Level measurement
Continuous level measurement
Ultrasonic transducers

EchoMax XPS

Overview

EchoMax XPS transducers use ultrasonic technology to measure level in a wide range of liquids and solids.

Benefits

- Integral temperature compensation
- Low ringing effect reduces blanking distance
- Optional foam facing for dusty applications
- Self-cleaning and low-maintenance
- Chemically resistant
- Hermetically sealed

Application

XPS transducers can be fully immersed, are resistant to steam and corrosive chemicals, and can be installed without flanges.

The XPS series offers versions for various measuring ranges up to 30 m (100 ft) and up to a max. temperature of 95 °C (203 °F).

During operation, the EchoMax transducers emit acoustic pulses in a narrow beam. The level monitor measures the propagation time between pulse emission and its reflection (echo) to calculate the distance.

4

Technical specifications

Input	XPS-10	XPS-15 (standard and F models)	XPS-30
Measuring range[1]	0.3 ... 10 m (1 ... 33 ft)	Standard: 0.3 ... 15 m (1 ... 50 ft) XPS-15F: 0.45 ... 15 m (1.5 ... 50 ft)	0.6 ... 30 m (2 ... 100 ft)
Output			
Frequency	44 kHz	44 kHz	30 kHz
Beam angle	12°	6°	6°
Environmental			
Location	Indoors/outdoors		
Ambient temperature	-40 ... +95 °C (-40 ... +203 °F)	Standard: -40 ... +95 °C (-40 ... +203 °F) XPS-15F: -20 ... +95 °C (-4 ... +203 °F)	-40 ... +95 °C (-40 ... +203 °F)
Storage temperature	-40 ... +95 °C (-40 ... +203 °F)	Standard: -40 ... +95 °C (-40 ... +203 °F) XPS-15F: -20 ... +95 °C (-4 ... +203 °F)	-40 ... +95 °C (-40 ... +203 °F)
Pollution degree	4		
Pressure	8 bar g (120 psi g) Flanged: 0.5 bar g (7.25 psi g)	8 bar g (120 psi g) Flanged: 0.5 bar g (7.25 psi g)	0.5 bar g (7.25 psi g) Flanged: 0.5 bar g (7.25 psi g)
Design			
Weight	0.8 kg (1.8 lb)	1.3 kg (2.8 lb) Flanged: 2 kg (4.4 lb)	4.3 kg (9.5 lb)
Power supply	Operation of transducer only with approved Siemens controllers		
Material	Standard: PVDF Flanged: PVDF with CPVC flange Option: PTFE face with CPVC flange	Standard: PVDF Flanged: PVDF with CPVC flange Option: PTFE face with CPVC flange	Standard: PVDF Flanged: PVDF with CPVC flange Option: PTFE face with CPVC flange
Color	Blue	Standard: Blue XPS-15F: Gray	Blue
Process connection	1" NPT or 1" BSPT	Standard: 1" NPT or 1" BSPT XPS-15F: 1" NPT	1.5" universal thread (NPT or BSPT)
Degree of protection	IP66/68	IP66/68	IP66/68
Cable	2-wire twisted pair/braided and foil shielded 0.5 mm² (20 AWG) PVC jacket		
Separation	Max. 365 m (1 200 ft)		
Certificates and approvals	Standard: CE, CSA, FM, ATEX, IECEx	Standard: CE, CSA, FM, ATEX, IECEx XPS-15F: FM Class I, Div. 1, Groups A, B, C, and D, Class II Div. 1, Groups E, F, and G, Class III	CE, CSA, FM, ATEX, IECEx

[1] Max range is rated for measurement of liquids, recommended range for solids is 50 % of maximum. Application conditions such as extreme dust or angle of repose may reduce the usable maximum range. Consult a local sales person for more details.

4

Level measurement
Continuous level measurement
Ultrasonic transducers

EchoMax XPS

Selection and ordering data	Article No.
EchoMax XPS-10 Ultrasonic level transducer	**7ML1115-**
Continuous, non-contact, 10 m (32.80 ft), for liquids and solids.	■ ■ ■ ■ 0
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	

Mounting thread and facing	
1" NPT [(Taper), ANSI/ASME B1.20.1]	0
1" NPT [(Taper), ANSI/ASME B1.20.1] with foam facing[1]	1
1" NPT [(Taper), ANSI/ASME B1.20.1] with PTFE facing[2]	2
R 1" [(BSPT), EN 10226]	3
R 1" [(BSPT), EN 10226] with foam facing[1]	4
R 1" [(BSPT), EN 10226] with PTFE facing[2]	5

Cable length	
5 m (16.40 ft)	B
10 m (32.81 ft)	C
30 m (98.43 ft)	E
50 m (164.04 ft)	F
100 m (328.08 ft)	K

Mounting flange	
None	A
3" ASME, 150 lb, flat faced	C
4" ASME, 150 lb, flat faced	D
6" ASME, 150 lb, flat faced	E
8" ASME, 150 lb, flat faced	F
DN 80, PN 10/16, Type A, flat faced	G
DN 100, PN 10/16, Type A, flat faced	J
DN 150, PN 10/16, Type A, flat faced	L
JIS10K3B Style	M
JIS10K4B Style	P
JIS10K6B Style	R
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.)	

Approvals	
ATEX 2GD Ex mb IIC T4 Gb, Ex tb IIIC T135 °C Db; IECEx SIR 13.0009X Ex mb IIC T4 Gb, Ex tb IIIC T135 °C Db; FM Class I, Div. 2, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III	3
CSA Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G, Class III [3]	4

[1] Not available with flanged versions.

[2] Available with flanged versions only.

[3] Valid with mounting thread and facing options 0 ... 2 only.

	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring point number/identification (max. 27 characters) specify in plain text	**Y15**
Operating Instructions	
All literature is available to download for free, in a range of languages, at	
http://www.siemens.com/processinstrumentation/documentation	

Accessories	Article No.
Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors	**7ML1930-1BJ**
Submergence shield kit	**7ML1830-1BH**
Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling	**7ML1830-1AQ**
Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings	**7ML1830-1AX**
Easy Aimer 304, NPT with 1" stainless steel coupling	**7ML1830-1AU**
Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings	**7ML1830-1GN**
Universal box bracket, mounting kit	**7ML1830-1BK**
Channel bracket, wall mount	**7ML1830-1BL**
Extended channel bracket, wall mount	**7ML1830-1BM**
Channel bracket, floor mount	**7ML1830-1BN**
Extended channel bracket, floor mount	**7ML1830-1BP**
Bridge channel bracket, floor mount (see Mounting Brackets on page 4/186 for more information)	**7ML1830-1BQ**
1" NPT locknut, plastic	**7ML1830-1DS**
1" BSP locknut, plastic	**7ML1830-1DR**
1" BSP locknut, flanged, plastic	**7ML1830-1DN**
Plastic adapter 1" BSP - 20 mm	**7ML1830-1EA**
Plastic adapter 1" NPT	**7ML1930-1FX**
Plastic adapter 1" NPT/M20	**7ML1830-1EF**

4

■ Selection and ordering data

	Article No.		Order code

EchoMax XPS-15 Ultrasonic level transducer	**7ML1118-**	
Continuous, non-contact, 15 m (49.21 ft), for liquids and solids.	■ ■ ■ ■ **0**	
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		

Mounting thread and facing		
1" NPT [(Taper), ANSI/ASME B1.20.1]	**0**	
1" NPT [(Taper), ANSI/ASME B1.20.1] with foam facing [1]	**1**	
1" NPT [(Taper), ANSI/ASME B1.20.1] with PTFE facing [2]	**2**	
R 1" [(BSPT), EN 10226]	**3**	
R 1" [(BSPT), EN 10226] with foam facing [1]	**4**	
R 1" [(BSPT), EN 10226] with PTFE facing [2]	**5**	

Cable length		
5 m (16.40 ft)	**B**	
10 m (32.81 ft)	**C**	
30 m (98.43 ft)	**E**	
50 m (164.04 ft)	**F**	
100 m (328.08 ft)	**K**	

Mounting flange		
None	**A**	
6" ASME, 150 lb, flat faced	**D**	
8" ASME, 150 lb, flat faced	**E**	
DN 150, PN 10/16, Type A, flat faced	**J**	
DN 200, PN 10, Type A, flat faced	**K**	
JIS10K 6B	**N**	
JIS10K 8B	**P**	
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.)		

Approvals		
ATEX 2GD Ex mb IIC T4 Gb, Ex tb IIIC T135 °C Db; IECEx SIR 13.0009X Ex mb IIC T4 Gb, Ex tb IIIC T135 °C Db; FM Class I, Div. 2, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III	**3**	
CSA Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G, Class III [3]	**4**	

[1] Not available with flanged versions.

[2] Available with flanged versions only.

[3] Available with mounting options 0 ... 2 only.

Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring point number/ identification (max. 27 characters) specify in plain text	**Y15**

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

http://www.siemens.com/processinstrumentation/documentation

Accessories	Article No.
Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors	**7ML1930-1BJ**
Submergence shield kit	**7ML1830-1BJ**
Universal box bracket, mounting kit	**7ML1830-1BK**
Channel bracket, wall mount	**7ML1830-1BL**
Extended channel bracket, wall mount	**7ML1830-1BM**
Channel bracket, floor mount	**7ML1830-1BN**
Extended channel bracket, floor mount	**7ML1830-1BP**
Bridge channel bracket, floor mount (see Mounting Brackets on page 4/186 for more information)	**7ML1830-1BQ**
1" NPT locknut, plastic	**7ML1830-1DS**
1" BSP locknut, plastic	**7ML1830-1DR**
1" BSP locknut, flanged, plastic	**7ML1830-1DN**
Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling	**7ML1830-1AQ**
Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings	**7ML1830-1AX**
Easy Aimer 304, NPT with 1" stainless steel coupling	**7ML1830-1AU**
Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings	**7ML1830-1GN**
Plastic adapter 1" BSP - 20 mm	**7ML1830-1EA**
Plastic adapter 1" NPT	**7ML1930-1FX**
Plastic adapter 1" NPT/M20	**7ML1830-1EF**

4

Level measurement
Continuous level measurement
Ultrasonic transducers

EchoMax XPS

■ **Selection and ordering data** · **Article No.** · **Order code**

	Article No.
EchoMax XPS-15F Ultrasonic level transducer	7ML1171-
Continuous, non-contact, 15 m (49.21 ft), for liquids and solids.	■ ■ ■ ■ 0
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Mounting thread and facing	
1" NPT [(Taper), ANSI/ASME B1.20.1]	1
Cable length	
5 m (16.40 ft)	B
10 m (32.81 ft)	C
30 m (98.43 ft)	D
50 m (164.04 ft)	E
100 m (328.08 ft)	F
Mounting flange, flush mount	
None	A
6" ASME, 150 lb, flat faced	B
8" ASME, 150 lb, flat faced	C
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2220 standard.)	
Approvals	
FM Class I, Div. 1, Groups A, B, C, and D, Class II Div. 1, Groups E, F, and G, Class III	1

Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring point number/ identification (max. 27 characters) specify in plain text	**Y15**

Operating Instructions

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

http://www.siemens.com/processinstrumentation/documentation

Accessories	Article No.
Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors	**7ML1930-1BJ**
Submergence shield kit	**7ML1830-1BJ**
Universal box bracket, mounting kit	**7ML1830-1BK**
Channel bracket, wall mount	**7ML1830-1BL**
Extended channel bracket, wall mount	**7ML1830-1BM**
Channel bracket, floor mount	**7ML1830-1BN**
Extended channel bracket, floor mount	**7ML1830-1BP**
Bridge channel bracket, floor mount (see Mounting Brackets on page 4/186 for more information)	**7ML1830-1BQ**
1" NPT locknut, plastic	**7ML1830-1DS**
Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling	**7ML1830-1AQ**
Easy Aimer 304, NPT with 1" stainless steel coupling	**7ML1830-1AU**

4

■ Selection and ordering data

	Article No.		Order code

EchoMax XPS-30 Ultrasonic level transducer	**7ML1123-**
Continuous, non-contact, 30 m (98.42 ft) for liquids and solids.	▦ ▦ ▦ ▦ 0
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	

Mounting thread and facing	
1½" universal thread	0
1½" universal thread, foam facing[1]	1
1½" universal thread, PTFE facing[2]	2

Cable length	
5 m (16.40 ft)	B
10 m (32.81 ft)	C
30 m (98.43 ft)	E
50 m (164.04 ft)	F
100 m (328.08 ft)	K

Mounting flange	
None	A
6" ASME, 150 lb, flat faced	D
8" ASME, 150 lb, flat faced	E
DN 150, PN 10/16, Type A, flat faced	J
DN 200, PN 10, Type A, flat faced	K
JIS10K 6B	N
JIS10K 8B	P
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.)	

Approvals	
ATEX 2G 1D Ex mb IIC T4 Gb, Ex ta IIIC T135 °C Da; IECEx SIR 13.0009X Ex mb IIC T4 Gb, Ex ta IIIC T135 °C Da	5

[1] Not available with flanged versions.

[2] Available with flanged versions only.

Further designs

	Order code
Please add "**-Z**" to Article No. and specify Order code(s).	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**

Operating Instructions

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

http://www.siemens.com/processinstrumentation/documentation

Accessories

	Article No.
Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors	**7ML1930-1BJ**
1½" BSPT locknut, plastic	**7ML1830-1DP**
Easy Aimer 2, aluminum, NPT with 1½" galvanized coupling	**7ML1830-1AN**
Easy Aimer 304, NPT with 1½" stainless steel coupling	**7ML1830-1AT**
Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings	**7ML1830-1AX**
Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings	**7ML1830-1GN**
Adapter 1½" BSP	**7ML1830-1EB**

4

Level measurement
Continuous level measurement
Ultrasonic transducers

EchoMax XPS

Selection and ordering data	Article No.		Order code
EchoMax XPS-30C Ultrasonic level transducer	7ML1155-		
Continuous, non-contact, 30 m (98.42 ft) for liquids and solids.	■ ■ ■ ■ 1		
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			

Mounting thread and facing		
1½" universal thread	**0**	
1½" universal thread, foam facing[1]	**1**	
1½" universal thread, PTFE facing[2]	**2**	

Cable length		
5 m (16.40 ft)	**B**	
10 m (32.81 ft)	**C**	
30 m (98.43 ft)	**E**	
50 m (164.04 ft)	**F**	
100 m (328.08 ft)	**K**	

Mounting flange		
None		**A**
6" ASME, 150 lb, flat faced		**D**
8" ASME, 150 lb, flat faced		**E**
DN 150, PN 10/16, Type A, flat faced		**J**
DN 200, PN 10, Type A, flat faced		**K**
JIS10K 6B		**N**
JIS10K 8B		**P**
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.)		

Approvals		
CSA, Class I, Div. 2, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III	**4**	

[1] Not available with flanged version.

[2] Available for flanged versions only.

Further designs

Please add "**-Z**" to Article No. and specify Order code(s).

	Order code
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**

Operating Instructions

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

http://www.siemens.com/processinstrumentation/documentation

Accessories	Article No.
Easy Aimer 2, aluminum, NPT with 1½" galvanized coupling	**7ML1830-1AN**
Easy Aimer 304, NPT with 1½" stainless steel coupling	**7ML1830-1AT**
1½" BSPT locknut, plastic	**7ML1830-1DP**
Adapter 1½" BSP	**7ML1830-1EB**

Dimensional drawings

Standard

Submergence shield

Bonded flange
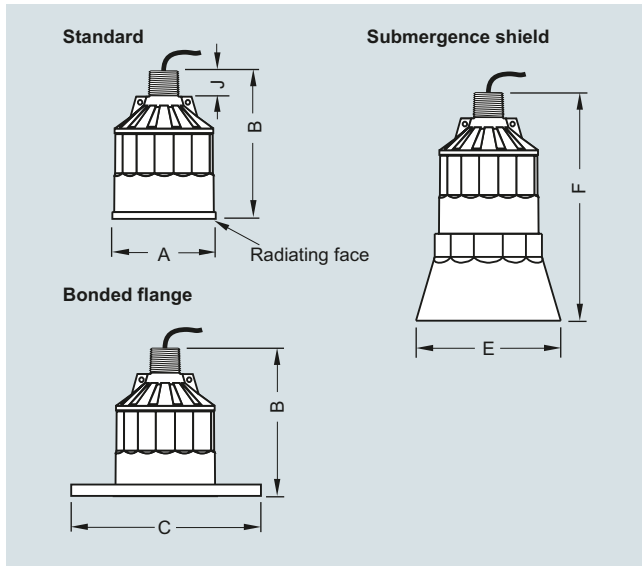
XPS ultrasonic transducer

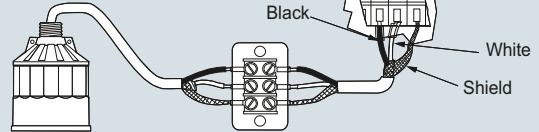| Version			
Dimension	**XPS-10**	**XPS-15**	**XPS-30**
A	88 mm (3.464 inch)	121 mm (4.764 inch)	175 mm (6.890 inch)
B	122 mm (4.803 inch)	132 mm (5.197 inch)	198 mm (7.795 inch)
C	According to ASME, DIN, and JIS		
E	124 mm (4.882 inch)	158 mm (6.220 inch)	n/a
F	152 mm (5.984 inch)	198 mm (7.795 inch)	n/a
J	28 mm (1.1 inch)	28 mm (1.1 inch)	28 mm (1.1 inch)

Circuit diagrams

Direct connection

Black
White
Shield

Coaxial connection

White
Shield

3 terminal direct*

Black
Shield
White
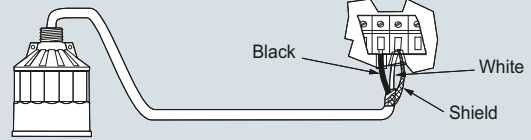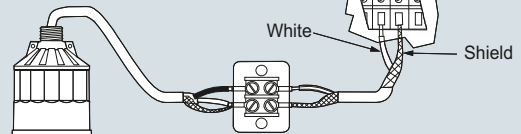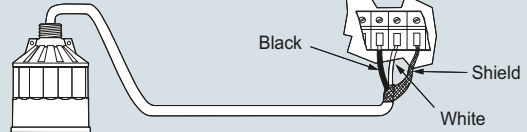
3 terminal extension*

Black
White
Shield

* For SITRANS LUT400, MultiRanger 100/200, HydroRanger 200

Mounting
Make particularly sure that the radiating face of the transducer is protected from damage. Mount the transducer so that it is above the maximum material level by at least the blanking value. On liquid applications, the transducer must be mounted so that the axis of transmission is perpendicular to the liquid surface. On solids applications, an Easy Aimer should be used to facilitate aiming the transducer. Consider the optional temperature sensor when mounting the transducer.

Interconnection
Do not route cable openly or near high voltage or current runs, contactors and SCR control drives. For optimum isolation against electrical noise, run cable separately in a grounded metal conduit. Seal all thread connections to prevent ingress of moisture.

XPS ultrasonic transducer connections

4