

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

The 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.

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Technical specifications










Input	XPS-10	XPS-15 (standard and F models)	XPS-30
Measuring range	0.3 ... 10 m (1 ... 33 ft)	<u>Standard:</u> 0.3 ... 15 m (1 ... 50 ft) <u>Flanged:</u> 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)	<u>XPS-15F:</u> -20 ... +95 °C (-4 ... +203 °F)	
Pollution degree	4		
Pressure	8 bar g (120 psi g) <u>Flanged:</u> 0.5 bar g (7.25 psi g)	8 bar g (120 psi g) <u>Flanged:</u> 0.5 bar g (7.25 psi g)	0.5 bar g (7.25 psi g) <u>Flanged:</u> 0.5 bar g (7.25 psi g)
Design			
Weight	0.8 kg (1.8 lb)	1.3 kg (2.8 lb) <u>Flanged:</u> 2 kg (4.4 lb)	4.3 kg (9.5 lb)
Power supply	Operation of transducer only with approved Siemens Milltronics controllers		
Material	<u>Standard:</u> PVDF <u>Flanged:</u> PVDF with CPVC flange <u>Option:</u> PTFE face with CPVC flange	<u>Standard:</u> PVDF <u>Flanged:</u> PVDF with CPVC flange <u>Option:</u> PTFE face with CPVC flange	<u>Standard:</u> PVDF <u>Flanged:</u> PVDF with CPVC flange <u>Option:</u> PTFE face with CPVC flange
Color	Blue	<u>Standard:</u> Blue <u>XPS-15F:</u> Gray	Blue
Process connection	1" NPT or 1" BSPT	<u>Standard:</u> 1" NPT or 1" BSPT <u>XPS-15F:</u> 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 mm ² (20 AWG) PVC jacket		
Separation	Max. 365 m (1 200 ft)		
Certificates and approvals	<u>Standard:</u> CE ¹⁾ , CSA, FM, ATEX II 2GD	<u>Standard:</u> CE ¹⁾ , CSA, FM, ATEX II 2GD <u>XPS-15F:</u> FM Class I, Div 1, Groups A, B, C, and D, Class II Div 1, Groups E, F, and G, Class III	CE ¹⁾ , CSA, FM, ATEX II 2G 1D

¹⁾ EMC certificate available on request.

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Selection and Ordering data	Article No.	Selection and Ordering data	Order code
EchoMax XPS-10 ultrasonic transducer High-frequency ultrasonic transducer designed for a wide variety of liquid and solid applications, for use with approved controllers. Includes integral temperature sensor. Measuring range: min. 0.3 m, max. 10 m	7ML1115-  0	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
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		Operating Instructions Quick Start guide, multi-language Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	Article No. A5E32282889 7ML1998-5HV61
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		Accessories Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors Submergence shield kit Easy Aimer 2, with ¾" x 1" NPT PVC coupling Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings Easy Aimer 304, with stainless steel coupling Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings Universal box bracket, mounting kit Channel bracket, wall mount Extended channel bracket, wall mount Channel bracket, floor mount Extended channel bracket, floor mount Bridge channel bracket, floor mount (see Mounting Brackets on page 4/188 for more information) 1" NPT locknut, plastic 1" BSPT locknut, plastic	7ML1930-1BJ 7ML1830-1BH 7ML1830-1AQ 7ML1830-1AX 7ML1830-1AU 7ML1830-1GN 7ML1830-1BK 7ML1830-1BL 7ML1830-1BM 7ML1830-1BN 7ML1830-1BP 7ML1830-1BQ 7ML1830-1DS 7ML1830-1DR
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 II 2 GD, FM Class I Div. 2, SAA Class I Zone 1  3 CSA Class I Div. 1 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

 We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 9/5 in the appendix.

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Selection and Ordering data

Article No.

EchoMax XPS-15 ultrasonic transducer

High-frequency ultrasonic transducer designed for a wide variety of liquid and solid applications, for use with approved controllers. Includes integral temperature sensor.

Measuring range: min. 0.3 m, max. 15 m

7ML1118-

0

Mounting thread and facing

1" NPT [(Taper), ANSI/ASME B1.20.1] ◆ 0

1" NPT [(Taper), ANSI/ASME B1.20.1] with foam facing¹⁾ 1

1" NPT [(Taper), ANSI/ASME B1.20.1] with PTFE facing²⁾ 2

R 1" [(BSPT), EN 10226] ◆ 3

R 1" [(BSPT), EN 10226] with foam facing¹⁾ 4

R 1" [(BSPT), EN 10226] with PTFE facing²⁾ 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 II 2GD, FM Class I Div. 2, SAA Class I ◆ 3

CSA Class I Div. 1³⁾ ◆ 4

¹⁾ Not available with flanged versions

²⁾ Available with flanged versions only

³⁾ Available with mounting options 0 ... 2 only

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.

Selection and Ordering data

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)]: ◆ Y15
Measuring point number/ identification (max. 27 characters) specify in plain text

Operating Instructions

Quick Start guide, multi-language

Applications Guidelines, multi-language
Note: The Applications Guidelines should be ordered as a separate line item on the order.

This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.

Accessories

Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors

Submergence shield kit

Universal box bracket, mounting kit

Channel bracket, wall mount

Extended channel bracket, wall mount

Channel bracket, floor mount

Extended channel bracket, floor mount

Bridge channel bracket, floor mount
(see Mounting Brackets on page 4/188 for more information)

1" NPT locknut, plastic

1" BSPT locknut, plastic

Easy Aimer 2, with 3/4" x 1" NPT PVC coupling

Easy Aimer 2, aluminum with M20 adapter and 1" and 1 1/2" BSPT aluminum couplings

Easy Aimer 304 with stainless steel coupling

Easy Aimer 304, with M20 adapter and 1" and 1 1/2" BSPT 304 stainless steel couplings


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Selection and Ordering data	Article No.
EchoMax XPS-15F ultrasonic transducer High-frequency ultrasonic transducer designed for a wide variety of liquid and solid applications, for use with approved controllers. Includes integral temperature sensor. Measuring range: min. 0.3 m, max. 15 m	7ML1171- 
Mounting thread and facing 1" NPT [(Taper), ANSI/ASME B1.20.1]	1
Cable length 5 m (16.40 ft) 10 m (32.81 ft) 30 m (98.43 ft) 50 m (164.04 ft) 100 m (328.08 ft)	B C D E F
Mounting flange, flush mount None 6" ASME, 150 lb, flat faced 8" ASME, 150 lb, flat faced (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2220 standard.)	A B C
Approvals FM Class I Div. 1	1

Selection and Ordering data	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 English Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	Article No. A5E32725813 7ML1998-5HV61
Accessories Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors Submergence shield kit Universal box bracket, mounting kit Channel bracket, wall mount Extended channel bracket, wall mount Channel bracket, floor mount Extended channel bracket, floor mount Bridge channel bracket, floor mount (see Mounting Brackets on page for more information) 1" NPT locknut, plastic Easy Aimer 2, with 3/4" x 1" NPT PVC coupling Easy Aimer 304 with stainless steel coupling	7ML1930-1BJ 7ML1830-1BJ 7ML1830-1BK 7ML1830-1BL 7ML1830-1BM 7ML1830-1BN 7ML1830-1BP 7ML1830-1BQ 7ML1830-1DS 7ML1830-1AQ 7ML1830-1AU

Selection and Ordering data	Article No.
EchoMax XPS-30 ultrasonic transducer High-frequency ultrasonic transducer designed for a wide variety of liquid and solid applications, for use with approved controllers. Includes integral temperature sensor. 1½" universal thread compatible with 1½" NPT and R 1½" [(BSPT), EN 10226] Measuring range: min. 0.6 m (1.97 ft), max. 30 m (98.43 ft)	7ML1123 - 
Mounting thread and facing 1½" universal thread 1½" universal thread, foam facing ¹⁾ 1½" universal thread, PTFE facing ²⁾	0 1 2
Cable length 5 m (16.40 ft) 10 m (32.81 ft) 30 m (98.43 ft) 50 m (164.04 ft) 100 m (328.08 ft)	B C E F K
Mounting flange None 6" ASME, 150 lb, flat faced 8" ASME, 150 lb, flat faced DN 150, PN 10/16, Type A, flat faced DN 200, PN 10, Type A, flat faced JIS10K 6B JIS10K 8B (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.)	A D E J K N P
Approvals ATEX II 2G 1D, FM Class I Div 2, SAA	5

- ¹⁾ Not available with flanged versions
²⁾ Available with flanged versions only

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Selection and Ordering data	Order code
<p>Further designs</p> <p>Please add "-Z" to Article No. and specify Order code(s).</p>	
<p>Acrylic coated, stainless steel tag [13 x 45 mm stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]; measuring-point number/identification (max. 27 characters) specify in plain text</p>	Y15
<p>Operating Instructions</p> <p>Quick Start guide, multi-language</p> <p>Applications Guidelines, multi-language</p> <p>Note: The Applications Guidelines should be ordered as a separate line item on the order.</p> <p>This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.</p>	<p>Article No.</p> <p>A5E32282889</p> <p>7ML1998-5HV61</p>
<p>Accessories</p> <p>Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors</p> <p>1½" BSPT locknut, plastic</p> <p>Easy Aimer 2, 1½" NPT galvanized coupling</p> <p>Easy Aimer 304, NPT with 1½" coupling</p> <p>Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings</p> <p>Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings</p>	<p>7ML1930-1BJ</p> <p>7ML1830-1DP</p> <p>7ML1830-1AN</p> <p>7ML1830-1AT</p> <p>7ML1830-1AX</p> <p>7ML1830-1GN</p>

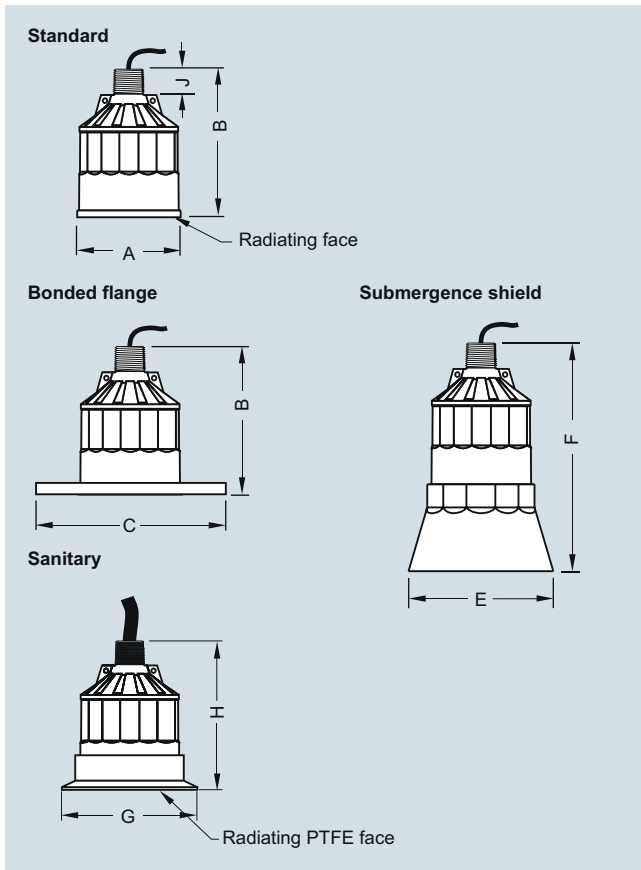
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Dimensional drawings

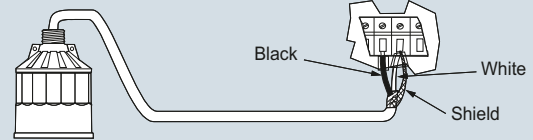


XPS ultrasonic transducer, dimensions in mm (inch)

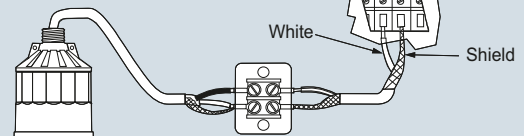
Version	XPS-10	XPS-15	XPS-30
Dimension			
A	88 mm (3.464 inch)	121 mm (4.764 inch)	175 mm (6.890 inch)
B	122 mm (4.803 inch)	132 mm (5.197 inch)	198 mm (7.795 inch)
C	According to ASME, DIN and JIS		
E	124 mm (4.882 inch)	158 mm (6.220 inch)	n/a
F	152 mm (5.984 inch)	198 mm (7.795 inch)	n/a
J	28 mm (1.1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

Schematics

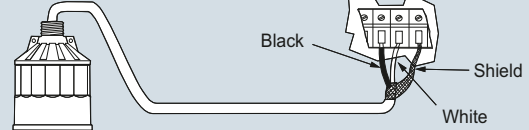
Direct connection



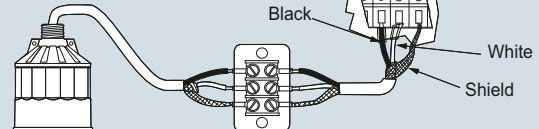
Coaxial connection



3 terminal direct*



3 terminal extension*



* 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, a Milltronics 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