

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 overflow or running pumps dry
- Anticipate out of stock materials in order to prevent being line-dow

Hygienic design/Process connection

- Hygienic process connection with CLEANadapt
- 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
- Complete overview of process connections: see order code
- The Anderson-Negele CLEANadapt system offers a flow-optimized, hygienic and easily sterilizable installation solution for sensors.

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

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

 **IO-Link**  **4...20 mA**

Horizontal Enclosure Orientation



Vertical Enclosure Orientation

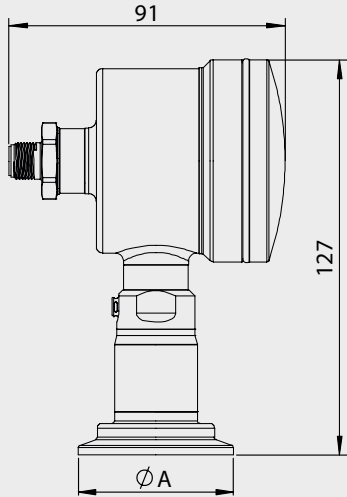


Remote Configuration

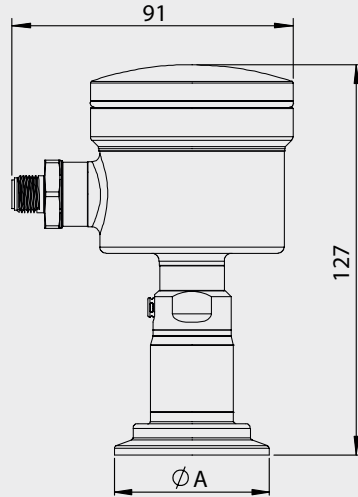


Specification		
Measuring range URL [bar]	Relative	0...0.4 / -1...2 / -1...7 / -1...35
Measuring range URL [psi]	Relative	0...6 / -14.7...30 / -14.7...100 / -14.7...500
Measuring range URL [inches of w.c.]	Relative	0...166 / -400...830 / -400...2 770 / -400...13 850
Turndown	max. 10:1	of upper range 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 CRN: 0F19809.5C
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

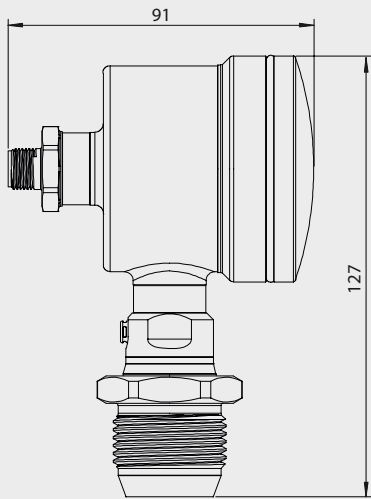
Type	Ø A [mm / inch]
002 / 3/4"	25.0 / 0.98
004 / 1½"	50.5 / 1.99
005 / 2"	64.0 / 2.52
006 / 2½"	77.5 / 3.05
007 / 3"	91.0 / 3.58

Information

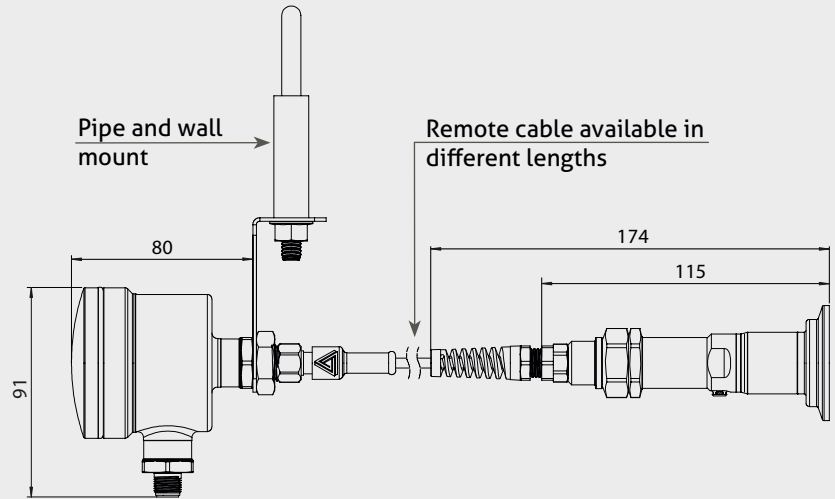


The remote kit, including all parts for separate mounting, can be ordered as accessory.

L3 / G1" Compact version

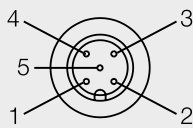


L3 Remote version

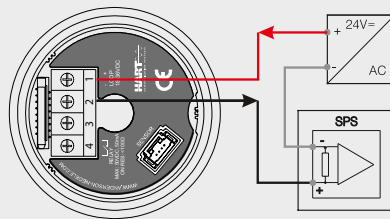


Electrical connection

M12 plug

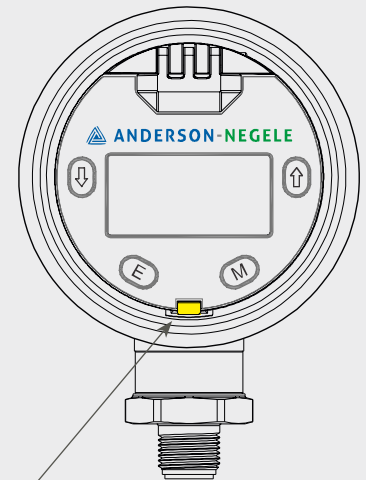


Cable gland



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, $R_a \leq 0.2 \mu\text{m} / 8 \mu\text{in}$) with 3.1 inspection certificate and calibration certificate

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...2 770" w.c.
8 30 "Hg/0/500 psi, -1...35 bar, -400...13 850" 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

L3	Sensor head
	Communication
E	HART
I	IO-Link
	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
L3	
I	
2	
1	
A	
P	
000	

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

L3S	Standard (HART)
L3I	Standard (IO-Link)
L3P	Pharmaceutical (HART) with 3.1 inspection certificate and calibration certificate
L3L	Pharmaceutical (IO-Link) with 3.1 inspection certificate and calibration certificate

Measurement range

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...2 770" w.c.
8	30 "Hg/0/500 psi, -1...35 bar, -400...13 850" 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	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	Flexibel thread G1", hygienic CLEANadapt
059	1½" NPT
182	G1" Fixed Thread
109	38 mm SMS Liner female
110	51 mm SMS Liner female
115	40 mm DIN 11851 (Milk Coupling)
124	50 mm DIN 11851 (Milk Coupling)
180	M38x1.5
181	DRD

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

Capillary fill

1	Mineral oil / FDA approved
5	Neobee / FDA approved

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

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

Click on the PDF icon to download the document.

L3 Remote kit

Complete accessories to convert compact version into remote version, including:

- M12 remote adaptor with nut
- Stem adaptor
- Wall mount
- Pipe mount

**Note:**

The remote cable is not part of the remote kit and must be ordered separately.

Remote cable for L3**Pre-assembled remote cable for L3**

L3 R-CABLE / 4-15	PVC cable, 4-pin, length 1.5 m
L3 R-CABLE / 4-30	PVC cable, 4-pin, length 3.0 m
L3 R-CABLE / 4-45	PVC cable, 4-pin, length 4.5 m
L3 R-CABLE / 4-60	PVC cable, 4-pin, length 6.0 m
L3 R-CABLE / 4-75	PVC cable, 4-pin, length 7.5 m
L3 R-CABLE / 4-150	PVC cable, 4-pin, length 15.0 m

Remote cable for L3**Accessories****PVC-cable with M12 connection, brass nickel-plated, IP69K, shielded**

M12-PVC/5G-8m	5 pin, length 8 m
M12-PVC/5G-15m	5 pin, length 15 m
M12-PVC/5G-30m	5 pin, length 30 m

Remote kit

L3 REMOTE-KIT	Complete accessories incl. wall mount
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Cap / Gaskets

L3 C-GASKET	Replacement silicone gaskets for cap (6 pieces)
L3 C-CLEAR	Clear plastic cap (incl. gasket)
L3 C-STEEL	Stainless steel cap without control window (incl. gasket)

Options

CERT / 2.2 / L3	Factory certificate 2.2 acc. to EN 10204 (only product contacting surface)
CAL / L3	Factory calibration certificate with 3 calibration points (0 %, 50 %, 100 %)
CAL / L3 / MP	Factory calibration certificate with 5 calibration points (0 %, 25 %, 50 %, 75 %, 100 %)