

SITRANS L Level instruments

Continuous measurement - Ultrasonic transducers

Echomax XPS and XCT

Overview



Echomax XPS/XCT 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
- Foam facing for dusty applications
- Self-cleaning and low-maintenance
- Connect using only 2 wires
- Chemically resistant
- FM approved versions available
- Hermetically sealed

Application

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

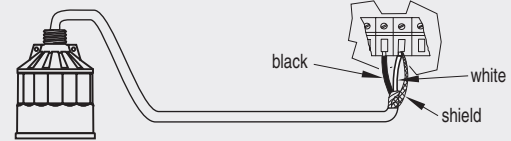
The XPS series offers versions for various measuring ranges up to 40 m (130 ft), and up to a max. temperature of 95 °C (203 °F). Two models have FM Class 1, Div. 1 approvals for applications with a measuring range up to 15 m (50 ft).

The XCT series can be used in applications at higher temperatures to measure level up to a distance of 12 m (40 ft) and at a max. temperature of 145 °C (293 °F).

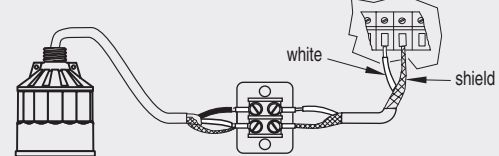
During operation, the Echomax transducers emit acoustic pulses in a narrow beam. The level monitor measures the propagation time between pulse emission and its reflection (echo) to calculate the distance.

Schematics

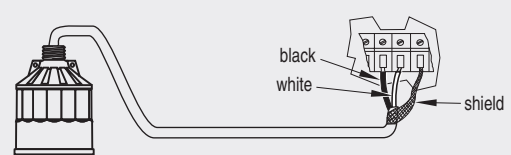
Direct Connection



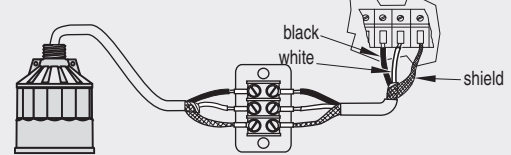
Coaxial Connection



3 Terminal Direct*



3 Terminal Extension*



* For SITRANS LUC500, 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 and XCT ultrasonic sensor connections

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Technical specifications

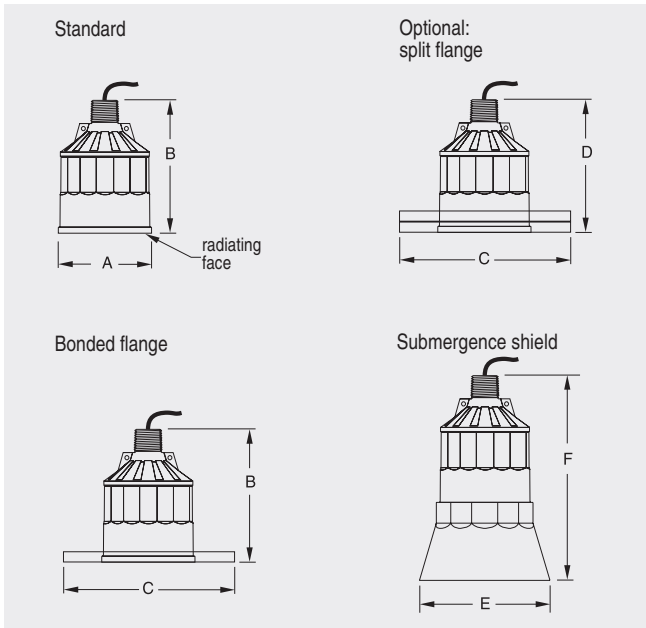
Input	XPS-10 (standard and F models)	XPS-15 (standard and F models)	XPS-30	XPS-40	XCT-8 (standard and sanitary models)	XCT-12
Measuring range	0.3 to 10 m (1 to 33 ft)	Standard: 0.3 to 15 m (1 to 50 ft) F: 0.45 to 15 m (1.5 to 50 ft)	0.6 to 30 m (2 to 100 ft)	0.9 to 40 m (3 to 130 ft)	0.6 to 8 m (2 to 26 ft)	0.6 to 12 m (2 to 40 ft)
Output						
Frequency	44 kHz	44 kHz	30 kHz	22 kHz	44 kHz	44 kHz
Beam angle	12°	6°	6°	6°	12°	6°
Environmental						
Location	Indoors/outdoors					
Ambient temp.	-40 to +95 °C (-40 to 203 °F)				standard: -40 to +145 °C (-40 to 293 °F) sanitary: -40 to +125 °C (-40 to 260 °F)	-40 to +145 °C (-40 to 293 °F)
Pollution degree	4					
Pressure	8 bar (120 psi)	8 bar (120 psi)	0.5 bar (7.3 psi)	0.5 bar (7.3 psi)	4 bar (60 psi): -40 to 138 °C (-40 to 280 °F) 8 bar (120 psi): -40 to 95 °C (-40 to 203 °F)	
Design						
Weight	0.8 kg (1.8 lbs)	1.3 kg (2.8 lbs) F: 2 kg (4.4 lbs)	4.3 kg (9.5 lbs)	8 kg (18 lbs)	0.8 kg (1.7 lbs)	1.3 kg (2.8 lbs)
Power supply	Operation of transducer only with approved Siemens Milltronics controllers					
Material	Standard, F: PVDF Option: PTFE face with flange	Standard, F: PVDF Option: PTFE face with flange	PVDF Option: PTFE face with flange	PVDF	Standard: PVDF Option: PTFE face with universal flange	
Color	Standard: blue F: gray	Standard: blue F: gray	blue	blue	white	
Process connection	Standard: 1" NPT or 1" BSP, F: 1" NPT	Standard: 1" NPT or 1" BSP, F: 1" NPT	1.5" universal thread (NPT or BSP)		1" NPT or 1" BSP	
Cable	2 wire twisted pair/braided and foil shielded 0.5 mm ² (20 AWG) PVC jacket				2 wire twisted pair/braided and foil shielded 0.5 mm ² (20 AWG) silicone jacket	
Separation	Max. 365 m (1200 ft)					
Certificates and approvals	Standard: CE, CSA, FM, ATEX II 2G F: FM Class I, Div 1, Group A, B, C and D, Class II Div 1, Group E, F and G, Class III	Standard: CE, CSA, FM, ATEX II 2G F: FM Class I, Div 1, Group A, B, C and D, Class II Div 1, Group E, F and G, Class III	CE, CSA, FM, ATEX II 2G 1D	CE, CSA, FM, ATEX II 2G 1D	Standard: CE, CSA, FM, ATEX II 2G Sanitary: CSA, 3A	CE, CSA, FM, ATEX II 2G

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Echomax XPS and XCT

Dimensional drawings



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XPS and XCT ultrasonic transducer dimensions

Version				
Dimen.	XPS-10	XPS-15	XPS-30	XPS-40
A	86 mm (3.386")	119 mm (4.685")	173 mm (6.811")	206 mm (8.110")
B	122 mm (4.803")	132 mm (5.197")	198 mm (7.795")	229 mm (9.016")
C	According to ANSI, DIN and JIS			n/a
D	128 mm (5.039")	138 mm (5.433")	204 mm (8.031")	n/a
E	124 mm (4.882")	158 mm (6.220")	n/a	n/a
F	152 mm (5.984")	198 mm (7.795")	n/a	n/a

Version		
Dimen.	XCT-8	XCT-12
A	86 mm (3.386")	119 mm (4.685")
B	122 mm (4.803")	132 mm (5.197")
C	According to ANSI, DIN and JIS	
D	128 mm (5.039")	138 mm (5.433")
E	n/a	n/a
F	n/a	n/a

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Continuous measurement - Ultrasonic transducers

Echomax XPS and XCT Transducers

Ordering data	Order No.
Echomax XPS-10 ultrasonic transducer	C) 7ML1115 -
Two-wire connection, integral temperature sensor, measuring range: min. 0.90 m, max. 30 m	0
Mounting thread and facing	
1" NPT with foam facing, not available with flanged versions	0
1" NPT with PTFE facing, available for flanged versions only	1
1" BSP	2
1" BSP with foam facing, not available with flanged versions	3
1" BSP with PTFE facing, available for flanged versions only	4
Cable length	
5 m	B
10 m	C
30 m	E
50 m	F
100 m	K
Mounting flange	
None	A
3" ANSI, 150 lbs	C
4" ANSI, 150 lbs	D
6" ANSI, 150 lbs	E
8" ANSI, 150 lbs	F
DN 80, PN 10/ 16	G
DN 100, PN 10/ 16	J
DN 150, PN 10/ 16	L
JIS10K3B Style	M
JIS10K4B Style	P
JIS10K6B Style	R
Approvals	
ATEX II 2G, FM Class 1 Div. 2, SAA Class 1 Zone 1	3
CSA Class 1 Div. 1 ¹⁾	4

Ordering data	Order No.
Echomax XPS-10 ultrasonic transducer	C) 7ML1115 -
Two-wire connection, integral temperature sensor, measuring range: min. 0.90 m, max. 30 m	0
Instruction Manual	
Quick Start Manual, multi-language Note: Due to ATEX regulations, one Quick Start Manual is included with every transducer.	C) 7ML1998-5QM82
Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order.	C) 7ML1998-5HV61
Accessories	
Tag, stainless steel with hole, 12 x 45 mm, one text line for fastening on sensors	PBD-45000787
Submergence shield kit	7ML1830-1BH
Easy Aimer II, NPT with 3/4" x 1" PVC coupling	7ML1830-1AQ
Easy Aimer II, Aluminum with M20 adapter and 1" and 1½" BSP aluminum couplings	7ML1830-1AX
Easy Aimer 304, with stainless steel coupling	7ML1830-1AU
Easy Aimer 304, with M20 adapter and 1" and 1½" BSP 304 SS 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 5/97 for more information)	7ML1830-1BQ
1" NPT locknut, plastic	7ML1830-1DS
1" BSP locknut, plastic	7ML1830-1DR
Split Flanges	
3", Aluminum	7ML1830-1AV
3", 304 Stainless Steel	7ML1830-1AW
Gasket Kit 3"	PBD-61007151
4", Aluminum	C) 7ML1830-1BA
4", 304 Stainless Steel	C) 7ML1830-1BB
Gasket Kit 4"	PBD-61007152
6", Aluminum	7ML1830-1BC
6", 304 Stainless Steel	7ML1830-1BD
Gasket Kit 6"	PBD-61007153
Instruction manual	7ML1998-1EP01

1) Valid with mounting thread and facing options 0, 1 and 2 only.

C) Subject to export regulations AL: N, ECCN: EAR99.

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Echomax XPS and XCT Transducers

Ordering data	Order No.
Echomax XPS-15 ultrasonic transducer Two-wire connection, integral temperature sensor, measuring range: min. 0.3 m, max. 15 m	C) 7ML1118-0
Mounting thread and facing 1" NPT 1" NPT with foam facing, not available with flanged versions 1" NPT with PTFE facing, available for flanged versions only 1" BSP 1" BSP with foam facing, not available with flanged versions 1" BSP with PTFE facing, available for flanged versions only	0 1 2 3 4 5
Cable length 5 m 10 m 30 m 50 m 100 m	B C E F K
Mounting flange None 6" ANSI, 150lb 8" ANSI, 150lb DN 150, PN 10/16 DN 200, PN 10/16 JIS10K 6B JIS10K 8B	A D E J K N P
Approvals ATEX II 2G, FM Class 1 Div. 2, SAA Class 1 Zone 1 CSA Class 1 Div. 1	3 4
Instruction Manual Quick Start Manual, multi-language Note: Due to ATEX regulations, one Quick Start Manual is included with every transducer. Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order.	C) 7ML1998-5QM82 C) 7ML1998-5HV61
Accessories Tag, stainless steel with hole, 12 x 45 mm, 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 5/97 for more information) 1" NPT locknut, plastic 1" BSP locknut, plastic Easy Aimer II, with PVC coupling Easy Aimer II, Aluminum with M20 adapter and 1" and 1½" BSP aluminum couplings Easy Aimer 304 with stainless steel coupling Easy Aimer 304, with M20 adapter and 1" and 1½" BSP 304 SS couplings Split Flanges 6" Aluminum Split Flanges 6" Stainless Steel Split Flanges Gasket Kit 6" Split Flanges Instruction manual	PBD-45000787 7ML1830-1BJ 7ML1830-1BK 7ML1830-1BL 7ML1830-1BM 7ML1830-1BN 7ML1830-1BP 7ML1830-1BQ 7ML1830-1DS 7ML1830-1DR 7ML1830-1AQ 7ML1830-1AX 7ML1830-1AU 7ML1830-1GN 7ML1830-1BE 7ML1830-1BF PBD-61007153 7ML1998-1EP01

C) Subject to export regulations AL: N, ECCN: EAR99.

Ordering data	Order No.
Echomax XPS-30 ultrasonic transducer Two-wire connection, integral temperature sensor, measuring range: min. 0.6 m, max. 30 m	C) 7ML1123-0
Mounting thread and facing 1½" BSP/NPT 1½" BSP/NPT, foam facing, not available with flanged versions 1½" BSP/NPT, PTFE facing, available for flanged versions only	0 1 2
Cable length 5 m 10 m 30 m 50 m 100 m	B C E F K
Mounting flange None Flange 6" ANSI Flange 8" ANSI Flange DN 150, PN 10/16 Flange DN 200, PN 10/16 Flange JIS10K 6B Flange JIS10K 8B	A D E J K N P
Approvals ATEX II 2G, FM Class 1 Div 2, SAA ATEX II 2G 1D, FM Class 1 Div 2, SAA	4 5
Instruction Manual Quick Start Manual, multi-language Note: Due to ATEX regulations, one Quick Start Manual is included with every transducer. Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order.	C) 7ML1998-5QM82 C) 7ML1998-5HV61
Accessories Tag, stainless steel with hole, 12 x 45 mm, one text line for fastening on sensors 1½" BSP locknut, plastic Easy Aimer II NPT 1½" Galvanized Easy Aimer II NPT 1½" with Stainless Steel coupling Easy Aimer II, Aluminum with M20 adapter and 1" and 1½" BSP aluminum couplings Easy Aimer 304, with M20 adapter and 1" and 1½" BSP 304 SS couplings	PBD-45000787 7ML1830-1DP 7ML1830-1AN 7ML1830-1AT 7ML1830-1AX 7ML1830-1GN

C) Subject to export regulations AL: N, ECCN: EAR99.

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Echomax XPS and XCT Transducers

Ordering data	Order No.
Echomax XPS-40 ultrasonic transducer Two-wire connection, integral temperature sensor, measuring range: min. 0.9 m, max. 40 m	C) 7ML1127- 0
Mounting thread and facing 1½" BSP/NPT 1½" BSP/NPT, foam facing	0 1 B C E F K
Cable length 5 m 10 m 30 m 50 m 100 m	B C E F K
Mounting flange None	A
Approvals ATEX II 2G, FM Class 1 Div 2, SAA ATEX II 2G 1D, FM Class 1 Div 2, SAA	4 5
Instruction Manual Quick Start Manual, multi-language Note: Due to ATEX regulations, one Quick Start Manual is included with every transducer. Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order.	C) 7ML1998-5QM82 C) 7ML1998-5HV61
Accessories Tag, stainless steel with hole, 12 x 45 mm, one text line for fastening on sensors 1½" BSP locknut, plastic Easy Aimer II NPT 1½" Galvanized Easy Aimer II NPT 1½" with Stainless Steel coupling Easy Aimer II, Aluminum with M20 adapter and 1" and 1½" BSP aluminum couplings Easy Aimer 304, with M20 adapter and 1" and 1½" BSP 304 SS couplings	PBD-45000787 7ML1830-1DP 7ML1830-1AN 7ML1830-1AT 7ML1830-1AX 7ML1830-1GN

C) Subject to export regulations AL: N, ECCN: EAR99.

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Echomax XPS and XCT Transducers

Ordering data	Order No.
Echomax XCT-8 ultrasonic transducer Two-wire connection, integral temperature sensor, measuring range: min. 0.45 m, max. 8 m	C) 7ML1132-0
Mounting thread and facing	
1" NPT	0
1" NPT, PTFE facing (only for flange versions S, T, U and V)	1
1" BSP	2
1" BSP, PTFE facing (only for flange versions S, T, U and V)	3
Cable length	
1 m	A
5 m	B
10 m	C
30 m	E
50 m	F
100 m	K
Mounting flange	
None	A
3" ANSI, 150lb	C
4" ANSI, 150lb	D
6" ANSI, 150lb	E
DN 80, PN 10/16	G
DN 100, PN 10/16	J
DN 150, PN 10/16	L
JIS10K 3B	M
JIS10K 6B	P
JIS10K 4B	R
3" universal ¹⁾	S
4" universal ²⁾	T
6" universal ³⁾	U
4" sanitary flange	V
Approvals	
ATEX II 2G, FM Class 1, Div. 2, SAA	4
CSA Class I Div. 1, available with process connection and facing option 0	5
3A Sanitary (only with 4" sanitary flange, option V)	6

Ordering data	Order No.
Echomax XCT-8 ultrasonic transducer Two-wire connection, integral temperature sensor, measuring range: min. 0.45 m, max. 8 m	C) 7ML1132-0
Instruction Manual	
Quick start manual, multi-language Note: Due to ATEX regulations, one Quick start manual is included with every transducer.	C) 7ML1998-5QM82
XCT-8 with Sanitary Flange, multi-language Note: This manual should be ordered as a separate line item with Mounting Option V.	C) 7ML1998-5HX61
Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order.	C) 7ML1998-5HV61
Accessories	
Tag, stainless steel with hole, 12 x 45 mm, one text line for fastening on sensors	PBD-45000787
Submersible Hood	7ML1830-1BH
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	7ML1830-1BQ
Bridge Channel Bracket, Floor Mount (See Mounting Brackets on page 5/97 for more information)	7ML1830-1BQ
1" NPT locknut, plastic	7ML1830-1DS
1" BSP locknut, plastic	7ML1830-1DR
Easy Aimer 304 with stainless steel coupling	7ML1830-1AU
Split Flanges	
3", Aluminum	7ML1830-1AV
3", 304 Stainless Steel	7ML1830-1AW
Gasket Kit 3"	PBD-61007151
4", Aluminum	C) 7ML1830-1BA
4", 304 Stainless Steel	C) 7ML1830-1BB
Gasket Kit 4"	PBD-61007152
6", Aluminum	7ML1830-1BC
6", 304 Stainless Steel	7ML1830-1BD
Gasket Kit 6"	PBD-61007153
Instruction manual	7ML1998-1EP01

C) Subject to export regulations AL: N, ECCN: EAR99.

1) Universal fits 3" ANSI, DN80, JIS 10K3B style

2) Universal fits 4" ANSI, DN100, JIS 10K4B style

3) Universal fits 6" ANSI, DN150, JIS 10K6B style

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Echomax XPS and XCT Transducers

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Ordering data	Order No.
Echomax XCT-12 ultrasonic transducer Two-wire connection, integral temperature sensor, measuring range: min. 0.45 m, max. 12 m	C) 7ML1136-0
Mounting thread and facing 1" NPT 1" NPT, PTFE facing, available for flange options U only 1" BSP 1" BSP, PTFE facing, available for flange options U only	0 1 2 3
Cable length 1 m 5 m 10 m 30 m 50 m 100 m	A B C E F K
Mounting flange None 6" ANSI, 150 lbs 8" ANSI, 150 lbs DN 150, PN 10/16 DN 200, PN 10/16 JIS10K 6B JIS10K 8B 6" universal for 6" ANSI, DIN 150, or JIS 10K6B style)	A D E J K N P U
Approvals ATEX II 2G, FM Class 1, Div.2, SAA CSA Class 1, Div. 1, available with process connection and facing option 0 or 2 only	3 4
Instruction Manual Quick Start Manual, multi-language Note: Due to ATEX regulations, one Quick Start Manual is included with every transducer. Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order.	C) 7ML1998-5QM82 C) 7ML1998-5HV61
Accessories Tag, stainless steel with hole, 12 x 45 mm, 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 5/97 for more information) 1" NPT locknut, plastic 1" BSP locknut, plastic Easy Aimer 304 with stainless steel coupling Easy Aimer II, Aluminum with M20 adapter and 1" and 1½" BSP aluminum couplings Easy Aimer 304, with M20 adapter and 1" and 1½" BSP 304 SS couplings Split Flanges 6" Aluminum Split Flanges 6" Stainless Steel Split Flanges Gasket Kit 6" Split Flanges Instruction manual	PBD-45000787 7ML1830-1BJ 7ML1830-1BK 7ML1830-1BL 7ML1830-1BM 7ML1830-1BN 7ML1830-1BP 7ML1830-1BQ 7ML1830-1DS 7ML1830-1DR 7ML1830-1AU 7ML1830-1AX 7ML1830-1GN 7ML1830-1BE C) 7ML1830-1BF PBD-61007153 7ML1998-1EP01

C) Subject to export regulations AL: N, ECCN: EAR99.
 Refer to page 5/96 for split flanges for XCT-12/XPS-15 transducers.