event of pulsating flows.

The LVDT converts the horizontal movement, proportional to the impact forces into an electrical signal, which is converted by the integrator to time-based flow rate indication and totaling. This method of sensing material flow has been proven best in thousands of applications all over the world.

Technical specifications

| | WFS300 | WFS320 |
|--|---|--------------------------------------|
| Mode of operation | | |
| Measuring principle | Deflection measurement using LVDT (linear variable differential transformer) | |
| Typical application | For use in all WF300 series flowmeters | |
| Flow input | | |
| Maximum particle size | 13 mm (0.5 inch) | 25 mm (1 inch) |
| Minimum flow rate | 0 ... 0.2 t/h (0 ... 0.2 STPH) | 0 ... 20 t/h (0 ... 22 STPH) |
| Maximum flow rate | 0 ... 40 t/h (0 ... 44 STPH) | 0 ... 300 t/h (0 ... 330 STPH) |
| Performance | | |
| Accuracy ¹⁾ | ± 1 % or better of full scale, higher accuracy with linearizing features offered by integrators | |
| Repeatability | ± 0.2 % | |
| Specified range | 33 ... 100 % | |
| Medium conditions | | |
| Ambient temperature | | |
| • Without internally mounted LVDT card | -40 ... +60 °C (-40 ... +140 °F) | -40 ... +60 °C (-40 ... +140 °F) |
| • With optional internally mounted LVDT card | -40 ... +50 °C (-40 ... +122 °F) | -40 ... +50 °C (-40 ... +122 °F) |
| Maximum product temperature | 232 °C (450 °F) | 232 °C (450 °F) |
| Design | | |
| | IP64 aluminum body, fiberglass cover, 304 (1.4306) stainless steel sensing plate | |
| Options | | |
| | <ul style="list-style-type: none"> • Epoxy paint coating of external aluminum casting surfaces • Internally mounted LVDT conditioner card for use with SF500 integrator • Externally mounted LVDT conditioner card in NEMA 4 (IP65) enclosure for use with Milltronics SF500 or SIWAREX FTC integrator when sensing head is mounted in hazardous areas or with high ambient temperatures | |
| Approvals | | |
| | CE, RCM, CSA, FM, GOST, ATEX, IEC Ex | CE, RCM, CSA, FM, GOST, ATEX, IEC Ex |

¹⁾ Accuracy subject to:
 On factory approved installations the flowmeter system's totalized weight will be within the specified accuracy when compared to a known weighed material test sample.
 The test rate must be within the specified range of the design capacity and held constant for the duration of the test.
 The minimum material test sample must be equivalent to a sample obtained at the test flow rate for at least ten minutes running time.

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SITRANS WFS300 series sensing heads

Selection and ordering data

SITRANS WFS300 sensing head

Out-of-the-process sensing element for 40 t/h (44 STPH) solids flowmeters. A flowguide, sensing plate and integrator are required to complete the system. Order flowguide, sensing plate and integrator separately.

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Mounting

Base

Side

Base, explosion proof, CSA/FM Class I, Div. 1, Groups C and D; Class II, Div. 1, Groups E, F and G, ATEX II 2D - Ex tb IIIC T70 °C Db IP64, ATEX II 3D, Ex tc IIIB T70 °C Dc IP5X, IECEX FMG 13.0016X, Ex nA IIC T6 Gc, Ex tb IIIC T70 °C Db IP64

Side, explosion proof, CSA/FM Class I, Div. 1 Groups C and D; Class II, Div. 1, Groups E, F, and G, ATEX II 2D - Ex tb IIIC T70 °C Db IP64, ATEX II 3D, Ex tc IIIB T70 °C Dc IP5X, IECEX FMG 13.0016X, Ex nA IIC T6 Gc, Ex tb IIIC T70 °C Db IP64

Note: Externally mounted LVDT Conditioner in NEMA 4 enclosure required for use with SF500 or SIWAREX FTC and mounting option 3 and 4. See optional equipment.

Range (Range spring size/leaf spring thickness/viscosity of damping fluid)

C2/A2/1 000

C3/A2/1 000

C4/A2/1 000

C5/A2/1 000

C6/A2/1 000

C7/A2/1 000

C8/A2/3 000

C9/A2/3 000

C10/A2/3 000

C11/A3/5 000

C12/A3/5 000

C13/A3/5 000

C14/A3/5 000

C0/A2/500

C0/A3/500

C10/A3/3 000

Gasketing

Silicone

Silicone, light duty

PTFE

Coating (process side only)

None, standard aluminum

Epoxy - white/aluminum, external castings only

Sensing head mounted LVDT conditioner

None¹⁾

Included, required for use with SF500 or SIWAREX FTC integrator²⁾

Article No.

7MH7110-

0

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1

Further designs

Please add **"-Z"** to article no. and specify order code(s).

Stainless steel tag [69 x 38 mm (2.7 x 1.5 inch)], Measuring-point number/identification (max. 27 characters), specify in plain text.

Application Eng. reference number (max. 15 characters), specify in plain text.

Manufacturer's test certificate: According to EN 10204-2.2

Instruction manuals

• English

• German

• Solids flowmeter Application Guidelines, English

• Solids flowmeter Application Guidelines, German

Note: The instruction manual should be ordered as a separate item on the order.

This device is shipped with the Siemens Milltronics manual DVD containing the complete instruction manual library.

Calibration hanger weights

20 g (0.04 lb)

50 g (0.1 lb)

100 g (0.2 lb)

200 g (0.4 lb)

500 g (1.1 lb)

1 000 g (2.2 lb)

2 000 g (4.4 lb)

5 000 g (11 lb)

Note: Calibration accessories should be ordered as a separate item on the order.

Order Code

Y15

Y31

C11

Article No.

A5E32880243

A5E35327994

7ML1998-5GK01

7ML1998-5GK31

7MH7724-1AC

7MH7724-1AD

7MH7724-1AE

7MH7724-1AF

7MH7724-1AG

7MH7724-1AH

7MH7724-1AJ

7MH7724-1AK

¹⁾ For use with Compu Series integrators or when externally mounted LVDT conditioner required.

²⁾ Applicable for mounting options 0 and 1 only.

| Selection and ordering data | Article No. |
|--|--------------------|
| <i>Spare parts</i> | |
| LDVT conditioner in NEMA 4 enclosure (to interface SF500 or SIWAREX FTC and LVDT sensor) | 7MH7723-1AJ |
| Silicone inner diaphragm | 7MH7723-1DN |
| Silicone outer diaphragm | 7MH7723-1DP |
| PTFE inner diaphragm | 7MH7723-1AL |
| PTFE outer diaphragm | 7MH7723-1AM |
| LVDT transformer and core, standard spare | 7MH7723-1DS |
| Encapsulated LVDT replacement kit | 7MH7723-1DE |
| Damping fluid, 1 000 CS, 1 lb bottle | 7MH7723-1EU |
| Damping fluid, 3 000 CS, 1 lb bottle | 7MH7723-1EV |
| Damping fluid, 5 000 CS, 1 lb bottle | 7MH7723-1EW |
| Range spring assembly, C2 | 7MH7723-1EX |
| Range spring assembly, C3 | 7MH7723-1EY |
| Range spring assembly, C4 | 7MH7723-1FA |
| Range spring assembly, C5 | 7MH7723-1FB |
| Range spring assembly, C6 | 7MH7723-1FC |
| Range spring assembly, C7 | 7MH7723-1FD |
| Range spring assembly, C8 | 7MH7723-1FE |
| Range spring assembly, C9 | 7MH7723-1FF |
| Range spring assembly, C10 | 7MH7723-1FG |
| Range spring assembly, C11 | 7MH7723-1FH |
| Range spring assembly, C12 | 7MH7723-1FJ |
| Range spring assembly, C13 | 7MH7723-1FK |
| Range spring assembly, C14 | 7MH7723-1FL |
| Leaf spring, A2, kit | 7MH7723-1BN |
| Leaf spring, A3, kit | 7MH7723-1BP |
| WFS300 calibration wheel kit | 7MH7723-1KB |
| Circuit card, LVDT, conditioner | 7MH7723-1ET |
| WFS300 replacement O-ring kit | 7MH7723-1DC |

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Sensing heads

SITRANS WFS300 series sensing heads

Selection and ordering data

SITRANS WFS320 sensing head

Out-of-the-process sensing element for use with 300 t/h (330 STPH) flowmeters. A flowguide, sensing plate and integrator are required to complete the system. Order flowguide, sensing plate and integrator separately.

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Classification

Non-hazardous

Hazardous, CSA/FM Class I, Div.1, Groups C and D; Class II, Div. 1, Groups E, F and G, ATEX II 2D - Ex tb IIIC T70 °C Db IP64, ATEX II 3D, Ex tc IIIB T70 °C Dc IP5X, IECEx FMG 13.0016X, Ex nA IIC T6 Gc, Ex tb IIIC T70 °C Db IP64

Note: Externally mounted LVDT conditioner in NEMA 4 enclosure required for use with SF500 or SIWAREX FTC and classification option 2. See calibration hanger weights.

Range (range spring size/viscosity of damping fluid)

D1/1 000 Position 1

D1/1 000 Position 2

D1/1 000 Position 3

D2/1 000 Position 1

D2/1 000 Position 2

D2/1 000 Position 3

D3/3 000 Position 1

D3/3 000 Position 2

D3/3 000 Position 3

D4/5 000 Position 1

D4/5 000 Position 2

D4/5 000 Position 3

D5/5 000 Position 1

D5/5 000 Position 2

D5/5 000 Position 3

Gasketing

Silicone

PTFE

Other gasketing available upon request

Coating (process side only)

None, standard aluminum

Epoxy - white/aluminum, external castings only

Other coatings available upon request.

Sensing head mounted LVDT conditioner

None¹⁾

Included, required for use with SF500 or SIWAREX FTC integrator²⁾

Article No.

7MH7112-



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1

Order Code

Further designs

Please add "-Z" to article no. and specify order code(s).

Stainless steel tag [69 x 38 mm (2.7 x 1.5 inch)], Measuring-point number/identification (max. 27 characters), specify in plain text.

Y15

Application Eng. reference number (max.15 characters), specify in plain text.

Y31

Manufacturer's test certificate: According to EN 10204-2.2

C11

Instruction manual

English

Article No.

A5E32880290

German

A5E35327995

Note: Instruction manual should be ordered as a separate item on the order.

This device is shipped with the Siemens Milltronics manual DVD containing the complete instruction manual library.

Calibration hanger weights

20 g (0.04 lb)

7MH7724-1AC

50 g (0.1 lb)

7MH7724-1AD

100 g (0.2 lb)

7MH7724-1AE

200 g (0.4 lb)

7MH7724-1AF

500 g (1.1 lb)

7MH7724-1AG

1 000 g (2.2 lb)

7MH7724-1AH

2 000 g (4.4 lb)

7MH7724-1AJ

5 000 g (11 lb)

7MH7724-1AK

Note: Calibration accessories should be ordered as a separate item on the order.

Spare parts

LVDT conditioner in NEMA 4 enclosure to interface SF500 and LVDT sensor)

7MH7723-1AJ

Silicone inner diaphragm

7MH7723-1DQ

Silicone outer diaphragm

7MH7723-1DR

PTFE inner diaphragm

7MH7723-1BA

PTFE outer diaphragm

7MH7723-1BB

LVDT transformer and core, standard spare

7MH7723-1DS

Encapsulated LVDT replacement kit

7MH7723-1DE

Damping fluid, 1 000 CS, 1 lb bottle

7MH7723-1EU

Damping fluid, 3 000 CS, 1 lb bottle

7MH7723-1EV

Damping fluid, 5 000 CS, 1 lb bottle

7MH7723-1EW

Range spring assembly, D1

7MH7723-1FM

Range spring assembly, D2

7MH7723-1FN

Range spring assembly, D3

7MH7723-1FP

Range spring assembly, D4

7MH7723-1FQ

Range spring assembly, D5

7MH7723-1GJ

Leaf spring kit, 4 required

7MH7723-1BQ

Circuit card, LVDT, conditioner

7MH7723-1ET

WFS320 calibration wheel kit

7MH7723-1KA

WFS320 replacement o-ring kit

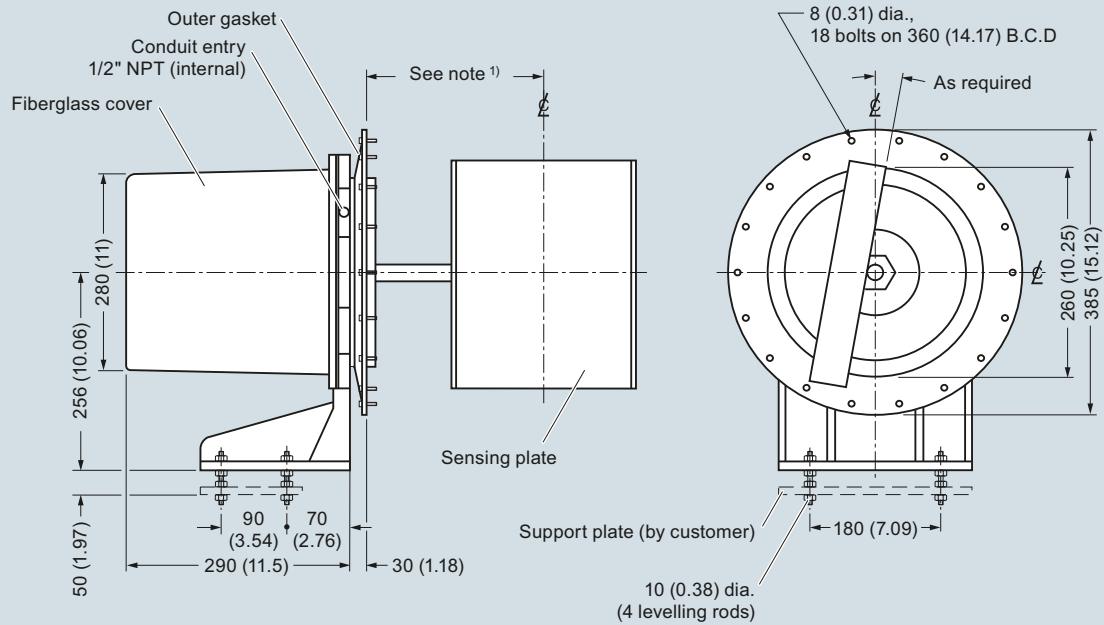
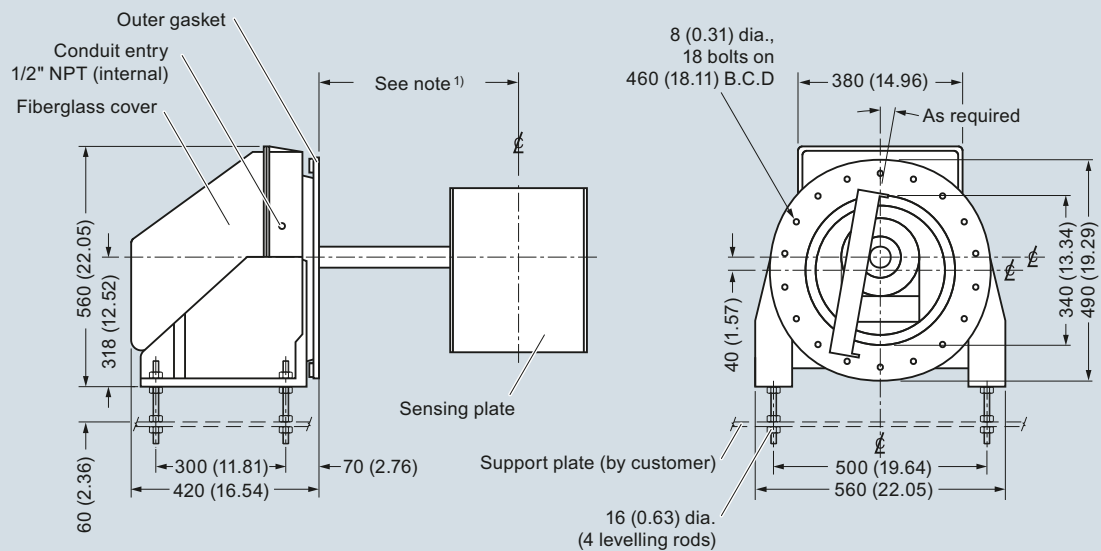
7MH7723-1DD

WFS320 Taper Pin, spare

7MH7723-1GD

¹⁾ For use with Compu series integrators or when externally mounted LVDT conditioner required. See Note under Classification.

²⁾ Available with classification option 1 only.

Dimensional drawings
WFS300 Sensing Head

WFS320 Sensing Head

Notes:

- 1) Refer to flowmeter drawing for sensing head mounting hole to flowguide centerline dimension.
- 2) Sensing head support plate should be rigid and independent of flowmeter housing.
- 3) Ensure outer gasket seals dust tight to flowmeter housing wall.

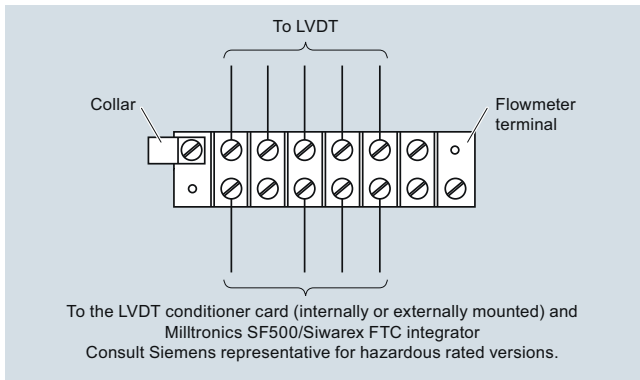
WFS300 series sensing head, dimensions in mm (inch)

Solids Flowmeters

Sensing heads

SITRANS WFS300 series sensing heads

Schematics



WFS300 series connections