
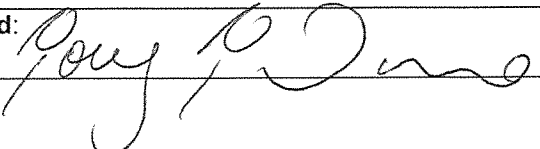


CONTRACTOR SUBMITTAL FORM

Project Name: Navajo Gallup Water Supply Project Reach 26.3	<input checked="" type="checkbox"/> M (Materials) <input type="checkbox"/> T (Testing) <input type="checkbox"/> A (Administrative)	Submittal No. M008
SMA Project No: 6921307		
Date: 06/27/2019		
Contractor: Navajo Engineering and Construction Authority	No. of Copies: 1	

Supplier: Core & Main	Manufacturer: Pipestone
Specification No.:	Drawing No.: DT-15
Bid Item No(s): 40	
Submittal Checklist No(s):	
Product Description: Pressure Transducer Vault at Tank Site	
Are there any deviations from the Contract Documents? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Explain:	
Contractor's certification that product meets requirements of Contract Documents: <input checked="" type="checkbox"/> Certified <input type="checkbox"/> Certified with variations as noted on shop drawings and/or attached sheets.	
Signed:  Quentin Benally	Date: 06/28/2019

Engineer's Comments: <input checked="" type="checkbox"/> No Exception Taken <input type="checkbox"/> Approved as Corrected <input type="checkbox"/> Exceptions as Noted <input type="checkbox"/> Submittal Rejected <input type="checkbox"/> Revise and Resubmit to Engineer <input type="checkbox"/> Contractor to Submit Specified Information	<p>Review is limited to check for compliance with design concept. No changes from provisions of Contract Documents are intended and Contractor remains responsible for compliance with revisions therein.</p> <p>The Contractor is solely responsible for quantities; correctness of dimensions; verification of physical interrelation of elements of the work as required by the drawings and specifications and by field determination; fabrication procedures, construction methods, techniques and sequences. This review does not relieve the Contractor from these responsibilities.</p> <p>Non-conformities and errors detected have been noted but such markings, or lack thereof, shall not relieve the Contractor from compliance with all requirements of the contract drawings and specifications.</p>
Signed: 	Date: 7/9/19



676 Moss Street, Unit A
Golden, CO 80401
Phone: 303-579-9658
Fax: 303-567-2861

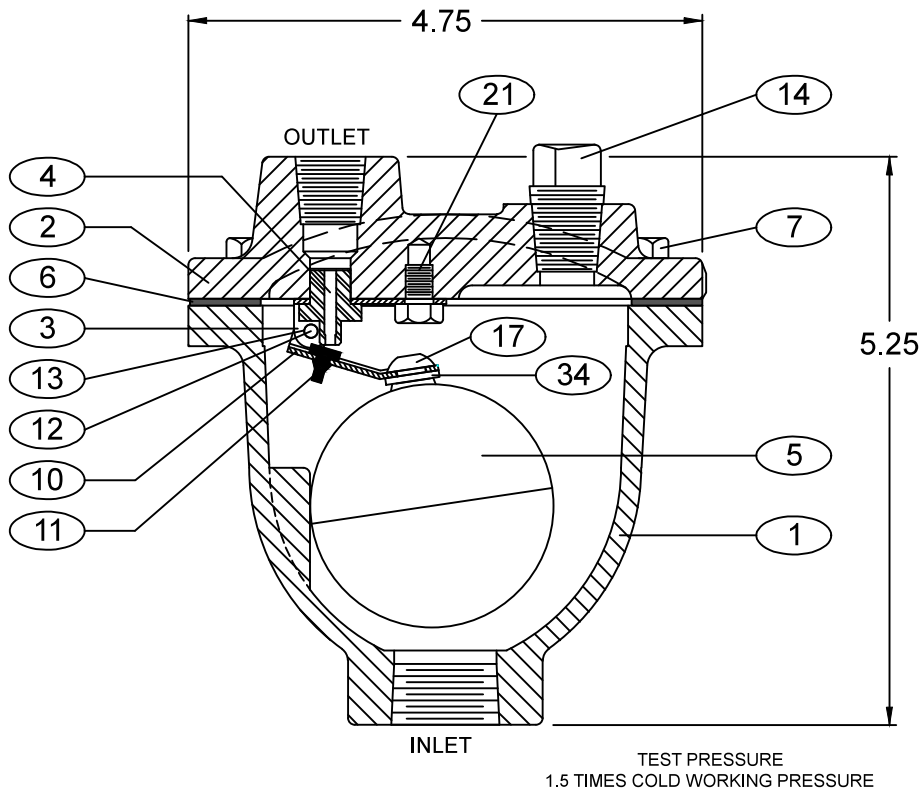
Navajo Gallup Reaches 26.3
Reach 26.3 to Torreon, NM

DT15

Qty

Product Description

1	1/2" ValMatic 15A.3DISVH Water Air Release Valve, Ductile Iron Body, 316SST Trim, EPDM Seating, Fusion Bonded Epoxy Coating, Stainless Steel Bolts and Pipe Plugs, 175psi CWP, Screened Hood
2	1/2" Apollo 76F10301A Stainless Steel, Full Port, NPT, Ball Valve
1	1/4" Apollo 76F10101A Stainless Steel, Full Port, NPT, Ball Valve
1	1/2" Ametek 88C-003-A-2 Electronic Pressure Transducer, 0-30psi Range, 316L Stainless Steel Base, Diaphragm, Silicone Fill, NPT Process Connector, 4-20mA Output
1	1/4" NPT Wika 233.34 Pressure Gauge, Plastic Case, SST Wetted Parts, 4.5" Safety Glass, Glycerine Filled, 0-30psi



SEE DRAWING NO. VM-15ASV-M FOR MATERIALS OF CONSTRUCTION
SEE DRAWING NO. VM-15ADISV-M FOR MATERIALS OF CONSTRUCTION

VALVE SIZE	MODEL NUMBER	INLET SIZE	OUTLET SIZE	MAX. W.P. P.S.I.	ORIFICE SIZE
1/2"	15ASV	1/2" NPT	1/2" NPT	175	1/16"
3/4"	15A.2SV	3/4" NPT	1/2" NPT	175	1/16"
1"	15A.3SV	1" NPT	1/2" NPT	175	1/16"

- | | | | |
|----|-------------|----|----------------------------|
| 1 | BODY | 11 | ORIFICE BUTTON |
| 2 | COVER | 12 | PIVOT PIN |
| 3 | LEVER FRAME | 13 | RETAINING RING (NOT SHOWN) |
| 4 | SEAT | 14 | PIPE PLUG |
| 5 | FLOAT | 17 | FLOAT RETAINER |
| 6 | GASKET | 21 | LOCATOR |
| 7 | COVER BOLT | 34 | LOCK WASHER |
| 10 | FLOAT ARM | | |

Revised 5-6-14 (Rev 1)

AIR RELEASE VALVE

DATE 4-18-11

VAL-MATIC

VALVE AND MANUFACTURING CORP.

DRWG. NO.

VMC-15ASV

AIR RELEASE VALVE

SERIES NO. 15A

DI SUPER VALVE MATERIALS OF CONSTRUCTION

<u>PART NO.</u>	<u>PART NAME</u>	<u>MATERIAL</u>
1	BODY	DUCTILE IRON ASTM 536, GRADE 65-45-12
2	COVER	DUCTILE IRON ASTM 536, GRADE 65-45-12
3	LEVER FRAME	STAINLESS STEEL T316, ASTM A240
4	SEAT	STAINLESS STEEL T316, ASTM A276
5	FLOAT	STAINLESS STEEL T316, ASTM A240
6	GASKET	COMPRESSED NON-ASBESTOS FIBER
7	COVER BOLT	STAINLESS STEEL T316, ASTM F593
10	FLOAT ARM	STAINLESS STEEL T316, ASTM A240
11	ORIFICE BUTTON	VITON
12	PIVOT PIN	STAINLESS STEEL T316, ASTM A479
13	PIN RETAINER	STAINLESS STEEL PH 15-7 MO
14	PIPE PLUG	STAINLESS STEEL
17	FLOAT RETAINER	STAINLESS STEEL T316, ASTM F879
21	LOCATOR	STAINLESS STEEL T316, ASTM F593
34	LOCK WASHER	STAINLESS STEEL T316, ASTM A240

NOTE: ALL SPECIFICATIONS AS
LAST REVISED.

MATERIALS OF CONSTRUCTION

DATE 5/6/14



VALVE AND MANUFACTURING CORP.

DRWG. NO.

VM-15ADISV-M

FUSION BONDED EPOXY (FBE) COATING

General Description:

Fusion Bonded Epoxy is a one-part, heat cured, thermosetting epoxy coating that is applied as a dry powder to the sandblasted surface of a pre-heated valve and then fused and cured in a high-temperature oven. The result is a durable coating with exceptional abrasion and chemical resistance ideally suited for valves in water and wastewater applications.

Advantages of FBE:

1. The coating is applied in accordance with AWWA Standard C550 "Protective Epoxy Coatings for Valves and Hydrants" and certified by to the requirements of ANSI/ NSF Standard 61 - "Drinking Water System Components - Health Effects" for coating valves and fittings.
2. FBE coatings are applied in an automated one-part process so that the mixing, surface preparation, and multiple-coat problems associated with liquid paints are eliminated.
3. The electrostatic application process for FBE provides a smooth, even coating thickness with no runs, sags, or thin spots common with applying liquid paints.
4. FBE coatings are durable and provide twice the impact strength of liquid epoxies.
The surface provides high abrasion resistance and has become a standard seating material for resilient gate and check valves.
5. FBE has a long-term performance history in water and sewage environments including salt water, slurries, methane and hydrogen sulfide exposure.

Application Process:

1. FBE is applied in an automated manufacturing process in accordance with the coating manufacturers' procedures and industry standards to assure consistency and high quality.
2. The valve is cleaned, sandblasted, and preheated in an oven.
3. An electrical charge is applied to the body and the powder is deposited over the surfaces of the valve to the specified thickness.
4. The epoxy is post cured in an oven to cure specifications and allowed to air cool to room temperature.
5. The final surface is visually and electrically (when specified) tested to verify thickness and that it is holiday free.

Typical Performance Characteristics:

1. Color:	Blue	
2. Thickness	12-20 mils	1 Coat
3. Gloss at 60 deg:	60-80 units	Din 67 530
4. Impact Resistance	>5 Joule (44 in-lb)	Din 30 677-2
5. Elongation:	>5%	Din 30 671
6. Hardness:	>100	Din 53 153
7. Water Immersion:	No visible change	90C, 672 Hours
8. Salt Spray Test:	>3000 hours	Din 53167
9. Adhesion:	16 Mpa (2320 psi)	7 days, 90C EN 24 624

Revised 2-15-17

FUSION BONDED EPOXY (FBE) COATING

DATE 7-17-02

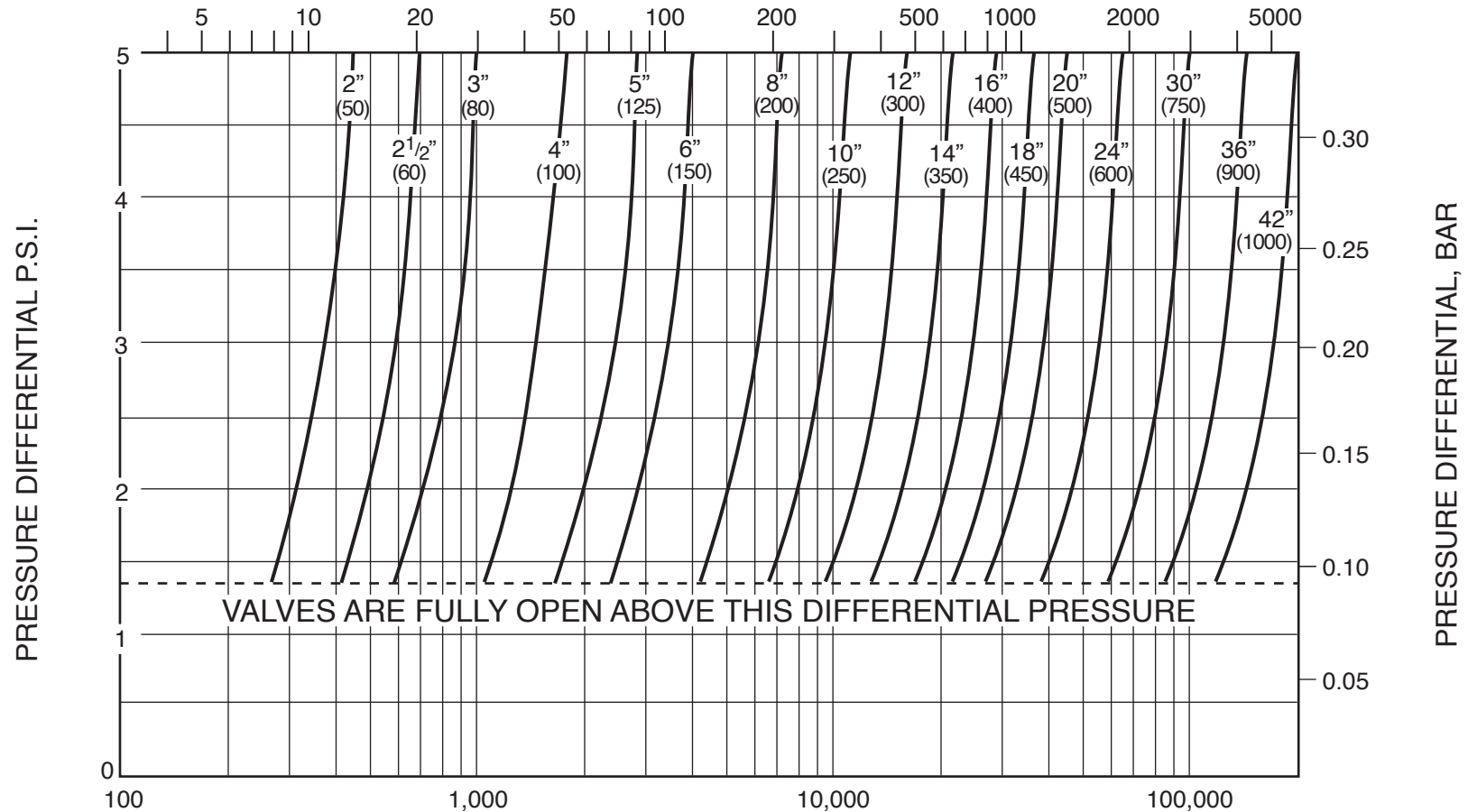


VALVE AND MANUFACTURING CORP.

DRWG. NO.

SS-1847

FLOW OF AIR IN STANDARD CUBIC METERS PER MINUTE



FLOW OF AIR IN S.C.F.M.
(STANDARD CUBIC FEET OF FREE AIR PER MINUTE)

VENTING CAPACITY FOR VACUUM BREAKERS, IN. (mm)



VALVE AND MANUFACTURING CORP.

Revised 3-4-13

DATE 2-10-04

DRWG. NO.

SS-1971

76F-100-A SERIES

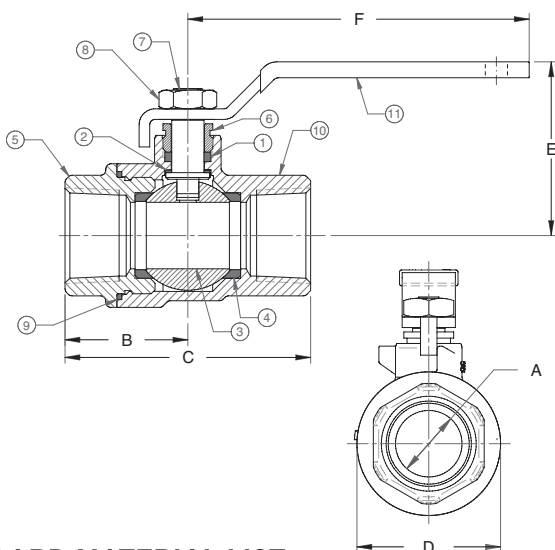
STAINLESS STEEL FULL PORT BALL VALVE



Female NPT Thread, 1/4"-3" 1000 CWP (psig), Cold Non-Shock. (See referenced P/T chart)
150 psig Saturated Steam.
Vacuum Service to 29 inches Hg.
MSS SP-110 Compliant.
Designed, cast, machined, assembled, and 100% factory tested in USA.

FEATURES

- Investment cast components
- Reinforced seats
- Blowout-proof stem design
- Adjustable packing gland
- Stainless steel lever and nut



STANDARD MATERIAL LIST

	PART	MATERIAL
1	Stem packing	MPTFE
2	Stem bearing	RPTFE
3	Ball	A276-316SS (1/4" to 2", except 1.25") A276-316SS or A351-CF8M stainless (1.25") A351-CF8M stainless (3")
4	Seat (2)	RPTFE (2" & smaller); RTFM (3")
5	Retainer	ASTM A276-316SS (1/4" & 3/8") ASTM A351-CF8M stainless (1/2" to 3")
6	Gland	A276-316 Stainless Steel
7	Stem	A276-316 Stainless Steel
8	Lever nut	304 Stainless Steel
9	Body Seal	RPTFE (1/2" to 3")
10	Body	A351-CF8M
11	Lever and grip	SS w/vinyl

DIMENSIONS

PRODUCT NO.	SIZE	A	B	C	D	E	F	WT.
76F-101-01	1/4"	0.37	0.95	1.91	1.12	1.60	3.85	0.47
76F-102-01	3/8"	0.37	0.95	1.91	1.12	1.60	3.85	0.44
76F-103-01A	1/2"	0.50	1.21	2.35	1.27	1.73	3.85	0.57
76F-104-01A	3/4"	0.81	1.39	2.77	1.62	1.96	3.85	0.91
76F-105-01A	1"	1.00	1.67	3.34	2.00	2.27	4.75	1.38
76F-106-01A	1.25"	1.25	1.96	3.92	2.73	3.21	7.77	4.17
76F-107-01A	1.5"	1.50	2.05	4.10	2.92	3.31	7.77	4.69
76F-108-01A	2"	2.00	2.37	4.74	3.75	3.69	7.77	6.90
76F-100-01A	3"	3.00	3.70	7.40	5.68	5.23	10.00	22.40

- Fire safe to API 607 (requires -24 suffix)
- Meets NACE MR0175 (2000) & MR0103 (2012)
- CSA CGA 3.16-M88 (Requires "GS" suffix)
- NSF/ANSI 61 Section 8, Annex G (1/4" to 2")
- NSF/ANSI 372 - Drinking Water System Components - Lead Content

OPTIONS AVAILABLE

(MORE INFORMATION IN SECTION J)

- Minimum quantities apply
- To specify an option, replace the "01" standard suffix with the suffix of the option.
- To specify multiple options, replace the "01" suffix with the desired suffixes in the numerical order shown below. NOTE: Not all suffixes can be combined together.

(SUFFIX)	OPTION	SIZES
-01	Standard Configuration	All
-P -01-	BSPP (Parallel) Thread Connection	1/2" to 2"
-T -01-	BSPT (Tapered) Thread Connection	1/2" to 3"
-02-	Stem Grounded	1/2" to 3"
-04-	2.25" Stem Extension (Carbon Steel, Zinc Plated)	1/2" to 2"
-08-	90° Reversed Stem	1/2" to 2"
-11-	Therma-Seal™ Insulating Tee Handle	1/4" to 2"
-14-	Side Vented Ball (Uni-Directional)	3/8" to 3"
-24-	Graphite packing, PTFE body seal, RPTFE bearing (Fire Safe API 607, 6th edition, ISO 10497:2010)	1/2" to 3"
-27-	SS Latch-Lock Lever & Nut	3/8" to 3"
-30-	Cam-Lock and Grounded	1/2" to 2"
-32-	SS Tee Handle & Nut	1/2" to 2"
-35-	PTFE Trim	3"
-39-	SS Hi-Rise Locking Wheel Handle, SS Nut	1/2" to 2"
-40-	Cyl-Loc and Grounded	1/2" to 2"
-44-	Seal Welded	1/4" to 3"
-45-	Less Lever & Nut	1/2" to 3"
-46-	Latch Lock Lever - Lock in Closed Position Only	1/2" to 2"
-47-	SS Latch Lock Oval Handle	1/2" to 2"
-48-	SS Oval Handle (No Latch) & Nut	1/4" to 2"
-49-	No Lubrication. Assembled Dry.	1/2" to 3"
-50-	2.25" CS Locking Stem Extension	1/2" to 2"
-56-	Multifill Seats & Packing	1/2" to 3"
-57-	Oxygen Cleaned	1/4" to 3"
-60-	Static Grounded Ball & Stem	1/2" to 3"
-GS	CSA CGA 3.16 (RTFE Seat - All sizes)	All

Pressure/Temperature Ratings - Page M-12, Graph No. 8

*LEAD FREE: The wetted surfaces of this product shall contain no more than 0.25% lead by weighted average. Complies with Federal Public Law 111-380. ANSI 3rd party approved and listed.
REV. 14FEB18

The listed C_v "factors" are derived from actual flow testing, at Apollo's Pageland, South Carolina factory. These tests were completed using standard "off the shelf" valves with no special preparation and utilizing standard schedule 40 pipe. It should be understood that these factors are for the valve only and also include the connection configuration. The flow testing is done utilizing water as a fluid media and is a direct statement of the gallons of water flowed per minute with a 1 psig pressure differential across the valve/connection unit. Line pressure is not a factor. Because the C_v is a factor, the formula can be used to estimate flow of most media for valve sizing.

FLOW OF LIQUID

$$Q = C_v \sqrt{\frac{\Delta P}{\text{SpGr}}}$$

$$\text{or } \Delta P = \frac{(Q)^2 (\text{SpGr})}{(C_v)^2}$$

WHERE:

- Q = Flow in US gpm
- ΔP = Pressure drop (psig)
- SpGr = Specific gravity at flowing temperature
- C_v = Valve constant

FLOW OF GAS

$$Q = 1360 C_v \sqrt{\frac{(\Delta P) (P_2)}{(\text{SpGr}) (T)}}$$

$$\text{or } \Delta P = \frac{5.4 \times 10^{-7} (\text{SpGr}) (T) (Q)^2}{(C_v)^2 (P_2)}$$

WHERE:

- Q = Flow in SCFH
- ΔP = Pressure drop (psig)
- SpGr = Specific gravity (based on air = 1.0)
- P_2 = Outlet pressure-psia (psig + 14.7)
- T = (temp. °F + 460)
- C_v = Valve constant

CAUTION: The gas equation shown, is valid at very low pressure drop ratios. The gas equation is NOT valid when the ratio of pressure drop (ΔP) to inlet pressure (P_1) exceeds 0.02.

NOTE: Only use the gas equation shown if $(P_1 - P_2)/P_1$ is less than 0.02.

CV FACTORS FOR APOLLO® VALVES (CONTINUED ON M-4)

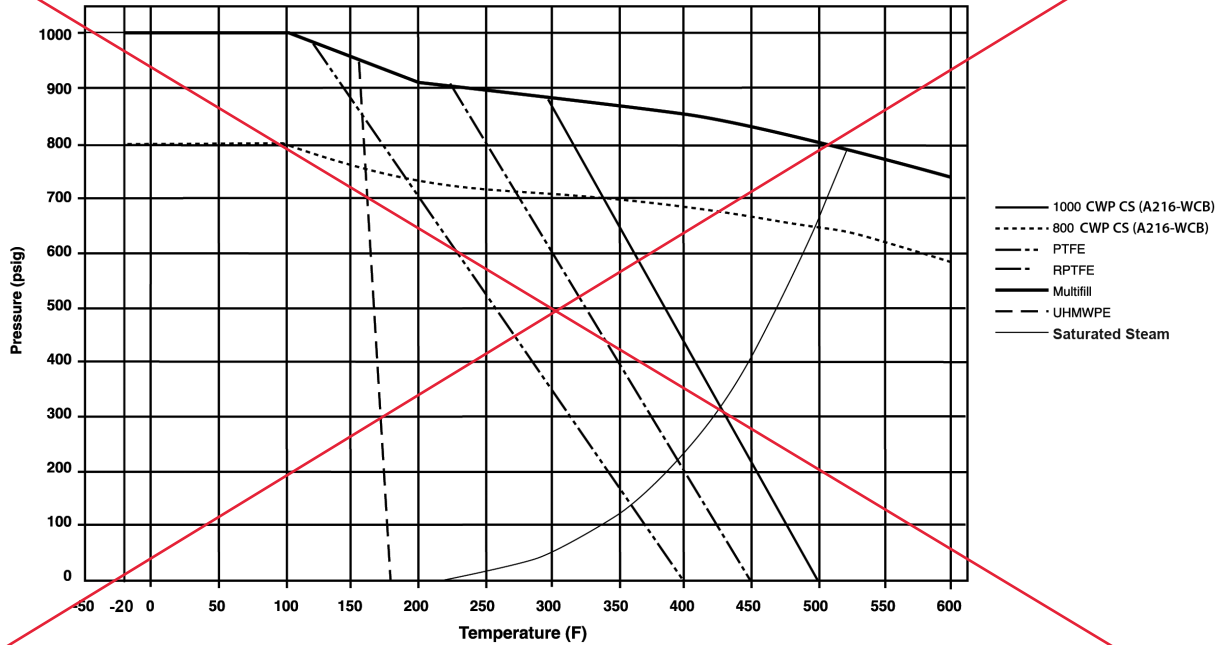
VALVE	SIZE (IN.)														
	1/4	3/8	1/2	3/4	1	1.25	1.5	2	2.5	3	4	6	8	10	12
70B-140 Series	8.4	7.2	15	30	43	48	84	108	190	370	670	--	--	--	--
70-100/200 Series	8.4	7.2	15	30	43	48	84	108	190	370	670	--	--	--	--
70-300/400 Series	--	--	15	30	43	48	84	108	--	--	--	--	--	--	--
70-600 Series	2.3	4.5	5.4	12	14	21	34	47	--	--	--	--	--	--	--
70-800 Series	8.4	7.2	15	30	43	48	84	--	--	--	--	--	--	--	--
71-AR Series	--	--	--	30	43	48	84	108	190	370	--	--	--	--	--
71-100/200 Series	--	--	--	30	43	48	84	108	190	370	--	--	--	--	--
72-100/900 Series	--	--	26	48	65	125	170	216	--	--	--	--	--	--	--
72-1xx-A/72-9xx-A Series	--	--	26	48	65	125	170	245	--	--	--	--	--	--	--
73A-100 Series	8.4	7.2	15	30	43	48	84	108	--	--	--	--	--	--	--
73-300/400 Series	--	--	26	48	65	125	170	216	--	--	--	--	--	--	--
74-100 Series	8.4	7.2	15	30	43	48	84	108	190	370	670	--	--	--	--
75-100 Series	8.4	7.2	15	30	43	48	84	108	190	370	670	--	--	--	--
76-AR Series	8.4	7.2	15	30	43	48	84	108	190	370	670	--	--	--	--
76F-100 Series	8.1	15	15	51	68	125	177	389	--	--	--	--	--	--	--
76FJ-100 Series	8.1	15	15	51	68	125	177	389	--	--	--	--	--	--	--
76FK-100 Series	8.1	15	15	51	68	125	177	389	--	--	--	--	--	--	--
76-100 Series	8.4	7.2	15	30	43	48	84	108	190	370	--	--	--	--	--
76-300/400 Series	--	--	26	48	65	125	170	216	--	--	--	--	--	--	--
76-600 Series	2.3	4.5	5.4	12	14	21	34	47	--	--	--	--	--	--	--
76J-100 Series	8.4	7.2	15	30	43	48	84	108	190	370	--	--	--	--	--
76J-AR Series	8.4	7.2	15	30	43	48	84	108	190	370	670	--	--	--	--
76K-100 Series	8.4	7.2	15	30	43	48	84	108	190	370	--	--	--	--	--
76K-AR Series	8.4	7.2	15	30	43	48	84	108	190	370	670	--	--	--	--
7K-100 Series	--	--	15	51	68	125	177	389	503	--	--	--	--	--	--
77-AR Series	8.1	15	15	51	68	--	177	389	--	--	--	--	--	--	--

REV. 21APR17

1000 CWP

(CS) ASTM A216-WCB

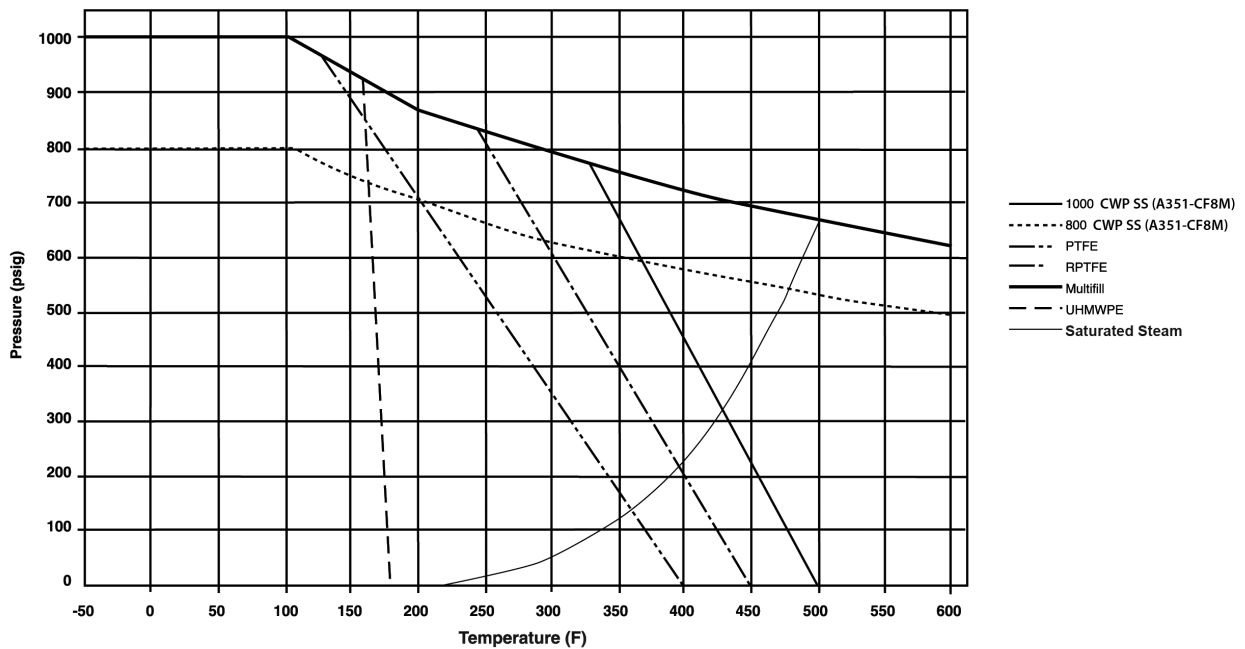
GRAPH 7



1000 CWP

(SS) ASTM A351-CF8M

GRAPH 8



MODEL 88C SERIES TRANSMITTER MODEL NUMBER CODE

88 ELECTRONIC PRESSURE TRANSMITTER

AGENCY APPROVAL

C = Approved by Factory Mutual (FM) & Canadian Standards Association (CSA) for Explosion Proof.

PRESSURE RANGE

PSI	BAR
001 = 3-15	0.2-1
002 = 0-6 to 0-15	0-0.4 to 0-1
003 = 0-15 to 0-30	0-1 to 0-2
004 = 0-20 to 0-100	0-1.4 to 0-7
005 = 0-60 to 0-300	0-4 to 0-20
006 = 0-200 to 0-1000	0-14 to 0-70
007 = 0-600 to 0-3000	0-40 to 0-200
008 = 0-1000 to 0-5000	0-70 to 350

Other ranges available upon request.

MATERIAL

BASE	DIAPHRAGM	FILL	PROCESS CONNECTOR
A = 316L stn stl	316L stn stl	silicone	1/2" female NPT

OUTPUT

2 = 4-20mA

CALIBRATION RANGE (specify)

Will be calibrated at the maximum range in psi if not specified.

88 C 004 A 2 (0 to 50 psi) example

Model 88C pressure transmitter, 100 psi maximum range, 316L stainless steel base and diaphragm, silicone oil fill, 1/2" female NPT process connection, 4-20mADC output, approved by FM and CSA, calibrated to 0 to 50 psi.

SECTION I

DESCRIPTION

The Model 88 is a durable and cost effective full featured pressure transmitter. A fully adjustable, all stainless steel transmitter, it is designed for years of stable performance in even the toughest environmental and media conditions. Approvals include ratings for CSA, for both intrinsic safety and explosion-proof, and FM for explosion-proof only. All Model 88 transmitters meet NACE standards for offshore applications.

The small size and lightweight of the Model 88 eliminate the need for bulky mounting hardware and mechanical supports. A lightweight mounting bracket may be all that is required for installation. The integral junction box permits simple field wiring without the need for additional hardware, adding to the speed and ease of installation.

A 4-20mA output is standard with a 12-40VDC power supply. With all 316 stainless steel welded construction, the Model 88 is compatible with corrosive media and hazardous environments.

FUNCTIONAL SPECIFICATIONS

Service: Liquid, Gas or Vapor

Range Limits:

For specific pressure range codes reference model code on preceding pages.

Output: 4-20 mADC, limited to 30 mADC

Power Supply: 12 to 40VDC with reverse polarity protection

Zero Adjust: 10%

Span Adjust: 10%

Turndown: 5:1, (15 PSI=2.5:1 & 6 & 30 PSI=2:1)

Temperature Limits:

Electronics (Ambient) -40°F to 140°F (-40°C to 60°C). (Model 88S has low limit of 10°F).

Process Interface -40°F to 212°F (-40°C to 100°C)

Process Interface (88S) 10°F to 250°F (-12°C to 121°C)

Storage -40°F to 212°F (-40°C to 100°C)

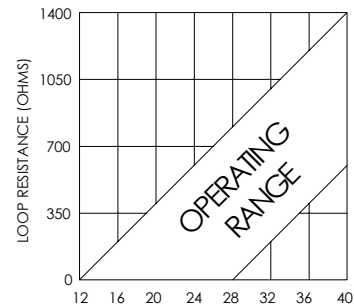
Over-range: 300% Upper Range Limit (URL)

Humidity Limits: 0-100% RH

Note 1: For intrinsically safe operation reference Barrier Entity Requirements for power supply limits.

SPECIFICATIONS

Loop Resistance: 1400 ohms max @40 volts



Supply Voltage

PERFORMANCE SPECIFICATIONS

Accuracy: $\pm 0.25\%$ of calibrated span including linearity (BFSL), hysteresis and repeatability ($\pm 0.50\%$ on 6 PSI)

Response Time: Time constant of 20 milliseconds

Stability: $\pm 0.5\%$ URL for six months

Temperature Effect:

(includes zero & span)

Compensated -20°F to 180°F (-29°C to 82°C)

Between 30°F and 130°F (-1°C & 54°C): $\pm 1\%$ of

URL per 50°F (28°C) Between -20°F and 180°F

(-29°C & 82°C): $\pm 1.6\%$ of URL per 50°F (28°C)

Power Supply Effect: $\pm 0.005\%$ FS per volt

Surge Protection: Standard

Vibration Effect: $\pm 0.1\%$ of URL for 3g to 200Hz.

Overrange Effect: $\pm 0.15\%$ FS per 300% of max range

PHYSICAL SPECIFICATIONS

Materials of Construction

Process Wetted Parts: 316LSS

Non Wetted Parts: 316SS

Cast Head: CF-8M (316 CastSS)

“O”Ring: Buna N

Fill Fluid: DC 200 Silicone (Standard) Mineral (Optional)

Process Connection: Reference Specific Model

Electrical Connction: 1/2” NPT Female

Weight: 1.67 Lbs (.76KG)

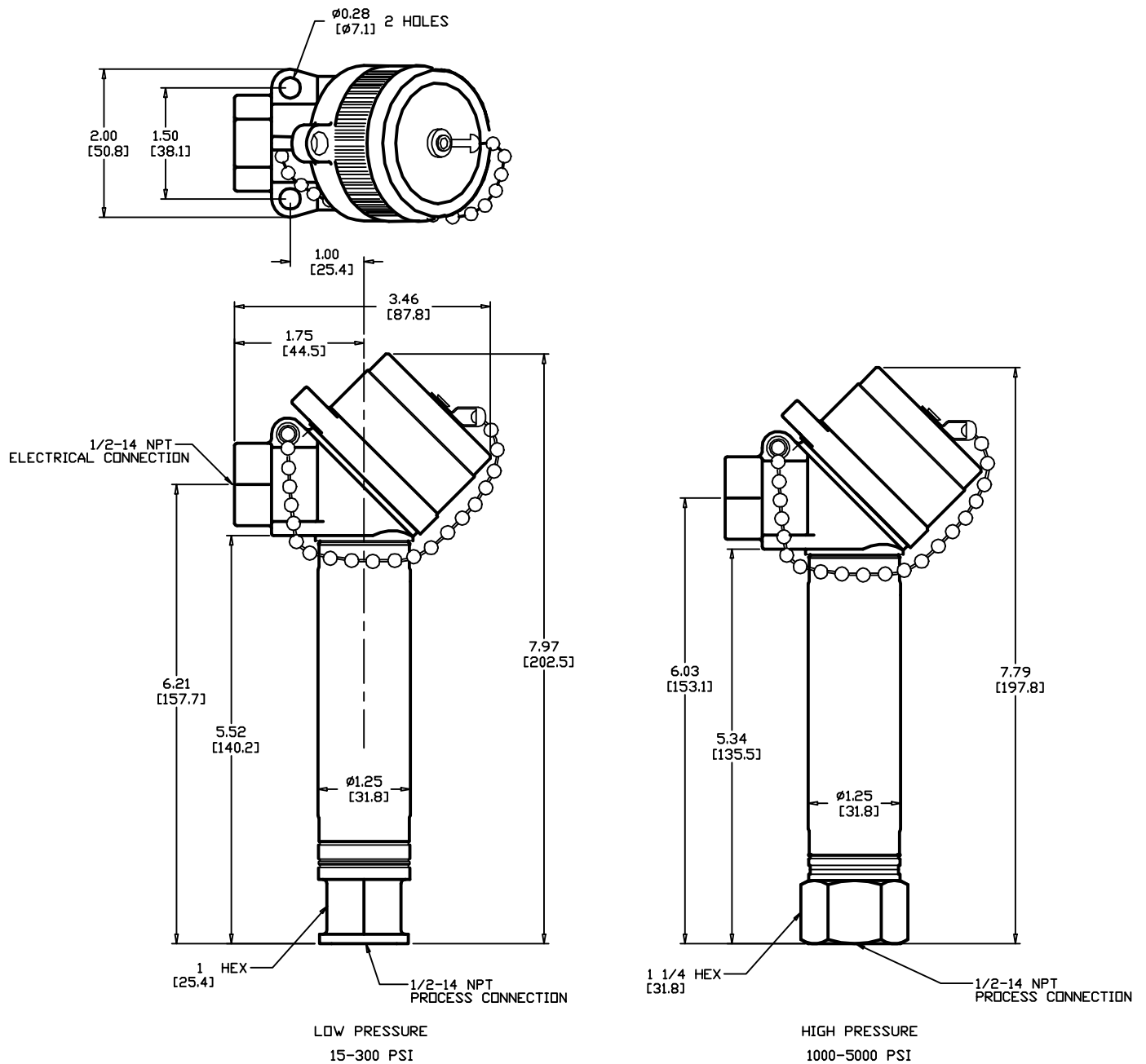


FIGURE 1-1
OUTLINE DIMENSIONS MODEL 88C

SECTION I

SPECIFICATIONS

CLASSIFICATION (FM, CSA, CENELEC)

All models with a "C" or "F" option are FM approved as Explosion-proof for Class I, Div 1, Groups B, C, D: Dust-ignition proof for Class II, Div 1, Groups E, F & G and suitable for Class III, Div 1; Hazardous Location, NEMA 4 enclosure. Conduit seal must be within 18 inches of transmitter.

CANADIAN STANDARDS ASSOCIATION (USA) APPROVALS:

All Models with a "C" or "F" option meet CSA requirements for intrinsically safe operation in Hazardous Locations as designated by Class I, Div. 1&2, Groups A, B, C, & D and Class II, Groups E, F & G.

Temperature code T3C.

All models with a "C" or "F" option meet CSA requirements for Explosion-proof in Hazardous Locations as designated by Class I, Div 1, Groups B, C, & D, Class II. Groups E, F, & G and Class III. The enclosure meets CSA requirements for Enclosure 4.

BARRIER REMARKS:

A. Installation of barrier should be in accordance with the manufacturer's instructions.



CSA - Figure 2-4

B. Barrier output terminals should not be exposed without de-energizing all system input power.

C. Resistance from barrier to ground should not exceed one ohm, and non-hazardous location equipment associated with this system shall not employ or generate in excess of 250 Vrms (360 volts peak).

D. Barrier Entity requirements:

CSA - $V_{max}=28$ VDC, $I_{max}=104$ mA,
 $R_{min}=290$ ohms.

MODEL	AMETEK U.S. GAUGE DIVISION PMT PRODUCTS MADE IN USA
SERIAL	
CAL RANGE	IN 12-40 VDC
MAX PRESS	OUT 4-20 mADC
TAG No	DATE
	EXPLOSIONPROOF FOR CLASS I, II, III, DIV 1, GR B, C, D, E, G FOR HAZARDOUS LOCATIONS CONDUIT SEAL MUST BE WITHIN 18 IN. OF TRANSMITTER MAXIMUM AMBIENT TEMP = 60°C. NEMA 4 ENCLOSURE.
 LR 50598	Exia - INTRINSICALLY SAFE FOR CLASS I, DIV. 1 & 2, GR A, B, C, D: CLASS II, GR E, F, G WHEN CONNECTED PER AMETEK DWG BK750483. TEMP CODE T3C EXPLOSIONPROOF FOR CLASS I, DIV 1, GR B, C, D: CLASS II, GR E, F, G: CLASS III FOR HAZ. LOC. ENCLOSURE 4
KEEP COVER TIGHT WHILE CIRCUITS ARE ALIVE GARDER LE COUVERCLE BIEN FERME TANT QUE LES CIRCUITS SONT SOUS TENSION	

MODEL 88C PIPING

Transmitter mounting is shown in Figure 2-1A and 2-1B of Figure 2-1 below.

Conduit drain should be provided to prevent moisture buildup in the conduit compartment.

Figure 2-1C shows a transmitter mounting with an elbow used to prevent sediment in the process from clogging the line.

Figure 2-1D shows a transmitter mounting with an elbow used to eliminate trapped vapor.

Figure 2-1E shows a tee which can be used for calibration.

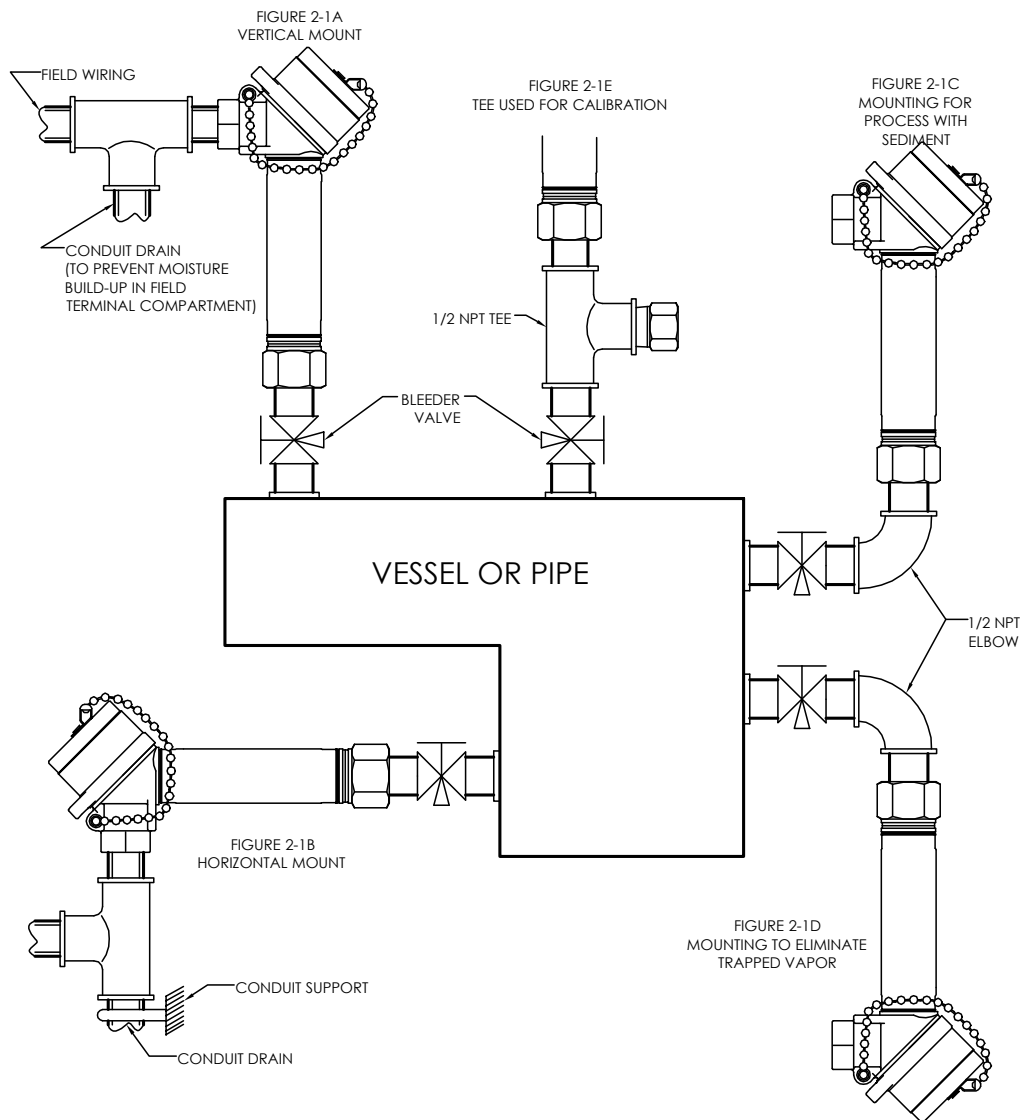


FIGURE 2-1
MODEL 88C/D PIPING

WIRING

WARNING: Power must be off while connections are made to the field terminals.

There are two field terminals (+ Signal & - Signal) located on the terminal board in the field terminal compartment. (The circuit is protected from reversing polarity).

To wire the transmitter to receiver and power supply:

1. The field terminal will accept a stripped wire lead from No. 14 AWG to No. 22 AWG.
2. Install wire between the negative terminal of the transmitter and the positive terminal of the receiver, see figure 2-3.
3. Install wire between the positive terminal of the transmitter and the positive terminal of the power supply, see figure 2-3.

4. Install wire between the negative terminal of the receiver and the negative terminal of the power supply, see figure 2-3.

5. The transmitter housing should be connected to earthground for safety reasons. Figure 2-3 shows the case ground screw that is to be used to attach a properly grounded safety wire.

6. Seal wires entering the housing with sealing compound to prevent water from entering the field terminal compartment.

There are two test terminals (TP+ & TP-) located on the terminal board in the field terminal compartment.

Test terminals have the same output signal (4 to 20mADC) as the signal terminals and are provided as an in-circuit monitor, see Figure 2-3.

NOTE: The cover must be closed tightly to ensure explosion proof design.

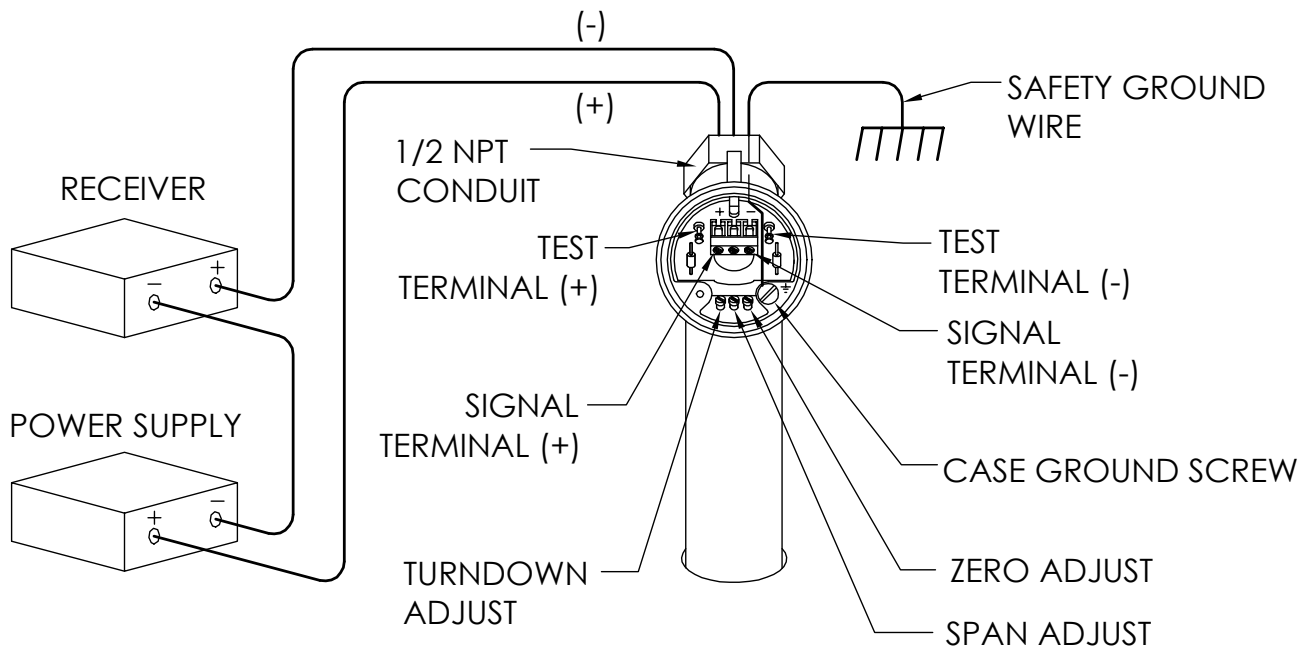
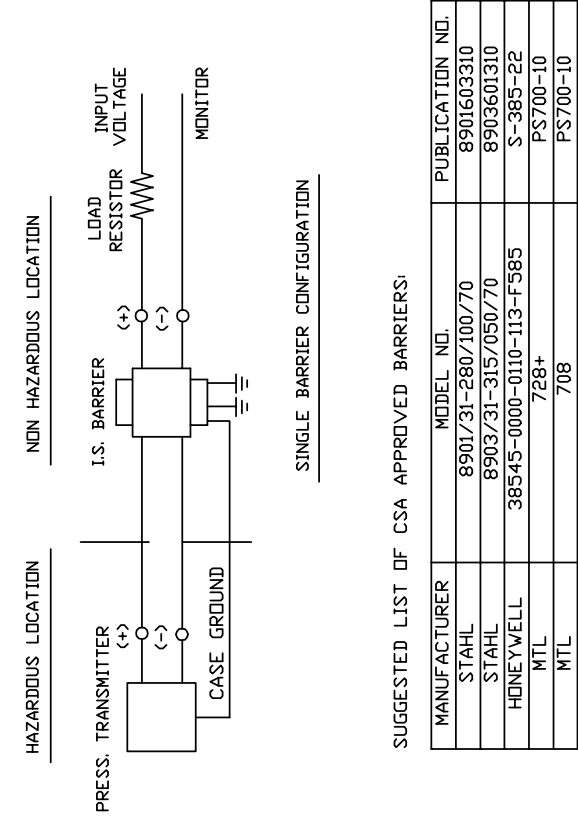


FIGURE 2-3
MODEL 88F WIRING

BASIC INSTALLATION CIRCUIT DIAGRAM



SUGGESTED LIST OF CSA APPROVED BARRIERS:

MANUFACTURER	MODEL NO.	PUBLICATION NO.
STAHL	8901/31-280/100/70	8901603310
STAHL	8903/31-315/050/70	8903601310
HONEYWELL	38545-0000-0110-113-F585	S-385-22
MTL	728+	PS700-10
MTL	708	PS700-10

NOTES :

- 1) USE ANY CSA CERTIFIED SINGLE CHANNEL ZENER DIODE BARRIER, HAVING SAFETY PARAMETERS OF 28 V MAX/290 OHM MIN. FOR THE SINGLE BARRIER CONFIGURATION OR FOR THE SUPPLY BARRIER IN THE 2 BARRIER CONFIGURATION.
- 2) FOR THE RETURN BARRIER IN THE 2 BARRIER CONFIGURATION, USE ANY CSA CERTIFIED DIODE-RETURN BARRIER.
- 3) TO ASSURE AN INTRINSICALLY SAFE SYSTEM, THE TRANSMITTER MUST BE WIRED IN ACCORDANCE WITH THE BARRIER MANUFACTURER'S FIELD WIRING INSTRUCTIONS.
- 3) INTRINSICALLY SAFE FOR HAZARDOUS LOCATIONS CLASS I, GROUPS A,B,C,D, CLASS II, GROUPS E,F,G, AND CLASS III

FIGURE 2-4
WIRING INTRINSICALLY SAFE (CSA)

XSEL® Process Gauge - Stainless Steel

Type 232.34 - Dry Case

Type 233.34 - Liquid-filled Case

WIKA Datasheet 23X.34

Applications

- For applications with high dynamic pressure pulsations or vibration a liquid filled case and socket restrictor are available
- Suitable for corrosive environments and gaseous or liquid media that will not obstruct the pressure system
- Process industry: chemical/petrochemical, power stations, mining, on and offshore, environmental technology, mechanical engineering and plant construction

Product features

- Excellent load-cycle stability and shock resistance
- Solid front thermoplastic case
- Positive pressure ranges to 30,000 psi (2,000 bar)
- XSEL® Process Gauge with 5 year warranty on gauge and 10 year warranty on pressure system (see terms and condition)
- All lower mount connection gauges are factory prepared for liquid filling

(LBM: must install membrane prior to field filling)

Specifications

Design

ASME B40.100

Sizes

4½" & 6" (115 & 160 mm) dial size

Accuracy class

± 0.5% of span (ASME B40.100 Grade 2A)

± 1.0% of span (ASME B40.100 Grade 1A)

for ≥ 20,000 psi (1,600 bar) range and above

Ranges

Vacuum / Compound to 400 psi (25 bar)

Pressure from 15 psi (1 bar) to 30,000 psi (2,000 bar)

or other equivalent units of pressure or vacuum

Working pressure

Steady: full scale value

Fluctuating: 0.9 x full scale value

Short time: 1.5 x full scale value

Operating temperature

Ambient: -40°F to +140°F (-40°C to +60°C) - dry

-4°F to +140°F (-20°C to +60°C) - glycerine filled

-40°F to +140°F (-40°C to +60°C) - silicone filled

Medium: max. +212°F (+100°C)



Bourdon Tube Pressure Gauge Model 232.34

Temperature error

Additional error when temperature changes from reference temperature of 68°F (20°C) ±0.4% of span for every 18°F (10°K) rising or falling.

Weather protection

Weather resistant (NEMA 3 / IP54) - without membrane

Weather tight (NEMA 4X / IP65) - dry case or filled case with membrane installed

Pressure connection

Material: 316L stainless steel

Lower mount (LM) or lower back mount (LBM)

1/4" or 1/2" NPT with M4 internal tap

Restrictor

Material: Stainless steel (0.6 mm), standard

Bourdon tube

Material: 316L stainless steel

≤ 1,000 psi (69 bar): C-shape

≥ 1,500 psi (100 bar): Helical

Movement

Stainless steel

Internal overload stop set at 1.1x full scale

Underload stop-optional

Dampened movement-optional

Dial

White aluminum with black lettering, stop pin at 6 o'clock

Standard WIKA psi single scales (4½" only) with large figures at beginning and end for quick and easy identification.

Pointer

Black aluminum, adjustable

Case

Black fiberglass-reinforced thermoplastic (POCAN)

Solid front, blowout back

Turret-style case with built in rear flange lugs

Window

Clear acrylic with Buna-N gasket

Case filling Type 233.34

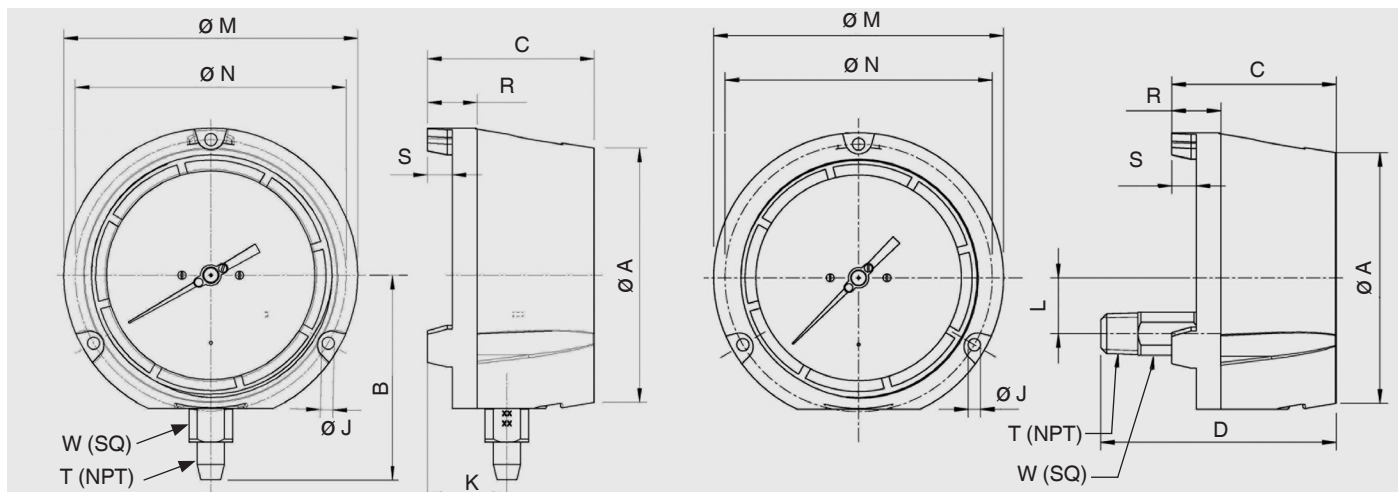
Glycerine 99.7% and ≥ 40 psi (2.5 bar)

Glycerine 86.5%/Water 13.5% - < 40 psi (2.5 bar)

Optional extras

- Silicone dampened movement
- Panel mounting adaptor kit (field assembled)
- Silicone case filling
- Halocarbon case filling
- Cleaned for oxygen service
- Instrument glass or safety glass window
- Drag pointer (maximum reading indicator)
- Alarm contacts switches (magnetic or inductive)
- Special process connections
- Custom dial layout
- External zero adjustment (4.5" size only)
- Case and ring in red or yellow thermoplastic (4½" LM only)
- Insight® reflective dial options available in white, fluorescent yellow, fluorescent orange or glow-in-the-dark

Dimensions



Size		A	B	C	D	J	K	L	M	N	R	S	T	W	Weight ¹	
4.5"	mm	128	103	84	120.3	6.3	40	28.5	148	136.5	25	12.5		22	2 lb.	dry
	in	5	4.06	3.31	4.74	0.248	1.57	1.12	5.83	5.37	0.99	0.49	1/2"	0.87	3 lb.	filled
6"	mm	164	122.5	88	123.4	7.1	40.2	28.5	190	177.8	25.4	12.7		22	3 lb.	dry
	in	6.46	4.82	3.46	4.86	0.28	1.58	1.12	7.5	7	1	0.5	1/2"	0.87	4 lb.	filled

¹ Weight without optional accessories

