








# Model P80 Series 1 • Capacitance Probe, Rigid Rod, Dry Granulated Solids and Powders

## Features

-  Full length concentric rod/insulator/body design withstands heavy loads and resists bending
-  Secondary PTFE seal prevents failures and false alarms due to moisture and condensation
-  For alarm or high/low control action
-  Can be installed in tiled or concrete silos
-  Heavy-duty, proven reliability
-  Suitable for many chunk solid applications
-  Easy model selection when using picofarad calculations to accurately forecast service results



Model P80 Series 1 (P81)

## Description

The side-mounted Delta Controls **Model P80 Series 1** Capacitance Probes feature a full length concentric rod/insulator/body design to withstand heavy loads and resist bending. The secondary PTFE seal **prevents failures and false alarms** due to moisture and condensation, or high/low control action.

The probes are rigid and rod-type for dry powders and granular solids. The sensing rod has a through-the-gland design for maximum strength and is resistant to bending. The glands are sealed against water and moisture. The sensing rod and body are 300 Stainless Steel. The insulator is Delrin® and the seal is PTFE.

The P80 Series are heavy-duty with proven reliability in tiled or concrete silos. The weight factor and picofarad calculations should be used to model probe results.

**Model P81** is a general-duty side inserted probe. The probe may be covered by 26 feet of sand or 65 feet of grain.

**Model P82** is a medium-duty, rugged, side inserted probe. The probe may be covered with up to 55 feet of sand or 130 feet of grain.

**Model P83** is a heavy-duty, side-inserted probe for more demanding applications. The probe may be covered with up to 75 feet of sand or 180 feet of grain and will withstand small to medium size chunk solids.

**Model P84** is an extreme-duty side-inserted probe for the toughest of applications. The probe may be covered with up to 150 feet of sand or 375 feet of grain and can withstand larger chunk size solids.

## Specifications

<b>Type:</b>	Side Mount
<b>Working Pressure:</b>	+1500 psig (+103.4 bar) at +100 °F (38 °C)
<b>Working Temperature:</b>	-460 °F to +400 °F (-273 °C to +204 °C)
<b>Bulk Density:</b>	3150 lb/ft <sup>3</sup> to 14 900 lb/ft <sup>3</sup>
<b>Insertion Length:</b>	Custom
<b>Process Connection:</b>	0.75 in to 1.25 in MPT
<b>Available Wetted Materials:</b>	316 Stainless Steel, PTFE

	COMPARISON CHART OF MODELS				
	MPT	"H"	"S"	O.D.	NPT
P81	0.75 in	3.0 (76)	1.0 (25)	0.37 (9)	0.75 in
P82	0.75 in	3.0 (76)	1.5 (38)	0.50 (13)	0.75 in
P83	1 in	3.1 (79)	2.0 (51)	0.625 (16)	1 in
P84	1.25 in	3.7 (94)	2.0 (51)	0.875 (22)	1 in

WEIGHT FACTORS*	
P81	3,150
P82	6,590
P83	8,880
P84	14,900

\*Use to calculate Maximum Allowable Material Elevation

## Maximum Allowable Elevation of Material

The horizontal sensing probe can withstand heavy loads without bending or failing. The loading on a probe is a function of the material's density. How deeply the sensing probe is covered, and the probe rod size and location. Delta Controls has simplified this complex relationship into a simple and easy to use equation. A "Weight Factor" value has been derived for each model. The maximum amount of coverage is easily determined by dividing the weight factor by the bulk density of the process material as follows:

$$\frac{\text{Weight Factor}}{\text{Bulk Density (lb/ft}^3\text{)}} = \text{Maximum Allowable Feet of Coverage}$$

$$\text{Maximum Coverage} = \frac{\text{Weight Factor}}{\text{lb/ft}^3} = \text{Height of Material in Feet}$$

WEIGHT FACTORS			
P81	P82	P83	P84
3,150	6,590	8,880	14,900

EXAMPLE: Using a Model P82 sensing probe for 48 lb/ft<sup>3</sup> of whole kernel corn

$$\text{Maximum Coverage} = \frac{6590}{48} = 137 \text{ ft (42 m)}$$

## Model Numbering System

MODEL  
EXAMPLE

**MODEL** - **PROCESS CONNECTION** - **OPTIONS**  
**P81** - **0.75"MPTY** - **AA**

MODEL	DESCRIPTION
P81	Capacitance Probe, Rigid Rod, Dry Granulated Solids and Powders, General-duty
P82	Capacitance Probe, Rigid Rod, Dry Granulated Solids and Powders, Medium-duty
P83	Capacitance Probe, Rigid Rod, Dry Granulated Solids and Powders, Heavy-duty
P84	Capacitance Probe, Rigid Rod, Dry Granulated Solids and Powders, Extreme-duty

PROCESS CONNECTION	DESCRIPTION	AVAILABLE TYPES
0.75 MPTY	0.75 in MPT, 316 Stainless Steel	P81, P82
1 in MPTY	1 in MPT, 316 Stainless Steel	P83
1.25 in MPTY	1.25 in MPT, 316 Stainless Steel	P84

OPTIONS	DESCRIPTION
AA	None
PH4	Probe head housing with terminals for use with remote mounted electronics unit, 4X housing
PH7	Probe head housing with terminals for use with remote mounted electronics unit, 7X housing

### REQUIRED ORDERING INFORMATION:

- Detailed model number
- Tag or nameplate detail (if required)
- Documentation & testing packages (if required, refer to Additional Resources)

### APPLICATION DETAILS:

- Process fluid or material name
- Process fluid or material dielectric constant
- Maximum process temperature
- Maximum process pressure