



**Waste Water**

# **Specification Guide**

**For**

**Pressure & Temperature Instruments  
& Related Accessories**

**Prepared for  
Consultant, Design & Specification Engineers**



## Gauges

### Heavy Duty Gauge with Stainless Steel Internals (P3S)

1. The pressure gauge shall have a 4.5" (115mm), 6" (150mm), 8.5" (215mm) or 10" (250mm) dial and constructed of an aluminum case and polished stainless steel or anodized aluminum ring. The dial shall be a white aluminum dish dial with black and red markings.
2. The wetted parts shall be made of a 316L stainless steel socket, 316L stainless steel TIG Argonarc welds and a 316L stainless steel bourdon tube. The movement is made of 304 stainless steel.
3. The process connection is 1/4" or 1/2" NPT lower or lower back mount.
4. The lens is glass or polycarbonate and the pointer is made of anodized black aluminum and is micrometer adjustable.
5. Pressure gauge accuracy to be  $\pm 0.5\%$  of full scale (ASME grade 2A).
6. The ambient or process temperature tolerance of the gauge shall be  $-40^{\circ}\text{F}$  to  $150^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$  to  $65^{\circ}\text{C}$ ) and the enclosure rating is IP52.
7. Manufacturer's series or model number to be marked on each dial and the socket to be stamped with the manufacturer's batch code.
8. Must be ASME B40.100 compliant.
9. The manufacturer is to provide a 5 year product warranty.
10. Pressure gauges to be Winters P3S Series or approved equivalent.

### Differential Gauge (PDT)

1. The pressure gauge shall have a 4.5" (115mm) or 6" (150mm) dial and an aluminum case and stainless steel or aluminum ring. The dial shall be white aluminum with black and red markings.
2. The wetted parts shall be made of a brass\* or 316 stainless steel sockets, tin/copper or Tig argonarc welds and phosphor bronze or stainless steel bourdon tubes. The movement is made of brass.
3. The process connection is either 1/4" NPT bottom or lower back mount.
4. The lens is glass and the pointer is made of black aluminum.
5. Pressure gauge accuracy to be  $\pm 1\%$  of full scale (ASME grade 1A).
6. The ambient or process temperature tolerance of the gauge shall be  $-40^{\circ}\text{F}$  to  $150^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$  to  $65^{\circ}\text{C}$ ).
7. Manufacturer's series or model number to be marked on each dial and the socket to be stamped with the manufacturer's batch code.
8. Must be ASME B40.100 compliant.
9. The manufacturer is to provide a 5 year product warranty.
10. Pressure gauges to be Winters PDT Series or approved equivalent.

**WinAIR Differential Gauge (PFD, WinAIR)\***

1. The pressure gauge shall be a 4.4" (112mm) case and constructed of black die-case aluminum.
2. The dial shall be 4" (103mm) in size and made of aluminum with black and white markings. The dial shall include 2 pointer stops, to safe guard from over and under travel. The pointer is painted black and made of aluminum.
3. The gauge shall measure positive, negative or differential pressure for air and non-corrosive gases.
4. Standard pressure scale to be single scale "H2O with mmH2O, PSI or Pa as alternate single or dual scale options.
5. The wetted parts shall be made of die-cast aluminum, copper and silicon.
6. The gauge movement is a resistance-free magnetic linkage which is displaced when media makes contact with the pressure diaphragm.
7. There are 2 sets of process connections which are 1/8" NPT; 2 connections are rated 'high' and 2 connections are rated 'low', they are located on the side and back of the case.
8. Over-pressure to be a maximum of 14.5 psi (100 kPa).
9. The window is polycarbonate and held in-place with a painted black threaded ring.
10. Pressure gauge accuracy to be +/- 2.0%, +/- 3.0% or +/- 4.0% of full scale.
11. Re-Zero screw to be accessible from the lens.
12. The ambient temperature tolerance of the gauge shall be -40°F to 140°F (-40°C to 60°C).  
The process temperature tolerance of the gauge shall be 14°F to 140°F (-10°C to 60°C).
13. The enclosure rating is IP67.
14. The manufacturer's Series and Brand to be marked on the dial and the back of the case to include the manufacturer's batch code.
15. The manufacturer to provide a 5 year product warranty
16. Pressure gauges to be Winters PFD Series or approved equivalent.

## **Premium, Liquid Filled Gauge with Stainless Steel Internals (PFP)**

1. The pressure gauge shall have a 2.5" (63mm), 4" (100mm) or 6" (150mm) dial. Case and ring to be constructed of 304 stainless steel. The dial shall be a white aluminum dial with black and red markings.
2. The wetted parts shall be made of a 316L stainless steel socket, TIG welds and a seamless 316L stainless steel bourdon tube. The movement is made of 304 stainless steel.
3. 4" and 6" dial gauges to have stainless steel under and overload stops.
4. The process connection is 1/4" or 1/2" NPT bottom, centre back or lower back mount with a removable restrictor screw in the orifice.
5. The lens is polycarbonate and the pointer is made of anodized black aluminum. 4" (100mm) and 6" (150mm) dial gauges to have a micrometer adjustable pointer.
6. The gauge will have a Buna-N fill plug. 4" (100mm) and 6" (150mm) dial gauges to have a blowout back plug.
7. Pressure gauge accuracy to be  $\pm 1.5\%$  of full scale value for 2.5" (63mm) or  $\pm 1\%$  of full scale value (Grade 1A) for 4" (100mm) and 6" (150mm) dials.
8. The ambient temperature tolerance of the gauge shall be  $-40^{\circ}\text{F}$  to  $250^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$  to  $120^{\circ}\text{C}$ ) if dry or  $-4^{\circ}\text{F}$  to  $150^{\circ}\text{F}$  ( $-20^{\circ}\text{C}$  to  $65^{\circ}\text{C}$ ) if glycerin filled. The process temperature tolerance of the gauge shall be  $-40^{\circ}\text{F}$  to  $250^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$  to  $120^{\circ}\text{C}$ ). The enclosure rating is IP66.
9. Manufacturer's series or model number to be marked on each dial and the socket to be stamped with the manufacturer's batch code.
10. Must be ASME B40.100 and EN837-1 compliant.
11. The manufacturer is to provide a 5 year product warranty.
12. Pressure gauges to be Winters PFP Series or approved equivalent.

## **Premium, Dampened Movement Gauge with Stainless Steel Internals (PFP-ZR)**

1. The pressure gauge shall have a 2.5" (63mm) or 4" (100mm) dial. Case and ring to be constructed of 304 stainless steel. The dial shall be white aluminum with black and red markings.
2. The wetted parts shall be made of a 316L stainless steel socket and a 316L stainless steel bourdon tube. The movement is made of 304 stainless steel. The gauge will have stainless steel under and overload stops.
3. The gauge movement shall be dampened; extended pointer shaft with paddles enclosed by a cap filled with an inorganic compound.
4. The process connection is 1/4" or 1/2" NPT bottom, centre back or lower back mount with a removable restrictor screw in the orifice.
5. The lens is polycarbonate and the pointer is made of black aluminum.
6. 4" (100mm) gauge to have a micrometer adjustable pointer and blowout back plug.
7. Pressure gauge accuracy to be  $\pm 1.5\%$  of full scale value for 2.5" (63mm) or  $\pm 1\%$  of full scale value (Grade 1A) for 4" (100mm) dials.
8. The ambient or process temperature tolerance of the gauge shall be  $-40^{\circ}\text{F}$  to  $250^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$  to  $120^{\circ}\text{C}$ ) and the enclosure rating is IP66.
9. Manufacturer's series or model number to be marked on the dial and the socket to be stamped with the manufacturer's batch code.
10. Must be ASME B40.100 and EN837-1 compliant.
11. The manufacturer is to provide a 5 year product warranty.
12. Pressure gauges to be Winters PFP-ZR Series or approved equivalent.

**Heavy Duty, Phenolic Gauge with Brass Internals (PPC)\***

1. The pressure gauge shall have a 4.5" (115mm) dial and a black phenolic case with pressure relief back, solid front and integral back flange. The dial shall be a white aluminum dial with black and red markings.
2. The wetted parts shall be made of a brass socket, silver alloy welds and a phosphor bronze bourdon tube. The movement is made of 304 stainless steel with under and overload stops.
3. The process connection is 1/4" or 1/2" NPT bottom mount or lower back mount. The socket is to have 4 wrench flats.
4. The window is polycarbonate with a phenolic bayonet ring and the pointer is made of black aluminum and is micrometer adjustable.
5. The pressure gauge shall be glycerin fillable in the field.
6. Pressure gauge accuracy to be  $\pm 0.5\%$  of full scale (ASME Grade 2A).
7. The ambient temperature tolerance of the gauge shall be  $-40^{\circ}\text{F}$  to  $250^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$  to  $120^{\circ}\text{C}$ ) dry or  $-4^{\circ}\text{F}$  to  $150^{\circ}\text{F}$  ( $-20^{\circ}\text{C}$  to  $65^{\circ}\text{C}$ ) glycerin filled. The process temperature tolerance of the gauge shall be  $-40^{\circ}\text{F}$  to  $250^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$  to  $120^{\circ}\text{C}$ ) for stainless steel wetted parts and  $-40^{\circ}\text{F}$  to  $150^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$  to  $65^{\circ}\text{C}$ ) for brass wetted parts and the enclosure rating is IP65.
8. Manufacturer's Series or Model number to be marked on the dial and the socket to be stamped with the manufacturer's batch code.
9. Must be ASME B40.100 compliant.
10. The manufacturer is to provide a 5 year product warranty.
11. Pressure gauges to be Winters PPC Series or approved equivalent.

**Heavy Duty Phenolic Gauge with Dampened Movement (PPC-ZR)\***

1. The pressure gauge shall have a 4.5" (115mm) dial and be constructed of black phenolic with a safety pressure relief back, solid front and integral back flange. The dial shall be white aluminum with black and red markings.
2. The wetted parts shall be made of a brass socket, silver alloy welds and a phosphor bronze bourdon tube. The movement is made of 304 stainless steel with under and overload stops.
3. The gauge movement shall be dampened; extended pointer shaft with paddles enclosed by a cap filled with an inorganic compound.
4. The process connection is 1/4" or 1/2" NPT bottom mount or lower back mount.
5. The window is polycarbonate with a phenolic ring and the pointer is made of black aluminum.
6. Pressure gauge accuracy to be  $\pm 0.5\%$  of full scale (ASME Grade 2A).
7. The ambient temperature tolerance of the gauge shall be  $-40^{\circ}\text{F}$  to  $250^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$  to  $120^{\circ}\text{C}$ ). The process temperature tolerance of the gauge shall be  $-40^{\circ}\text{F}$  to  $250^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$  to  $120^{\circ}\text{C}$ ) for stainless steel wetted parts and  $-40^{\circ}\text{F}$  to  $150^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$  to  $65^{\circ}\text{C}$ ) for brass wetted parts and the enclosure rating is IP65.
8. Manufacturer's Series or Model number to be marked on the dial and the socket to be stamped with the manufacturer's batch code.
9. Must be ASME B40.100 compliant.
10. The manufacturer is to provide a 5 year product warranty.
11. Pressure gauges to be Winters PPC-ZR Series or approved equivalent.



## General Purpose Transmitter (LE3)

1. The transmitter shall be constructed of stainless steel with a ceramic sensor.
2. The wetted parts shall be made of a 304 stainless steel process connection, an FKM seal and a ceramic diaphragm.
3. Output signal shall be 2-wire (4-20 mA / Vs= 8-32 Vdc), 3-wire (0-10 V / Vs= 14-30 Vdc) or 3-wire ratiometric (Vsig= 0.5-4.5 Vs=  $5 \pm 0.5$  Vdc).
4. The process connection is 1/4" NPT.
5. The response time is to be <10msec for 2-wire output and <3msec for 3-wire.
6. Transmitter accuracy is to be  $\pm 0.5\%$  FSO.
7. The operating temperature range is to be -40°F to 257°F (-40°C to 125°C) and the enclosure rating is NEMA 4X / IP65 or IP67.
8. Transmitter to be CE, CSA and RoHS compliant.
9. The manufacturer is to provide a 5 year product warranty.
10. Transmitters to be Winters LE3 Series or approved equivalent.

## Intrinsically Safe Transmitter (LIS)

1. The transmitter shall be constructed of stainless steel with a ceramic sensor.
2. The wetted parts shall be made of a 316 stainless steel process connection, an FKM70 or FKM90 seal and ceramic diaphragm.
3. Output signal shall be 2-wire (4-20 mA / Vs= 8-32 Vdc, I.S. protection: Vs= 14-28 Vdc) or 3-wire (0-20 mA / Vs= 14-30 Vdc, 0-10V / Vs= 14-30 Vdc).
4. The process connection is 1/4" NPT.
5. The response time is to be <10msec.
6. Transmitter accuracy is to be  $\pm 0.5\%$  FSO.
7. The operating temperature range is to be -40°F to 257°F (-40°C to 125°C) and the enclosure rating is NEMA 4X and 6P / IP65, IP67 or IP68.
8. Transmitter to be CE, CSA and RoHS compliant.
9. The manufacturer to provide a 5 year product warranty.
10. Transmitters to be Winters LIS Series or approved equivalent.

## Anti-Clogging Submersible Transmitter (LM1)

1. The transmitter shall be constructed of a 316L stainless steel housing with no exposed bolts and a 316 stainless steel triple seated sensor.
2. Output signal shall be 2-wire (4-20 mA / Vs= 8-38 Vdc) or 3-wire (0-5 V / Vs= 8-38 Vdc).
3. The electrical connection is 1/2" NPTM.
4. The response time is to be <5msec.
5. Transmitter accuracy is to be  $\pm 0.5\%$  FSO or  $\pm 0.25\%$  FSO.
6. The operating temperature range is to be 0°F to 200°F (-18°C to 93°C) and the enclosure rating is NEMA 6P / IP68.
7. The transmitter shall come with 40' of cable for submersing.
8. The manufacturer is to provide a 5 year product warranty.
9. Transmitters to be Winters LM1 Series or approved equivalent.

## All Stainless Steel Submersible Transmitter (LM6)

1. The transmitter shall be constructed of 316L stainless steel with a 316 stainless steel sensor.
2. Output signal shall be 2-wire (4-20 mA / Vs= 8-32 Vdc) or 3-wire (0-20 mA / Vs= 14-30 Vdc, 0-10 V / Vs= 14-30 Vdc).
3. The response time is to be <10msec.
4. Transmitter accuracy is to be  $\pm 0.35\%$  FSO BFSL or  $\leq \pm 0.25\%$  FSO BFSL. or  $\leq \pm 0.1\%$  FSO BFSL
5. The operating temperature range is to be  $-13^{\circ}\text{F}$  to  $158^{\circ}\text{F}$  ( $-25^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ ) and the enclosure rating is NEMA 6P / IP68.
6. Transmitter to be CE, CSA and RoHS compliant.
7. The manufacturer is to provide a 5 year product warranty.
8. Transmitters to be Winters LM6 Series or approved equivalent.



## Switches

### **Explosion Proof Compact Pressure Switch (9WPS)**

1. The housing shall be constructed of 316 stainless steel.
2. The wetted parts shall be made of FKM or stainless steel with a PTFE backup ring and a FKM o-ring.
3. The switch shall be either Single Pull Double Throw (SPDT) or Double Pull Double Throw (DPDT).
4. The process connection is 1/4" NPTF (1/2" NPTM is optional). The electrical connection is 1/2" NPTM, 18 AWG, 18" (300m) free leads.
5. Switch accuracy is to be  $\pm 2\%$  of full scale.
6. The ambient temperature range is to be -40°F to 149°F (-40°C to 65°C) and the enclosure rating is NEMA 4X, 7 and 9.
7. Switch is to be CSA approved for hazardous locations and NACE MR0175-2009 compliant.
8. The manufacturer to provide a 5 year product warranty.
9. Switch to be Winters 9WPS Series or approved equivalent.



## General Purpose 1 Piece Diaphragm Seal (D40)

1. The diaphragm housing shall be constructed of a one piece 316 stainless steel body with a welded 316L stainless steel diaphragm.
2. The maximum operating pressure is to be 1,000 psi (6,900 kPa).
3. The diaphragm will have 1/4" or 1/2" NPTF instrument connection and a 1/4" or 1/2" NPTF or NPTM process connection.
4. The diaphragm will be able to handle a process temperature of -49°F to 302°F (-45°C to 150°C).
5. Must be ASME B40.100 compliant.
6. The manufacturer is to provide a 5 year product warranty.
7. Diaphragms to be Winters D40 Series or approved equivalent.

## Heavy Duty 2 Piece Diaphragm Seal (D70)

1. The diaphragm shall be constructed of a two piece 316L stainless steel upper housing, diaphragm and lower housing.
2. The maximum operating pressure is to be 2,500 psi (17,250 kPa).
3. The diaphragm will have a 1/4", 1/2", 3/4" or 1" NPTF process connection and 1/4" or 1/2" NPTF instrument connection.
4. The diaphragm will be able to handle a process temperature of -22°F to 212°F (-30°C to 100°C).
5. The lower housing will come equipped with a 1/8" or 1/4" flushing port.
6. The upper and lower housings will be held together with 316 stainless steel nuts and bolts.
7. Must be ASME B40.100 compliant.
8. The manufacturer is to provide a 5 year product warranty.
9. Diaphragms to be Winters D70 Series or approved equivalent.

## Isolation Ring (Annular Seal) (D81)

1. The isolation ring is to be constructed of a carbon steel or stainless steel centre and stem. The stem shall be at least 1.25" thick.
2. The end caps are to be made of stainless steel and designed as a wafer style or full flange.
3. The elastomer sleeve is to be made of Buna-N or any other flexible polymer.
4. The inner diameter of the isolation ring is to be between 1" and 42" (25mm and 1067mm) in size.
5. The isolation ring will have a modular seal that allows instruments to be installed on a quick release fitting which incorporates a check-ball to retain the system fill-fluid or an equivalent WinCONNECT fitting which can be removed without shutting down the process.
6. The isolation ring shall have the option of adding a one-piece instrumentation tee capable of managing a secondary pressure sensing instrument.
7. The isolation ring will have the ability to have instruments installed in the field while the system is pressurized.
8. The system fill fluid will be silicone, glycerin or glycerin and water.
9. Must be ASME B40.100 compliant.
10. The manufacturer is to provide a 5 year product warranty.
11. Isolation rings to be Winters D81 Series or approved equivalent.



### Direct Reading Bi-Metal Dial Thermometer (TBM)

1. The thermometer case shall have a 2" (50mm), 3" (75mm), 4" (100mm), 5" (125mm) or 6" (150mm) dial and be anti-parallax dish-shaped, a non-reflective silver colour with black markings. It will come with an external recalibration screw on the back of the dial. The stem shall be 2.5" (63mm) or greater with a 1/4" or 1/2" NPT connection.
2. Thermometer stem shall be bottom mount, centre back mount or fully adjustable.
3. The stem will be able to withstand 125 psi of pressure without a thermowell.
4. Accuracy to be  $\pm 1\%$  of full scale.
5. The thermometer enclosure rating to be rated as IP68 and hermetically sealed.
6. Manufacturer's series or model number to be marked on the dial and the socket to be stamped with the manufacturer's batch code.
7. Must be ASME B40.200 compliant.
8. The manufacturer is to provide a 5 year product warranty.
9. Bi-metal thermometers to be Winters TBM Series or approved equivalent.

### Remote Reading Dial Thermometer (TRR)

1. The thermometer case shall have a 2.5" (63mm), 3.5" (90mm), 4" (100mm), 4.5" (115mm), 6" (150mm) or 8.5" (215mm) dial with a stainless steel, steel or aluminum case. It will come with a glass or polycarbonate lens and an aluminum pointer painted black.
2. Thermometer stem shall be panel or direct mountable.
3. The capillary will be brass or stainless steel and gas or vapour filled. The capillary length is to be specified as required.
4. The bulb to be 6" in length and constructed of either brass\* or stainless steel as required.
5. Accuracy to be  $\pm 2\%$  of full scale for a vapour filled capillary or  $\pm 1\%$  of full scale for a gas filled capillary.
6. Must be ASME B40.200 compliant.
7. The manufacturer is to provide a 5 year product warranty.
8. Remote reading thermometers to be Winters TRR Series or approved equivalent.

### Stainless Steel Needle Valve (NVA)

1. The needle valve will have a one piece 316 stainless steel, 316 stainless steel NACE or carbon steel body.
2. Needle and needle tip to be of 316 stainless steel or 316 stainless steel NACE material.
3. The process connection will be 1/4", 3/8", 1/2", 3/4" or 1" NPT female or NPT male.
4. Available in Soft and Hard Seat.
  - a. Soft seat to have a maximum operating pressure rating of 6,000 psi (41,368.54 kPa)
  - b. Hard seat to have a maximum operating pressure rating of 10,000 psi (68,947.57 kPa).
5. Fastening screw to be solid 304 stainless steel.
6. Needle valve must be CRN registered to withstand 4 times rated valve pressure (for Canada only).
7. Must be ASME B1.20.1 compliant.
8. The manufacturer is to provide a 5 year product warranty.
9. Needle valves to be Winters NVA Series or approved equivalent.

**Stainless Steel 2-Handle Block & Bleed Valve (BBV)**


1. The 2-handle block and bleed valve will have a one piece 316 stainless steel, 316 stainless steel NACE or carbon steel body.
2. The Isolation and Vent needle and needle tip to be of 316 stainless steel or 316 stainless steel NACE material.
3. The process connection will be 1/4", 1/2" or 3/4" NPT female or NPT male.
4. Available in Soft and Hard Seat.
  - a. Soft seat to have a maximum operating pressure rating of 6,000 psi (41,368.54 kPa)
  - b. Hard seat to have a maximum operating pressure rating of 10,000 psi (68,947.57 kPa).
5. Fastening screw to be solid 304 stainless steel.
6. Needle valve must be CRN registered to withstand 4 times rated valve pressure (for Canada only).
7. Must be ASME B1.20.1 compliant.
8. The manufacturer is to provide a 5 year product warranty.
9. Needle valves to be Winters NVA Series or approved equivalent.

**Snubber (SSN)**

1. The snubber shall be made of stainless steel with a stainless steel snubbing element.
2. The process connection will be 1/4" or 1/2" NPT.
3. Operating pressure will be a maximum of 20,000 psi (137,900 kPa) with a burst pressure of 60,000 psi (413,700 kPa).
4. Operating temperature will be -320°F to 1,500°F (-195°C to 815°C).
5. Must be ASME B40.100 compliant.
6. The manufacturer is to provide a 5 year product warranty.
7. Pressure snubbers to be Winters SSN Series or approved equivalent.

**Over Pressure Protector (SOP)**

1. The over pressure protector will be made of 316 stainless steel with a FKM gasket.
2. The protector will have an external adjusting screw and lock nut.
3. The process connection will be 1/4" x 1/4" FNPT x MNPT or 1/2" x 1/2" FNPT x MNPT.
4. The burst pressure of the over pressure protector will be 10,000 psi (68,950 kPa).
5. Operating temperature will be -40°F to 248F (-40°C to 120°C).
6. The manufacturer is to provide a 5 year product warranty.
7. Over pressure protectors to be Winters SOP Series or approved equivalent.

\*  **WARNING:** This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

# WINTERS INSTRUMENTS

MANUFACTURER OF INDUSTRIAL INSTRUMENTATION



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