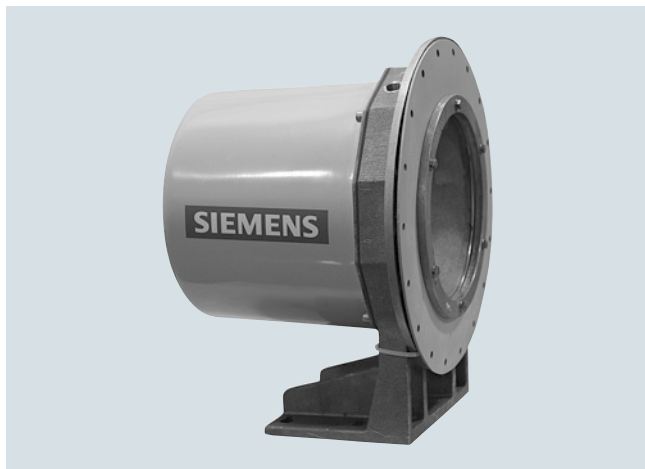


Solid Flowmeters

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

Sensing heads	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, UKCA, RCM, CSA, FM, EAC, KC, ATEX, UKEX, IECEx, EAC Ex	CE, UKCA, RCM, CSA, FM, EAC, KC, ATEX, UKEX, IECEx, EAC 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.

Solid Flowmeters

Sensing heads

SITRANS WFS300 series sensing heads

Selection and ordering data

Article No.

Article No.

SITRANS WFS300 Sensing head

Impact solids flowmeter for low to medium capacity applications. Accuracy is $\pm 1\%$ or better, with capacity up to 40 t/h (44 STPH).

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

Mounting

Base - Ordinary Locations/General Purpose (Non-Ex) **0**

Side - Ordinary Locations/General Purpose (Non-Ex) **1**

Base **3**
 CSA/FM Class I, Div. 1, Groups C, D, Class II, Div. 1, Groups E, F, G;
 ATEX II 2D Ex tb IIIC T70°C Db, -40°C = Ta = +60°C, IP64;
 UKEX II 2D Ex tb IIIC T70°C Db, -40°C = Ta = +60°C, IP64;
 ATEX II 3G Ex ec IIC T6 Gc, -40°C = Ta = +60°C, IP64;
 UKEX II 3G Ex ec IIC T6 Gc, -40°C = Ta = +60°C, IP64;
 IECEx Ex tb IIIC T70°C Db, Ta = -40°C to +60°C, IP64;
 IECEx Ex ec IIC T6 Gc, Ta = -40°C to +60°C;
 EAC Ex Ex tb IIIC T70°C Db X;
 EAC Ex Ex nA IIC T6 Gc X;
 RCM, EAC, KC

Side **4**
 CSA/FM Class I, Div. 1, Groups C, D, Class II, Div. 1, Groups E, F, G;
 ATEX II 2D Ex tb IIIC T70°C Db, -40°C = Ta = +60°C, IP64;
 UKEX II 2D Ex tb IIIC T70°C Db, -40°C = Ta = +60°C, IP64;
 ATEX II 3G Ex ec IIC T6 Gc, -40°C = Ta = +60°C, IP64;
 UKEX II 3G Ex ec IIC T6 Gc, -40°C = Ta = +60°C, IP64;
 IECEx Ex tb IIIC T70°C Db, Ta = -40°C to +60°C, IP64;
 IECEx Ex ec IIC T6 Gc, Ta = -40°C to +60°C;
 EAC Ex Ex tb IIIC T70°C Db X;
 EAC Ex Ex nA IIC T6 Gc X;
 RCM, EAC, KC

Note: Externally mounted LVDT Conditioner in NEMA 4 enclosure required for use with SF500 or SIWAREX FTC and mounting options 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

A
B
C
D
E
F
G
H
J
K
L
M
N
P
Q
R

Gasketing

Silicone
 Silicone, light duty
 PTFE

Coating (process side only)

None, standard aluminum **0**
 Epoxy - white/aluminum, external castings only **1**

Sensing head mounted LVDT conditioner

None¹⁾ **0**
 Included, required for use with SF500 or SIWAREX FTC integrator²⁾ **1**

A
B
E
0
1
0
1

Selection and ordering data	Order code	Spare parts	
Further designs		LDVT conditioner in NEMA 4 enclosure (to interface SF500 or SIWAREX FTC and LVDT sensor)	7MH7723-1AJ
Please add "-Z" to article no. and specify order code(s).		Silicone inner diaphragm	7MH7723-1DN
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	Silicone outer diaphragm	7MH7723-1DP
Application Eng. reference number (max. 15 characters), specify in plain text.	Y31	PTFE inner diaphragm	7MH7723-1AL
Manufacturer's test certificate: According to EN 10204-2.2	C11	PTFE outer diaphragm	7MH7723-1AM
Instruction manuals		LVDT transformer and core, standard spare	7MH7723-1DS
All literature is available to download for free, in a range of languages, at https://www.siemens.com/weighing/documentation		Encapsulated LVDT replacement kit	7MH7723-1DE
Calibration hanger weights	Article No.	Damping fluid, 1 000 CS, 1 lb bottle	7MH7723-1EU
20 g (0.04 lb)	7MH7724-1AC	Damping fluid, 3 000 CS, 1 lb bottle	7MH7723-1EV
50 g (0.1 lb)	7MH7724-1AD	Damping fluid, 5 000 CS, 1 lb bottle	7MH7723-1EW
100 g (0.2 lb)	7MH7724-1AE	Range spring assembly, C2	7MH7723-1EX
200 g (0.4 lb)	7MH7724-1AF	Range spring assembly, C3	7MH7723-1EY
500 g (1.1 lb)	7MH7724-1AG	Range spring assembly, C4	7MH7723-1FA
1 000 g (2.2 lb)	7MH7724-1AH	Range spring assembly, C5	7MH7723-1FB
2 000 g (4.4 lb)	7MH7724-1AJ	Range spring assembly, C6	7MH7723-1FC
5 000 g (11 lb)	7MH7724-1AK	Range spring assembly, C7	7MH7723-1FD
Note: calibration accessories should be ordered as a separate item on the order.		Range spring assembly, C8	7MH7723-1FE
1) For use with Compu Series integrators or when externally mounted LVDT conditioner required.		Range spring assembly, C9	7MH7723-1FF
2) Applicable for mounting options 0 and 1 only.		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, internal to sensing head	7MH7723-1ET
		WFS300 replacement O-ring kit	7MH7723-1DC
		Side mount gasket replacement	7MH7723-1FT

Solid Flowmeters

Sensing heads

SITRANS WFS300 series sensing heads

Selection and ordering data

Article No.

Order code

SITRANS WFS320 Sensing head

Impact solids flowmeter for medium capacity applications. Accuracy is $\pm 1\%$ or better, with capacity up to 300 t/h (330 STPH).

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

Classification

Ordinary Locations/General Purpose (Non-Ex) **1**

CSA/FM Class I, Div. 1, Groups C, D, Class II, Div. 1, Groups E, F, G; **2**

ATEX II 2D Ex tb IIIC T70°C Db, -40°C = Ta = +60°C, IP64;

UKEX II 2D Ex tb IIIC T70°C Db, -40°C = Ta = +60°C, IP64;

ATEX II 3G Ex ec IIC T6 Gc, -40°C = Ta = +60°C, IP64;

UKEX II 3G Ex ec IIC T6 Gc, -40°C = Ta = +60°C, IP64;

IECEX Ex tb IIIC T70°C Db, Ta = -40°C to +60°C, IP64;

IECEX Ex ec IIC T6 Gc, Ta = -40°C to +60°C;

EAC Ex Ex tb IIIC T70°C Db X;

EAC Ex Ex nA IIC T6 Gc X

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 **A**

D1/1 000 Position 2 **B**

D1/1 000 Position 3 **C**

D2/1 000 Position 1 **D**

D2/1 000 Position 2 **E**

D2/1 000 Position 3 **F**

D3/3 000 Position 1 **G**

D3/3 000 Position 2 **H**

D3/3 000 Position 3 **J**

D4/5 000 Position 1 **K**

D4/5 000 Position 2 **L**

D4/5 000 Position 3 **M**

D5/5 000 Position 1 **N**

D5/5 000 Position 2 **P**

D5/5 000 Position 3 **Q**

Gasketing

Silicone **A**

PTFE **D**

Other gasketing available upon request

Coating (process side only)

None, standard aluminum **0**

Epoxy - white/aluminum, external castings only **1**

Other coatings available upon request.

Sensing head mounted LVDT conditioner

None¹⁾ **0**

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

All literature is available to download for free, in a range of languages, at

<https://www.siemens.com/weighing/documentation>

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.

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 **7MH7723-1BQ**

Circuit card, LVDT, conditioner, internal to sensing head **7MH7723-1ET**

WFS320 calibration wheel kit **7MH7723-1KA**

WFS320 replacement o-ring kit **7MH7723-1DD**

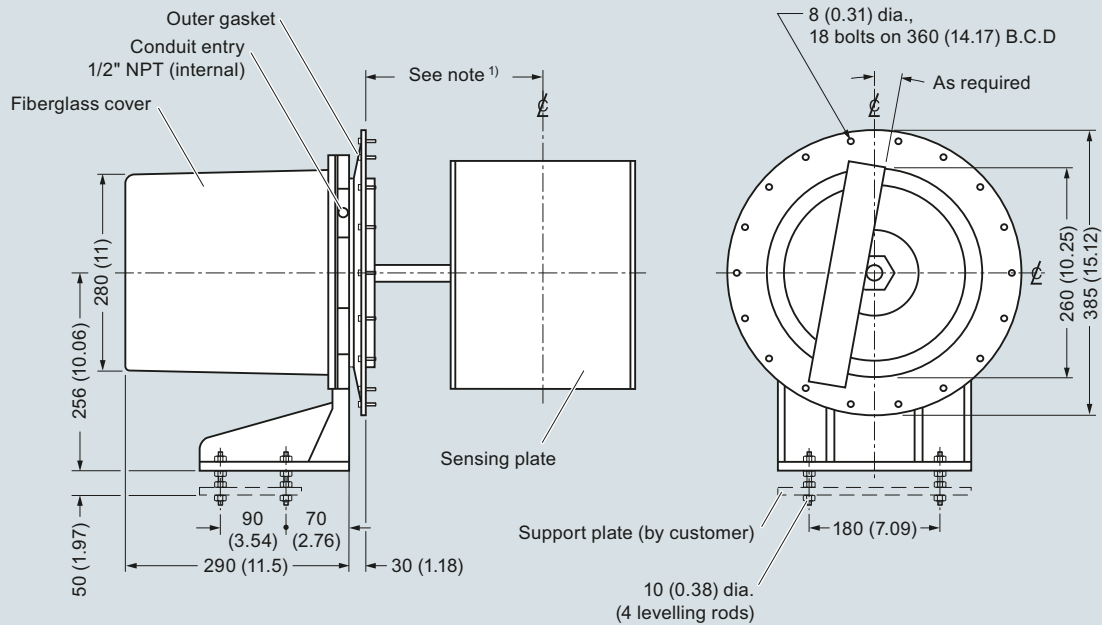
WFS320 Taper Pin, spare **7MH7723-1GD**

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

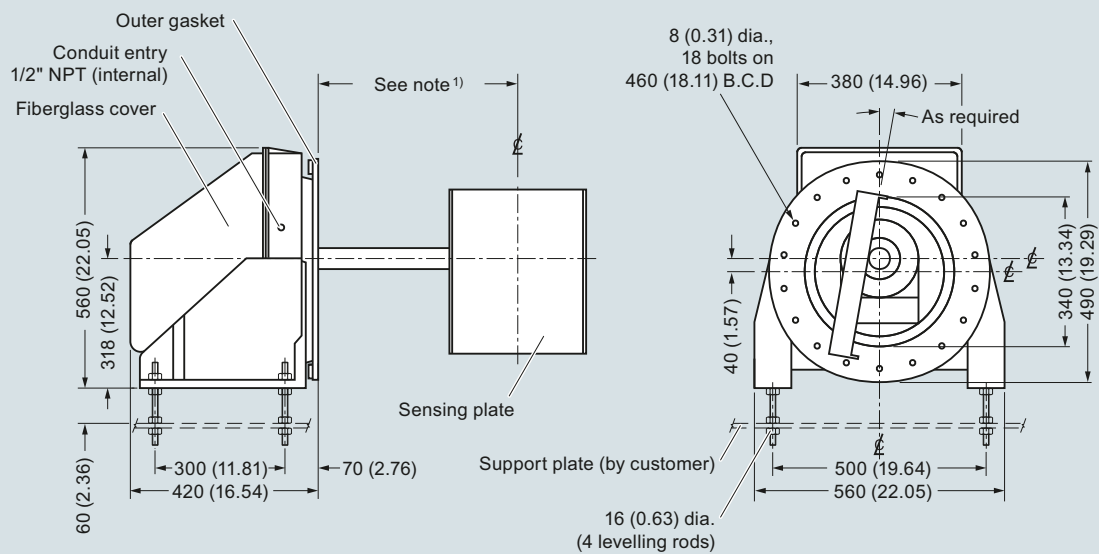
²⁾ Available with classification option 1 only.

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.

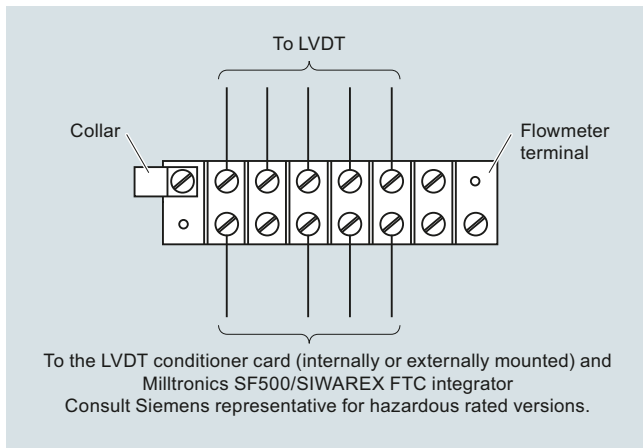
SITRANS WFS300 sensing heads, dimensions in mm (inch)

Solid Flowmeters

Sensing heads

SITRANS WFS300 series sensing heads

Circuit diagrams



SITRANS WFS300 sensing heads connections