

## Product Information L3

## LIFE SCIENCES

## FOOD

# L3 Pressure and Level Transmitter



## 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 up to 135 °C (275 °F) for 1 hour when ambient is below 60 °C (140 °F)

## Application examples

- Accurately and efficiently monitor liquid inventory levels for inventory management processes in Dairy, Beverage, Breweries, Food (with 3-A compliance)
- Optional Pharma / Life Science version with ASME BPE compliance
- Increase level accuracy and decrease inventory scrap costs in vessels with high or changing process temperatures
- Limit the risk of costly damages that are the result of overfill or running pumps dry
- Anticipate out of stock materials in order to prevent being line-dow

## Hygienic design/Process connection

- Front flush, hygienic installation for silos with Anderson flush fitting, competitive universal, or tank spud connections
- Sensor and product contact surfaces made of stainless steel and electropolished with a surface finish to conform with FDA, 3-A and/or AMSE BPE standards
- Available with over 20 integral hygienic connections, more available through CLEANadapt adapters

## Features

- Capable of being configured for volume with pre-programmed tank geometry and product selection with density compensation
- 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, IO-Link or HART interface
- Intuitive user interface makes set-up and configuration easy
- On board interface allows reconfiguration including 10:1 range turndown
- Field repairable and reconfigurable through modular design
- Dual o-ring seals provide IP69K ingress protection
- Standard HART 7.0 communication and graphical LC display with bar graph

## Options/Accessories

- Optional digital remote kit making display easier to view
- Wide range of ranges and fittings available
- Add-On Instructions are available at [www.anderson-negele.com/aoi](http://www.anderson-negele.com/aoi)

## 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 HART models and digitally transferred to IO-Link master using IO-Link for IO-Link models. For relative sensors the back of the diaphragm is vented and the output is relative to the atmospheric conditions.

## Communication



## Horizontal Enclosure Orientation



## Vertical Enclosure Orientation

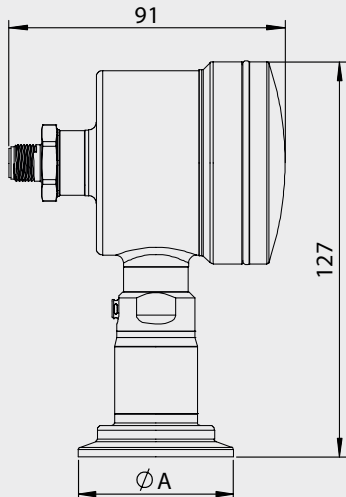


## Remote Configuration

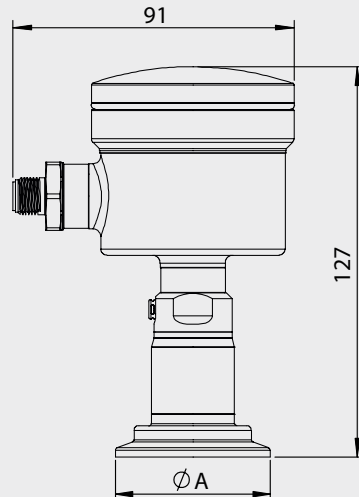


Specification		
Measuring range URL [bar]	Relative	0...0.4 / -1...2 / -1...7 / -1...35
Measuring range URL [psi]	Relative	0...6 / -14.7...30 / -14.7...100 / -14.7...500
Measuring range URL [inches of w.c.]	Relative	0...166 / -400...830 / -400...2 770 / -400...13 850
Turndown	max. 10:1	of upper range 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 $t_{\text{ambient}} \leq 71 \text{ °C (160 °F)}$ -18...71 °C (0...160 °F) 135 °C (275 °F) / 60 minutes max., at $t_{\text{ambient}} \leq 60 \text{ °C (140 °F)}$ , temperature limit of 121 °C (250 °F) for fitting options 088 and 089
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), $R_a \leq 0.8 \text{ }\mu\text{m (32 }\mu\text{in)}$ Stainless steel, AISI 304 (1.4301), $R_a \leq 0.8 \text{ }\mu\text{m (32 }\mu\text{in)}$ Polycarbonate Stainless steel, AISI 304 (1.4301), $R_a \leq 0.8 \text{ }\mu\text{m (32 }\mu\text{in)}$ FOOD: Stainless steel, AISI 316L, $R_a \leq 0.64 \text{ }\mu\text{m (25 }\mu\text{in)}$ PHARMA: Stainless steel, AISI 316L, $R_a \leq 0.2 \text{ }\mu\text{m (8 }\mu\text{in)}$ Medical white oil / mineral oil / paraffin oil FDA approval number 21CFR172.878, 21CFR178.3620, 21CFR573.680 Neobee® M-20 (optional)
Process connection		See order code
Electric connection	Cable gland Plug-in connection	M16x1.5 M12 plug, 5-pin, AISI 304 (1.4301)
Approvals	Hygienic  Saftey/Design	PHARMA only: ASME BPE 2022 compliant FOOD only: 3-A CE Compliant CSA-C22.2
Protection class		IP 67 (with cable gland) / NEMA 4X IP 69 K (with plug-in connection)
Operating voltage	IO-Link HART	18...36 V DC 18...35 V DC
Output	Analog Digital Digital switch	analog 4...20 mA/20...4 mA and HART 7.0 IO-Link normally open relay (50 V DC, 50 mA, < 100 Ω ON resistance)
Weight		780 g (1.72 lbs)

L3 / Tri-Clamp with horizontal enclosure



L3 / Tri-Clamp with vertical enclosure



Tri-Clamp size

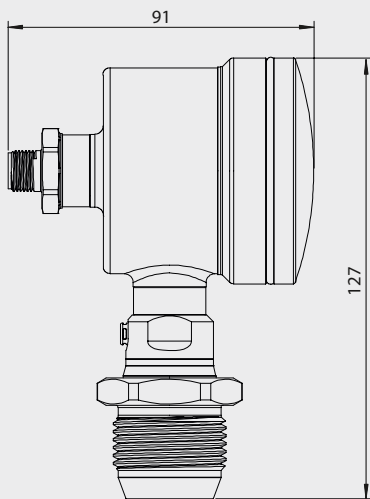
Type	Ø A [mm / inch]
002 / 3/4"	25.0 / 0.98
004 / 1½"	50.5 / 1.99
005 / 2"	64.0 / 2.52
006 / 2½"	77.5 / 3.05
007 / 3"	91.0 / 3.58

Information

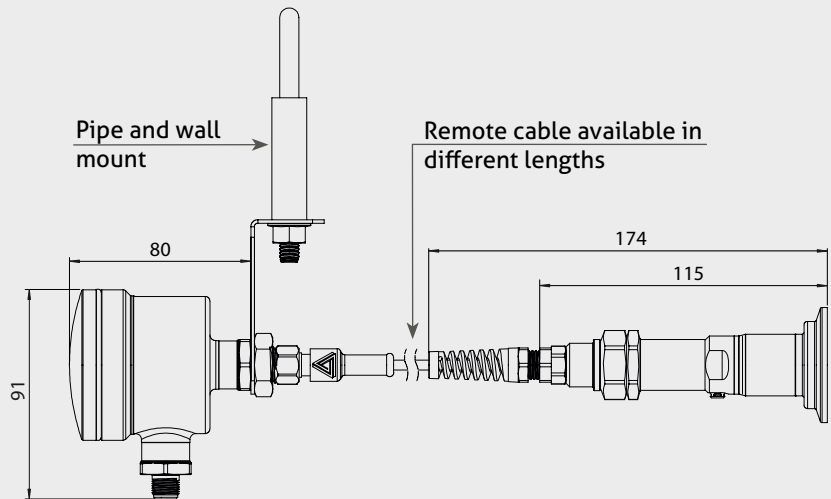


The remote kit, including all parts for separate mounting, can be ordered as accessory.

L3 / G1" Compact version

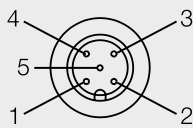


L3 Remote version

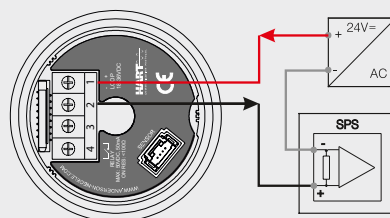


Electrical connection

M12 plug

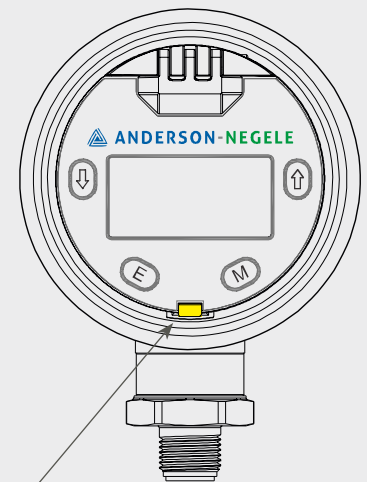


Cable gland



4...20 mA  
2-wire current loop

L3 with open cap



Pull up the clip to open the display.

Connection M12 plug

Pin	Output	Type A (analog)	Type A (IO-Link)	Type G (analog and HART)
1: red		+ supply	+ supply	+ supply
2: black		4...20 mA current output	n. c.	- supply 4...20 mA
3: green		- supply	- supply	relay normally open
4: blue		digital output	IO-Link	relay normally open
5:		n. c.	n. c.	n. c.

## Order code of fully assembled sensor

## L3A Sensor assembled

- S** Standard Stem (AISI 316L,  $R_a \leq 0.64 \mu\text{m} / 25 \mu\text{in}$ )  
**P** Pharmaceutical Stem (AISI 316L,  $R_a \leq 0.2 \mu\text{m} / 8 \mu\text{in}$ )

## 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

- 002** Tri-Clamp® 3/4"  
**004** Tri-Clamp® 1½"  
**005** Tri-Clamp® 2"  
**006** Tri-Clamp® 2½"  
**007** Tri-Clamp® 3"  
**123** CPM Fitting\*  
**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** Flexibel thread G1",  
hygienic CLEANadapt  
**059** 1½" NPT  
**182** Fixed thread G1",  
hygienic CLEANadapt  
**109** 38 mm SMS Liner (female)  
**110** 51 mm SMS Liner (female)  
**115** Dairy flange DIN 11851 DN 40  
**124** Dairy flange DIN 11851 DN 50  
**180** M38x1.5  
**181** DRD flange 65 mm

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

## Capillary fill

- 1** Mineral oil  
**5** Neobee® M-20

## Sensor type

- 0** Integral (Compact version)  
**A** Remote with 1.5 m = 5' cable  
**B** Remote with 3.0 m = 10' cable  
**C** Remote with 4.5 m = 15' cable

- D** Remote with 6.0 m = 20' cable  
**E** Remote with 7.5 m = 25' cable  
**F** Remote with 15 m = 50' cable

## Output

- A** Analog and IO-Link  
**G** Analog and HART

## 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** mbar

## Calibration range

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

L3A S 5 004 1 0 A 2 1 A P 000

Calibration range bar			Calibration range mbar			Calibration range psi			Calibration range inches w.c.		
Code	Range	Stem URL	Code	Range	Stem URL	Code	Range	Stem URL	Code	Range	Stem URL
251	-1...1	6, 7	067	0...40	5	025	Full vac...0	6	502	0...18	5
286	-1...2.5	7	068	0...50	5	028	Full vac...15	6, 7	065	0...20	5
217	-1...3	7	069	0...60	5	029	Full vac...30	6, 7	066	0...30	5
056	-1...4	7, 8	206	0...70	5	031	Full vac...60	7, 8	067	0...40	5
304	-1...7	7, 8	071	0...100	5	032	Full vac...100	7, 8	068	0...50	5
501	0...1.2	6, 7	294	0...140	5	314	Full vac...200	8	069	0...60	5
428	0...1.5	6, 7	073	0...150	5	501	0...1.2	5	206	0...70	5
057	0...2	6, 7	074	0...160	5	428	0...1.5	5	071	0...100	5, 6
235	0...3	7	075	0...200	5, 6	057	0...2	5	294	0...140	5, 6
192	0...4	7, 8	077	0...300	5, 6	235	0...3	5, 6	073	0...150	5, 6
060	0...6	7, 8	078	0...350	5, 6	192	0...4	5, 6	074	0...160	5, 6
309	0...7	7, 8	079	0...400	5, 6	060	0...6	5, 6	075	0...200	6
061	0...10	8	503	0...415	5, 6	309	0...7	6	077	0...300	6, 7
502	0...18	8	504	0...480	6	061	0...10	6, 7	078	0...350	6, 7
065	0...20	8	081	0...500	6	502	0...18	6, 7	079	0...400	6, 7
066	0...30	8	505	0...830	6, 7	065	0...20	6, 7	503	0...415	6, 7
			084	0...1000	6, 7	066	0...30	6, 7	504	0...480	6, 7
			499	0...1200	6, 7	067	0...40	7	081	0...500	6, 7
			506	0...1385	6, 7	068	0...50	7, 8	505	0...830	6, 7
			507	0...1600	6, 7	069	0...60	7, 8	084	0...1000	7
			086	0...2000	6, 7	206	0...70	7, 8	499	0...1200	7
			508	0...3300	7	071	0...100	7, 8	506	0...1385	7, 8
			089	0...4000	7, 8	294	0...140	8	507	0...1600	7, 8
						073	0...150	8	086	0...2000	7, 8
						074	0...160	8	508	0...3300	8
						075	0...200	8	089	0...4000	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			


## Note

- Full vac = -14.7 psi
- When multiple stem URL's are available (**Example 5, 6**), lower stem URL is recommended (**Select 5**).



## Order code of sensor head

<b>L3</b>	Sensor head
	<b>Communication</b>
<b>E</b>	HART
<b>I</b>	IO-Link
	<b>Cap</b>
<b>2</b>	Clear
<b>3</b>	Stainless steel
	<b>Enclosure orientation</b>
<b>1</b>	Vertical
<b>2</b>	Horizontal
	<b>Electrical connection</b>
<b>A</b>	M12 QDR
<b>C</b>	Cable Gland
<b>N</b>	1/2" NPTF Adaptor
	<b>Engineering units</b>
<b>P</b>	psi
<b>B</b>	bar
<b>W</b>	inches of water
<b>L</b>	mbar
	<b>Calibration range</b>
<b>000</b>	Full range of stem URL
<b>999</b>	Custom range
<b>XXX</b>	see calibration range table
<b>L3</b>	
<b>I</b>	
<b>2</b>	
<b>1</b>	
<b>A</b>	
<b>P</b>	
<b>000</b>	

Conventional usage 

- Not suitable for applications in explosive areas.
- Not suitable for applications in security-relevant equipment (SIL).

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!

Standards and guidelines 

- You have to comply with applicable regulations and directives.

Disposal 

- Electrical devices should not be disposed of with household trash. They must be recycled in accordance with national laws and regulations.
- Take the device directly to a specialized recycling company and do not use municipal collection points.

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 / -67...194 °F
- Relative humidity max. 95 %

Cleaning/Maintenance 

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

Note on CE 

- Applicable directives:  
Electromagnetic Compatibility Directive 2014/30/EU
- Compliance with the applicable EU directives is identified by the CE label on the product.
- The operating company is responsible for complying with the guidelines applicable to the entire installation.

## Order code of sensor stem

## Stem version

<b>L3S</b>	Standard (HART)
<b>L3I</b>	Standard (IO-Link)
<b>L3P</b>	Pharmaceutical (HART)
<b>L3L</b>	Pharmaceutical (IO-Link)

## Measurement range

<b>5</b>	0...6 psi, 0...0.4 bar, 0...166" w.c.
<b>6</b>	30 "Hg/0/30 psi, -1...2 bar, -400...830" w.c.
<b>7</b>	30 "Hg/0/100 psi, -1...7 bar, -400...2 770" w.c.
<b>8</b>	30 "Hg/0/500 psi, -1...35 bar, -400...13 850" w.c.

## 3-A compliant fittings

<b>002</b>	Tri-Clamp® 3/4"
<b>004</b>	Tri-Clamp® 1½"
<b>005</b>	Tri-Clamp® 2"
<b>006</b>	Tri-Clamp® 2½"
<b>007</b>	Tri-Clamp® 3"
<b>123</b>	AIC CPM Flush Mount*
<b>088</b>	Anderson Flush Mount Short (71060-A4, A6, A8)
<b>089</b>	Anderson Flush Mount Long (71060-A3, A5, A7, A9)
<b>092</b>	King Gage Flush Mount Long (1777-3)
<b>093</b>	King Gage Flush Mount Medium (1777-1, -6 Standard)
<b>094</b>	King Gage Flush Mount Short (1777-2 non-insulated)
<b>141</b>	Rosemount/Foxboro Sanitary Spud - Short
<b>142</b>	Rosemount/Foxboro Sanitary Spud - Long
<b>154</b>	Endress & Hauser Universal Adaptor - Short
<b>155</b>	Endress & Hauser Universal Adaptor - Long

## Fittings not 3-A compliant

<b>160</b>	Flexibel thread G1", hygienic CLEANadapt
<b>059</b>	1½" NPT
<b>182</b>	G1" Fixed Thread
<b>109</b>	38 mm SMS Liner female
<b>110</b>	51 mm SMS Liner female
<b>115</b>	40 mm DIN 11851 (Milk Coupling)
<b>124</b>	50 mm DIN 11851 (Milk Coupling)
<b>180</b>	M38x1.5
<b>181</b>	DRD

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

## Capillary fill

<b>1</b>	Mineral oil / FDA approved
<b>5</b>	Neobee / FDA approved

## Sensor type

<b>0</b>	Integral (Compact version)
<b>A</b>	Remote with 1.5 m = 5' cable
<b>B</b>	Remote with 3.0 m = 10' cable
<b>C</b>	Remote with 4.5 m = 15' cable

<b>D</b>	Remote with 6.0 m = 20' cable
<b>E</b>	Remote with 7.5 m = 25' cable
<b>F</b>	Remote with 15 m = 50' cable

**L3S 5 004 1 0**

## Note on 3-A Sanitary Standard 74-



Information on installation according to 3-A standard is available on our website:  
[www.anderson-negele.com/3A74.pdf](http://www.anderson-negele.com/3A74.pdf)

Click on the PDF icon to download the document.

**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 (AISI 316L)**

Anderson Long - Insulated Standard Vessel	71060A0003
Anderson Short - Uninsulated Standard 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	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
5' Remote Kit	73228A0005
10' Remote Kit	73228A0010
15' Remote Kit	73228A0015
20' Remote Kit	73228A0020
25' Remote Kit	73228A0025
50' Remote Kit	73228A0050
M12 QDR w/ ribbon cable for remote cable	SP56726B0004
Rosemount/Foxboro Clamp Connection	46600A0001