

**Product Information L3****LIFE SCIENCES**

# 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
- 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 life science applications
- Bio-reactor level and head space monitoring
- SIP monitoring
- Filtration processes
- Sterile gas lines and transfer lines

**Hygienic design/Process connection**

- Sensor and product contact surfaces made of stainless steel and electropolished with a surface finish not exceeding Ra 8 microinches (0.2 µm)
- Product contact materials compliant to FDA
- Front flush for vessels with Anderson flush fitting, E&H universal, or tank spud connections
- Available with over 10 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**

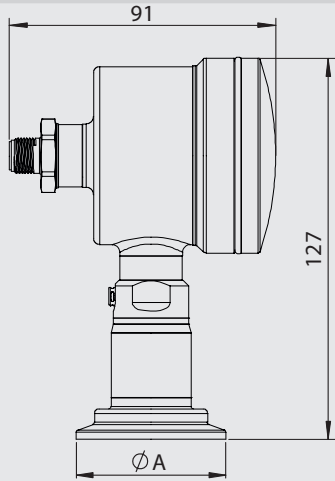
**AMSE BPE  
2019  
Compliant**

**Horizontal Enclosure Orientation****Vertical Enclosure Orientation****Remote Configuration**

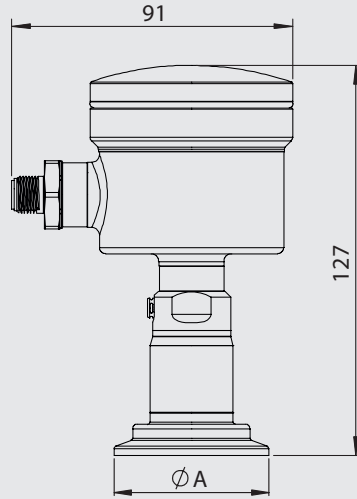
Specification		
Measuring range URL [bar] Measuring range URL [psi] Measuring range URL [inches of w.c.]	Relative Relative Relative	0...0.4 / -1...2 / -1...7 / -1...35 0...6 / -14.7...30 / -14.7...100 / -14.7...500 0...166 / -400...830 / -400...2770 / -400...13850
Turndown	max. 10:1	of upper range limit (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 <sub>a</sub> ≤ 0.8 μm (32 microinch) Stainless steel, AISI 304 (1.4301), R <sub>a</sub> ≤ 0.8 μm (32 microinch) Polycarbonate Stainless steel, AISI 304 (1.4301), R <sub>a</sub> ≤ 0.8 μm (32 microinch) Stainless steel, AISI 316L, R <sub>a</sub> ≤ 0.2 μm (8 microinch) Stainless steel, AISI 316L, R <sub>a</sub> ≤ 0.2 μm (8 microinch) Medical white oil / mineral oil / paraffin oil FDA approval number 21CFR172.878, 21CFR178.3620, 21CFR573.680 Neobee M20 (optional)
Process connection		1-1/2" Tri-Clamp® 2" Tri-Clamp® 2-1/2" Tri-Clamp® 3" Tri-Clamp® AIC CPM Flush Mount Anderson Flush Mount - Short and Long Rosemount/Foxboro Sanitary Spud - Short and Long Endress & Hauser Universal Adaptor - Short and Long G1" CLEANadapt DRD
Electric connection	Cable gland Plug-in connection	M16x1.5 M12 plug, 5-pin, 1.4305
Certifications/Compliances		ASME BPE 2019 Compliant CE 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

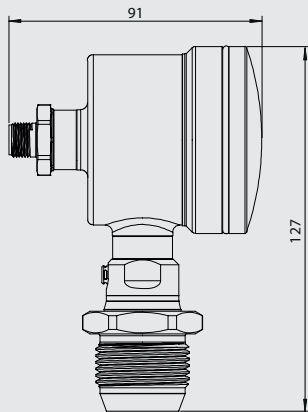
Type	Ø A
004	50,5 mm
005	64,0 mm

Information

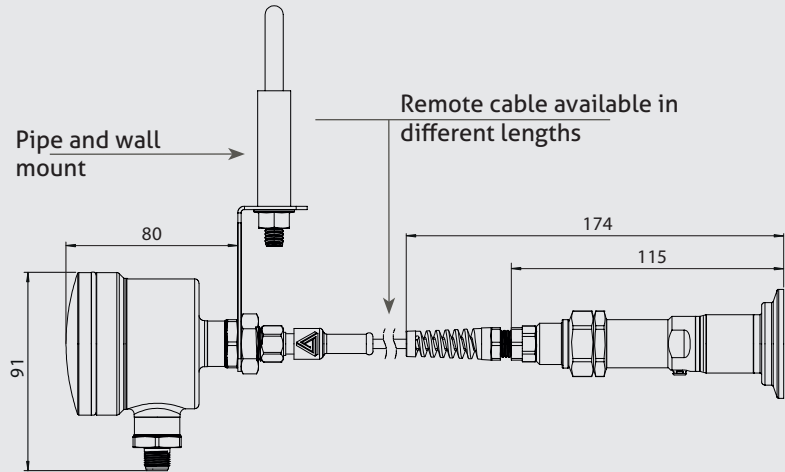


The remote kit, including all parts for separate mounting, can be ordered as accessory.

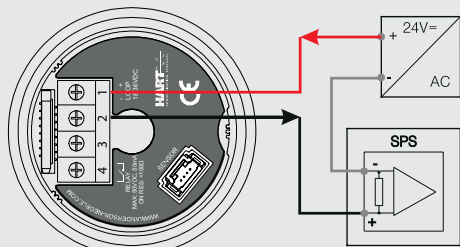
L3 / G1" Compact version



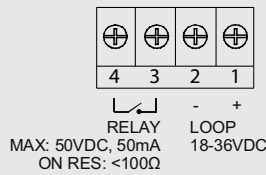
L3 Remote version



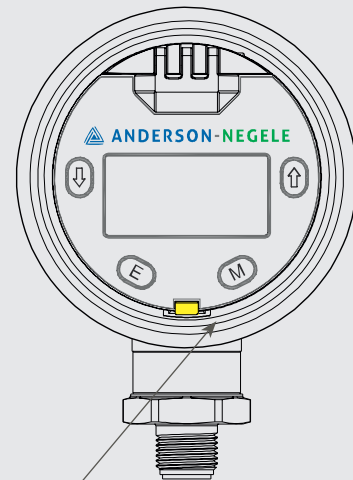
Electrical connection with cable gland



4...20 mA  
2-wire current loop

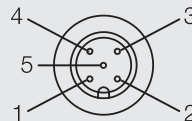


L3 with open cap



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.



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 -14.7...30 PSI, -1...2 BAR, -400...830" w.c.
- 7 -14.7...100 PSI, -1...7 BAR, -400...2770" w.c.
- 8 -14.7...500 PSI, -1...35 BAR, -400...13850" w.c.

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)
- 089 Anderson Flush Mount Long (71060-A3, A5, A9)
- 141 Rosemount/Foxboro Sanitary Spud - Short
- 142 Rosemount/Foxboro Sanitary Spud - Long
- 154 Endress & Hauser Universal Adaptor - Short
- 155 Endress & Hauser Universal Adaptor - Long
- 160 G1" CLEANadapt
- 181 DRD

Capillary fill

- M Mineral oil
- N 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 N O 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	-14.7...0	6
028	-14.7...15	6, 7
029	-14.7...30	6, 7
031	-14.7...60	7, 8
032	-14.7...100	7, 8
314	-14.7...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:** 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.

6 -14.7...30 PSI, -1...2 BAR, -400...830" w.c.

7 -14.7...100 PSI, -1...7 BAR, -400...2770" w.c.

8 -14.7...500 PSI, -1...35 BAR, -400...13850" w.c.

## 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)

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160 G1" CLEANadapt

181 DRD

## Capillary fill

M Mineral oil

N Neobee

## Remote cable

O Integral

B 10' Cable

E 25' Cable

L3S 5 004 N O

## Accessories

## Cord Sets

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

## Flush Mount Gaskets

Anderson - Silicon Gasket (USP Class VI) 44348A0003

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

Anderson Long-Insulated Std. Vessel 71060A0003  
 Anderson Short-Uninsulated Std. Vessel 71060A0004  
 Anderson Long-Insulated Press. Vessel 71060A0000  
 Anderson Short-Uninsulated Press. Vessel 71060A0006  
 Anderson Long-Insulated H/D Press. Vessel 71060A0009

## Tank Shell Plugs (Supplied with nut and gasket)

Anderson Long 56511B0001  
 Anderson Short 56511B0002

## Flush Mount Calibration Adapters

Anderson Fitting Calibration Adapter 73198A0001

## Other Accessories

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 SP73328A0050  
 Rosemount/Foxboro Clamp Connection 46600A0001

