50094 / 1.7 / 2024-11-05 / NV / NA

Product Information D3 **FOOD**

D3 Differential Pressure & Level Transmitter

CLEANadapt

Range of applications

- Level in pressurized vessels with continuous process temperatures up to 110 °C (230°F)
- CIP/SIP at 135°C (275°F) for 1 hour when ambient is below 60 °C (140 °F)*
- Differential pressure measurement across filters

Application examples

- Level monitoring in yogurt culture vessels
- Level monitoring in fermentation vessels
- Grain bed monitoring in lauter tuns
- Level monitoring in brite tanks
- Pressure drop measurement across filters

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 contacting 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

- Intuitive user interface makes set-up and configuration easy
- Electronic Differential provides 2 analog outputs (differential pressure and top or bottom pressure)
- State of the art temperature compensation minimizes error in dynamic temperature applications
- Fully electronic differential allows field replacement of components and repairability.
- Integrated tank tables allows volume and mass output when tank and product information are input
- Available in relative (vacuum and pressure)
- Dual o-ring seals provide IP69K ingress protection
- Dual loop output with graphical LCD display

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

In the D3 system each sensor uses a piezoresistive transducer to measure the difference between the atmospheric and process pressures. Additionally, a temperature sensor measures the temperature of the transducer and fill fluid to provide an output compensation. The resistive temperature signal and the voltage signal from the transducer are inputs to a correction algorithm which provides a pressure output in digital form. The digital signal is transferred from each sensor to the head where the microprocessor determines the difference and converts the output to a 4-20mA signal for the difference and one for the head pressure or total system pressure depending on the user's selection.

* CIP/SIP temperature limit of 121°C (250 °F) for fitting options 088 and 089

Authorizations

3-A 74-06

Differential level sensor D3

Differential level sensor D3

Specification		
Measuring range URL	Relative	-14.7...500 PSI, -1...35 BAR, -400...13850 inches of w.c.
Overpressure strength	Factor	1.5 x nominal pressure of measuring element
Measurement accuracy	Differential (PV) error Top/Bottom sensor (SV) error Repeatability Long-term stability	+/- 0.15% ($DIFF_{URV}$+TOP_{URV}) +/-0.10% of calibrated range up to 5:1 turndown (+/-0.15% if over 5:1 turndown) 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		< 0.2 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	1.5", 2", 2.5", 3" Tri-Clamp® AIC CPM Flush Mount Anderson Flush Mount - Short and Long King Gage Flush Mount - Short, Medium and Long Rosemount/Foxboro Sanitary Spud - Short and Long Endress & Hauser Universal Adaptor - Short and Long G1" CLEANadapt 1.5" NPT G1" Fixed Thread 38mm, 51mm SMS Liner (female) 40mm, 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#0F19809.5 (consult factory for applicable regions and configurations) CAN/CSA-22.2 No. 61010-1 IP 69 K (with plug-in M12 connection) IP 67 (with cable gland) / NEMA 4X
Auxiliary Power Supply	Voltage Current Limit	20...35 V DC 4.2A
Output	Loop 1 (Differential) Loop 2 (Top or Bottom)	analog 4...20 mA analog 4...20 mA
Tightening torque	For assembly all D3 components	27 Nm (20 ft-lbs)

* CIP/SIP temperature limit of 121°C (250 °F) for fitting options 088 and 089

Cleaning/Maintenance

- In case of using pressure washers, dont'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 equipement.

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.

Click or Scan

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 fully assembled sensor

D3 Sensor assembled

Capillary fill
- **1** Mineral Oil (FDA approved)
- **5** Neobee M20

Top Sensor 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.

Top Sensor Fitting
- **XXX** (See fittings table for 3 digit code)

Top Sensor Remote Cable
- **0** Integral
- **B** 10' Cable
- **E** 25' Cable
- **F** 50' Cable

Bottom Sensor 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.

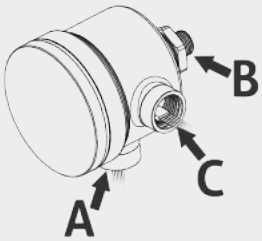
Bottom Sensor Fitting
- **XXX** (See fittings table for 3 digit code)

Bottom Sensor Remote Cable
- **0** Integral
- **B** 10' Cable
- **E** 25' Cable
- **F** 50' Cable

Enclosure cap
- **2** Clear cap
- **3** Stainless steel cap

Connector Locations

	Electric	Top Sensor	Bottom Sensor
1	A	B	C
2	A	C	B
3	B	A	C
4	B	C	A
5	C	A	B
6	C	B	A



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

Top Pressure Unit
- **P** PSI
- **B** BAR
- **W** inches of water
- **L** millibar

Top Pressure Range
- **XXX** See "Calibrated Range" table
- **999** Specify custom range

Differential Output Unit
- **P** PSI
- **B** BAR
- **W** inches of water
- **L** millibar

Differential Output Range
- **XXX** See "Calibrated Range" table
- **999** Specify custom range

D3	1	6	005	A	6	005	A	2	1	A	P	060	W	294

Order code - Calibration Range

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 URLs are available **(Example 5,6)**, lower stem URL is recommended **(Select 5)**.

Order code of sensor stem

D3S (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.

Fitting (See Fittings Table)

XXX

Capillary fill

- **1** Mineral Oil (FDA approved)
- **5** Neobee M20

Remote cable

- **0** Integral
- **B** 10' Cable
- **E** 25' Cable
- **F** 50' Cable

L3S 6 005 1 0

Fittings Table

3-A compliant fittings

004	1.5" Tri-Clamp®
005	2" Tri-Clamp®
006	2.5" 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)
092	King Gage Flush Mount Long (1773-3)
093	King Gage Flush Mount Medium (1773-1, -6 Std.)
094	King Gage Flush Mount Short (1773-2)
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	1.5" 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

Order code of sensor head

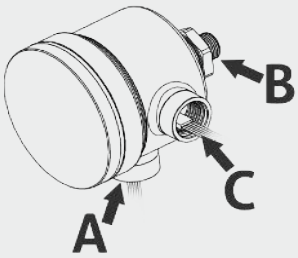
D3E

Enclosure cap

- **2** Clear cap
- **3** Stainless steel cap

Connector Locations

	Electric	Top Sensor	Bottom Sensor
1	A	B	C
2	A	C	B
3	B	A	C
4	B	C	A
5	C	A	B
6	C	B	A



Electrical connection

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

Top Pressure Unit

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

Top Pressure Range

- **XXX** See "Calibrated Range" table
- **999** Specify custom range

Differential Output Unit

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

Differential Output Range

- **XXX** See "Calibrated Range" table
- **999** Specify custom range

D3E 2 1 A P 060 W 294

Cord Sets	
Shielded Molded w/10' cable	42117H0010
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 (3A, USP Class VI)	44348A0002
Cherry Burrell - Silicone	44292B0001
Endress & Hauser	45352B0001
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	SP73228C0010
25' Remote Kit	SP73228C0025
50' Remote Kit	SP73228C0050
Rosemount/Foxboro Clamp Connection	46600A0001

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