Rosemount 8705 Flanged and 8707 High-Signal Flanged Flowtube Sensors Specifications

Functional Specifications

Service

Conductive liquids and slurries

Line Sizes

1/2–36 in. (15–900 mm) for Rosemount 8705

3–36 in. (80–600 mm) for Rosemount 8707

Interchangeability

Rosemount 8705 Flowtube Sensors are interchangeable with 8712D, 8732, and 8742C Transmitters. Rosemount 8707 High-Signal Flowtube Sensors are interchangeable with 8712H High-Signal Transmitters. System accuracy is maintained regardless of line size or optional features. Each flowtube sensor nameplate has a sixteen-digit calibration number that can be entered into a transmitter through the Local Operator Interface (LOI) or the HART Communicator on the 8712D and the 8732E. In a FOUNDATION fieldbus environment, the 8742C can be configured using the DeltaV™ fieldbus configuration tool or another FOUNDATION fieldbus configuration device. No further calibration is necessary.

Upper Range Limit

39 ft/s (12 m/s)

Process Temperature Limits

PTFE Lining
–20 to 350 °F (–29 to 177 °C)

ETFE Lining
–20 to 300 °F (–29 to 149 °C)

PFA Lining
-20 to 350 °F (-29 to 177°C)

Polyurethane Lining
0 to 140 °F (–18 to 60 °C)

Neoprene Lining
0 to 185 °F (–18 to 85 °C)

Linatex Lining
0 to 158 °F (–18 to 70°C)

Ambient Temperature Limits

–30 to 150 °F (–34 to 65 °C)

Pressure Limits

See Table 4 and Table 6

Vacuum Limits

PTFE Lining
Full vacuum to 350 °F (177 °C) through 4-in. (100 mm) line sizes. Consult factory for vacuum applications with line sizes of 6 inches (150 mm) or larger.

All Other Standard Flowtube Sensor Lining Materials
Full vacuum to maximum material temperature limits for all available line sizes.

Submergence Protection

IP68. Continuous submergence to 30 ft. (10 m). Requires conduit entries of the flowtube sensor remote junction box be properly sealed to prevent water ingress. This requires the user to install sealed IP68 approved cable glands, conduit connections, or conduit plugs.

Conductivity Limits

Process liquid must have a conductivity of 5 microsiemens/cm (5 micromhos/cm) or greater for 8705. Process liquid must have a conductivity of 50 microsiemens/cm (50 micromhos/cm) for 8707 when used with 8712H, 5 microsiemens/cm when used with other transmitters. Excludes the effect of interconnecting cable length in remote mount transmitter installations.

TABLE 4. Temperature vs. Pressure Limits[1]

Flowtube Sensor Temperature vs. Pressure Limits for ASME B16.5 Class Flanges (1/2- to 36-in. line sizes) [2]					
		Pressure			
Flange Material	Flange Rating	@ -20 to 100 °F (-29 to 38 °C)	@ 200 °F (93 °C)	@ 300 °F (149 °C)	@ 350 °F (177 °C)
Carbon Steel	Class 150	285 psi	260 psi	230 psi	215 psi
	Class 300	740 psi	675 psi	655 psi	645 psi
	Class 600 [3]	1000 psi	800 psi	700 psi	650 psi
	Class 600 [4]	1480 psi	NA	NA	NA
	Class 900	2220 psi			
304 Stainless Steel	Class 150	275 psi	235 psi	205 psi	190 psi
	Class 300	720 psi	600 psi	530 psi	500 psi
	Class 600 [5]	1000 psi	800 psi	700 psi	650 psi
	Class 600 [6]	1440 psi	NA	NA	NA
	Class 900	2160 psi			

(1) Liner temperature limits must also be considered. Polyurethane, Linatex, and Neoprene have temperature limits of 140 °F (60 °C), 158 °F (70 °C), and 185°F (85 °C), respectively.

(2) 30- and 36-in. AWWA C207 Table 5 Class D rated to 150 psi at atmospheric temperature.

(3) Option Code C6

(4) Option Code C7

(5) Option Code S6

(6) Option Code S7

TABLE 5. Temperature vs. Pressure Limits [1]

Flowtube Sensor Temperature vs. Pressure Limits for AS2129 Table D and E Flanges (4- to 24-in. line sizes)					
		Pressure			
Flange Material	Flange Rating	@ -200 to 50 °F (-320 to 122 °C)	@ 100 °F (212 °C)	@ 150°F (302 °C)	@ 200 °F (392 °C)
Carbon Steel	D	101.6 psi	101.6 psi	101.6 psi	94.3 psi
	E	203.1 psi	203.1 psi	203.1 psi	188.6 psi

(1) Liner temperature limits must also be considered. Polyurethane, Linatex, and Neoprene have temperature limits of 140 °F (60 °C), 158 °F (70 °C), and 185°F (85 °C), respectively.

TABLE 6. Temperature vs. Pressure Limits [1]

Flowtube Sensor Temperature vs. Pressure Limits for DIN Flanges (15 to 600 mm line sizes)					
		Pressure			
Flange Material	Flange Rating	@ -196 to 50 °C (-320 to 122 °F)	@ 100 °C (212 °F)	@ 150°C (302 °F)	@ 175°C (347 °F)
Carbon Steel	PN 10	10 bar	10 bar	9.7 bar	9.5 bar
	PN 16	16 bar	16 bar	15.6 bar	15.3 bar
	PN 25	25 bar	25 bar	24.4 bar	24.0 bar
	PN 40	40 bar	40 bar	39.1 bar	38.5 bar
304 Stainless Steel	PN 10	9.1 bar	7.5 bar	6.8 bar	6.5 bar
	PN 16	14.7 bar	12.1 bar	11.0 bar	10.6 bar
	PN 25	23 bar	18.9 bar	17.2 bar	16.6 bar
	PN 40	36.8 bar	30.3 bar	27.5 bar	26.5 bar

(1) Liner temperature limits must also be considered. Polyurethane, Linatex, and Neoprene have temperature limits of 140°F, 158°F, and 185°F, respectively.

Performance Specifications

(System specifications are given using the frequency output and with the unit at referenced conditions.)

Accuracy

Includes the combined effects of linearity, hysteresis, repeatability, and calibration uncertainty.

Rosemount 8705/8707 with 8732E and 8712D:
Standard system accuracy is ±0.25% of rate ±1.0 mm/sec from 0.04 to 6 ft/s (0.01 to 2 m/s); above 6 ft/s (2 m/s), the system has an accuracy of ±0.25% of rate ±1.5 mm/sec.

Optional high accuracy is ±0.15% of rate ±1.0 mm/sec from 0.04 to 13 ft/s (0.01 to 4 m/s); above 13 ft/s (4 m/s), the system has an accuracy of ±0.18% of rate.(1)

Rosemount 8742C with 8705/8707 Flowtube Sensor:
Standard system accuracy is ±0.3% of rate ±1.0 mm/sec from 0.04 to 39 ft/s (0.01 to 12 m/s).

Optional high accuracy is ±0.2% of rate ±1.0 mm/sec from 0.04 to 39 ft/s (0.01 to 12 m/s)(1).

Rosemount 8707 with 8712H:
System accuracy is ±0.5% of rate from 3 to 30 ft/s (1 to 10 m/s); between 0.04 and 3.0 ft/s (0.01 and 0.3 m/s), the system has an accuracy of ±0.005 ft/s (0.0015 m/s).

Vibration Effect

IEC 60770-1

Mounting Position Effect

None when installed to ensure flowtube sensor remains full

(1) For Flowtube Sensor sizes greater than 12 in. (300 mm) the high accuracy is ±0.25% of rate from 3 to 40 ft/sec (1 to 12 m/sec).

Physical Specifications

Non-Wetted Materials

Flowtube Sensor
AISI Type 304 SST (optional 316L SST)

Flanges
Carbon steel, AISI Type 304/304L SST, or Type 316/316L SST

Housing
Welded steel

Paint
Polyurethane

Process Wetted Materials

Lining
PFA, PTFE, ETFE, polyurethane, neoprene, Linatex

Electrodes
316L SST, Nickel Alloy 276 (UNS N10276), tantalum, 80% platinum-20% iridium, titanium

Process Connections

ASME B16.5 (ANSI) Class 150, Class 300, Class 600, or Class 900
0.5- to 30-in. (Class 150)

0.5- to 24-in. (Class 300)

0.5- to 10-in. (Class 600 derated to 1000 psi max)

1- to 8-in. (Full rated Class 600 and 900)

AWWA C207 Table 3 Class D
30 and 36 in.

EN 1092 (DIN) PN 10, 16, 25, and 40
PN10: Not available for flange sizes from 15 to 150 mm

PN16: Not available for flange sizes from 15 to 80 mm

PN 25: Not available for flange sizes from 15 to 150 mm

PN40: Available for all flange sizes

AS 2129 Table D and E
0.5 to 36 in.

Electrical Connections

Two $^{1}/_{2}$–14 NPT connections with number 8 screw terminals are provided in the terminal enclosure for electrical wiring.

Grounding Electrode

An optional grounding electrode can be installed similarly to the measurement electrodes through the flowtube sensor lining on 8705 flowtube sensors. It is available in all electrode materials.

Grounding Rings

Optional grounding rings can be installed between the flange and the tube face on both ends of the flowtube sensor. Single ground rings can be installed on either end of the flowtube sensor. They have an I.D. slightly smaller than the flowtube sensor I.D. and an external tab to attach ground wiring. Grounding rings are available in 316L SST, Nickel Alloy 276 (UNS N10276), titanium, and tantalum.

Lining Protectors

Optional lining protectors can be installed between the flange and the tube face on both ends of the flowtube sensor. The leading edge of lining material is protected by the lining protector; lining protectors cannot be removed once they are installed. Lining protectors are available in 316L SST, Nickel Alloy 276 (UNS N10276), and titanium.

Dimensions

See Figure 9, Figure 10, and Figure 12 and Table 16, Table 19, and Table 20.

Weight

See Table 7 and Table 8

TABLE 7. Flowtube Sensor Weight (ASME)

Nominal Line Size[1] Inches (mm)	Flowtube Sensor Flange Rating		Flowtube Sensor Weight lb (kg)
	ASME B16.5 (ANSI)	EN 1092-1 (DIN)	
½ (15)	150	PN 40	20 (9)
½ (15)	300		22 (10)
1 (25)	150	PN 40	20 (9)
1 (25)	300		22 (10)
1½ (40)	150	PN 40	22 (10)
1½ (40)	300		24 (11)
2 (50)	150	PN 40	26 (12)
2 (50)	300		28 (13)
3 (80)	150	PN 40	40 (18)
3 (80)	300		47 (21)
4 (100)	150	PN 16	48 (22)
4 (100)	300		65 (30)
6 (150)	150	PN 16	81 (37)
6 (150)	300		93 (42)
8 (200)	150	PN 10	110 (50)
8 (200)	300		162 (74)
10 (250)	150	PN 10	220 (98)
10 (250)	300		300 (136)
12 (300)	150	PN 10	330 (150)
12 (300)	300		435 (197)
14 (350)	150	PN 10	370 (168)
16 (400)	150	PN 10	500 (227)
18 (450)	150	PN 10	600 (272)
20 (500)	150	PN 10	680 (308)
24 (600)	150	PN 10	1,000 (454)
30 (750)	125	-	1,747 (792)
36 (900)	125	-	1,975 (898)

(1) 30- and 36-in. AWWA C207 Table 2 Class D rated to 150 psi at atmospheric temperature.

TABLE 8. Flowtube Sensor weights (AS2129)

Nominal Line Size Inches (mm)	AS2129	Flowtube Sensor Weight lb (kg)
4 (100)	D	33 (15)
4 (100)	E	37 (17)
6 (150)	D	66 (30)
6 (150)	E	71 (32)
8 (200)	D	86 (39)
8 (200)	E	88 (40)
10 (250)	D	187 (85)
10 (250)	E	201 (91)
12 (300)	D	273 (124)
12 (300)	E	284 (129)
14 (350)	D	293 (133)
14 (350)	E	317 (144)
16 (400)	D	386 (175)
16 (400)	E	430 (195)
18 (450)	D	516 (234)
18 (450)	E	569 (258)
20 (500)	D	569 (258)
20 (500)	E	626 (284)
24 (600)	D	855 (388)
24 (600)	E	974 (442)