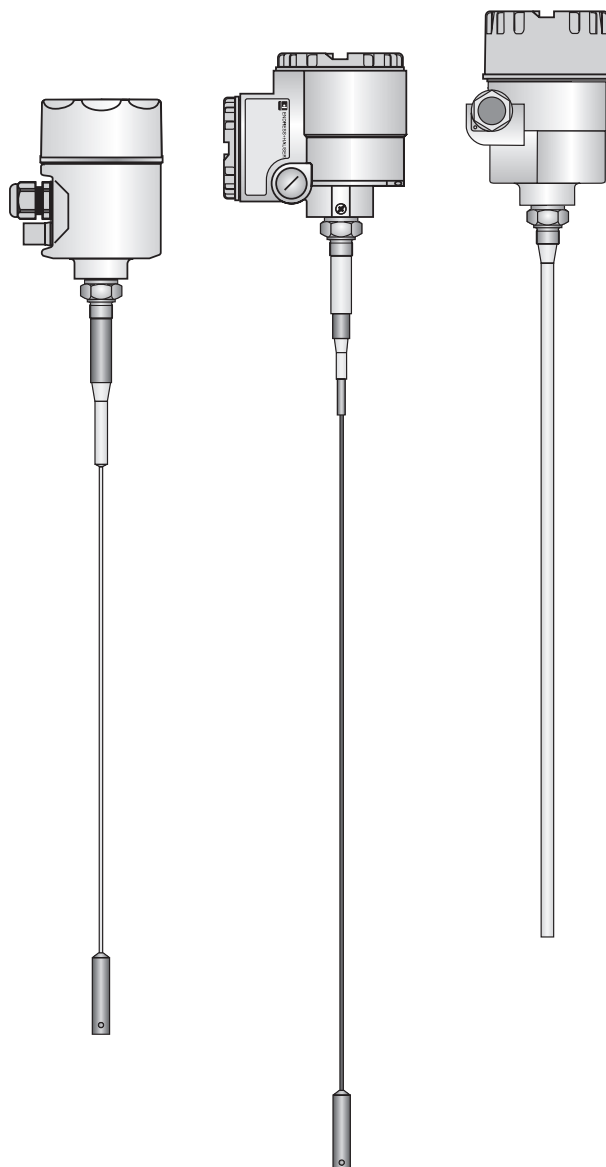


Level Probes

multicap T DC 12 TA

multicap T DC 11/16/21/26 TAN/TAS

**Compact capacitive level probes
(with North American certificates).
Fully and partially insulated rod and rope probes**



Applications

Multicap T probes are designed for continuous level measurement and limit detection, primarily in liquids. The DC 12 T probe with reinforced rod is also suitable for use in light bulk solids.

The probe rod or rope and insulation are made of corrosion-resistant materials able to withstand extremely aggressive products. The tried-and-tested rugged construction is gas-tight for pressures from vacuum to 360 psi. Seal and insulation materials enable probes to be used at operating temperatures in the vessel of -110 °F to +390 °F.

Your Benefits

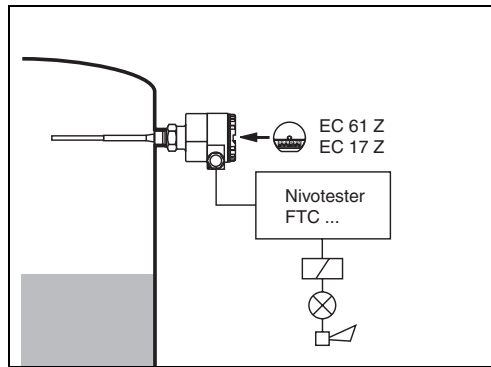
- Certificates from many North American approval authorities
= the probes have universal use
- Versions for a wide range of applications
= ideally adapted to your application at a cost effective price
- Wide range of process connections from 3/4 NPT
= easy mounting in tight spaces
- Screened against condensation in the nozzle
= reliable function even with condensation
- Active build-up compensation for limit detection
= steady and accurate switchpoint even with heavy contamination on the probe, no cleaning or recalibration

Endress + Hauser

The Power of Know How

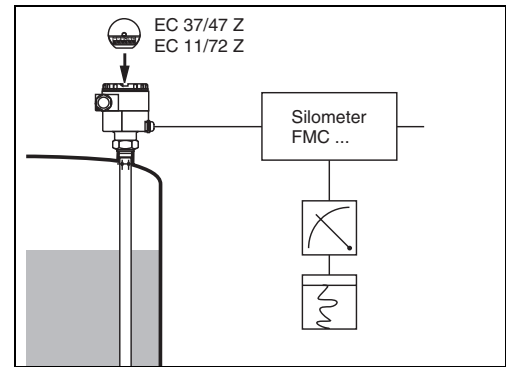


Measuring System



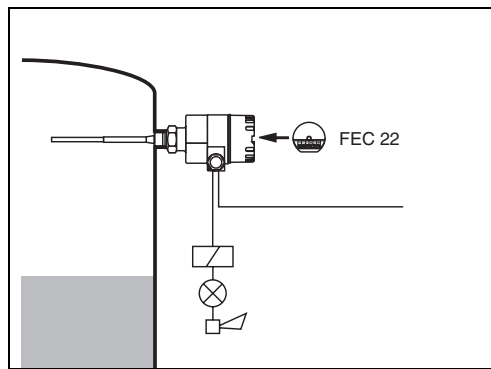
L00-DC12TAxx-14-05-xx-xx-001

Limit detection with separate Nivotester switching unit



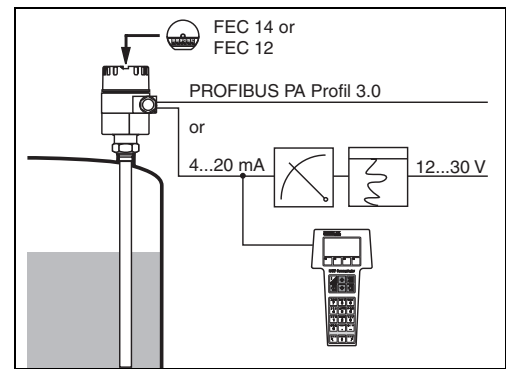
L00-DC12TAxx-14-05-xx-xx-002

Level measurement with separate Silometer transmitter



L00-DC12TAxx-14-05-xx-xx-003

Compact level switch with relay or transistor output

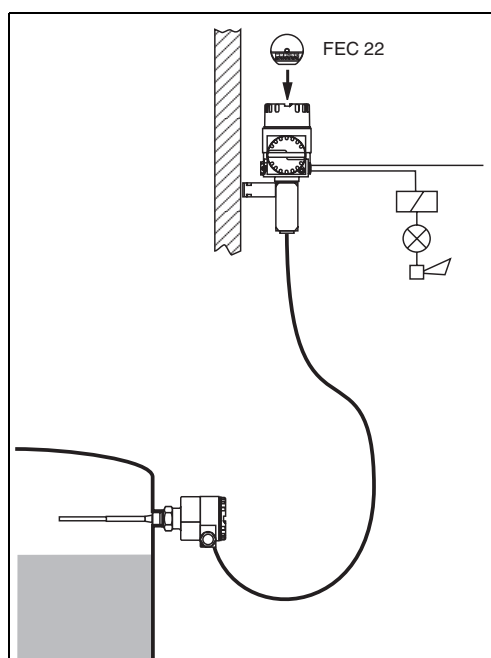


L00-DC12TAxx-14-05-xx-en-001

Compact loop-powered level measurement system with standard 4...20 mA current output.

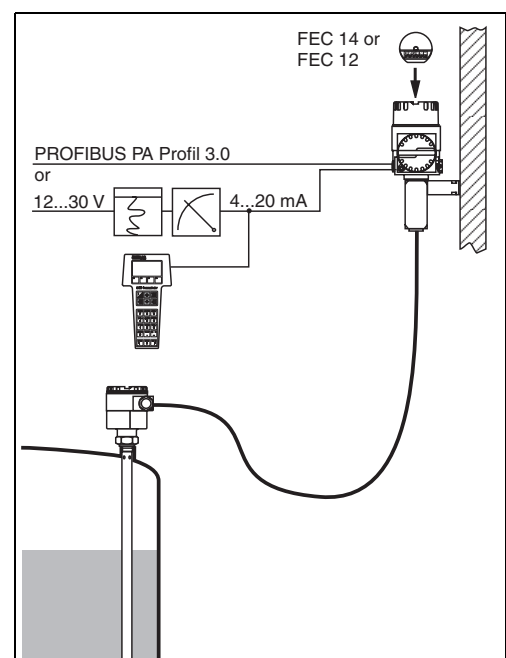
FEC 12: smart electronic insert which allows remote calibration over the 4...20 mA output (HART protocol)

FEC 14: communication and commissioning with PROFIBUS PA



L00-DC12TAxx-14-05-xx-xx-004

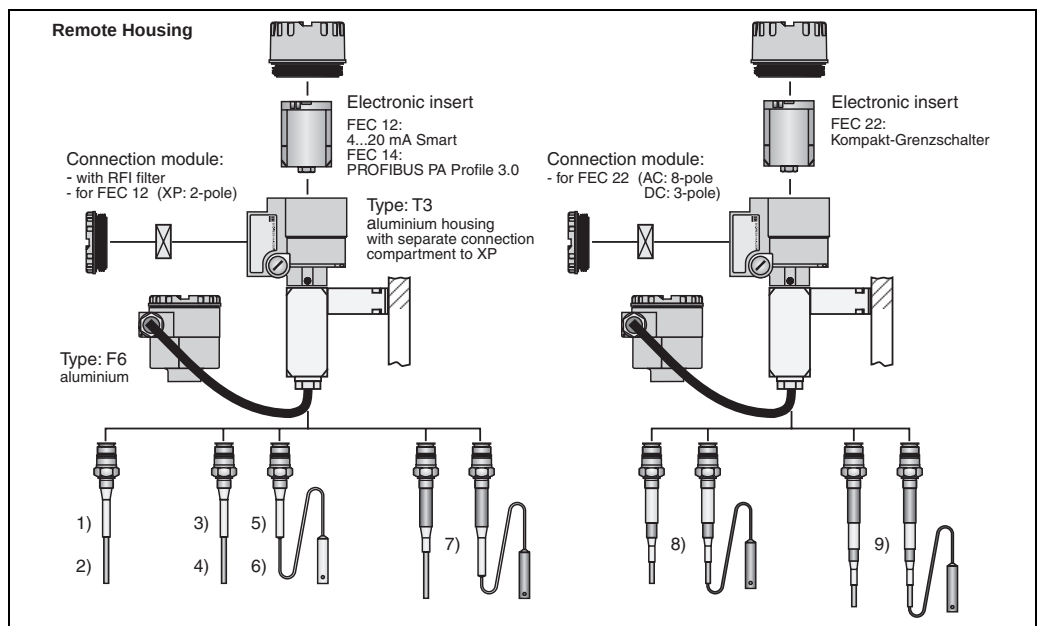
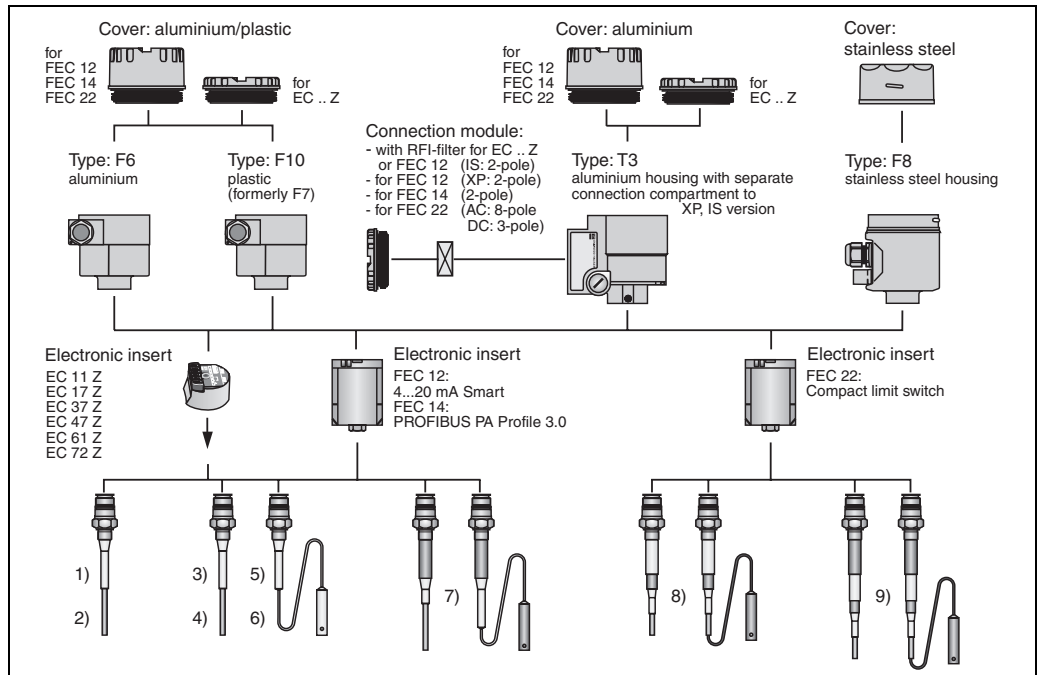
Remote housing with electronic insert FEC 22



L00-DC12TAxx-14-05-xx-xx-002

Remote housing with electronic insert FEC 12 or FEC 14

Probe Selection



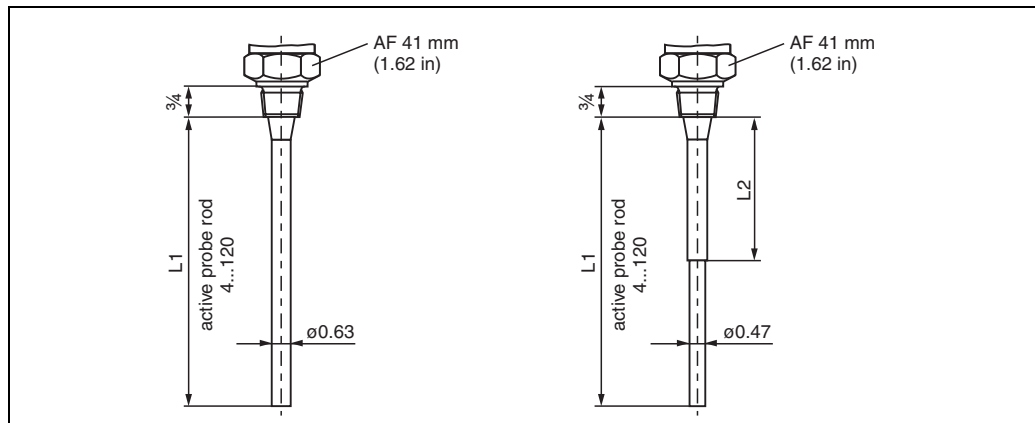
- 1) DC 12 TA with reinforced rod, fully insulated
- 2) DC 12 TA with reinforced rod, partially insulated
- 3) DC 11 TAN with fully insulated rod
- 4) DC 16 TAN with partially insulated rod
- 5) DC 21 TAN with fully insulated rope
- 6) DC 26 TAN with partially insulated rope
- 7) DC 11, 16, 21, 26 TAS with screening against condensation and material build-up at the process connection
- 8) DC 11, 16, 21, 26 TAS with active compensation of conductive material build-up at the probe
- 9) DC 11, 16, 21, 26 TAS with screening and active build-up compensation

Not shown: rod probes DC 11, 16 TAN/TAS with ground tube;
not for probes with active build-up compensation

Dimensions (all dimensions in inches)

DC 12 TA

L1 = Length of active probe rod
 L2 = Length of partial insulation
 minimum: 3 in
 maximum: length L1 minus 2 in
 Thread: $\frac{3}{4}$ - 14 NPT

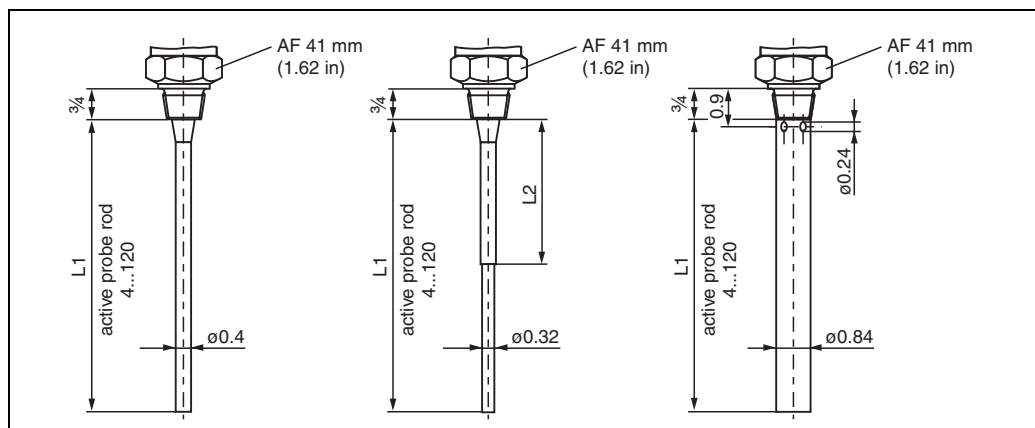


L00-DC12TAxx-06-05-xx-en-001

DC 12 TA rod probe with reinforced rod for high lateral load
 left: fully insulated
 right: partially insulated

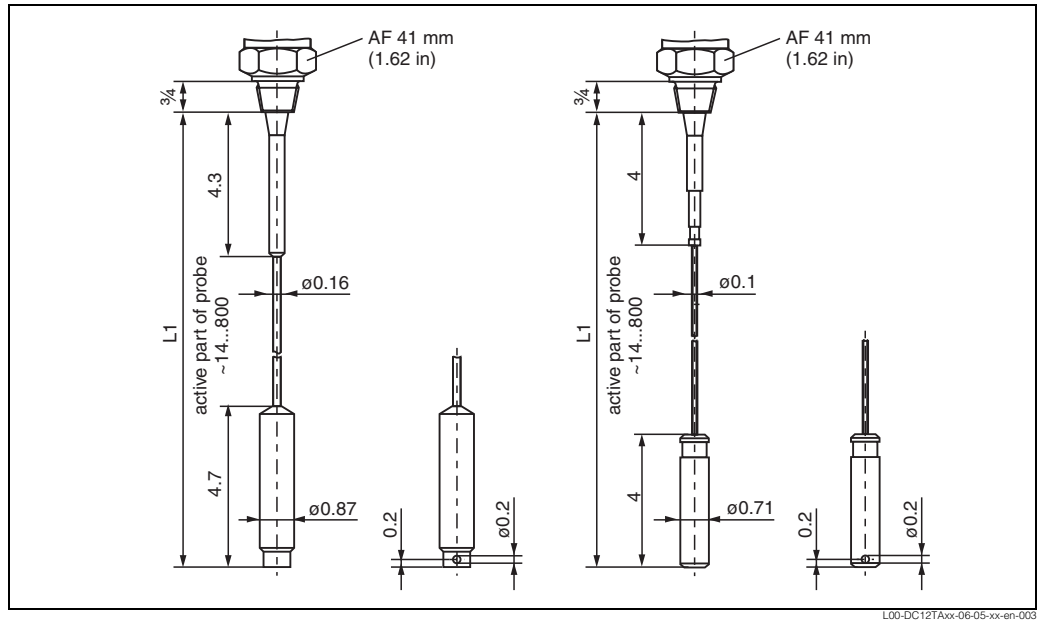
DC 11/16/21/26 TAN

L1 = Length of active probe rod or probe rope
 L2 = Length of partial insulation
 minimum: 3 in
 maximum: length L1 minus 2 in
 Thread: $\frac{3}{4}$ - 14 NPT



L00-DC12TAxx-06-05-xx-en-002

left: DC 11 TAN fully insulated rod probe
 centre: DC 16 TAN partially insulated rod probe
 right: DC 11, 16 TAN with ground tube (fully or partially insulated probe rod)



L00-DC12TAxx-06-05-xx-en-003

Tensioning weight with anchor hole

left: DC 21 TAN fully insulated rope probe

right: DC 26 TAN partially insulated rope probe

DC 11/16/21/26 TAS

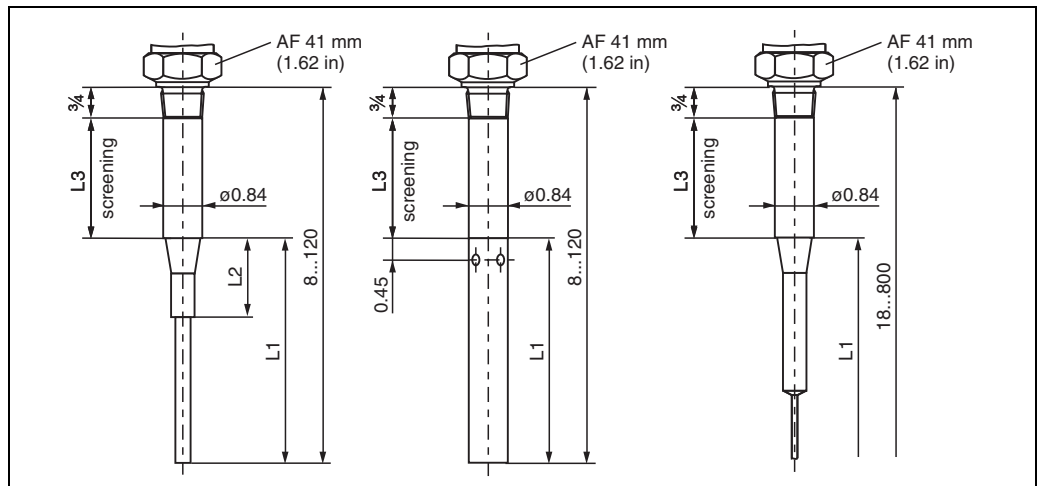
All following probes on page 5 and 6 are shown with partial insulation.

All versions are available with full insulation

L1 = Length of probe rod or probe rope

L2 = Length of partial insulation see page 3

Thread: 3/4 - 14 NPT



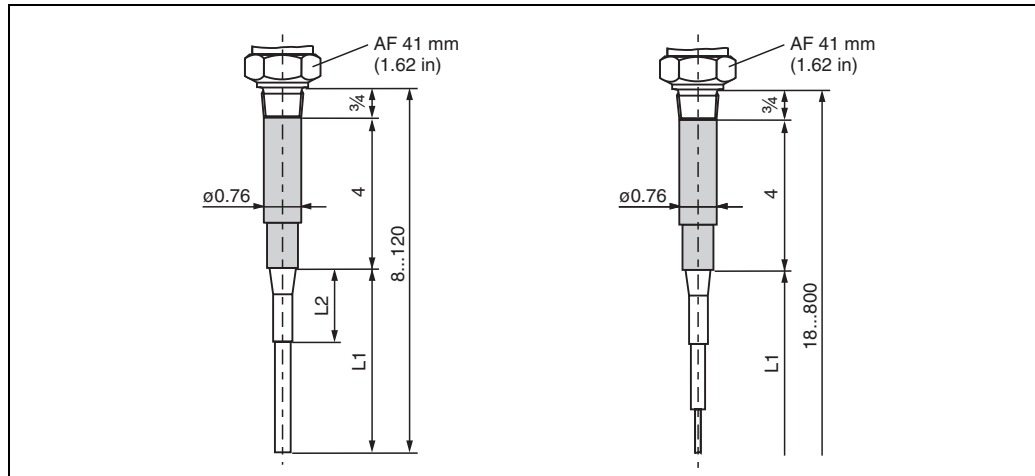
L00-DC12TAxx-06-05-xx-en-004

Probes with **screening L3** against condensation and material build-up on the process connection

left: rod probe DC 11 TAS or DC 16 TAS

centre: rod probe DC 11 TAS or DC 16 TAS with ground tube

right: rope probe DC 21 TAS or DC 26 TAS

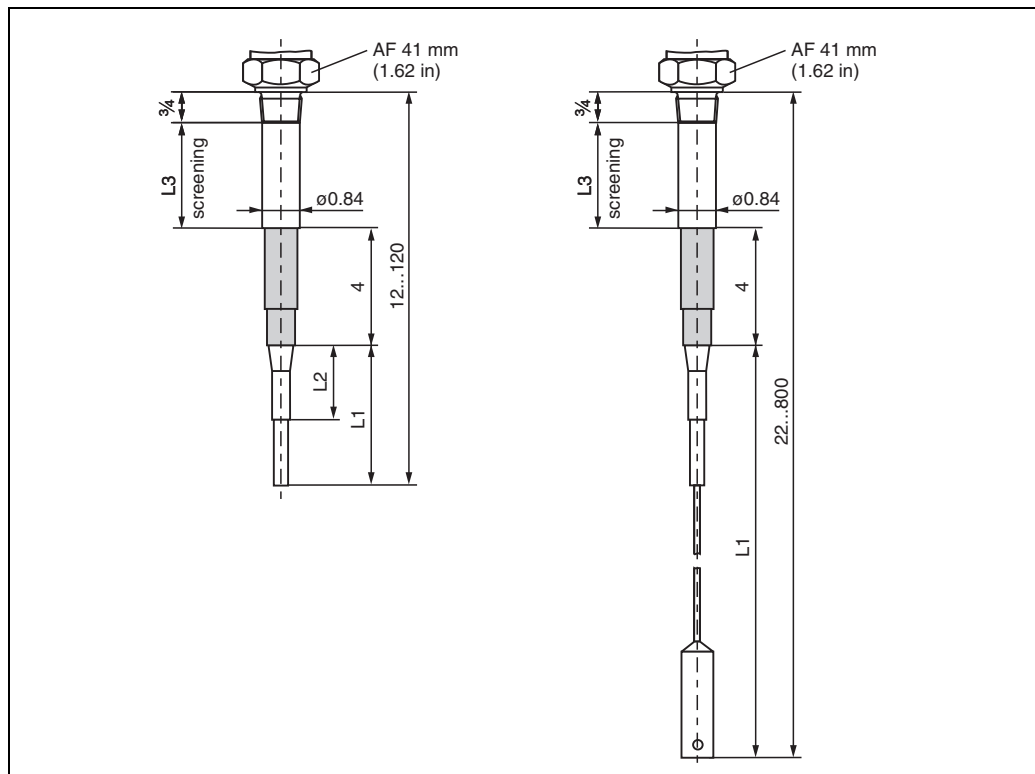


L00-DC12TAcc-06-05-xx-en-005

Probes with **active build-up compensation** (always 4 in)

left: rod probe DC 11 TAS or DC 16 TAS

right: rope probe DC 21 TAS or DC 26 TAS



L00-DC12TAcc-06-05-xx-en-006

Probes with **screening L3** and with **active build-up compensation**

left: rod probe DC 11 TAS or DC 16 TAS

right: rope probe DC 21 TAS or DC 26 TAS

L3

The screening is available in three standard lengths:

L3 = 6 in

L3 = 9 in

L3 = 20 in

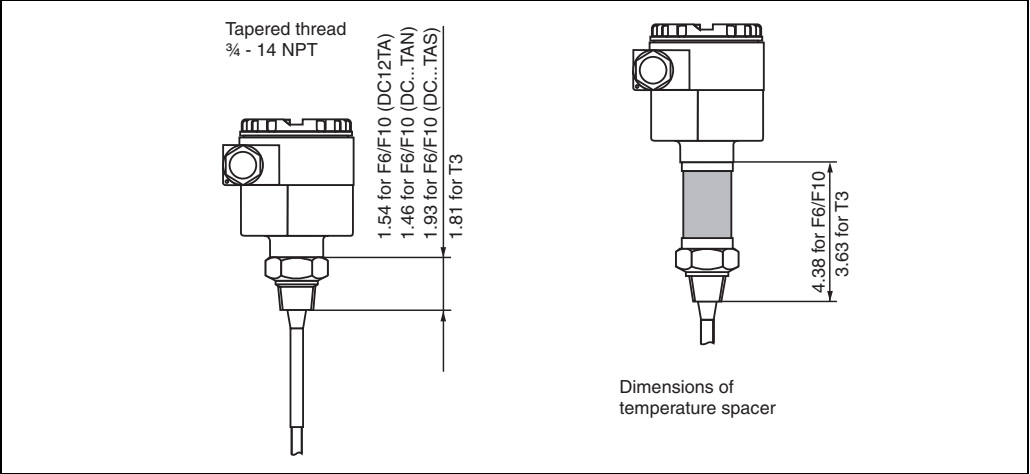
Special lengths on demand

L3 min. 4 in

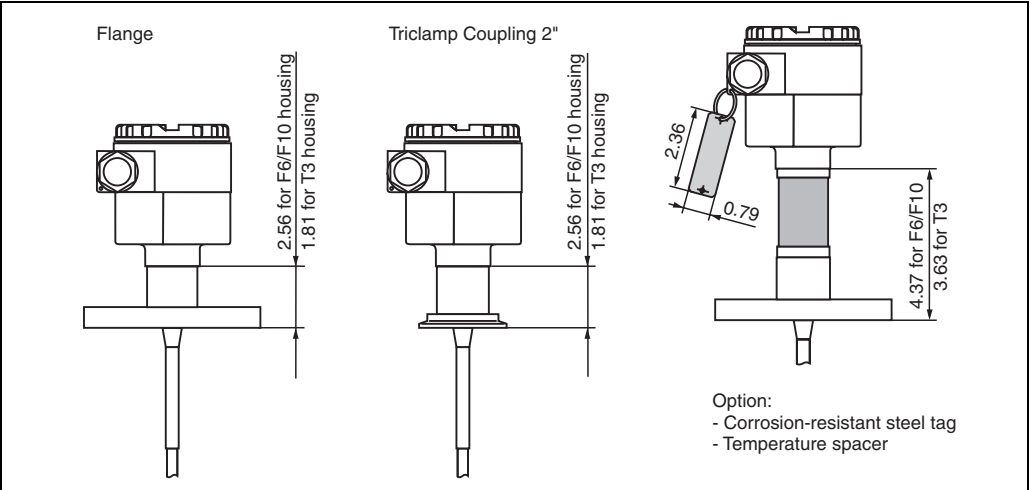
L3 max. 60 in

Dimensions Continued / Additional Process Connections

All probes shown with type F6/F10 housing (dimensions for type T3 housing are also shown).



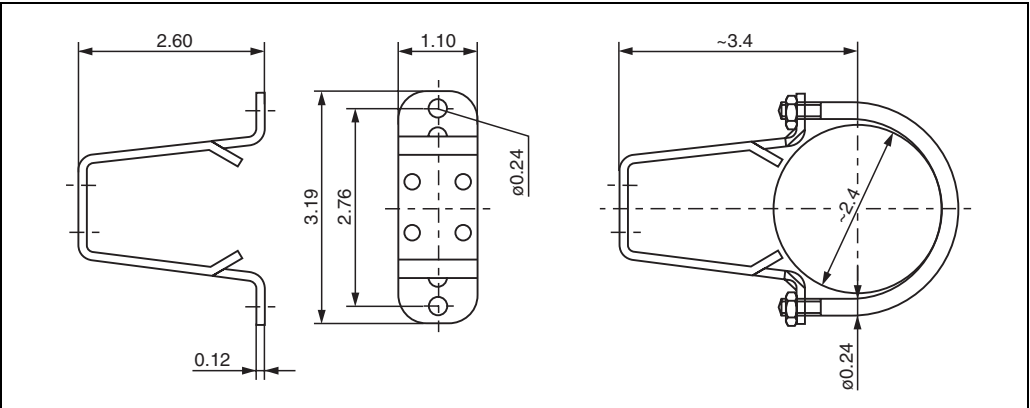
L00-DC12TAxx-06-05-xx-en-007



L00-DC12TAxx-06-05-xx-en-008

Mounting Accessories

Mounting accessories for remote housing T3



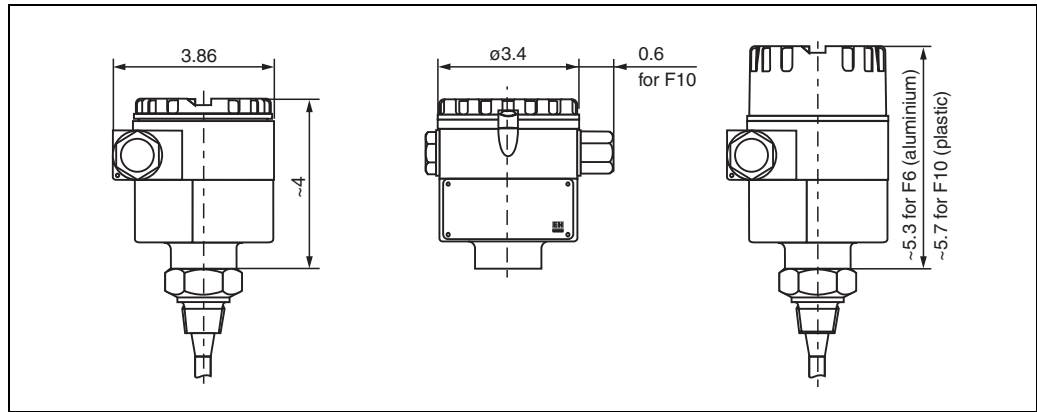
L00-DC12TAxx-06-05-xx-en-001

left: bracket for wall mounting
right: clamp for mounting on a 2" pipe

Housing Dimensions

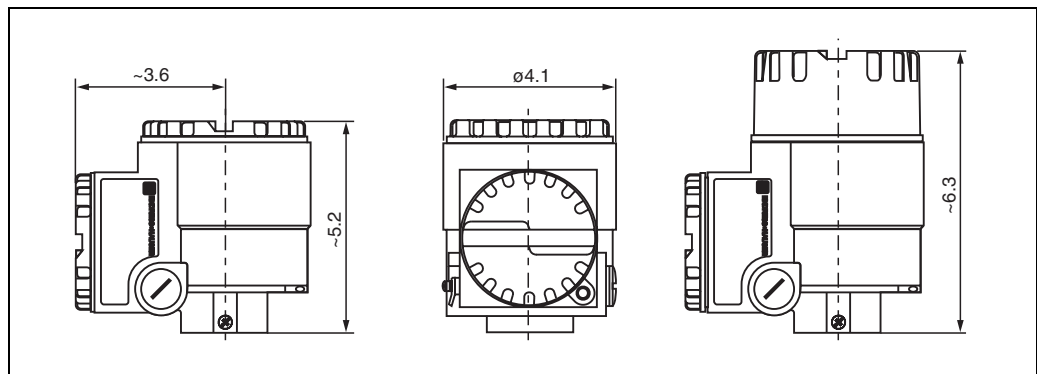
For both housings (F6 and F10):

- with low cover for small electronic inserts EC...Z,
- with raised cover for electronic inserts FEC 12, FEC 14, FEC 22 with two cable entries, one sealed with a blind plug



L00-DC12TAXx-06-05-xx-en-009

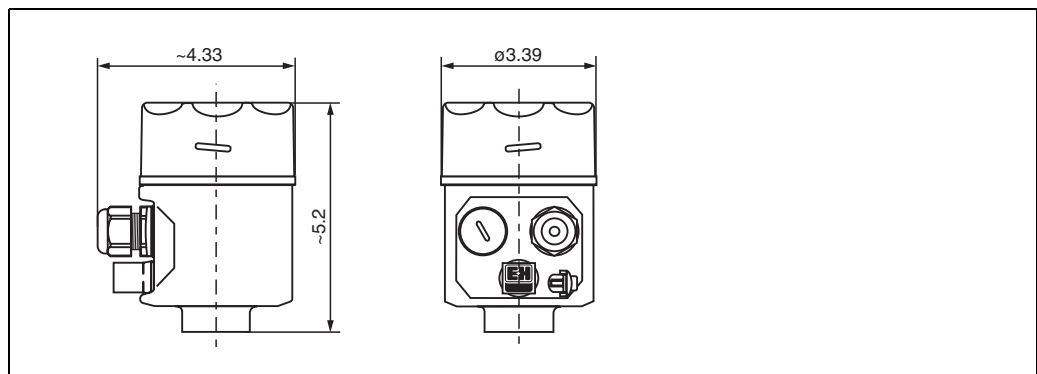
Housings in aluminium (type F6) or plastic (type F10, formerly F7)



L00-DC12TAXx-06-05-xx-en-010

Housings in aluminium (type T3) with separate connection compartment

- with RFI filter for small electronic inserts EC 17 Z, EC 61 Z, EC 37 Z / 47 Z, EC 11 Z / 72 Z
- with RFI filter and terminal connection module for FEC 12 (IS)
- with RFI filter and safety barriers for FEC 12 (XP)
- terminal connection module for FEC 22

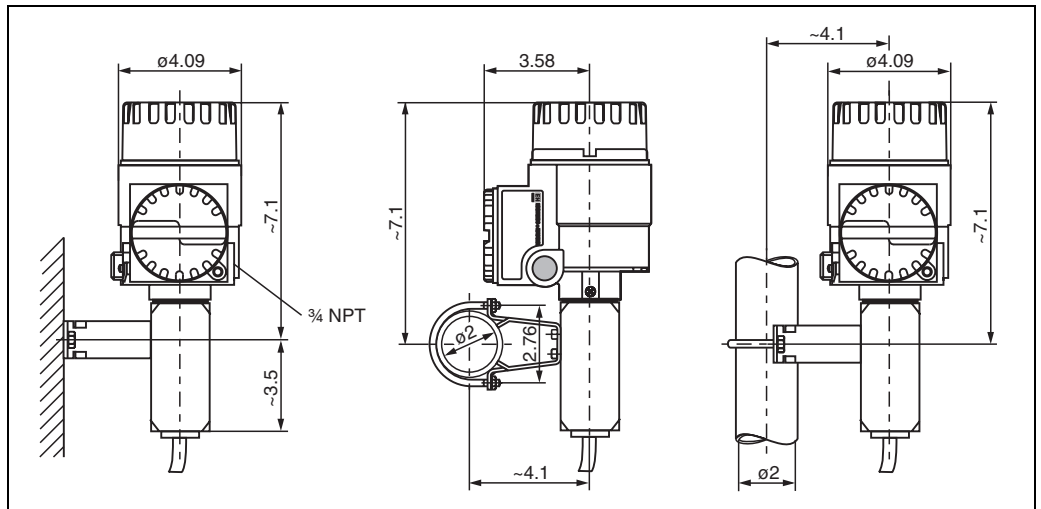


L00-DC12TAXx-06-05-xx-en-011

Stainless steel housing (type F8) for electronic inserts EC...Z/FEC... with two cable entries, one sealed with a blind plug

Remote Housing

Remote housing T3 for electronic insert FEC 12, FEC 14 or FEC 22
(mounting accessories see Page 7).



L00-DC12TAxx-06-05-xx-en-012

left: wall mounting
right: pipe mounting

Technical Data

General Information

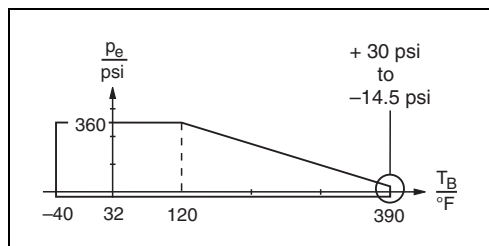
- Instrument family: Multicap T
- Instrument types: DC 12 TA, DC 11, 16, 21, 26 TAN/TAS
- Function: Probes for capacitive level measurement and limit detection

Operating data

1 NM = 0.74 ft lbs
1 N = 0.225 lbs

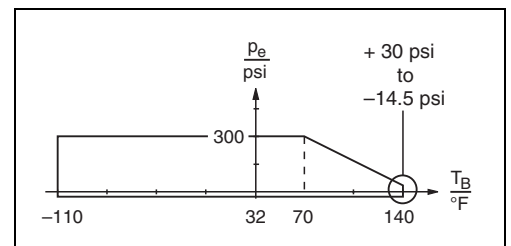
- Operating pressure: max. 360 psi. Depending on material - see below!
- Operating temperature: max. 390 °F. Depending on material - see below!
- Lateral load on probe rod:
DC 12 TA: 22.2 ft lbs at 70 °F, static
DC 11, 16: 11.1 ft lbs at 70 °F, static
- Max. tension on probe rope: 45 lbs at 70 °F, static

Permitted operating pressures p_e and operating temperatures T_B :



L00-DC12TAxx-05-05-xx-en-001

Insulation PTFE, FEP or PFA



L00-DC12TAxx-05-05-xx-en-002

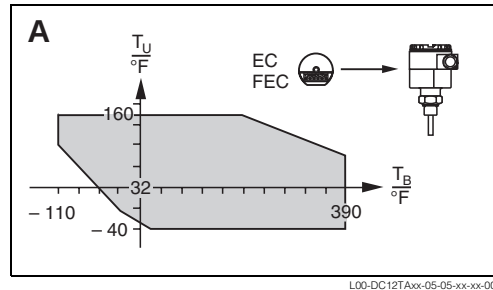
Insulation PE

Applications

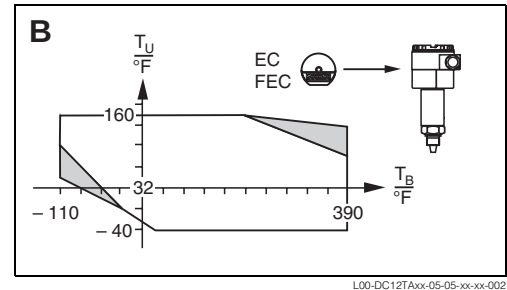
The graphs A and B apply to **all** electronic inserts.

The graphs C and D apply to the small electronic inserts EC 17 Z, EC 61 Z, EC 37 Z, EC 47 Z, EC 11 Z, EC 72 Z.

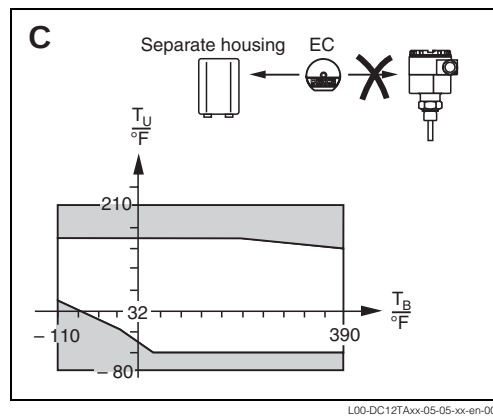
Operating ranges of the various probe types as a function of operating temperature T_B and ambient temperature T_U :



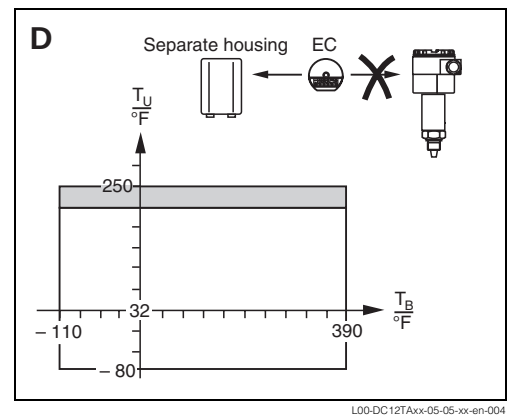
Basic probe



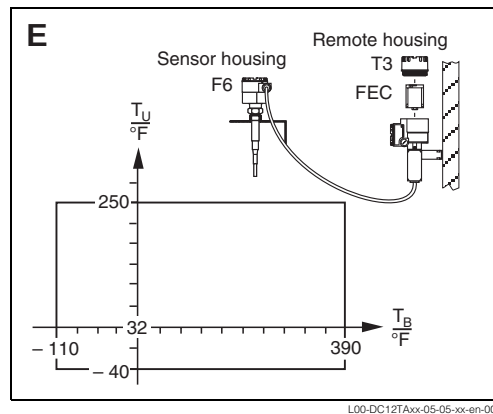
Probe with temperature spacer



Electronic insert in separate housing



Probe with temperature spacer and electronic insert in separate housing



Basic probe and electronic insert in remote housing

Probe lengths

- Total length of rod probe: min. 4 in, max. 120 in, see dimensions
- Total length of rope probe: min. 14 in, max. 800 in, see dimensions

Capacitance values of the probe

- Basic capacitance: approx. 30 pF
- Temperature spacer: approx. 5 pF
- Active build-up compensation: < 10 pF

Additional capacitances	- Probe 10 in from a conductive vessel wall: Probe rod: approx. 0.33 pF/in in air Probe rope: approx. 0.25 pF/in in air - Insulated probe rod in water: approx. 10 pF/in DC 12 TA approx. 13 pF/in DC 11 TA - Insulated probe rope in water: approx. 5 pF/in - Rod probe with ground tube: insulated probe rod: in air approx. 1.6 pF/in; in water approx. 12.7 pF/in uninsulated probe rod: in air approx. 1.4 pF/in
Probe lengths for continuous measurement in conducting liquids	- EC with $\Delta C_{\max} = 2000$ pF (EC 47 Z, EC 72 Z, FEC 12): Rope probe up to 300 in (up to 800 in in non conducting liquids) Rod probe up to 120 in - EC with $\Delta C_{\max} = 4000$ pF (EC 37 Z, EC 11 Z): Rope probe up to 800 in Rod probe up to 120 in
Accuracy	- Length tolerances: up to 40 in: +0 in, -0.2 in rod probe/ -0.4 in rope probe up to 120 in: +0 in, -0.4 in rod probe/ -0.8 in rope probe up to 240 in: +0 in, -1.2 in up to 800 in: +0 in, -1.6 in The following specifications apply to fully insulated probes operating in conducting liquids - Linearity error: < 1 % for 40 in ** - Temperature dependence of the probe rod: < 0.1 % per K DC 12 TA ** < 0.12 % per K DC 11 TA ** - Pressure dependence of the probe rod: 0.8...2.3 % per 100 psi ** - Temperature dependence of the probe rope: < 0.1 % per K ** - Pressure dependence of the probe rope: < 0.7 % per 100 psi ** ** Error in non-conducting materials insignificant
Process connections	- Tapered thread $\frac{3}{4}$ - 14 NPT: ANSI B 1.20.1 - ANSI flanges: ANSI B 16.5 - Triclamp coupling: ISO 2852
Materials	- Aluminium housing (F6, T3): GD-Al Si 10 Mg, DIN 1725, plastic coated (blue/grey) - Plastic housing (F10): fibre-glass reinforced polyester (blue/grey) - Stainless steel housing (F8): stainless steel 1.4301 (AISI 304), unvarnished - Seal for housing cover: F6, T3 housings: O-ring in EPDM (elastomer) F10 housing: O-ring in silicone rubber F8 housing: profiled O-ring in silicone - Temperature spacer: Stainless steel AISI 316 or similar - Probe rod, ground tube, process connection, screening, build-up compensation, tensioning weight for rope probe: AISI 316L - Probe rope: AISI 316 Further material specifications see product structure on Page 12...16

Product Structure

Product Structure Multicap DC 12 TA

Design		Basic weight				
DC 12 TA	Rod probe for standard applications					2,6 lbs*
10	Certificate					
	A	For non-hazardous areas				
	J	FM IS	Class I, II, III	Div. 1, Groups A-G		
	K	FM XP	Class I	Div. 1, Groups A-D		
	Q	CSA IS	Class I, II, III	Div. 1, Groups A-G		
	R	CSA XP	Class I	Div. 1, Groups B-D		
	Y	Special version				
20		Type of insulation				Additional weight
	1	Fully insulated probe				--
	6	Partiall insulated probe				--
30		Length of insulation L2				
	F	 in (3 in... 118 in)	partially insulated	PTFE		0.09 oz/in
	G	 in (3 in... 118 in)	partially insulated	PFA		0.09 oz/in
	H	 in (3 in... 118 in)	partially insulated	PE		0.09 oz/in
	Y	Special version				
	1	Fully insulated probe				--
40		Active length L1, Material				
	F	 in (4 in... 144 in)	fully insulated	PTFE		0.09 oz/in
	G	 in (4 in... 118 in)	fully insulated	PFA		0.09 oz/in
	H	 in (4 in... 118 in)	fully insulated	PE		0.09 oz/in
	Y	Special version				
	2	 in (4 in... 118 in)	partially insulated			0.08 oz/in
50		Process connection, Material				
	C	¾" NPT	Thread ANSI	316L		--
	D	1" NPT	Thread ANSI	316L		--
	F	DN 40-51 (2")	ISO 2852	316L		1.1 lbs
		Tri-Clamp connection				
	G	DN 32 (1½")	ISO 2852	316L		--
		Tri-Clamp connection				
	H	DN 25 (1")	ISO 2852	316L		--
		Tri-Clamp connection				
	L	DN 38 (1½") removable	ISO 2852	316L, A3		--
		Tri-Clamp connection				
	Y	Special version				
	5	Flanged process connection		316L		--
60		Flange type, Material				
	1B	without process flange connection				--
	5A	1"	150 lbs	RF	Flange ANSI B16.5 316L	0.5 lbs
	5B	1"	300 lbs	RF	Flange ANSI B16.5 316L	2.6 lbs
	5E	1½"	150 lbs	RF	Flange ANSI B16.5 316L	2.9 lbs
	5F	1½"	300 lbs	RF	Flange ANSI B16.5 316L	5.5 lbs
	5G	2"	150 lbs	RF	Flange ANSI B16.5 316L	4.8 lbs
	5H	2"	300 lbs	RF	Flange ANSI B16.5 316L	6.6 lbs
	5M	3"	150 lbs	RF	Flange ANSI B16.5 316L	--
	5N	3"	300 lbs	RF	Flange ANSI B16.5 316L	--
	5P	4"	150 lbs	RF	Flange ANSI B16.5 316L	--
	5Q	4"	300 lbs	RF	Flange ANSI B16.5 316L	--
	6A	1"	150 lbs	RF	Flange ANSI B16.5 PTFE >316L	1.5 lbs
	6B	1"	300 lbs	RF	Flange ANSI B16.5 PTFE >316L	2.6 lbs
	6E	1½"	150 lbs	RF	Flange ANSI B16.5 PTFE >316L	2.9 lbs
	6F	1½"	300 lbs	RF	Flange ANSI B16.5 PTFE >316L	5.5 lbs
	6G	2"	150 lbs	RF	Flange ANSI B16.5 PTFE >316Ti	4.8 lbs
	6H	2"	300 lbs	RF	Flange ANSI B16.5 PTFE >316L	6.6 lbs
	9Y	Special version				

70										Electronic insert	
										A Prepared for ECxx electronic insert with low housing cover	--
										B with EC 61 Z 3-wire insert	0.44 lbs
										C with EC 11 Z 3-wire Tx, 33 kHz	0.44 lbs
										D with EC 72 Z 3-wire Tx, 1 MHz	0.44 lbs
										E with EC 17 Z 2-wire PFM	0.44 lbs
										G with EC 37 Z 2-wire PFM, 33 kHz	0.44 lbs
										H with EC 47 Z 2-wire PFM, 1 MHz	0.44 lbs
										K with FEC 12 2-wire 4-20 mA HART	0.66 lbs** + 0.66 lbs
										M with FEC 22 90-253 V AC, DPDT relay	0.66 lbs** + 0.66 lbs
										N with FEC 22 10-55 V DC, 3-wire PNP	0.66 lbs** + 0.66 lbs
										P with FEC 14 PROFIBUS PA	--
										V with FEC 14 Local operation FHB 20 and PROFIBUS PA	--
										Y Special version	
										2 Prepared for FECxx electronic insert with raised housing cover	0.66 lbs**
80										Housing	
										N Aluminium T3 Housing PA-plug M12 IP66	--
										O 316L F8 Housing PA-plug M12 IP66	--
										P Polyester F10 Housing Nema4X NPT ½"	--
										R Aluminium F6 Housing Nema4X NPT ½"	--
										S Aluminium T3 Housing Nema4X NPT ¾"	2.2 lbs
										Y Special version	--
										1 316L F8 Housing gland Pg13,5 IP66	--
										2 316L F8 Housing entry G ½" IP66	--
										3 316L F8 Housing gland M20x1,5 IP66	--
										4 316L F8 Housing entry NPT ½" IP66	--
										5 Polyester Housing PA-plug M12 IP66	--
										6 Aluminium F6 Housing PA-plug M12 IP66	--
										7 80 inch cable, remote T3-electronic housing (NEMA4X), NPT ¾" F6-housing NEMA4x on probe	--
										8 80 inch conduit, remote T3-electronic housing (NEMA4X), NPT ¾" F6-housing NEMA4x on probe	--
90										Option	
										1 Basic version	--
										2 TAG number	--
										3 Temperature spacer	0.44 lbs
										4 Temperature spacer and TAG number	0.44 lbs
										9 Special version	
DC 12 TA-										Complete product designation	

* Basic weight including ¾" process connection and F10 housing

** Additional weight for raised cover



Note!
Please don't forget:

Length of

Partial insulation

L2



□ □ □ □ in

Active probe length

L1



□ □ □ □ in

1 lb = 0.45 kg

1 oz = 28.35 g

1 in = 25.4 mm

Product Structure

Product Structure

Multicap DC 11 TAN/TAS

Multicap DC 16 TAN/TAS

Multicap DC 21 TAN/TAS

Multicap DC 26 TAN/TAS

Design		Basic weight	
DC 11 TAN	Fully insulated rod probe for standard applications		2,6 lbs*
DC 16 TAN	Partially insulated rod probe for standard applications		2,6 lbs*
DC 21 TAN	Fully insulated rope probe for standard applications		3,1 lbs*
DC 26 TAN	Partially insulated rope probe for standard applications		3,1 lbs*
DC 11 TAS	Fully insulated rod probe with protection features		2,6 lbs*
DC 16 TAS	Partially insulated rod probe with protection features		2,6 lbs*
DC 21 TAS	Fully insulated rope probe with protection feature		3,1 lbs*
DC 26 TAS	Partially insulated rope probe with protection features		3,1 lbs*

10	Certificate		
	A	For non-hazardous areas	
	J	FM IS	Class I, II, III Div. 1, Groups A-G
	K	FM XP	Class I Div. 1, Groups A-D
	Q	CSA IS	Class I, II, III Div. 1, Groups A-G
	Y	Special version	

20	Build-up protection		Additional weight
	DC 11, 16, 21, 26 TAN		
	A	Protection feature not selected	--
	DC 11, 16, 21, 26 TAS		
	B	4 inch active guard	0.44 lbs
	M	6 inch L3 screening	0.44 lbs
	N	9 inch L3 screening	0.66 lbs
	P	20 inch L3 screening	1.3 lbs
	R	... in (4 in...59 in) L3 screening	1.1 oz/in
	S	6 inch L3 screening and 4 inch active guard	0.88 lbs
	T	9 inch L3 screening and 4 inch active guard	1.1 lbs
	U	20 inch L3 screening and 4 inch active guard	2.0 lbs
	V	... in (4 in...59 in) L3 screening and 4 inch active guard	1.5 oz/in + 0.44 lbs
	Y	Special version	

30	Probe insulation		
	DC 11 TAN/TAS, DC 16 TAN/TAS		
	1	Fully insulated probe	--
	DC 16 TAN/TAS		
	F	... in (3 in... 118 in) partially insulated PTFE	0.06 oz/in
	DC 26 TAN/TAS		
	C	Rope type 1/10 inch diameter	--
	9	Special version	

40	Active length L1		
	DC 11 TAN/TAS		
	3	... in (4 in...118 in) 316L + PTFE	0.45 oz/in
	4	... in (4 in...118 in) with ground tube 316L + PTFE	1.1 oz/in
	DC 16 TAN/TAS		
	3	... in (4 in...118 in) 316L	0.4 oz/in
	4	... in (4 in...118 in) with ground tube 316L	1.0 oz/in
	DC 21 TAN/TAS		
	3	... in (4 in... 800 in) 316 + FEP	0.04 oz/in
		tensioning weight with anchor hole	

Endress+Hauser	15
----------------	----

80										Housing	
										6	Aluminium F6 Housing PA-plug M12 IP66 - -
										7	80 inch cable, remote T3-electronic housing (NEMA4X), NPT 3/4" F6-housing NEMA4x on probe - -
										8	80 inch conduit, remote T3-electronic housing (NEMA4X), NPT 3/4" F6-housing NEMA4x on probe - -
90										Option	
										1	Basic version - -
										2	TAG number - -
										3	Temperature spacer 0.44 lbs
										4	Temperature spacer and TAG number 0.44 lbs
										9	Special version
DC 11 TAx-										Complete product designation	
DC 16 TAx-										Complete product designation	
DC 21 TAx-										Complete product designation	
DC 26 TAx-										Complete product designation	

* Basic weight including 3/4" process connection and F10 housing
for rope probes with tensioning weight

** Additional weight for raised cover



Note!
Please don't forget:

Length of

Screening
L3



in

Partial insulation
L2



in

Active probe length
L1



in

1 lb = 0.45 kg

1 oz = 28.35 g

1 in = 25.4 mm

Accessories

- Protective cover for the small probe housing (F6, F10) see Technical Information TI 229F: "Probe accessories"
The protective cover shields the probe from excessive heat and prevents condensation from forming in the housing when temperatures vary over a wide range
- Slip-on plate for partially insulated probe DC 12 TA for increasing the switching safety for limit detection
- Rope shortening kit for fully insulated probes
- Rope shortening kit for partially insulated probes

Supplementary Documentation

Technical Information (TI)

- Probe accessories
TI 229F/00/en
- Electronic insert FEC 12
TI 250F/00/en
- Electronic insert FEC 14
TI 376F/00/en
- Electronic insert FEC 22
TI 251F/00/en
- Electronic insert EC 11 Z, EC 72 Z
TI 270F/00/en
- Electronic insert EC 17 Z
TI 268F/00/en
- Electronic insert EC 37 Z, EC 47 Z
TI 271F/00/en
- Electronic insert EC 61 Z
TI 267F/00/en

Transmitters for limit detection and continuous level measurement on request

Certificates

See product structure on page 12/14

Endress+Hauser GmbH+Co.

Instruments International
P.O. Box 2222
D-79574 Weil am Rhein
Germany

Tel. (07621) 975-02
Tx 773926
Fax (07621) 975 345
e-mail: info@ii.endress.com

Internet:

<http://www.endress.com>

Endress + Hauser

The Power of Know How

