

ECHOTEL® 960 AS-INTERFACE®

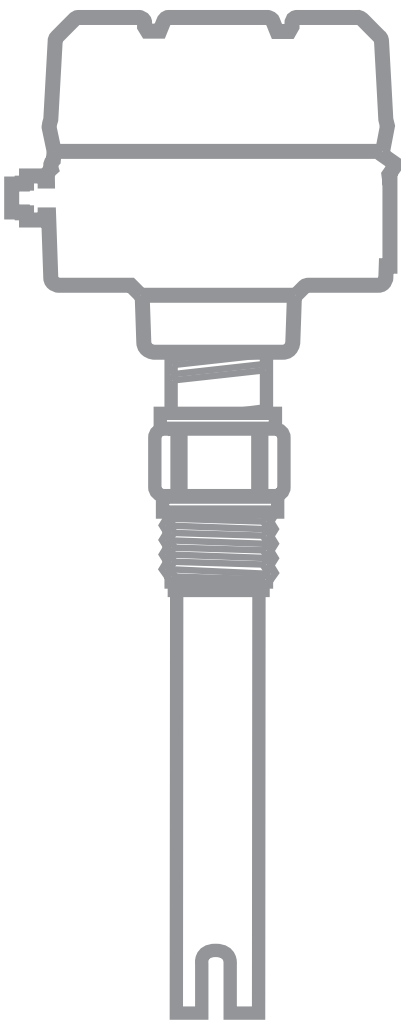


Installation and Operating Manual

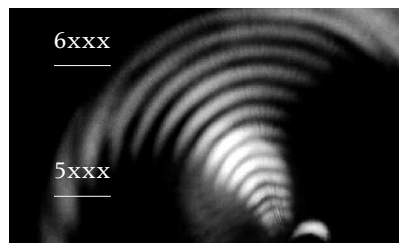
Ultrasonic

Contact

Level Switch



7xxx



6xxx

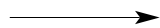
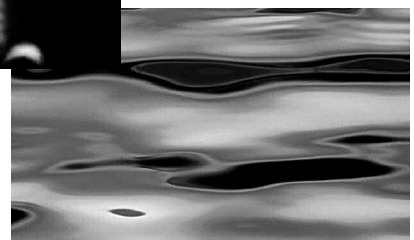
5xxx

4xxx

3xxx

2xxx

1xxx



Magnetrol®

UNPACKING

Unpack the instrument carefully. Make sure all components have been removed from the foam protection. Inspect all components for damage. Report any concealed damage to the carrier within 24 hours. Check the contents of the carton/crates against the packing slip and report any discrepancies to Magnetrol. Check the nameplate model number (Model number/approvals as per inserted separate sheet) to be sure it agrees with the packing slip and purchase order. Check and record the serial number for future reference when ordering parts.

Nameplate:
- part number
- serial n°



These units are in compliance with:

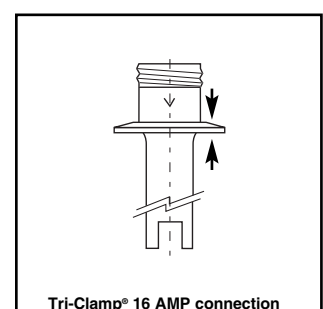
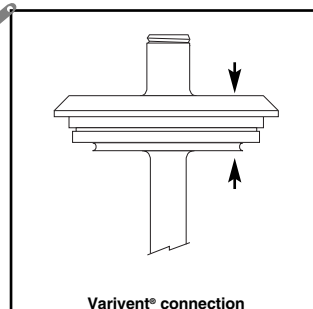
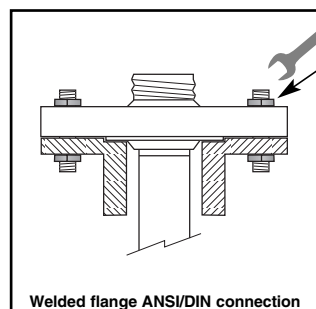
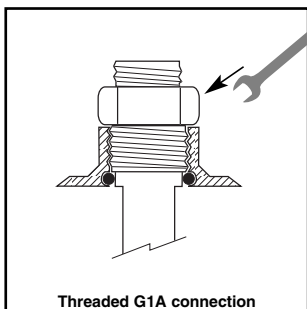
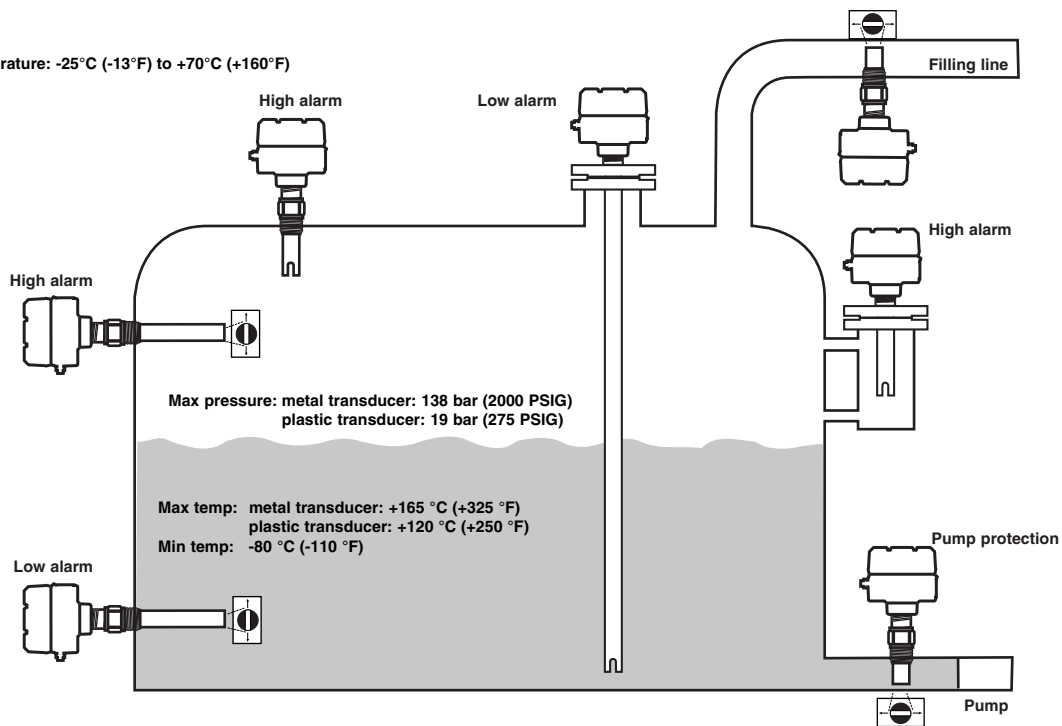
1. The EMC directive 89/336/EEC. The units have been tested to EN 61326.
2. Directive 94/9/EC (ATEX 95A) for equipment or protective system intended for use in potentially explosive atmospheres. EC-type examination certificate ISSep06ATEX008 - explosion proof.



3. The PED Directive 97/23/EC (pressure equipment directive). Safety accessories per category IV module H1.

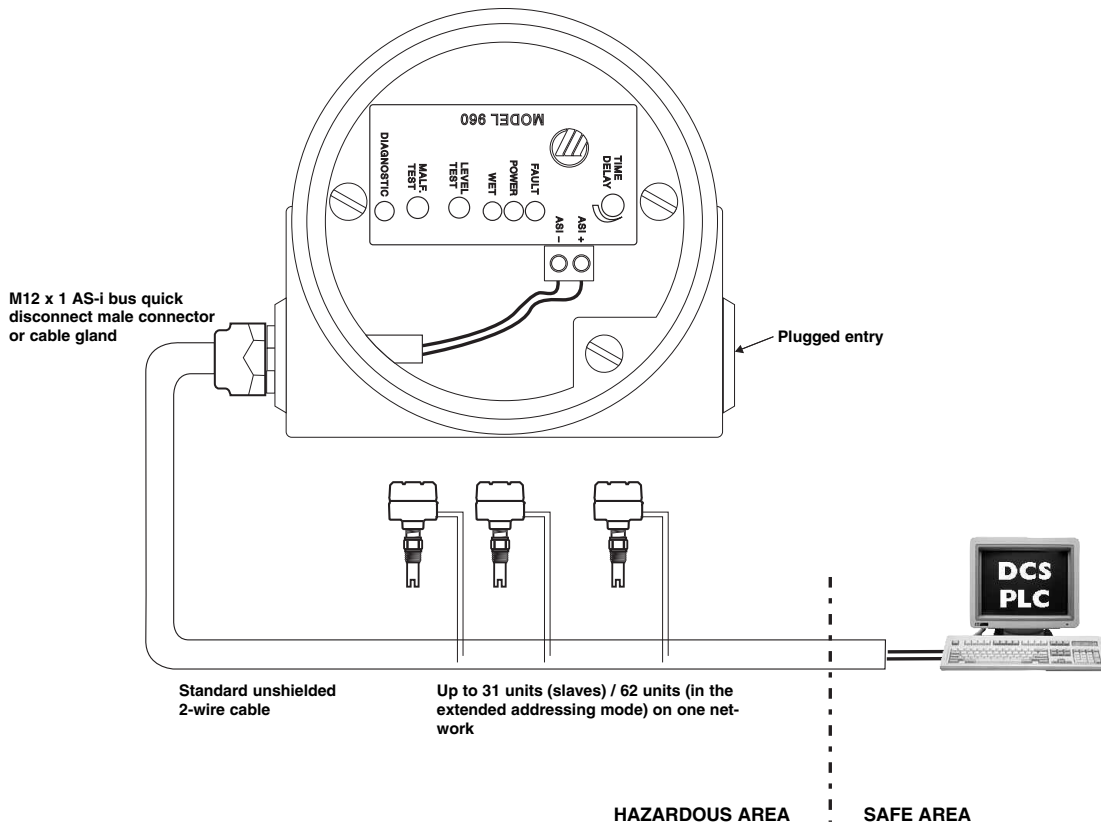
MOUNTING

Ambient temperature: -25°C (-13°F) to +70°C (+160°F)



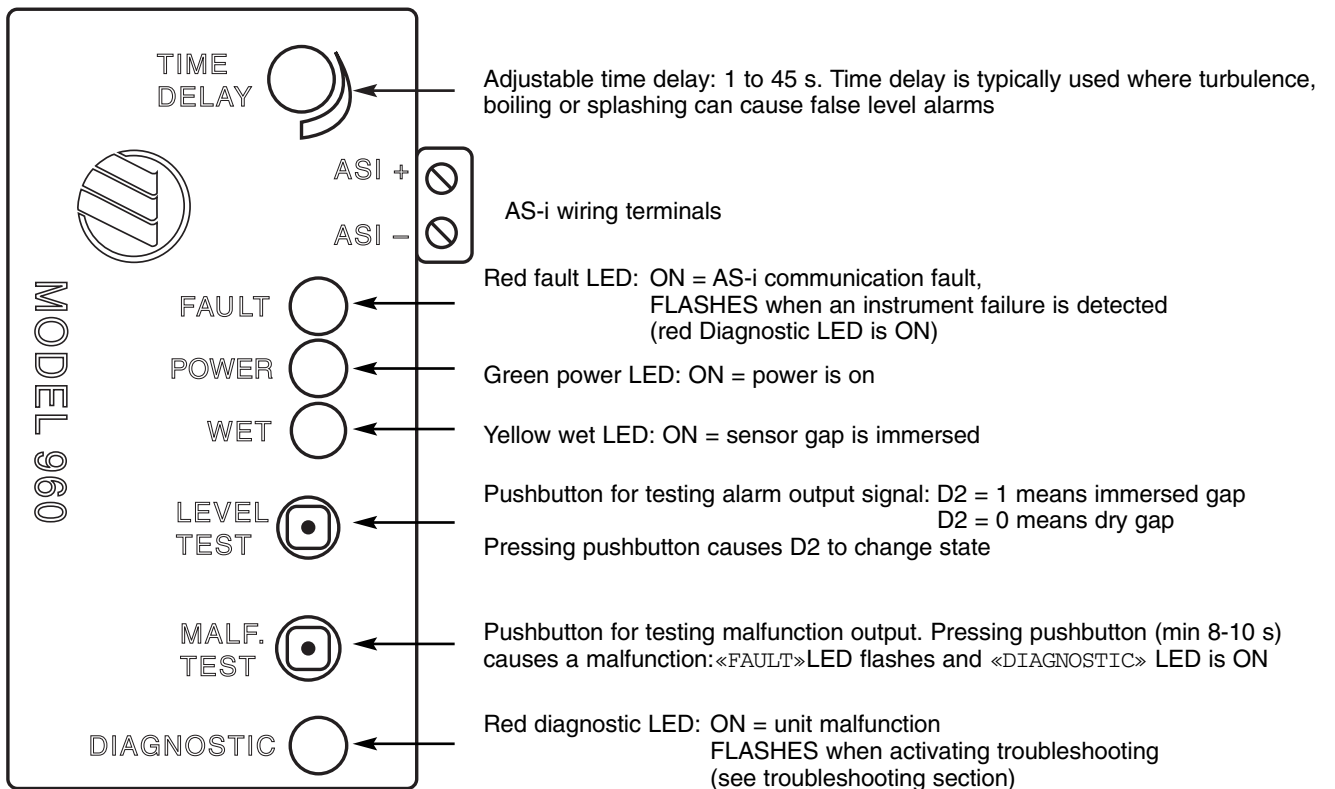
WIRING

Echotel® 960 electronics



Important: In extended addressing mode, the A or B channel select must be programmed as well. Model 960 units are factory configured as unassigned slaves with the address defaulted to 0. The address must be changed by the end user via programming at the PLC or with special handheld addressing devices.

USER INTERFACE



Manual Testing

Level Test:

Pressing the "Level Test" pushbutton, will manually test the AS-i output. The level test forces the D2 output and corresponding LED's from "1" (wet gap) to "0" (dry gap) data bits or vice versa. The time delay setting is not active during testing.

Fault Test

Pressing the "Fault Test" pushbutton for min 2 s, will manually test the fault output. The fault test simulates a circuit failure and forces the D3 output to "1" data bits. The time delay setting is not active during testing.

Troubleshooting

Problem	Action/Indication	Solution
No power	No LED's are ON	Check wiring / input power Check for malfunction. See below
No change in output between wet gap / dry gap	Gap may be plugged by solids / dense foam	Clean the transducer
	Gap is out of reach of liquid	Check mounting section on page 2 and relocate the unit or check blocking valves.
Chattering output	Excessive aeration / Turbulence	Introduce a time delay
		Check input power
		Relocate the switch
Fault LED FLASHES Diagnostic LED is OFF	A system fault has been detected	Check input power
	Press «Level Test» pushbutton to identify the problem:	
	* --- * : 1 flash (red LED)	Check wiring between transducer and electronics or replace transducer.
	** --- ** : 2 flashes (red LED)	Replace electronics
*** --- *** : 3 flashes (red LED)	The unit senses excessive noise interference. Check shield connection or eliminate interference from a walkie-talkie, radio, mechanical vibration from a nearby source	

REPLACEMENT PARTS

Replacing electronics/transducer

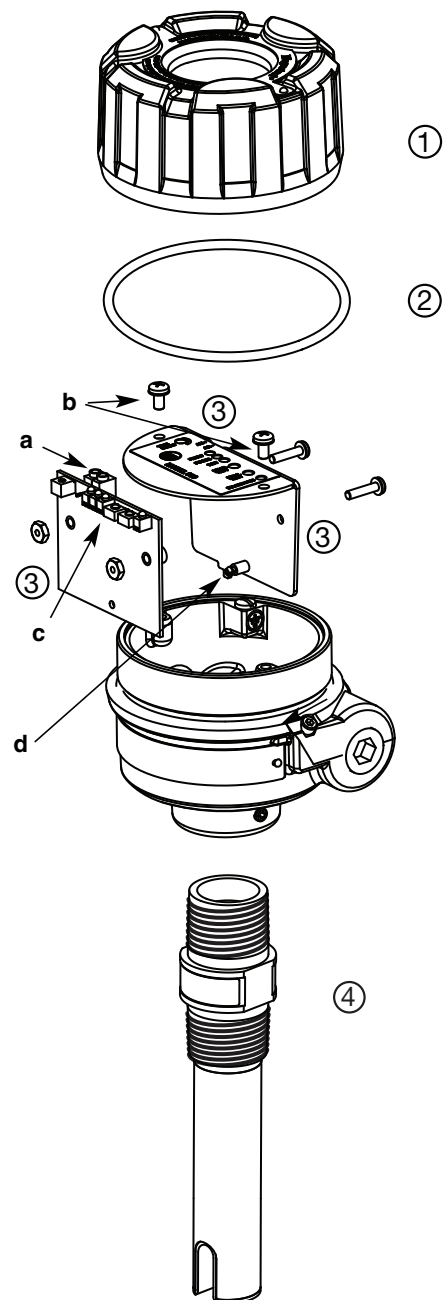
Echotel electronics can be removed in the field under process conditions. Follow below steps to exchange electronics/transducer:

Note: Adjust set up of the replacing electronics following the settings of the old electronics (see configuration section)

1. Disconnect power before removing the housing cover
2. Remove power/output wires (a)
3. Remove the 2 bracket screws and slide out electronics (b)
4. Remove the transducer wires (c)
5. Re-assemble following the same procedure in opposite way. Make sure that the tip on the bracket of the electronic block is seated properly in the corresponding recess in the housing base - (d)

Replacement parts

No.	Description	Part Number
1	Cast aluminium cover Blind	004-9192-009
	With window	036-4410-010
	Deep drawn stainless steel cover Blind	036-5702-003
	With window	036-5702-002
2	"O"-Ring	012-2201-237
3	Electronic module	089-7255-001
4	Transducer	See model identification



MODEL IDENTIFICATION

A complete measuring system consists of:

1. Echotel 960 electronics
2. Echotel 9M1 transducer
3. M12 x 1, AS-i quick disconnect male connector part n° for 960 electronics: **037-7916-001**

1. Code for Echotel 960 electronics

BASIC MODEL NUMBER

9	6	0	Echotel 960 electronics with AS-i bus communication
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INPUT POWER

5	8	A	2-wire loop powered with current shift output
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ACCESSORIES

0	Blind housing cover
1	Housing cover with glass window (for aluminium housings only)

MOUNTING

0	Integral mount electronics
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APPROVALS

Units with aluminium housing

3	ATEX II 1 G EEx ia IIC T5, intrinsically safe (except deep drawn SST housing)	
1	Non flammable area	
C	ATEX II 1/2 G EEx d IIC T6, explosion proof	

Units with stainless steel housing

7	Non flammable area	for all outputs
E	ATEX II 3 G EEx n II T6, non sparking	for AS-i bus

HOUSING / CABLE ENTRY

1	Cast aluminium housing with M20 x 1,5 cable entry (2 entries – one plugged)
0	Cast aluminium housing with 3/4" NPT cable entry (2 entries – one plugged)
5	Deep drawn steel with M20 cable entry (2 entries – one plugged)
4	Deep drawn steel with 1/2"NPT cable entry (2 entries – one plugged)

9	6	0
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5	8	A
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0		
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complete Code for Echotel 960 electronics

MODEL IDENTIFICATION

2. Code for Echotel 961 transducer

BASIC MODEL NUMBER

9 M 1	Echotel 961 transducer with single setpoint
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TRANSDUCER MATERIALS (use only metal transducers for hazardous area)

A	316/316 L (1.4401/1.4404) stainless steel ^①
B	Hastelloy C (2.4819)
C	Monel (2.4360)
P	CPVC
R	Kynar (PVDF)
S	316/316L (1.4401/1.4404) with 0,5 µm (Ra 20) hygienic finish

^① Low temperature sensor (min -80 °C) is only available in 316/316L SST for 961 units

PROCESS CONNECTION

Threaded (Plastic transducers are only available with 3/4" NPT connection)

1	1	threaded 3/4" NPT connection
2	1	threaded 1" NPT connection
2	P	threaded G1A connection, compatible with hygienic weld flange

ANSI RF Flanges

2	3	1"	150 lbs	Raised face
2	4	1"	300 lbs	Raised face
2	5	1"	600 lbs	Raised face
3	3	1 1/2"	150 lbs	Raised face
3	4	1 1/2"	300 lbs	Raised face
3	5	1 1/2"	600 lbs	Raised face
4	3	2"	150 lbs	Raised face
4	4	2"	300 lbs	Raised face
4	5	2"	600 lbs	Raised face

CPVC flanges for CPVC transducers.
Kynar clad SST flanges for Kynar transducers
Use only 150 lbs / PN 16 order codes for plastic transducers

EN/DIN Flanges

B	A	DN 25	PN 16	EN 1092-1 Type A
B	B	DN 25	PN 25/40	EN 1092-1 Type A
B	C	DN 25	PN 63/100	EN 1092-1 Type B2
C	A	DN 40	PN 16	EN 1092-1 Type A
C	B	DN 40	PN 25/40	EN 1092-1 Type A
C	C	DN 40	PN 63/100	EN 1092-1 Type B2
D	A	DN 50	PN 16	EN 1092-1 Type A
D	B	DN 50	PN 25/40	EN 1092-1 Type A
D	D	DN 50	PN 63	EN 1092-1 Type B2
D	E	DN 50	PN 100	EN 1092-1 Type B2

Hygienic (use only in combination with hygienic transducer material code "S")

3	T	1" / 1 1/2" Tri-Clamp® 16 AMP fitting
4	T	2" Tri-Clamp® 16 AMP fitting
V	V	DN 65 Varivent® flange

SENSOR TYPE

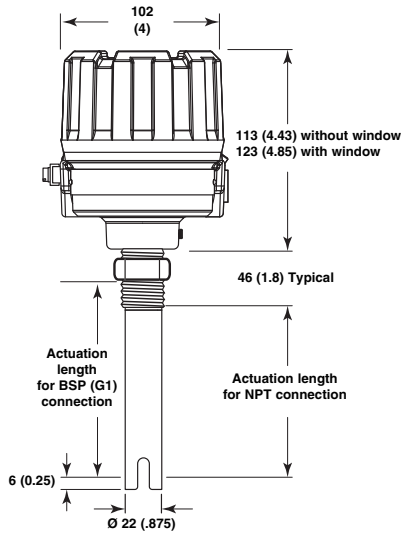
A	Standard sensor: min -40 °C / max +165 °C (-40 °F / +325 °F)
C	Low temperature sensor: min -80 °C / max +105 °C (-110 °F / +220 °F) – only for 961 with 316/316L sensor

ACTUATION LENGTH – specify in cm (per 0.39") increments
Total insertion length = actuation length + 6 mm (0.25")

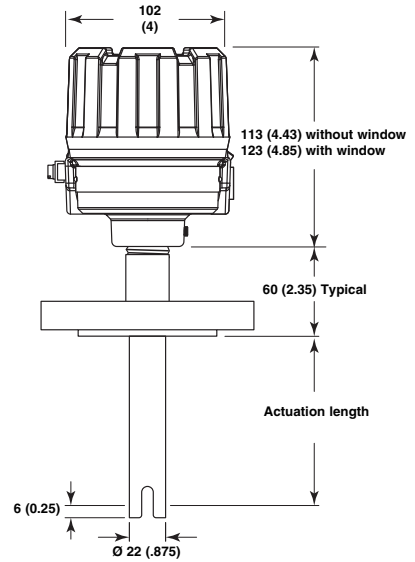
0	0	3	Min 30 mm (1.2")
0	0	4	Min 40 mm (1.5") - for 1" BSP (G1) / flanged and hygienic units
3	3	0	Max 3300 mm (130")

9	M	1						
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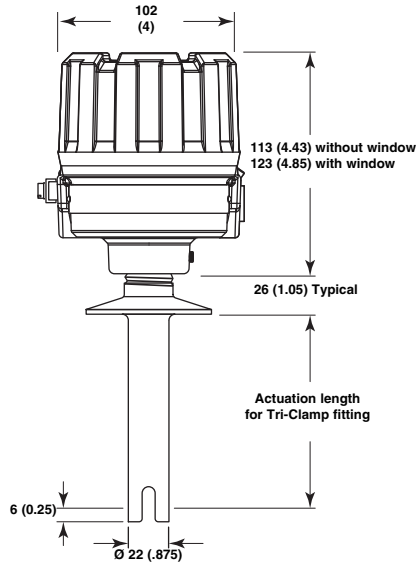
complete code for Echotel 961 transducer



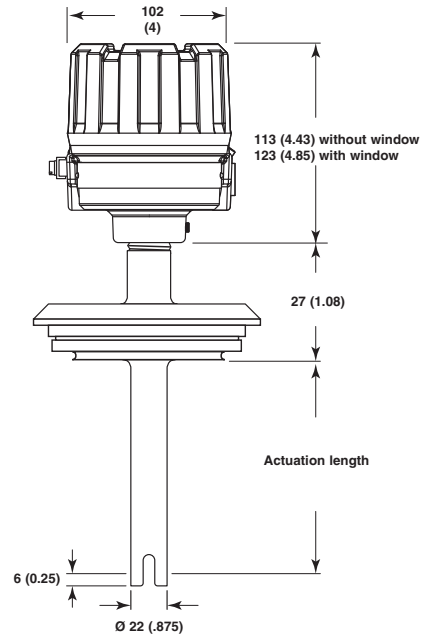
Threaded connection



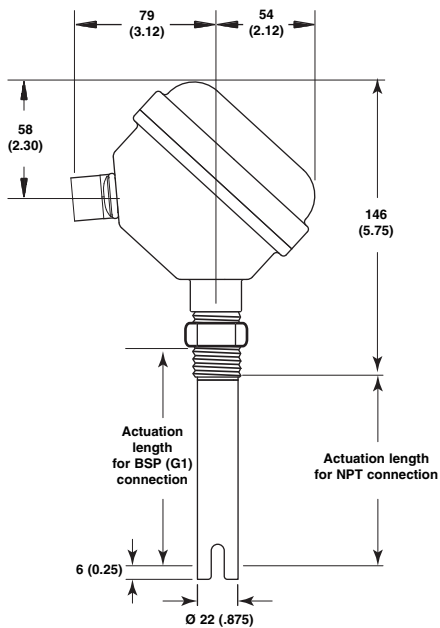
Flanged connection



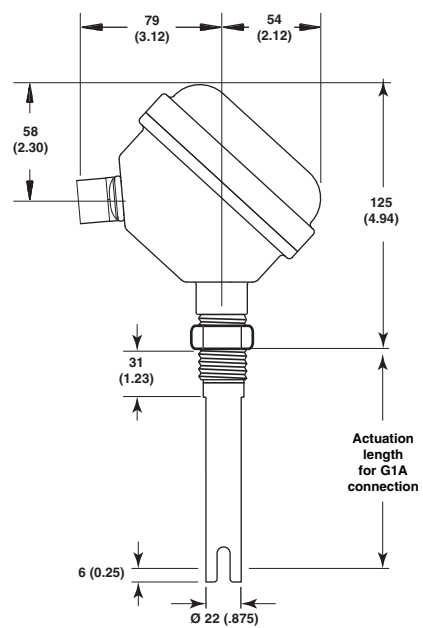
Tri-Clamp® 16 AMP fitting



Varivent flange



Threaded connection



Threaded G1A connection

SPECIFICATIONS

Physical/Functional specifications

Description		Specification
Input Voltage		21 - 31 V DC (2-wire)
Power Consumption		< 1 Watt
Signal Output		D2 = "1" with a wet gap / "0" with a dry gap D3 = "1" during malfunction / "0" during normal operation
Indication		LED's for process alarm status, malfunction (error of transducer, electronics or electrical noise interference) and wet/dry status of transducer
Selftest	Automatic	Continuously verifies electronics, transducer and noise interference
	Manual	Via pushbutton for checking alarm output and error output/function.
Housing material		IP66, cast aluminium or deep drawn 304 stainless steel
Approvals ^①		ATEX, II 3 G, EEx n II T6, non sparking ATEX, II 1/2 G, EEx d IIC T6, explosion proof (units with metal transducers) EHEDG certification (per TNO report # V4772/01) AS-i: tested to EN 50295 and IEC 62026-2 (AS-i test certificate #76401) FM/CSA, non incandive and explosion proof Overfill prevention TÜV - WHG § 19 / VLAREM II 5.17.7
Shock/Vibration		ANSI/ISA-S71.03 Class SA1 (shock), ANSI/ISA-S71.03 Class VC2 (vibration)
Net Weight		1.5 kg (3 lbs) with 50 mm (2") transducer
AS-i bus specifications	AS-i version	V3.0
	Slave type	A/B (maximum of 62 nodes)
	Slave profile	S-0.A.E.
	Connectable load	EN 50295 and IEC 62026-2

^① Only available with cast aluminium or cast stainless steel housings.

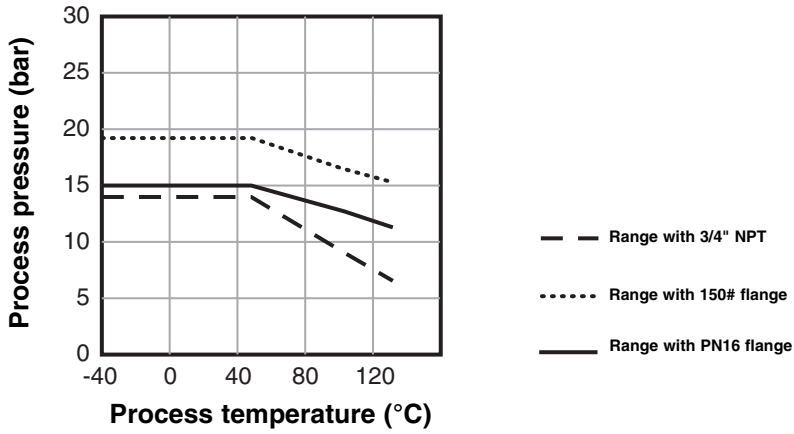
Performance specifications

Description	Specification
Response time	0,5 s typical
Repeatability	± 2 mm (0.078")
Ambient Temperature	-25 °C up to +70 °C (-13 °F to +160 °F)
Humidity	0-99 %, non condensing
Electromagnetic Compatibility	Meets CE requirements (EN 61326)

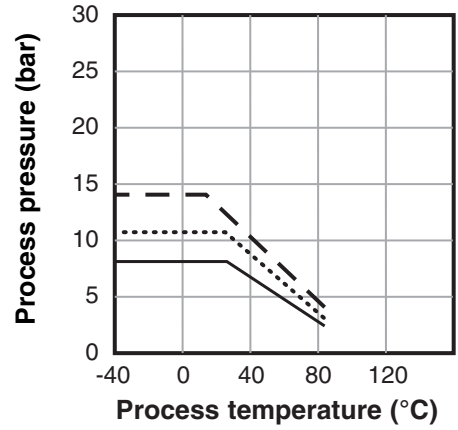
Transducers specifications

Description	Plastic transducers	Metal transducers
Transducer materials	CPVC Kynar® (PVDF)	316/316L SST (1.4401/1.4404) Hastelloy® C (2.4819) Monel® (2.4360)
Mounting	Threaded (NPT) – Flanged (ANSI - EN/DIN)	
Actuation length	From 50 mm up to 3300 mm (2" up to 130")	From 30 mm up to 3300 mm (1" up to 130")
Max process temp. (consult temp/press. graphs)	-40 °C up to 120 °C (-40 °F up to 250 °F) – PVDF -40 °C up to 80 °C (-40 °F up to 180 °F) – CPVC	-40 °C up to 165 °C (-40 °F up to 325 °F) -80 °C up to +105 °C (-110 °F up to +220 °F) – 316/316L SST
Max pressure (consult temp/press. graphs)	14 bar @ +40 °C (200 psi @ +100 °F) for NPT threaded units	138 bar (2000 psi): ≤ 5 cm transducers – except Monel 103 bar (1500 psi): > 5 cm transducers – except Monel 83 bar (1200 psi) for Monel transducers
	Flanged models are downrated to the design pressure of the selected flange	
Max viscosity	10.000 cP	

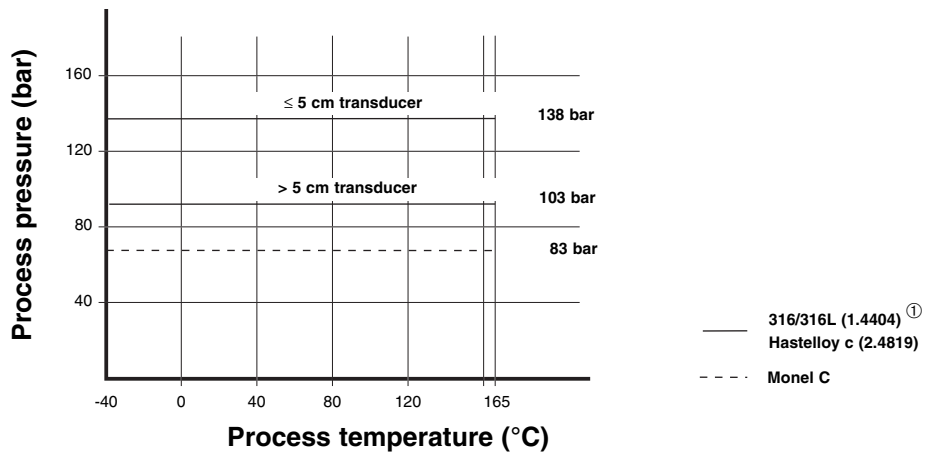
Kynar Transducer Ratings



CPVC Transducer Ratings



Metal Transducer Ratings



① For low temperature sensor: from -80 °C up to +105 °C

IMPORTANT

SERVICE POLICY

Owners of Magnetrol products may request the return of a control; or, any part of a control for complete rebuilding or replacement. They will be rebuilt or replaced promptly. Magnetrol International will repair or replace the control, at no cost to the purchaser, (or owner) **other than transportation cost** if:

- a. Returned within the warranty period; and,
- b. The factory inspection finds the cause of the malfunction to be defective material or workmanship.

If the trouble is the result of conditions beyond our control; or, is **NOT** covered by the warranty, there will be charges for labour and the parts required to rebuild or replace the equipment.

In some cases, it may be expedient to ship replacement parts; or, in extreme cases a complete new control, to replace the original equipment before it is returned. If this is desired, notify the factory of both the model and serial numbers of the control to be replaced. In such cases, credit for the materials returned, will be determined on the basis of the applicability of our warranty.

No claims for misapplication, labour, direct or consequential damage will be allowed.

RETURNED MATERIAL PROCEDURE

So that we may efficiently process any materials that are returned, it is essential that a "Return Material Authorisation" (RMA) form will be obtained from the factory. It is mandatory that this form will be attached to each material returned. This form is available through Magnetrol's local representative or by contacting the factory. Please supply the following information:

1. Purchaser Name
2. Description of Material
3. Serial Number and Ref Number
4. Desired Action
5. Reason for Return
6. Process details

Any unit that was used in a process must be properly cleaned in accordance with the proper health and safety standards applicable by the owner, before it is returned to the factory.

A material Safety Data Sheet (MSDS) must be attached at the outside of the transport crate or box.

All shipments returned to the factory must be by prepaid transportation. Magnetrol **will not accept** collect shipments.

All replacements will be shipped FOB factory.

BULLETIN N°: BE 51-632.0
EFFECTIVE: JULY 2007
SUPERSEDES: New

UNDER RESERVE OF MODIFICATIONS



www.magnetrol.com

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