SANITARY PRESSURE TRANSMITTER

TSC

3-A Certified

CE

FEATURES / BENEFITS

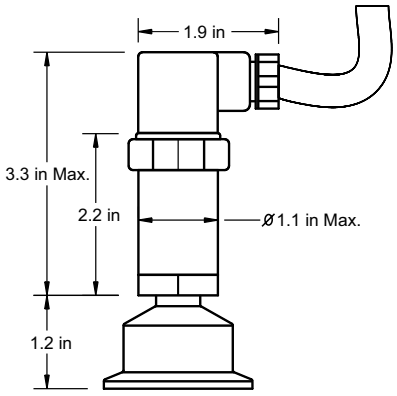
- 3-A, Tri-Clamp® Sanitary Connection
- 316 Stainless Wetted parts
- Designed for “Clean-in-place” and “Sterilize-in-place” Procedures
- Media Temperatures Up to 750°F
- Internal Zero & Span Adjustments

SPECIFICATIONS

Output Signal	4-20mA, 2-wire (standard), 1-5Vdc, 1-6Vdc, or 1-11Vdc (3-wire)
Pressure Ranges	Vacuum, compound, pressure 0/2 to 0/1000 PSI gauge and absolute. Ranges 60 psi and below not recommended with 3/4” Tri-Clamp.

	Proof Pressure	Burst Pressure
0/5 - 0/200 psi	3 x range	3.8 x range
0/300 - 0/1,000 psi	1.75 x range	4 x range

Accuracy (BFSL)	±1.0% of span, ±0.5% of span, or ±0.25% of span
Adjustment	±5% full scale, zero & span
Input	10-30 Vdc (for current output), 14-30 Vdc (for voltage output)
Temperature	Temperature effect with 1.5” or 2” Tri-Clamp: ±0.1% of span/10°F (for zero and span) or ±0.02 psi/10°F (greater of) Note: 3/4” tri-clamp not recommended for temperature variations. Effect is ≤ ±0.9 psi/10°F



TSC

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SANITARY PRESSURE TRANSMITTER

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HOW TO ORDER: Choose options to build a part number. For example: TSAP18ATC75A03-DWD-AG-PM

TSA	P18	A	TC	75	A03
MODEL	**RANGE**	**OUTPUT SIGNAL**	**CONNECTION TYPE**	**TRI-CLAMP® SIZE**	**ELECTRICAL CONNECTION**
TSA = General Purpose Sanitary Transmitter (1% Accuracy) **TSB** = Industrial Sanitary Transmitter (0.5% Accuracy) **TSC** = High-Accuracy Sanitary Transmitter (0.25% Accuracy)	*Common Ranges* **P01** = -30inHg-0 psi **P03** = -30inHg-0-30 psi **P16** = 0-30 psi **P18** = 0-100 psi **P20** = 0-200 psi **P21** = 0-300 psi *Available Ranges* ■ Vac to 1,000 psi ■ Gauge Pressure, Vacuum, or Compound ■ Lowest Pressure = 2 psi *See Transmitter Technical Reference on 108 for Complete Range Guide*	**A** = 4-20mA (2-wire) (standard) **B** = 0-5Vdc (3-wire) **C** = 1-5Vdc (3-wire) **E** = 0-10Vdc (3-wire)	**TC** = Tri-Clamp **CI** = I-Line	*TSA Model* **75** = 3/4" Tri-Clamp **15** = 1.5" Tri-Clamp **20** = 2" Tri-Clamp *TSB & TSC Models* **15** = 1.5" Tri-Clamp **20** = 2" Tri-Clamp **25** = 2.5" Tri-Clamp **30** = 3" Tri-Clamp	*All Models* **J??** = 1/2" NPT Conduit (?? = ft. of cable) *TSA & TSB Model ONLY* **A00** = Mini-Hirschmann (No Cable) **A??** = Mini-Hirschmann (?? = ft. of cable) **M00** = M12 x 1 (4-pin) *TSC Model ONLY* **M00** = M12 x 1 (4-pin) **B00** = Hirschmann, No Cable (DIN EN 175301-803 Form A) **B??** = Hirschmann (?? = ft. of cable)

-DWD	-AG	-PM
MOUNTING	**FILL FLUID**	**OPTIONS**
-DWD = Direct Mount, Welded **-RTR** = 6" Cooling Tower **-STW** = 3" Cooling Standoff **-W??** = PVC Coated SS Armored Capillary, Welded Note: ?? = Length in feet (e.g. 05 = 5 feet)	**-AG** = Glycerin USP **-BN** = Neobee M20 **-AS** = Silicone DC200 **-BS** = Food-grade Silicone *See 58 for Complete Fill Guide*	**-PD** = 4-Digit LCD Digital Display, (Model TSC Only) **-TS** = Stainless Steel Tag **-PM** = Positive Material Identification Certification

Optional Digital Display Available (-PD)

Diaphragm Seal Suitability Guide

	Tri-Clamp	Total Span* (in psi) 2	3	5	10	15	30	60	100	150+
TSA	3/4"	X	X	X	S	S	S	T	T	
	1.5"	X	X	T	T					
	2"	X	X							
TSB	1.5"	X	X	T	T	T	T			
	2"	X	X	T	T					
	2.5"	X	X	T						
	3"	X	X							
TSC	1.5"	S	S	S	T	T				
	2"	S	T	T						
	2.5"	T	T							
	3"	T								

*Total gauge span is additive of negative and positive pressures. Example: -15 - 0 - 30 psi = 45 psi span

- Assembly will function correctly with minimal accuracy degradation.
- T — Assembly will function correctly given stable process temperature.
- S — Assembly is highly sensitive to orientation and temperature variance. REOTEMP cannot guarantee a stated accuracy.
- X — Assembly not offered.

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TRANSMITTERS

TRANSMITTER TECHNICAL REFERENCE

SPECIFICATIONS

Wetted Parts: Body: 316 SS for ranges under 400 psi, high pressure ranges 17-4PH SS diaphragm and 300 series SS pressure chamber.

Repeatability: 0.05% of scale (model TM, 0.2%)

Hysteresis: 0.1% full-scale

Stability: 0.2% full-scale (model TM, 0.5%)

Burst Pressure: 4 x range

Response Time: <1 ms (between 10-90% of scale), Model TM: <5ms

Operating Life: 100 million cycles

Electromagnetic Rating: CE compliant to EMC norm, EN61326:1997/A1:1998, RFI, EMI and ESD protection

Electrical Protection: Reverse Polarity, over voltage, and short circuit protection

SHOCK: Less than ± 0.05% full-scale effect for 1,000 g's @ 2ms on any axis (model TM: 600 g's)

Vibration: Less than ± 0.01% full scale effect for 15 g's @ 0-2,000 Hz on any axis (model TG: less than 0.05% full scale effect for 20 g's @ 5-2,000 Hz on any axis.)

Temperature Range for Storage: -40-212°F

Environmental Protection: NEMA 4x (IP65), Series TL: NEMA 6, IP68

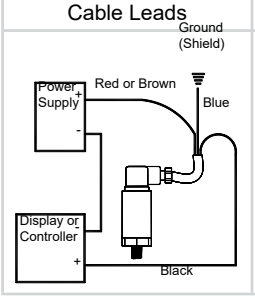
Proof Pressure: At Proof Pressure, zero and span may shift but no permanent damage has occurred.

Burst Pressure: At Burst Pressure, permanent non-recoverable damage may occur.

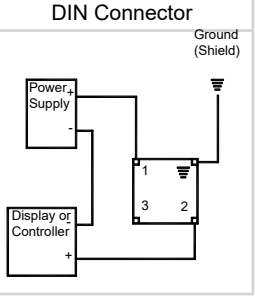
WIRING DIAGRAMS

4-20 mA, 2 Wire System

Cable Leads

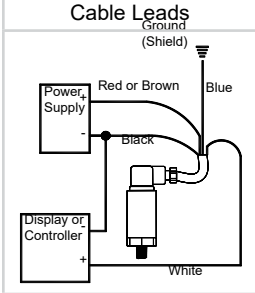


DIN Connector

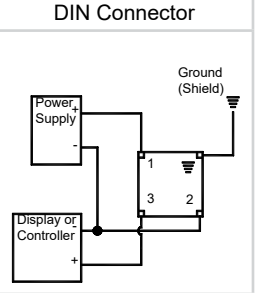


Voltage Output, 3 Wire System

Cable Leads



DIN Connector



SERIES		TSA	TSB	TSC	TG1	TM	TE	TH1	THX	TL1
Code	Range	VACUUM								
P01	-30"Hg VAC	✓	✓	✓	✓	✓	✓	✓	✓	
Code	Range	COMPOUND RANGES								
P02	-30"Hg/0/15psi	✓	✓	✓	✓			✓	✓	
P03	-30/0/30 psi	✓	✓	✓	✓		✓	✓		
P04	-30/0/60 psi	✓	✓	✓	✓					
P05	-30/0/100 psi	✓	✓	✓	✓		✓			
P06	-30/0/150 psi	✓	✓	✓	✓				✓	
P07	-30/0/200 psi						✓			
P08	-30/0/300 psi	✓	✓	✓	✓					
Code	Range	PRESSURE RANGES								
IN50	0/50 inH_2O							✓		✓
IN100	0/100 inH_2O				✓			✓		✓
IN200	0/200 inH_2O									✓
L11	0/55 INWC			✓				✓		
L12	0/80 INWC			✓				✓		
L13	0/140 INWC	✓	✓	✓	✓			✓		
L14	0/280 INWC	✓	✓	✓	✓			✓		
P11	0/2 psi			✓				✓	✓	✓
P12	0/3 psi			✓				✓	✓	✓
P13	0/5 psi	✓	✓	✓	✓			✓	✓	✓
P14	0/10 psi	✓	✓	✓	✓			✓	✓	✓
P15	0/15 psi	✓	✓	✓	✓	✓	✓	✓	✓	✓
P16	0/30 psi	✓	✓	✓	✓	✓	✓	✓	✓	✓
P17	0/60 psi	✓	✓	✓	✓	✓	✓	✓	✓	✓
P18	0/100 psi	✓	✓	✓	✓	✓	✓	✓	✓	✓
P195	0/150 psi	✓	✓	✓	✓	✓		✓	✓	✓
P20	0/200 psi	✓	✓	✓	✓	✓	✓	✓	✓	✓
P21	0/300 psi	✓	✓	✓	✓	✓	✓	✓	✓	✓
P26	0/500 psi	✓	✓	✓	✓	✓	✓	✓	✓	✓
P23	0/600 psi	✓	✓	✓	✓	✓		✓		
P27	0/750 psi	✓	✓	✓	✓	✓	✓	✓	✓	✓
P25	0/1000 psi	✓	✓	✓	✓	✓	✓	✓	✓	✓
P30	0/1500 psi				✓	✓		✓		
P31	0/2000 psi				✓	✓	✓	✓		
P32	0/3000 psi				✓	✓	✓	✓		
P34	0/5000 psi				✓	✓	✓	✓	✓	
P35	0/6000 psi				✓	✓	✓	✓		
P28	0/7500 psi				✓	✓		✓	✓	
P37	0/10000 psi				✓	✓	✓	✓	✓	
P38	0/15000 psi				✓	✓	✓	✓	✓	
P39	0/20000 psi							✓		
P40	0/30000 psi							✓		
P41	0/40000 psi							✓		
P42	0/50000 psi							✓		
P43	0/60000 psi							✓		
Code	Range	ABSOLUTE RANGES								
A15	0/15 psia	✓	✓		✓					
A16	0/30 psia	✓	✓		✓					
A17	0/60 psia	✓	✓		✓					
A18	0/100 psia	✓	✓		✓					
A19	0/150 psia	✓	✓		✓					
A20	0/200 psia	✓	✓		✓					
A21	0/300 psia	✓	✓		✓					

Don't See the Range You Need? Other ranges may be available, contact REOTEMP customer service for more information.

FILL GUIDE

Diaphragm seals are designed to protect pressure instruments from hot process media and corrosive chemicals while minimizing any negative effect on instrument accuracy and durability. A well-made diaphragm seal can achieve this goal only if it is properly assembled, filled, and tested. REOTEMP's highly trained technicians use state-of-the-art equipment so that every diaphragm seal assembly is filled and tested to assure optimal instrument performance:

- ✓ 24-hour Minimum Fluid De-gassing
- ✓ Evacuated Instrument Chamber Up to 10^{-8} mbar Absolute
- ✓ Complete Fill Integrity Check
- ✓ Fill-port Leak Test
- ✓ Post-fill Static Test
- ✓ Verification of Instrument Calibration
- ✓ High-temp Pipe Sealant Used on All Threaded Joints (Welded Joints Upon Request)
- ✓ Tamper-proof (Inspection Seal) Lacquer used on All Threaded Joints
- ✓ Sturdy Diaphragm Packaging Protection

Part Number Code	Name	Description	Temperature Range (Vacuum Service <5psia)	Pulse+™	Viscosity cst @ ~77°F	Specific Gravity @ ~77°F	Thermal Expansion cc/cc/°C
STANDARD FILL FLUID							
AS	Silicone DC200[1]	This is the standard fill fluid for most diaphragm seal applications.	-40°F to 400°F (-40°F to 250°F)	Yes	20	0.94	.00104
HIGH TEMP SILICONE							
BH	Silicone DC704[1]	Standard for Smart Transmitters and capillary systems. Performs well in applications with high temperature and a deep vacuum.	0°F to 650°F (0°F to 450°F)	No	44	1.07	.00077
B1	Silicone DC710[1]	Highest temperature rating; ideal for gauge seal assemblies. Too thick for capillary assemblies. Response time can become very slow in cold conditions.	50°F to 750°F (50°F to 400°F)	Yes	500	1.11	.00043
C8	Syltherm 800[2]	Low viscosity allows it to perform well in both low and high temperatures. Not recommended for vacuum service or at high temperatures when under low static pressure.	-40°F to 750°F (-40°F to 150°F)	No	9.5	0.93	.00136
B5	Silicone DC705[1]	Performs very well in high temperatures when under vacuum. The high viscosity and freezing point of this fluid makes it a poor choice for cold or outdoor installations without heat tracing.	50°F to 675°F (50°F to 550°F)	Yes	175	1.09	.00096
B2	Silicone DC550[1]	Similar high temperature performance as DC705, however it performs better at lower temperatures.	-40°F to 575°F (-40°F to 400°F)	No	125	1.07	.00076
FOOD GRADE							
AG	Glycerin USP	This is the standard fill fluid for most gauge seal assemblies for food, beverage, and pharmaceutical applications. Its high viscosity will cause very slow response at times in low temperature and outdoor installations.	60°F to 450°F (Not Suitable)	Yes	1100	1.26	.00061
BN	NEOBEE M20[7]	Low viscosity and a wide temperature range makes this the standard sanitary fill fluid for Smart Transmitters and capillary systems.	-10°F to 400°F (-10°F to 200°F)	No	10	0.92	.00101
BS	Food Grade Silicone	Highest temperature limit for food grade fluids. Because of its high viscosity it does not perform well in low temperatures.	20°F to 550°F (20°F to 250°F)	Yes	350	0.97	.00096
BP	Propylene Glycol	This is the fill fluid used when Glycol is called for on the customer specification. It has a very narrow temperature range.	0°F to 200°F (Not Suitable)	No	2.85	1.03	.00073
INERT (TYPICALLY FOR CHLORINE AND OXYGEN APPLICATIONS OR IN SILICONE-FREE ENVIRONMENTS)							
C1	Fomblin Y06[4]	Ideal inert fluid for transmitter applications. Relatively high vapor pressure above 200°F. Not recommended for use in high temperature situations with low static pressure.	-40°F to 450°F (0°F to 250°F)	No	71	1.88	.00086
C2	Halocarbon 6.3[3]	Standard inert fluid used in gauge seal assemblies.	-40°F to 400°F (-40°F to 200°F)	Yes	6.3	1.97	.00084
C3	Halocarbon 1.8[3]	Typically used in low temperature applications because of its low viscosity.	-110°F to 220°F (-100°F to 100°F)	No	1.8	1.82	.00084
C4	Fluorolube FS-5[5]	Similar performance to Halocarbon 6.3, however not suitable for vacuum service.	-40°F to 450°F (Not Suitable)	No	5	1.86	.00087
SPECIALTY							
CK	Krytox 1506[6]	Specialty fill fluid, inert.	-40°F to 350°F (-40°F to 300°F)	No	62	1.88	.00095
BE	Ethylene Glycol	Occasionally used in annular (O-ring) seal assemblies.	-25°F to 320°F (Not Suitable)	No	30	1.10	.00062

1 Trademark Dow Corning
2 Trademark The Dow Chemical Company
3 Trademark Halocarbon Product Corporation
4 Trademark AUSIMONT S.P.A
5 Trademark Hooker Chemical Company
6 Trademark The Chemours Company FC, LLC
7 Trademark Stepan Specialty Products

Note: PulsePlus™ fill fluids may have different physical properties than specified. Chemical composition and temperature ranges do not vary.