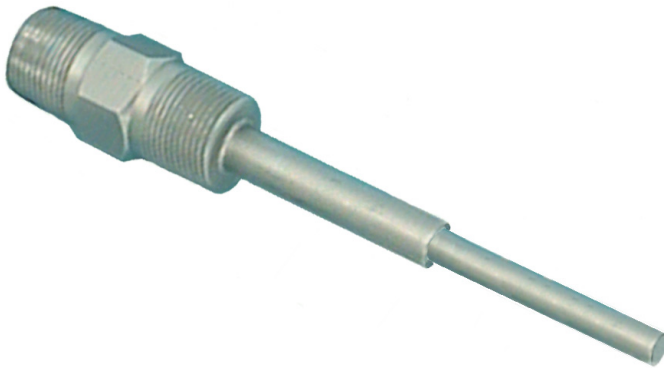


# SERIES 80 PROBES FOR SIDE OF TANK MOUNTING DRY GRANULATED SOLIDS AND POWDERS

TS P81

## ADVANTAGES - FOR DRY SOLIDS

- Full length concentric rod/insulator/body design withstands heavy loads, resists bending
- Secondary Teflon® 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
- P84 is suitable for many chunk solid applications
- Easy selection of required model by using "WF" and "QSU" values to model probe results



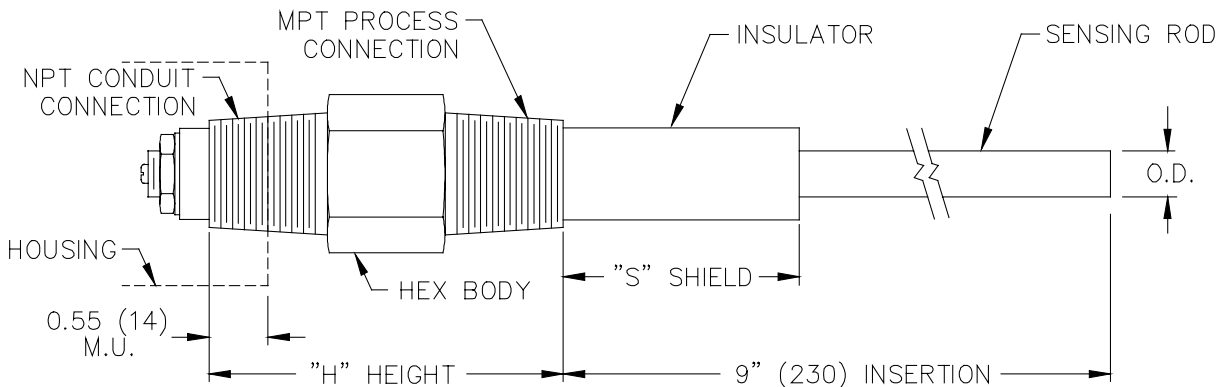
## APPLICATION

The Series 80 probes are rigid rod type probes for dry powders and granular solids. The sensing rod has a "through-the-gland" design for maximum strength and resistance to bending. These types are necessary when the probe is to be mounted into the side of a vessel. The glands are sealed against water and moisture. The sensing rod and body are 300 S.S., the insulator is Delrin®, and the seal is Teflon®.

- Model P81 Is a medium duty probe for inserting in from the side or down from the top; it may be covered by 26 feet of sand or 65 feet of grain.
- Model P82 Is a general duty, rugged, side inserted probe. It 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 jobs. It may be covered with up to 75 feet of sand or 180 feet of grain. It will also withstand small to medium size chunk solids.
- Model P84 Is an extra heavy duty side inserted probe for the very toughest of applications. It may be covered with up to 150 feet of sand or 375 feet of grain. It is also rugged enough to withstand some larger chunk size solids.

Insertion: Any unwanted or unneeded insertion length can be sawed off at the plant site.  
Temperature: 260°F (125°C) maximum.

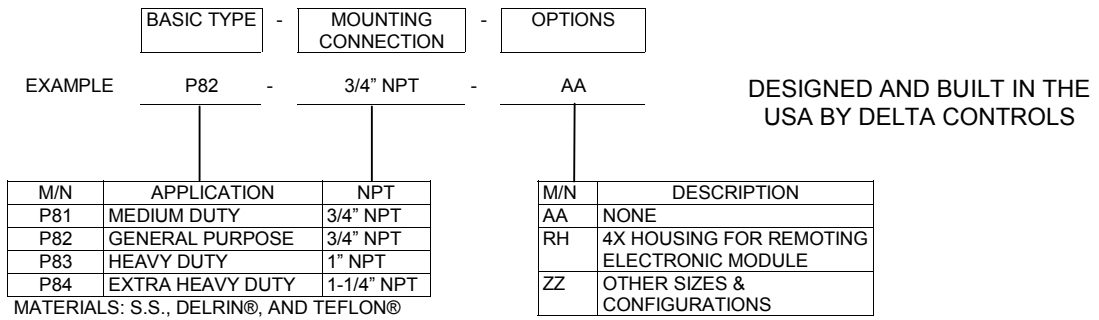
## OUTLINE DIMENSIONS



M/N	MPT	"H"	"S"	O.D.	NPT
P81	3/4"	3.0 (76)	1.0 (25)	0.37 (9)	3/4"
P82	3/4"	3.0 (76)	1.5 (38)	0.50 (13)	3/4"
P83	1"	3.1 (79)	2.0 (51)	0.625 (16)	1"
P84	1-1/4"	3.7 (94)	2.0 (51)	0.875 (22)	1"

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## MODEL NUMBERING SYSTEM



## MAXIMUM ALLOWABLE ELEVATION OF MATERIAL

The horizontal sensing probe can withstand heavy, but not unlimited, loads without bending or failing. The loading on a probe is a function of the density of the material. 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. The resultant is a term called "Weight Factor" or "WF". A "WF" value has been derived for each model probe. The maximum amount of coverage is easily determined by dividing "WF" by the bulk density of the process material; as follows

$$\frac{\text{WF (Weight Factor)}}{\text{BULK DENSITY (LBS/FT}^3\text{)}} = \text{MAXIMUM ALLOWABLE FEET OF COVERAGE}$$

$$\text{MAXIMUM COVERAGE} = \frac{\text{"WF"}}{\text{LBS/FT}^3} = \text{HEIGHT OF MATERIAL IN FEET}$$

EXAMPLE: Whole kernel corn, 48 LBS/FT<sup>3</sup> Using a Model P82 sensing probe

$$\text{MAXIMUM COVERAGE} = \frac{\text{"6590"}}{48} = 137 \text{ FEET (42 M)}$$

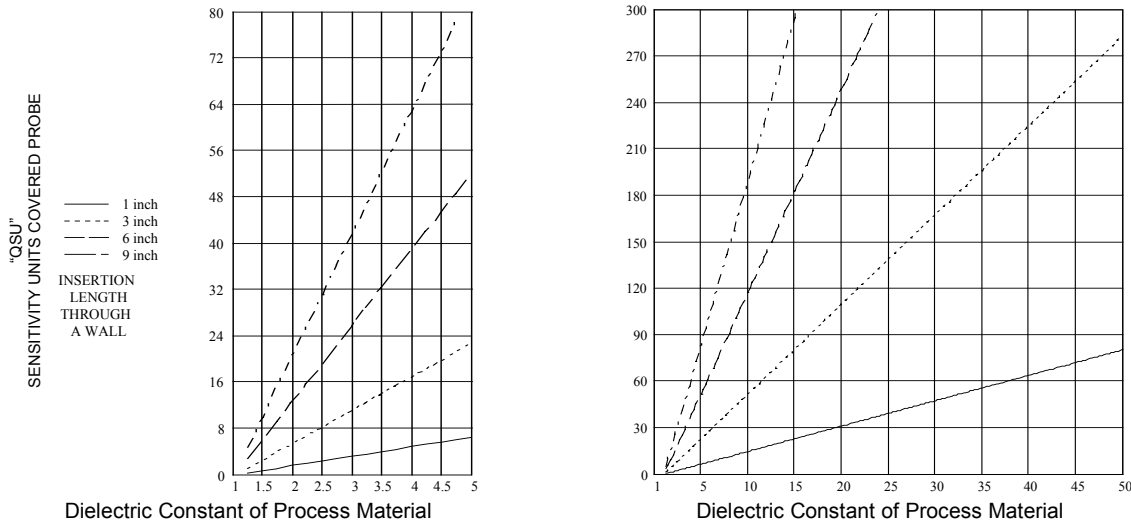
Weight Factors				
M/N	P81	P82	P83	P84
"WF"	3,150	6,590	8,880	14,900

## ESTIMATING PROBE PERFORMANCE

**Determine "QSU"** - Series 80 probes are normally only used for single point on-off alarm service. "QSU" is the number of sensing units due to the probe length being covered by the process material. Read "QSU" from the graph below. "QSU" should be greater than 6.0 for use with the Model 103 or 105 modules.

**Determine maximum allowable material coverage** - Service cannot allow more depth above probe elevation.

**Base Sensing Units** - Determining "BSU" is not usually required for Series 80 probes, because the total values are inherently low. The electronic module ranges are adequate to cover integral module applications.



For remoted modules and non-alarm applications; refer to Application Notes #PROB-198 "FORMULAS FOR MODELING AND PERFORMANCE TESTING" and #PROB-298 "DESIGN TIPS" for guidance. Delta factory application engineering is also available for assistance and consultation.

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