

Product Information SL

FOOD

SL Hydrostatic Level Sensor



Application / Specified usage

- Hydrostatic level measurement with superior precision and long-term stability, even in humid environments
- Ideal for hygienic dairy, brewery or beverage processes due to fully sealed design
- The Dual Diaphragm Design, with atmospheric reference measured with an industry proven diaphragm design, minimises drift problems consistently

Application examples

- Reliable and consistently accurate overflow protection to prevent run-dry and overfill risks
- Particularly suitable for food & beverage applications with heavy condensation, such as outdoor applications or cooling tanks
- Measurement up to 130 °C (266 °F) medium temperature

Hygienic design / Process connection

- Options with 3-A approved process connections
- Full stainless steel design, product contact surfaces electropolished to conform with FDA and 3-A standards and improve clean-ability and CIP/SIP
- 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 / Advantages

- Stable performance: Minimizes drift from environmental exposure (temp/humidity swings)
- Fully closed system: Measurement cell without any contact to atmosphere
- Highly accurate: Calibrated measurement accuracy 0.2 % of URL
- The new, integrated tank linearization guarantees maximum application and process reliability through direct volume output, even for tanks with complex geometries
- Integrated field calibration with one-touch setup without tools
- Automatic connectivity with IO -Link in Flex Hybrid technology (4...20 mA and IO -Link in parallel) or HART 7 offers plug-and-play connection, easier configuration, and efficient operation.
- Protection class IP 69 K / NEMA 4X
- Special IO-Link features:
 - Process Temperature output in parallel as a second measuring value
 - Firmware updates can be made on site, no need to uninstall and ship the sensor
- Electrical connection with M12 plug-in connector

Special Features / Advantages of the Display Version

- Display orientation in 45° angle with rotatable backlit display, ensuring optimum visibility in any vertical or horizontal installation
- Illuminated head and ring with LED color signal for easy recognition of sensor status (e.g., normal, warning, error)
- The visual signals support quick reaction to avoid process errors
- Hermetically sealed for perfect protection even in harsh conditions and wash-downs
- Simple, intuitive on-site programming via capacitive touch buttons on the outside of the display

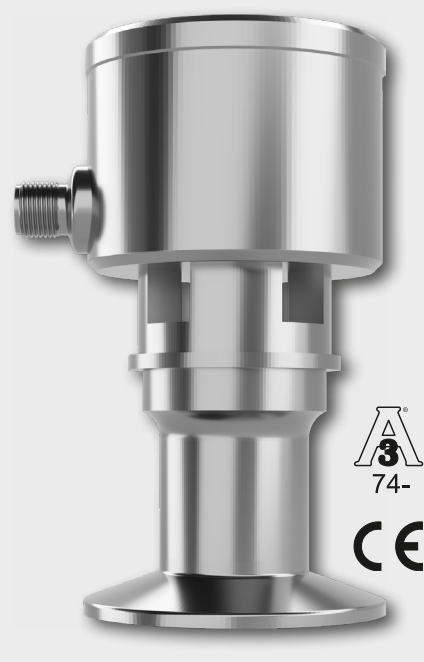
Options / Accessories

- Special pressure ranges, specific pressure calibration ex works
- Hastelloy "C" Diaphragm
- Preambled cable for M12 plug-in connector

Communication

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


SL



SL with Display and LED status light

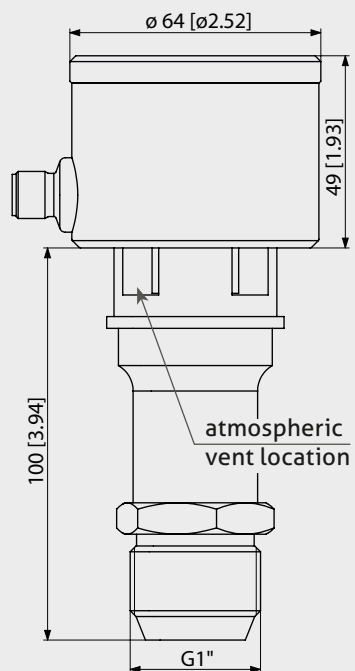


Specification		
Measuring range URL [bar]	Relative	0...0.35 / 0...1 / 0...2 / 0...4
Measuring range URL [psi]	Relative	0...5 / 0...15 / 0...30 / 0...60
Measuring range URL [inches of w.c.]	Relative	0...140 / 0...415 / 0...830 / 0...1385
Measuring range	Absolute	Vacuum ranges on request
Over-range rating	Factor	2 times the URL
Process connection		see order code
Materials	Connector head Thread connection Wetted partd / diaphragm Oil filling Plastic cover display	Stainless steel AISI 316 / 1.4305, Ø 2.59 in / 66 mm Stainless steel AISI 316L / 1.4404 Stainless steel AISI 316L / 1.4404, R _a < 0.64 µm / 25 µin medical white oil, FDA approval number 21CFR172.878, 21CFR178.3620, 21CFR573.680 Polycarbonate
Temperature ranges	Ambient Process Compensated CIP-/SIP-cleaning	-10...50 °C / 15...120 °F -18...130 °C / -0...265 °F -18...120 °C / 0...250 °F 140 °C / 284 °F max. 60 minutes
Temperature compensation time	t ₉₀	30 s/10 K
Calibrated accuracy	Incl. hysteresis, linearity, reproduceability	≤ 0.20 % of URL at stable calibration temperature
Calibration stability		within ≤ 0.2 % of URL for one year minimum
Temperature stability		±0.2 % of URL per 10°F (5.5 °C)
Response time		0.5 sec.
Electrical connection	Cable connection	M12 connector AISI 304 / 1.4301
Approvals	Hygienic Safety / Design	3-A CE compliant UL Std C22.2611010-1 3rd ed CRN# 0F19809.5CADD2 (see fittings)
Protection class		IP 69 K / NEMA 4X (suiteable for use in wet locations at up to 100% relative humidity)
Operating voltage		18...30 V DC
Output	Analog Digital	4...20 mA IO-Link / HART 7
Max. loop resistance	Power supply 24 V DC 30 V DC	max. resistive load 500 Ω 800 Ω
Weight		approx. 1050 g

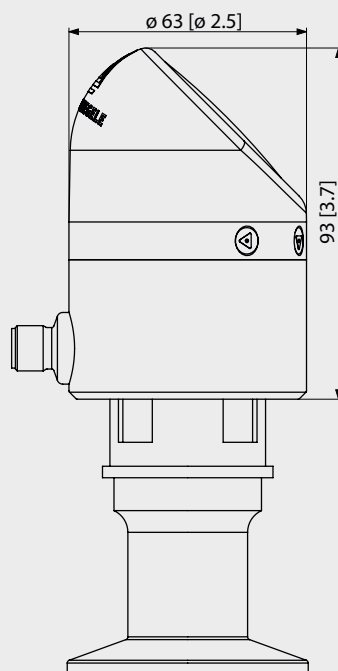
Pressure ranges

Type	Operation range						Over-range rating		
	min. [bar]	max. [bar]	min. [psi]	max. [psi]	min. [in w.c.]	max. [in w.c.]	[bar]	[psi]	[in w.c.]
SL A	0...0.1	0...0.35	0...1.5	0...5	0...30	0...140	0.6	10	280
SL B	0...0.35	0...1.0	0...6	0...15	0...141	0...415	2.0	30	830
SL C	0...1.0	0...2.0	0...16	0...30	0...416	0...830	4.0	60	1660
SL D	0...2.0	0...4.0	0...31	0...60	0...831	0...1385	8.0	100	2770

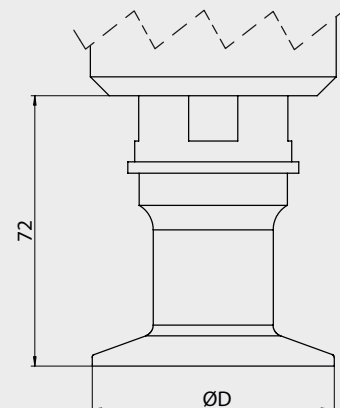
SL | G1" CLEANadapt



SL Display



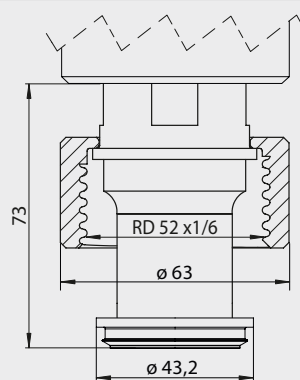
SL | Tri-Clamp



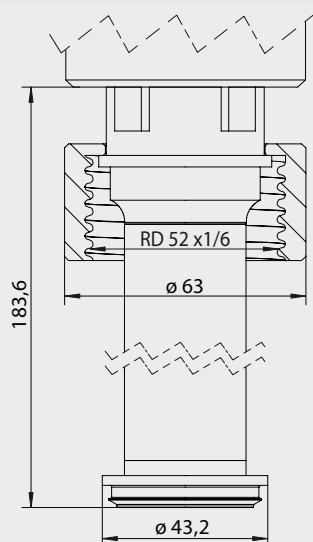
Tri-Clamp size

Type	Ø D [mm / inch]
004 / 1½"	50.5 / 1.99
005 / 2"	64.0 / 2.52
007 / 3"	91.0 / 3.58

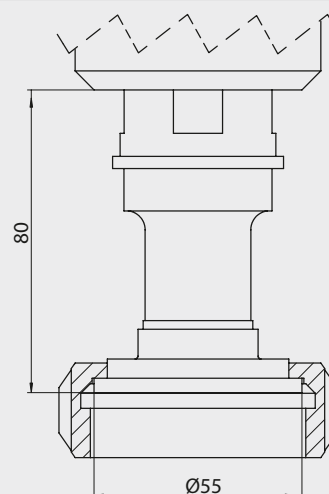
SL | Endress+Hauser - Short



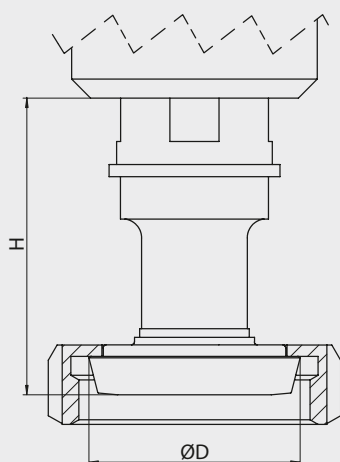
SL | Endress+Hauser - Long



SL | SMS 38



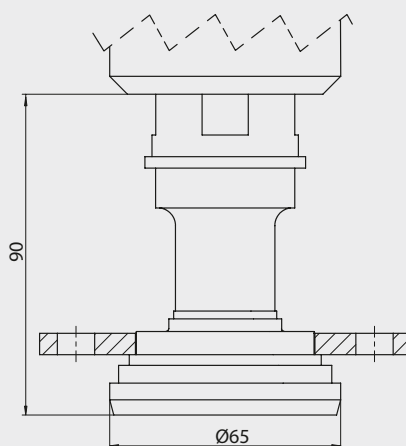
SL | Dairy flange DIN 11851



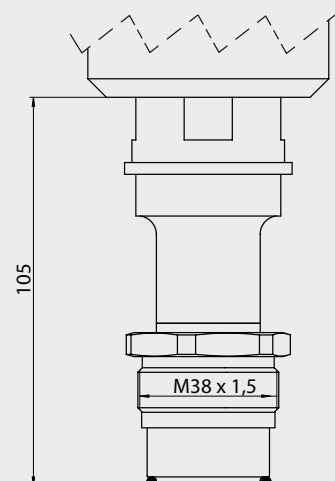
DIN 11851 size

Type	H [mm / inch]	Ø D [mm / inch]
DN40	75.7 / 2.98	55.9 / 2.20
DN50	77.0 / 3.03	68.5 / 2.70

SL | DRD-65

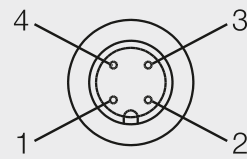


SL | HPV



Connection M12 plug			
Pin	Output	IO-Link	Analog and HART
1		+ supply	+ supply
2		n/c	- supply / 4...20 mA
3		- supply	n/c
4		IO-Link	n/c

M12-plug



Start up



- Connect the sensor with power supply (18...30 VDC) -> see "electrical connection SL".
- The sensor is now ready for use.
- At standard factory-setting 0...100 % of the full range are equivalent to 4...20 mA of the current output.
Example: SL B = 0...1 bar -> 0 bar = 4 mA; 1 bar = 20 mA
- In case of specific factory calibration the customized measurement range is equal to 4...20 mA of the current output.
Example: SL B calibrated to 0...0.8 bar -> 0 bar = 4 mA; 0.8 bar = 20 mA
- Calibration is on-site customizable for special measurement tasks.
- Settings of ZERO (4 mA) and SPAN (20 mA) are non-interactive, having no effect on each other.

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.

Download Manual



For further setup, calibration, adjustment, and troubleshooting procedures, refer to the SL manual:
www.anderson-negele.com/manuals

Click on the icon to download the document.

Mechanical connection / Installation



- Do not exceed a tightening torque of 20 Nm when using the Negele CLEANadapt system!
- Do not cover the four ventilation ports for the atmospheric compensation.

Cleaning

- Cleaning with fluids does not effect operation
- Metal diaphragm (process and reference) mustn't be cleaned mechanically
- In case of using pressure washers, don't point nozzle directly to electrical connection or reference diaphragm (atmospheric vent location)!
- In case of inside cleaning with pressure washers, don't point nozzle directly to the diaphragm!

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.

Conventional Usage

- Not suitable for applications in explosive areas.
- Not suitable for applications in security-relevant equipments (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!

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 0...40 °C / 32...104 °F
- Relative humidity max. 80 %

Disposal

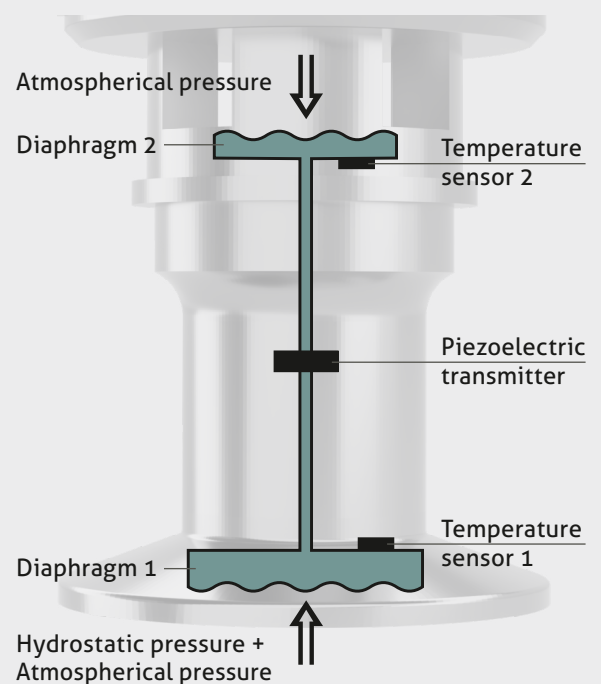
- Electrical devices should not be disposed of with household trash. They must be recycled in accordance with national laws and regulations.
- Take the device directly to a specialized recycling company and do not use municipal collection points.

Measuring principle

A special dual-measurement system featuring two coupled diaphragms and two RTD temperature sensors has been developed for the SL.

This prevents any influence of condensation or moisture on the measurement result, as can occur with conventional hydrostatic sensors that have a simple opening for atmospheric compensation. Two temperature sensors ensure highly accurate temperature compensation, thereby reducing temperature drift to a minimum even under fluctuating process temperatures.

As a result, the measured values remain stable under all climatic conditions, and are processed via an integrated piezoelectric transmitter as an mV signal and output by the electronics as a 4...20 mA, IO-Link or HART signal.

Dual-Diaphragm measuring principle

Order Code

SL Hydrostatic Level Sensor with 4...20 mA, IO-Link and HART communication

Span range (see pressure range table)

- A** 0...0.35 bar / 0...5 psi / 0...140" max
B 0...1.0 bar / 0...15 psi / 0...415" max
C 0...2.0 bar / 0...30 psi / 0...830" max
D 0...4.0 bar / 0...60 psi / 0...1385" max

Process connection (Ⓐ: 3-A conform)

- | | |
|--|---|
| 182 Fixed thread G1", hygienic CLEANadapt | 154 Endress+Hauser Universal - Short Ⓐ |
| 004 Tri-Clamp 1½" Ⓐ | 155 Endress+Hauser Universal - Long Ⓐ |
| 005 Tri-Clamp 2" Ⓐ | 181 DRD flange 65 mm |
| 007 Tri-Clamp 3" Ⓐ | 109 38 mm SMS Liner (female) |
| 115 Dairy flange DIN 11851 DN 40 | 180 HENGESBACH PZM/VRM series |
| 124 Dairy flange DIN 11851 DN 50 | |

Diaphragm

- 1** Stainless Steel AISI 316L Electropolished Diaphragm
2 Hastelloy „C" Diaphragm

Mounting

- 0** Horizontal
1 Vertical
2 Other (specify angle from vertical or from horizontal)

Wiring

- 98** M12-plug

Display version

- XX** No Display, Stainless Steel Cap
XY With Display, Stainless Steel housing and Polycarbonate Cap

Calibration range

- XXX** No calibration
[end value] Specify in „bar" (3 digits), e.g.:
 025 for 0.25 bar
 100 for 1 bar
 200 for 2 bar

SL / A / 004 / 1 / 0 / 98 / XX / 025

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

- 5632900001** Stainless Steel Cap
M12-EVK M12 plug-in screw cap, 1.4305 / AISI 303, with o-ring, as a protection against humidity and dirt

- CERT / 2.2 / SL** factory certificate 2.2 acc. to EN10204 (only product contacting surface)
CAL / SL factory calibration certificate with 3 calibration points

M12 plug-in screw cap



Note on the Order Code "Mounting"



This specification is used to ensure correct calibration of the sensor and has no mechanical or hardware implications.