

MODEL P31 R.F. ADMITTANCE LEVEL PROBE - SENSOR MOUNTED IN AN EXTERNAL CAGE -

ADVANTAGES FOR LIQUIDS AND INTERFACES

- INHERENT HIGH GAIN SENSITIVITY
- CAN BE CALIBRATED, TESTED, OR INSPECTED WITHOUT DISTURBING A CONTINUOUS PROCESS
- AVOIDS PROBLEMS DUE TO TURBULENCE AND SPLASHING,
- TEMPERATURE AND PRESSURE SERVICE; -15 TO 425 PSIG (-1 TO 30 BAR) @ 750°F (400°C)
- LOW TEMPERATURE: -350 TO +750°F (-210 TO +400°C)
- WORKS IN HIGHLY CORROSIVE SERVICE; AVAILABLE WITH ALL PVC OR KYNAR® WETTED PARTS
- FULL SCALE 4-20mA OUTPUT SIGNAL CHANGE ACHIEVABLE OVER A FEW INCHES OF LEVEL CHANGE

APPLICATION

The P31 external caged probe is primarily used in the chemical, petrochemical, refining and other continuous process industries. This probe design can be tested, calibrated, and maintained without shutting down the process. Common applications include Dowtherm® heating fluid, interface position, tower bottoms; water knockout traps, etc.

The P31 probe is equipped with an external (to the process vessel or tank) cage. This cage is a vertical cylindrical pressure vessel containing the probe. Block valves are normally installed (by the user) between the cage connection ports and the process vessel or tank. This allows the instrument to be isolated from the process pressure (or partially full tank) for testing and calibration purposes without blow down or draining.

The cage serves as the ground reference for the sensing rod. This is the same principle employed by the Series 20 probes with tubular ground sheaths. The P31 is essentially an "external cage" version of the Series 20 internal caged probes. A signal linear to the level or an interface position is generated for alarm or signal transmission outputs.

The P31 cage serves as the vessel for calibration purposes, eliminating the need to calibrate the probe in actual service. The calibration may be performed prior to operation by filling the cage with the liquid to be measured, varying the level and making the necessary zero and span or alarm adjustments. Likewise, the procedures may be used for testing or recalibration after installation. A means of ventilating and draining the cage is recommended to facilitate the adjustment of the fluid level during calibration and testing. The basic configuration has side/bottom process connections; others are available, consult the factory.

The P31 unit with NPT connections is limited to a maximum working pressure of 1500 PSIG (95 bar) @ 175°F (80°C); higher is available with optional temperature extensions. For other configurations, materials and applications requirements, consult the factory.

SPECIFICATIONS

Wetted Cage Materials: Steel, 316 S.S., Hastelloy® "C", PVC, or Kynar

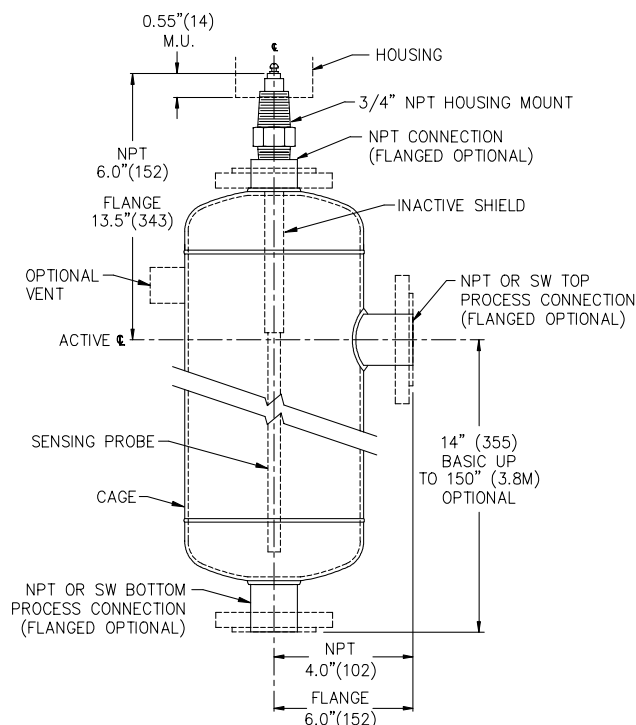
Working Pressures:

WETTED MATERIALS		MAXIMUM WORKING PSIG @ °F				
CAGE	INSULATION	100	250	400	500	750
METAL	PTFE	1440	500	25	N/A	N/A
METAL	ALUMINA	720	690	665	625	425

WETTED MATERIALS		MAXIMUM WORKING PSIG @ °F				
CAGE	INSULATION	100	140	180	220	280
PVC	PTFE	150	50	N/A	N/A	N/A
KYNAR	KYNAR	150	150	115	80	25

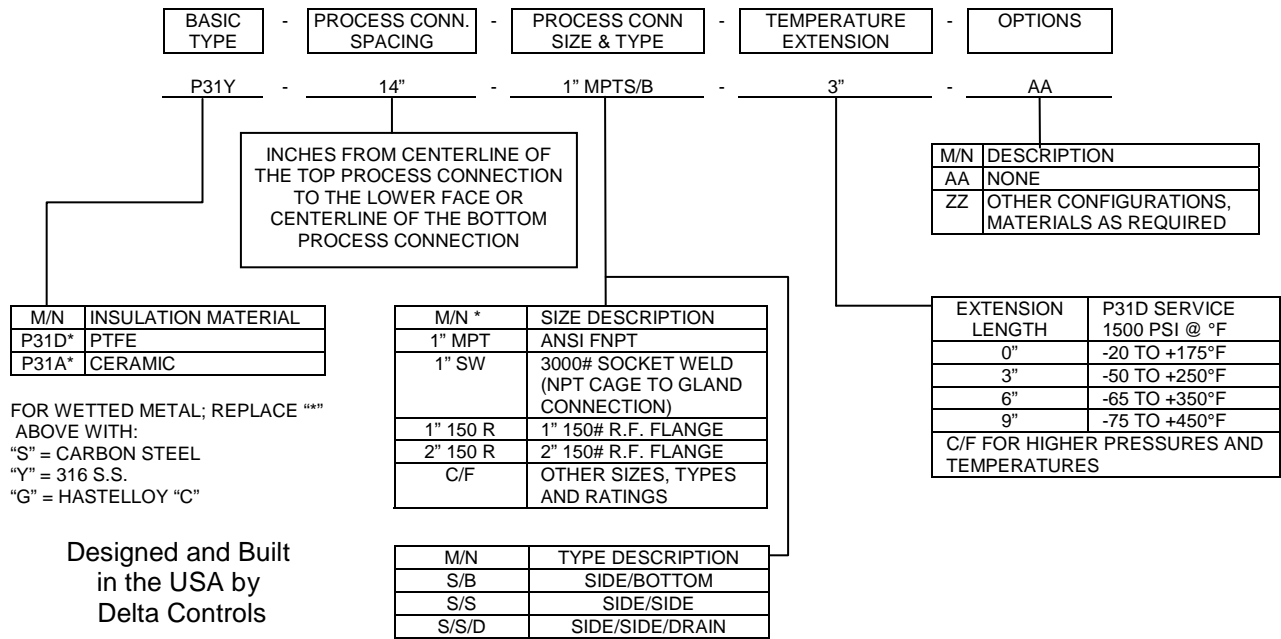


OUTLINE DIMENSIONS



DELTA CONTROLS
CORPORATION

MODEL NUMBERING SYSTEM

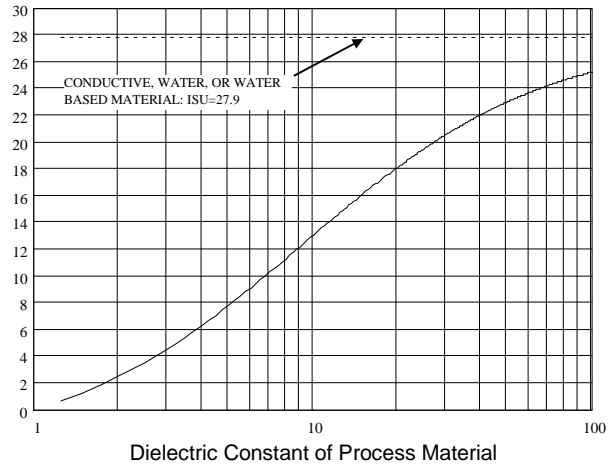
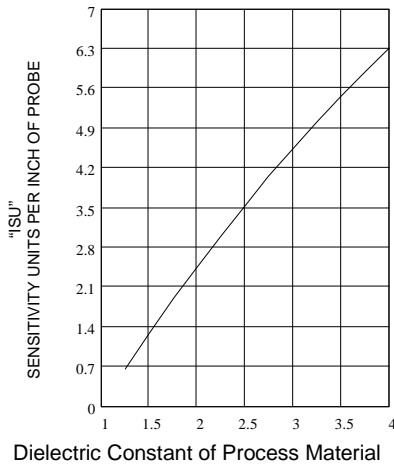


ESTIMATING PROBE PERFORMANCE

STEP # 1 Determine "BSU", which is the total Sensing Unit equivalent when no material is covering the sensing probe with a metal cage. (C/F for plastic cage determination)

- | | |
|---|----------------|
| (A) BASIC "SU" DUE TO SEAL/BODY | = 387 |
| (B) INCHES VERTICAL CONNECTION SPACING X 3.0 | = _____ |
| (C) INCHES TEMPERATURE EXTENSION OR ADDITIONAL INACTIVE SHIELD X 31.0 | = _____ |
| (E) INCHES CABLE FOR REMOTED MODULE X 4.5 | = _____ |
| "BSU" TOTAL | = _____ |

STEP # 2 Determine "ISU", which is the quantity of Sensing Unit change caused by a 1 inch change in the elevation of the process material covering the sensing probe, "ISU" = Read from the graph below



STEP # 3 Insert "BSU" AND "ISU" (determined above) into the formulas shown in Application Note # PROB-198; "FORMULAS FOR MODELING AND PERFORMANCE TESTING". Verify that the selected probe and electronics module will meet the requirements of the application and provide the expected results.



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