

Product Information L3

FOOD

L3 Pressure and Level Transmitter with Switch Output

Range of applications

- Hydrostatic level measurement in dynamic temperature applications
- Pressure measurement in pipes and vessels
- Hydrostatic level measurement in inventory silos
- Continuous process up to 110°C (230°F) and CIP/SIP at 135°C (275°F) for 1 hour when ambient is below 60°C (140°F)

Application examples

- Hygienic pressure and level monitoring for brewing, dairy, and food and beverage processing

Hygienic design/Process connection

- Front flush, 3-A installation for silos by Anderson flush fitting, E&H universal, or tank spud connections
- Conforming to 3-A Sanitary Standard 74-06 with Tri-Clamp® DIRECTadapt
- Product contact materials compliant to FDA
- Sensor and product contact surfaces made of stainless steel
- Available with over 20 integral hygienic connections, more available through CLEANadapt adapters

Features

- State of the art temperature compensation minimizes error in dynamic temperature applications
- Digital switch output assignable to alarms or errors
- mA output scaled to product volume or mass in the tank when tank dimensions and product information are input through local display or HART interface
- Intuitive user interface makes set-up and configuration easy
- On board interface allows reconfiguration including 10:1 range turndown in any units
- Field repairable and reconfigurable through modular design
- Patented dual o-ring seals provide IP69K ingress protection
- Standard Hart 7.0 communication and graphical LCD display with bar graph

Options/Accessories

- Optional digital remote kit making display easier to view
- Optional M12 molded cordset available
- Wide range of ranges and fittings available

Measuring principle of the pressure sensor

This unit utilizes an internal piezoelectric transducer and an RTD temperature element to measure the pressure and temperature of the internal actuating fluid. The mV signal of the transducer and resistance of the RTD are measured and converted to a compensated pressure value by way of the signal acquisition board in the stem. This signal is digitally communicated to the head where the signal is converted to industry standard 4...20 mA and Hart 7.0 signals.

For relative sensors the back of the diaphragm is vented and the output is relative to the atmospheric conditions.

Authorizations



Horizontal Enclosure Orientation



Vertical Enclosure Orientation



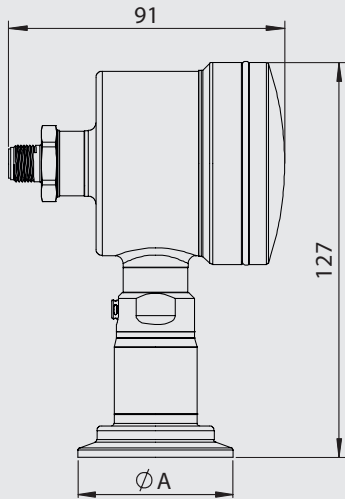
Remote Configuration



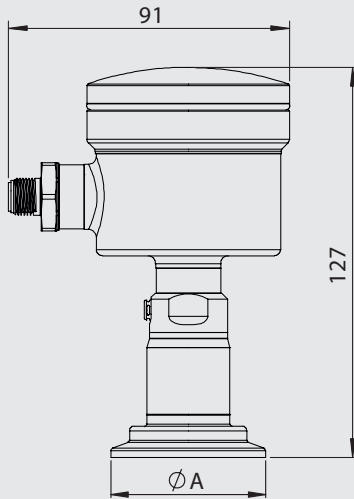
Specification		
Measuring range URL [bar] Measuring range URL [psi] Measuring range URL [inches of w.c.]	Relative Relative Relative	0...0.4 / -1...2 / -1...7 / -1...35 0...6 / -14.7...30 / -14.7...100 / -14.7...500 0...166 / -400...830 / -400...2770 / -400...13850
Turndown	max. 10:1	of upper range limit (see also measurement accuracy)
Overpressure strength	Factor	1.5 x nominal pressure of measuring element
Reference accuracy	Turndown to 5:1 Turndown over 5:1 Repeatability Long-term stability	≤ 0.10 % in calibrated measuring range ≤ 0.15 % in calibrated measuring range 0.05 % 0.2 % URL every 2 years
Temperature effect	Process Ambient	< 0.016 % of calibrated measuring range / 5.5°C (10°F) < 0.016 % of calibrated measuring range / 5.5°C (10°F)
Temperature range	Process Ambient CIP/SIP Cleaning	-18...110°C (0...230°F), at ambient ≤ 71°C (160°F) -18...71°C (0...160°F) 135°C (275°F) for 1 hour when ambient is below 60°C (140°F)
Response time		< 0.1 seconds
Sample rate		< 0.05 seconds
Materials	Connection head Metal cover Plastic cover Threaded connector Wetted parts Diaphragm Diaphragm seal/oil filling	Stainless steel, AISI 304 (1.4301), R _a ≤ 0.8 μm (32 microinch) Stainless steel, AISI 304 (1.4301), R _a ≤ 0.8 μm (32 microinch) Polycarbonate Stainless steel, AISI 304 (1.4301), R _a ≤ 0.8 μm (32 microinch) Stainless steel, AISI 316L, R _a ≤ 0.64 μm (25 microinch) Stainless steel, AISI 316L, R _a ≤ 0.64 μm (25 microinch) Medical white oil / mineral oil / paraffin oil FDA approval number 21CFR172.878, 21CFR178.3620, 21CFR573.680 Neobee M20 (optional)
Process connection	3-A compliant not 3-A compliant	1-1/2" Tri-Clamp® 2" Tri-Clamp® 2-1/2" Tri-Clamp® 3" Tri-Clamp® AIC CPM Flush Mount Anderson Flush Mount Short (71060-A4, A6, A8) Anderson Flush Mount Long (71060-A3, A5, A7, A9) King Gage Flush Mount Long (1777-3) King Gage Flush Mount Medium (1777-1, -6 Standard) King Gage Flush Mount Short (1777-2 non-insulated) Rosemount/Foxboro Sanitary Spud - Short and Long Endress & Hauser Universal Adaptor - Short and Long G1" CLEANadapt 1-1/2" NPT G1" Fixed Thread 38mm SMS Liner (female) 51mm SMS Liner (female) 40mm DIN 11851 (Milk Coupling) 50mm DIN 11851 (Milk Coupling) M38x1.5 DRD
Electric connection	Cable gland Plug-in connection	M16x1.5 M12 plug, 5-pin, 1.4305
Approvals		3A CE Compliant CRN (CSA-B51-03)** CSA22.2 IP 67 (with cable gland) / NEMA 4X IP 69 K (with plug-in M12 connection)
Operating voltage		18...35 V DC
Output	Current loop Digital switch	analog 4...20mA/20...4mA and Hart 7.0 normally open relay (50VDC, 50mA, <100Ω ON resistance)
Tightening torque	For assembly all L3 components	27 Nm (20 ft-lbs)

** consult factory for regions and configurations

L3 / Tri-Clamp with horizontal enclosure



L3 / Tri-Clamp with vertical enclosure



Tri-Clamp size

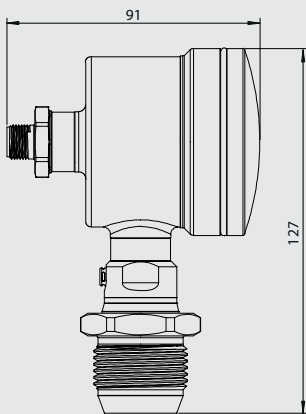
Type	Ø A
004	50,5 mm
005	64,0 mm

Information

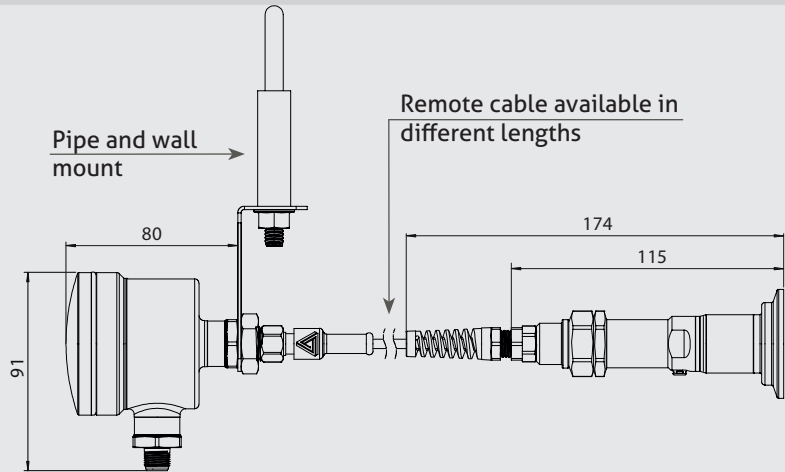


The remote kit, including all parts for separate mounting, can be ordered as accessory.

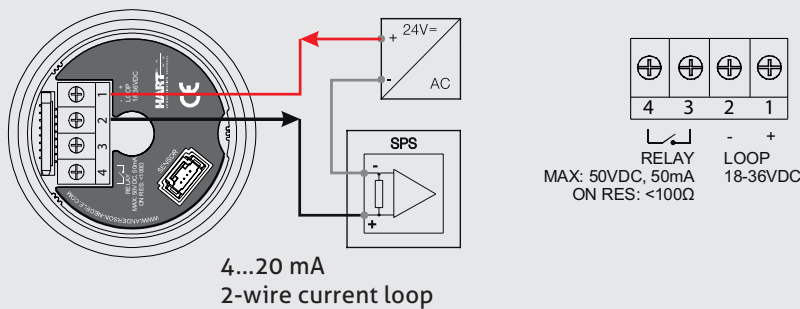
L3 / G1" Compact version



L3 Remote version

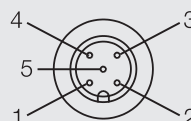


Electrical connection with cable gland

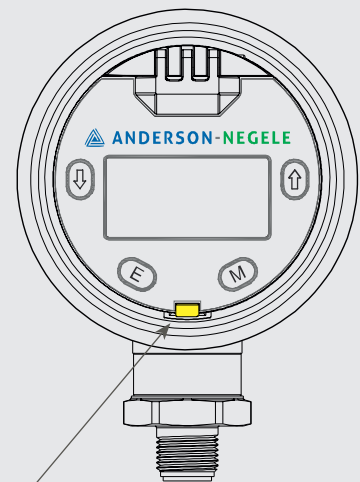


Electrical connection with M12 plug

1: red	+ supply
2: black	- supply 4...20 mA
3: green	relay normally open
4: blue	relay normally open
5:	n. c.



L3 with open cap



Pull up the clip to open the display.

Order code of fully assembled sensor

L3A Sensor assembled

S Standard Stem

URL

- 5 0...6 PSI, 0...0.4 BAR, 0...166" w.c.
- 6 30"Hg/0/30 PSI, -1...2 BAR, -400...830" w.c
- 7 30"Hg/0/100 PSI, -1...7 BAR, -400...2770" w.c.
- 8 30"Hg/0/500 PSI, -1...35 BAR, -400...13850" w.c.

3-A compliant fittings

- 004 1-1/2" Tri-Clamp®
- 005 2" Tri-Clamp®
- 006 2½" Tri-Clamp®
- 007 3" Tri-Clamp®
- 123 AIC CPM Flush Mount*
- 088 Anderson Flush Mount Short (71060-A4, A6, A8)
- 089 Anderson Flush Mount Long (71060-A3, A5, A7, A9)
- 092 King Gage Flush Mount Long (1777-3)
- 093 King Gage Flush Mount Medium (1777-1, -6 Standard)
- 094 King Gage Flush Mount Short (1777-2 non-insulated)
- 141 Rosemount/Foxboro Sanitary Spud - Short
- 142 Rosemount/Foxboro Sanitary Spud - Long
- 154 Endress & Hauser Universal Adaptor - Short
- 155 Endress & Hauser Universal Adaptor - Long

Fittings not 3-A compliant

- 160 G1" CLEANadapt
- 059 1-1/2" NPT
- 182 G1" Fixed Thread
- 109 38mm SMS Liner (female)
- 110 51mm SMS Liner (female)
- 115 40mm DIN 11851 (Milk Coupling)
- 124 50mm DIN 11851 (Milk Coupling)
- 180 M38x1.5
- 181 DRD

* Sensor is 3A compliant when installed in a 3A compliant instrument tee

Capillary fill

- 1 Mineral oil
- 5 Neobee

Remote cable

- O Integral
- B 10' Cable
- E 25' Cable

E Enclosure

Cap

- 2 Clear
- 3 Stainless steel

Enclosure orientation

- 1 Vertical
- 2 Horizontal

Electrical connection

- A M12 QDR
- C Cable gland
- N 1/2" NPTF adaptor

Engineering units

- P PSI
- B BAR
- W inches of water
- L millibar

Calibration range

- 000 Full range of stem URL
- 999 Custom range
- XXX see calibration range table

L3A S 6 004 1 0 E 2 1 A P 000

Calibration range inches w.c.		
Code	Range	Stem URL
502	0...18	5
065	0...20	5
066	0...30	5
224	0...35	5
067	0...40	5
068	0...50	5
069	0...60	5
206	0...70	5
071	0...100	5, 6
294	0...140	5, 6
073	0...150	5, 6
074	0...160	5, 6
075	0...200	6
077	0...300	6, 7
078	0...350	6, 7
079	0...400	6, 7
503	0...415	6, 7
504	0...480	6, 7
081	0...500	6, 7
505	0...830	6, 7
084	0...1000	7
499	0...1200	7
506	0...1385	7, 8
507	0...1600	7, 8
086	0...2000	7, 8
508	0...3300	8
089	0...4000	8

Calibration range PSI		
Code	Range	Stem URL
025	Full vac...0	6
028	Full vac...15	6, 7
029	Full vac...30	6, 7
031	Full vac...60	7, 8
032	Full vac...100	7, 8
314	Full vac...200	8
501	0...1.2	5
428	0...1.5	5
057	0...2	5
235	0...3	5, 6
192	0...4	5, 6
060	0...6	5, 6
309	0...7	6
061	0...10	6, 7
502	0...18	6, 7
065	0...20	6, 7
066	0...30	6, 7
224	0...35	7
067	0...40	7
068	0...50	7, 8
069	0...60	7, 8
206	0...70	7, 8
071	0...100	7, 8
294	0...140	8
073	0...150	8
074	0...160	8
075	0...200	8
077	0...300	8
078	0...350	8
079	0...400	8
503	0...415	8
504	0...480	8
081	0...500	8

Calibration range BAR		
Code	Range	Stem URL
251	-1...1	6, 7
286	-1...2.5	7
217	-1...3	7
056	-1...4	7, 8
304	-1...7	7, 8
501	0...1.2	6, 7
428	0...1.5	6, 7
057	0...2	6, 7
235	0...3	7
192	0...4	7, 8
060	0...6	7, 8
309	0...7	7, 8
061	0...10	8
502	0...18	8
065	0...20	8
066	0...30	8
224	0...35	8

Calibration range mBAR		
Code	Range	Stem URL
224	0...35	5
067	0...40	5
068	0...50	5
069	0...60	5
206	0...70	5
071	0...100	5
294	0...140	5
073	0...150	5
074	0...160	5
075	0...200	5, 6
077	0...300	5, 6
078	0...350	5, 6
079	0...400	5, 6
503	0...415	5, 6
504	0...480	6
081	0...500	6
505	0...830	6, 7
084	0...1000	6, 7
499	0...1200	6, 7
506	0...1385	6, 7
507	0...1600	6, 7
086	0...2000	6, 7
508	0...3300	7
089	0...4000	7, 8

Note: Full vac = -14.7 PSI

Note: When multiple stem URL's are available (**Example 5,6**), lower stem URL is recommended (**Select 5**).

Order code of sensor head

L3E Sensor head

Cap

- 2 Clear
- 3 Stainless steel

Enclosure orientation

- 1 Vertical
- 2 Horizontal

Electrical connection

- A M12 QDR
- C Cable gland
- N 1/2" NPTF adaptor

Engineering units

- P PSI
- B BAR
- W inches of water
- L millibar

Calibration range

- 000 Full range of stem URL
- 999 Custom range
- XXX See calibration range table

L3E 2 1 A P 000

Cleaning/Maintenance 

- In case of using pressure washers, don't point nozzle directly to electrical connections!

Reshipment 

- Sensors shall be clean and must not be contaminated with dangerous media! Note the advice for cleaning!
- Use suitable transport packaging only to avoid damage of the equipment!

Advice to conformity 

- Applicable guidelines: Electromagnetic compatibility 2004/108/EC
- The accordance with applicable EC-guidelines is confirmed with CE-labeling of the device.
- You have to guarantee the compliance of all guidelines applicable for the entire equipment.

Transport/Storage 

- No outdoor storage
- Dry and dust free
- Not exposed to corrosive media
- Protected against solar radiation
- Avoiding mechanical shock and vibration
- Storage temperature -55...+90 °C
- Relative humidity max. 95 %

Standards and guidelines 

- You have to comply with applicable regulations and directives.

Disposal 

- This instrument is not subject to the WEEE directive 2002/96/EC and the respective national laws.
- Pass the instrument directly on to a specialised recycling company and do not use the municipal collecting points.

Order code of sensor stem

L3S Sensor stem

URL

- 5 0...6 PSI, 0...0.4 BAR, 0...166" w.c.
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- 180 M38x1.5
- 189 DRD

* Sensor is 3A compliant when installed in a 3A compliant instrument tee

Capillary fill

- 1 Mineral oil
- 5 Neobee

Remote cable

- 0 Integral
- B 10' Cable
- E 25' Cable

L3S 5 004 1 0

Cord Sets

Shielded Molded w/25' cable	42117H0025
Shielded Molded w/50' cable	42117H0050
Shielded Molded w/100' cable	42117H0100

Weld-In Shells for Anderson Flush Mount (316L)

Anderson Long - Insulated Standard Vessel	71060A0003
Anderson Short - Uninsulated Standar Vessel	71060A0004
Anderson Long - Insulated Pressure Vessel	71060A0005
Anderson Short - Uninsulated Pressure Vessel	71060A0006
Anderson Long - Insulated H/D Pressure Vessel	71060A0009

Tank Shell Plugs (Supplied with nut and gasket)

Anderson Long	56511B0001
Anderson Short	56511B0002
Cherry Burrell Long	56511A0001
Cherry Burrell Short	56511A0002
King Long	56511C0001
King Medium	56511C0002
King Short	56511C0003

Flush Mount Calibration Adapters

Anderson Fitting	73198A0001
Cherry Burrell Fitting	73198A0002
King Gage Fitting	73198A0003

Gaskets for Flush Mount Fittings

Anderson - Silicone	44348A0001
Anderson - Silicone (USP Class VI)	44348A0003
Cherry Burrell - Silicone	44292A0001
Endress & Hauser - Silicone	45352A0001
King Gage - Silicone O-Ring	36240S3212
Rosemount - Silicone O-Ring	36240S3341

Other Accessories

Clear Cap w/gaskets	5632800001
Stainless Steel Cap w/gaskets	5632900001
M12 Quick Disconnect Receptacle	SP56726A0004
Cord Grip	SP5633100000
1/2" NPTF adaptor	SP5633200000
Seal Kit (6) gaskets	5633000001
Field Wireable Connector-Straight	42119B0000
Field Wireable Connector-90°	42119A0000
10' Remote Kit	SP73228A0010
25' Remote Kit	SP73228A0025
50' Remote Kit	SP73228A0050
Rosemount/Foxboro Clamp Connection	46600A00010

50077 / 1.3 / 2019-08-19 / AM / NA