

Introduction

The Sapphire Dual Point system (PDS) is an extension of the field proven Sapphire. It has the industries best sensitivity with a wet to dry ratio of over 10,000 utilizing the patented Time Gate technology. The DPS provides two independent Sapphires in one enclosure with a common sensor body. The DPS can be used for sump level control, high - high, low - low or high - low level control, pump control and numerous other applications. Distances between points can range from as little as 2-1/2 inches to over ten (10) feet with slot sensors. The DPS incorporates all of the Sapphire test and set up features so it provides the greatest flexibility with the utmost in reliability.

Performance Specifications for Electronics, Relay Operation (Integral and Remote)

Supply Voltage:

15-35 VDC (Electronics Model F)
115 VAC, ±10%, 50/60 Hz (Model G)
230 VAC, ±10%, 50/60 Hz (Model S)

Power Consumption:

4 Watts maximum

Outputs:

Two (2) hermetically sealed relay outputs. Process relay is field selectable for Hi/Lo operation. Auxiliary relay is field selectable for Fault/Mimic operation, and NC/NO operation.

Process Relay:

SPDT relay with gold plated contacts. De-energizes on process alarm, self-test or power loss.

Maximum Contact Rating:

5 amps at 115/250 VAC or 5 amps at 30 VDC

Minimum Contact Rating:

100 mA at 5 VDC or 15 mA at 24 VDC

Auxiliary Relay:

SPST (either NC or NO as ordered or selectable by customer) relay with gold plated contacts. De-energizes on self-test, power loss (and process alarm when mimix operation is field selected).

Maximum contact rating:

5 amps at 115/250 VAC or 5 amps at 30 VDC

Minimum contact rating:

100 mA at 5 VDC or 15 mA at 24 VDC



Features & Benefits

- ◆ Dual Point Systems
- ◆ Unmatched Reliability
- ◆ Superior Self-Testing Capabilities
- ◆ Variable System Qualification Time
- ◆ Manual Loop Test
- ◆ Dual-compartment Housing (Single Point)
- ◆ Lowest Total Installed Cost
- ◆ Broad Range of Sensor Materials
- ◆ Hazardous Location Approvals
3A Sanitary Finish and Fittings
- ◆ Dual Point Switch with completely independent electronics
- ◆ Dual point with up to 10 ft. or more separation
- ◆ Two Year Product Warranty

Performance Specifications for Electronics, Two-wire Operation (Integral and Remote)

Supply Voltage:

12-55 VDC (Model J)

Power Consumption:

1.1 Watt maximum

Current Loop Loads:

$RI_{load, max} = V_{supply} - 12) \times 50, \text{ Ohms}$

Analog Output (1 mA)

19 mA / 5 mA Self-Test Fault (field selectable)

8 mA Dry / 16 mA Wet (field selectable)

16 mA Dry / 8 mA Wet (field selectable)

Self-Test Feature:

Continuous. Checks operation of electronics and sensor including crystal bond to sensor body.

Manual Loop Test Feature:

All output conditions momentarily change to the opposite state (except when in a fault condition) by placing the supplied magnet (part #XB4353) over the housing cover at the location marked "Loop Test"

Sensor Qualification Time:

0.3 or 12 seconds, field selectable

Repeatability:

±0.1 inches

Enclosure:

Single-compartment NEMA 4 (ANSI 250 type 4) Enclosure 4 housing. Low-copper aluminum; Polyurethane paint; Buna-N O-rings

Connections:

Single 1/2-inch NPT conduit connections. Wire range is 22 AWG to 12 AWG

Operating Temperature Range

Electronics:

-40° to 158°F (-40° to 70°C)

Metal Sensors:

-40° to 320°F (-40° to 160°C)

-310° to 212°F (-190° to 100°C)

Humidity:

10% - 95% RH, non-condensing

Weight (with 3/4-inch NPT):

6 lbs. (2.7 Kg)

Factory Mutual Research Corporation (FMRC) Approved for the Following:

Explosion-proof:

Class I, Division 1, Groups B, C, & D

Dust-Ignition Proof:

Class II, Division 1, Groups E, F, & G

Class III, Hazardous Locations

Non-incendive:

Class I, Division 2, Groups A, B, C, & D

Suitable for Class II, Groups E & G

Suitable for Class III, Hazardous Locations

Indoor / Outdoor Use:

NEMA 4 (ANSI type 4)

Indoor / Outdoor Use:

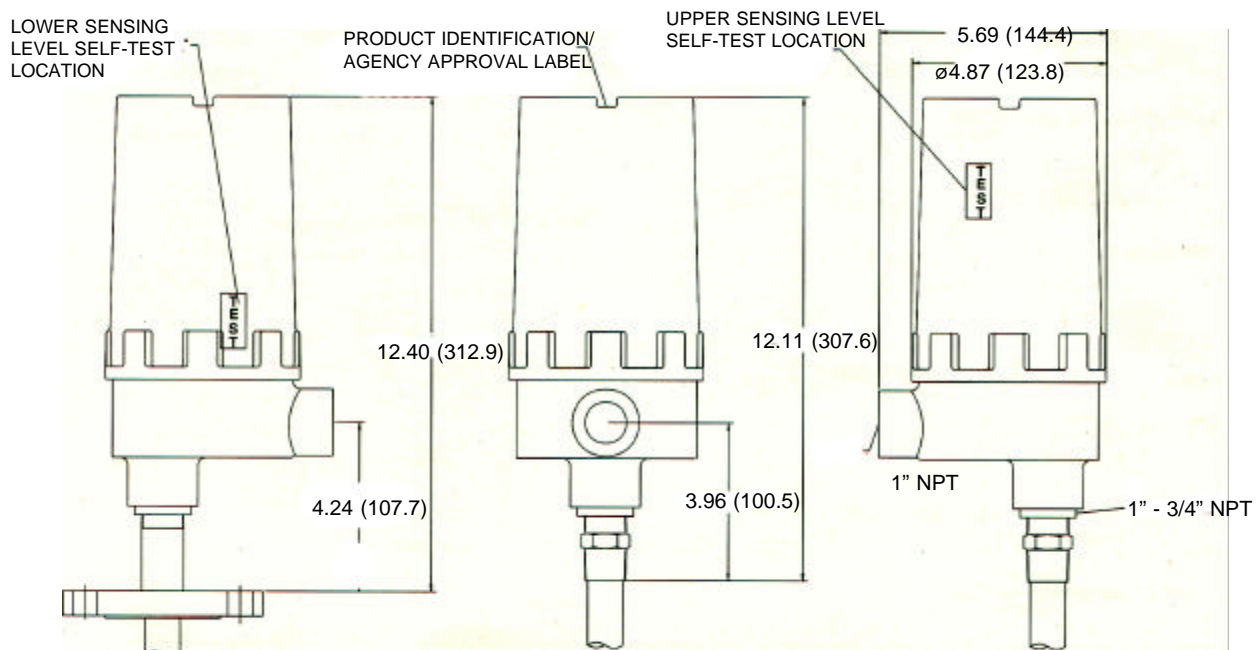
Enclosure 4

3A Sanitary Standards:

Designed to 3A Standards

Remote sensor and field wiring are approved as N.I. field wiring when installed in accordance with Class I, Division 2 wiring diagram of instruction manual (Section 4).

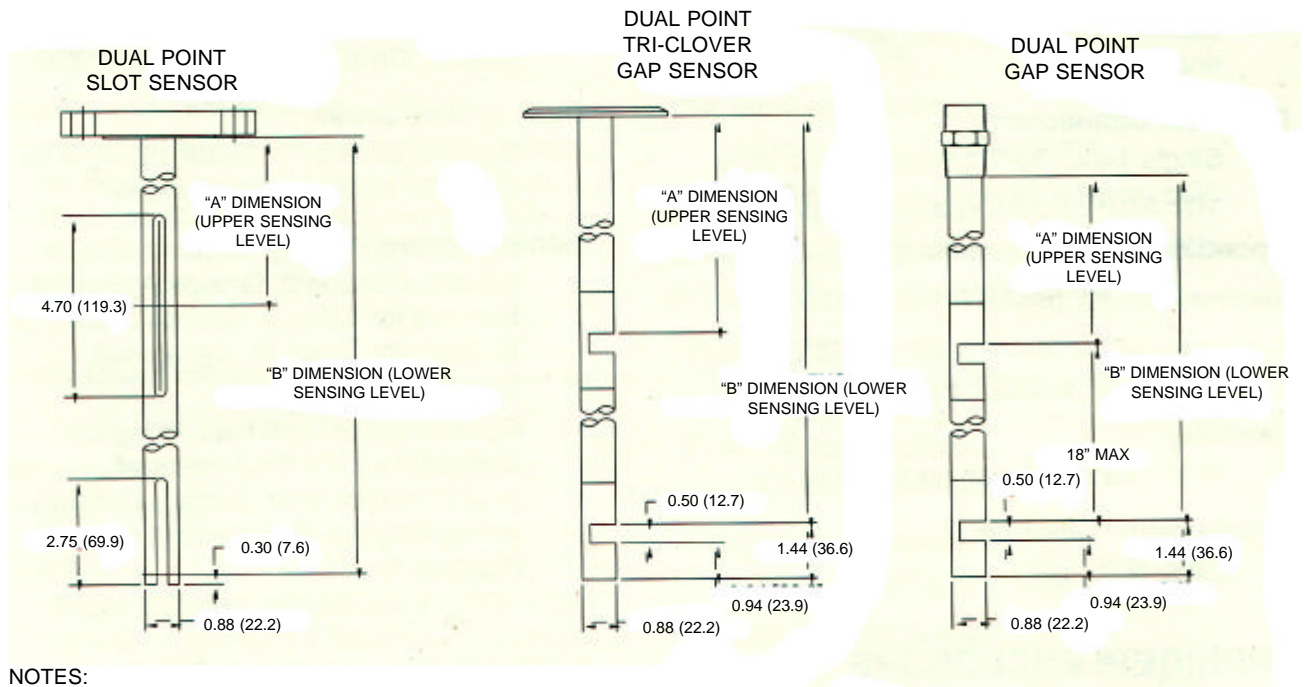
SAPPHIRE™ ENCLOSURE DIMENSIONS



NOTES:

1. Dimensions are in inches (millimeters), nominal, and are for reference only.
2. Dimensions increase by 3 inches (76.2 mm) with installation of optional thermal isolator.

SAPPHIRE™ SENSOR DIMENSIONS



NOTES:

1. Dimensions are in inches (millimeters), nominal, and are for references only.

DUAL POINT SAPPHIRE™ REFERENCE NOTES

1. Spare electronics boards come in sets including the input power board and the logic board.
2. Fitting/flange materials must be the same as the sensor material for all but Tri-Clover fittings. Tri-Clover fittings are only available in 316L and must be used with only 316SS sensors.
3. Minimum distance between A & B dimension on Gap sensors is 2-1/2 inches.
4. Minimum distance between A & B dimension on Slot sensors is 7 inches.
5. Order in 5/10 inch or 10 millimeter increments, because manufacturing tolerances are $\pm 2/10$ inch (± 5 mm) for metal sensors.
6. When specifying sensor lengths, be sure to take into consideration that the total installed sensor length is equal to the "B" dimension plus the remaining sensor length.
7. 1 inch is equal to 25.4 mm; given inches, multiply by 25.4 to get equivalent millimeters; given millimeters, divide by 25.4 to get equivalent inches.
8. Metal flanges have a raised face.
9. Tri-Clover fittings are available with integral or remote mounted Sapphire systems. A 1" Tri-Clover is the same size as a 1-1/2" Tri-Clover fitting. Tri-Clover Dual Point Sapphire fittings do not carry 3A approvals.

Code	System Nomenclature
D	Dual Point
Code	Hazardous Location Approvals
F	Factory Mutual (FM) and Canadian Standards Association (Pending) (CSA) certified
Code	Electronics
J	12-55 VDC input, 4-20 mA output
F	15-35 VDC input, relay output, NO or NC user-selectable Auxiliary Fault Relay
G	115 VAC input, relay output, NO or NC user-selectable Auxiliary Fault Relay
S	230 VAC input, relay output, NO or NC user-selectable Auxiliary Fault Relay
Code	Mounting Configuration
O	Internal electronics and Sensor
T	Thermal Isolator (required for 3/4" NPT units w/process temperatures above 275°F / 135°C)
R	Remote Mounted Electronics (specify cable lengths up to 25 ft. max.)
Code	Sensor Type
G	Gap (Maximum distance between A & B dimension is 18 inches)
S	Slot (316SS and Hastelloy C)
Code	Measurements for "A" & "B" Dimensions
T	Inches, 0.5" increments
M	Millimeters, 1.0 mm increments
Code	Sensor "A" Dimensions (See Notes 2 & 3)
####	Sensors are available in 0.5 inch increments only 0035 - 1200 for Gap Sensors (e.g., 0010 is 1.0") 0100 - 1200 for Slot Sensors (e.g., 1200 is 120.0")
####	Sensors available in 10 millimeter increments only 0090 - 3048 for Gap Sensors (e.g., 0025 is 25 mm) 0254 - 3048 for Slot Sensors (e.g., 3048 is 3048 mm)
Code	Sensor "B" Dimensions (See Notes 3, 4, 5, 6 & 7)
####	Sensors are available in 0.5" increments 0035 - 1200 for Gap Sensors (e.g., 0010 is 1.0") 0100 - 1200 for Slot Sensors (e.g., 1200 is 120.0")
####	Sensors available in 10 mm increments only 0090 - 3048 for Gap Sensors (e.g., 0025 is 25 mm) 0254 - 3048 for Slot Sensors (e.g., 3048 is 3048 mm)
Code	Fitting / Flange (See Note 8)
N	3/4" NPT (material same as sensor)
F	Flange 150 lb. ANSI Raised Face (Metal)
G	Flange 300 lb. ANSI Raised Face (Metal)
S	Tri-Clover (16 AMP) sanitary fitting & 150 grit polished sensor
Code	Fitting / Flange Size
00	3/4" NPT only
10	1" Flange/Tri-clover not avail. with PFA Teflon-faced metal flange
15	1-1/2" Flange / Tri-clover
20	2" Flange / Tri-clover
25	2-1/2" Tri-clover only (Flange not available)
30	3" Flange / Tri-clover
40	4" Flange / Tri-clover
60	6" Flange only (Tri-clover not available)
Code	Fitting / Flange Material (See Notes 2, 8 & 9)
S	316 Stainless Steel (Gap & Slot)
P	316 Stainless Steel (Gap & Slot) polished
H	Hastelloy C (Gap & Slot)
U	Monel (Gap only)
B	Hastelloy B (Gap only)
Q	Carpenter 20 (Gap only)
V	316L Stainless Steel (Tri-Clover fitting only)
J	Titanium

D F J O G T 0010 0195 N 00 S Typical Integral Nomenclature

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