



# PS175

## Position Sensor System 75 mil



<b>Centers (mm/mil)</b>	1,90 / 75
<b>Current</b>	5,0 A *
<b>R typ</b>	20 mOhm *
<b>Temperature</b>	-45°C...+100°C

### Spring Force Probe+Sensor (cN ±20%)

Version	Preload	Nominal
Sensor	40	60
Standard	50	100

### Travel (mm)

Version	Nominal	Maximum
Standard	4,3	6,4
Thread (M)		1,0
Wrench Size		1,0
Pointing Accuracy		±0,08 mm

### Materials and Plating

Plunger	BeCu, gold plated
Barrel	Brass, gold plated
Spring	Music wire, silver plated
Receptacles	Brass, unplated

### Accessories

Insertion tool receptacle	FEWZ-075E0
Screw-in tool probe	FWZ730S1; FWZ730T1
Screw-in tool sensor element	FWZPS075
Extension cable for Molex-connector (250mm)	2112221

### Drill Size (mm)

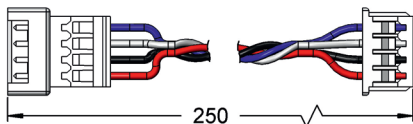
H175PSRD	1,59 - 1,60
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### Projection Height (mm)

H175PSRD with PS175	10,5
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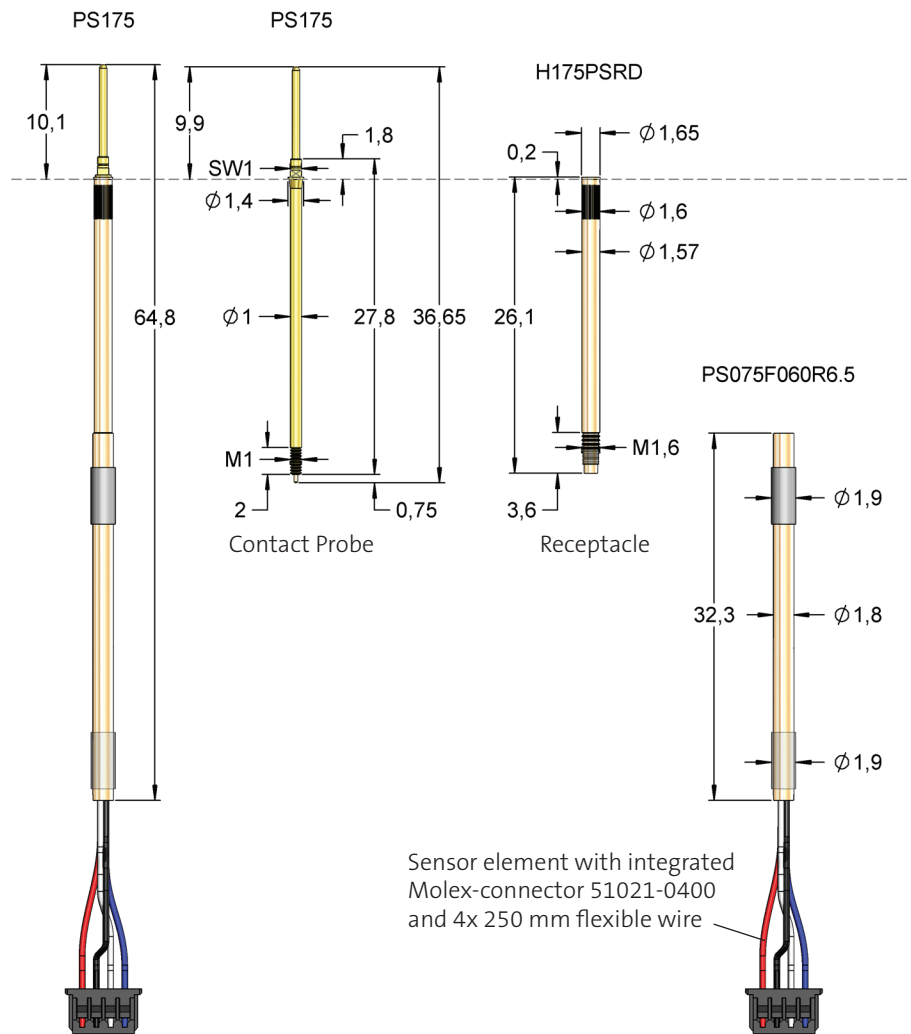
### 2112221:

Extension cable 250 mm for Molex-connector



Series	Tip-Ø	Spring Force (cN)
<b>PS175 11 B 064 G 100</b>		

Tip Style	Material	Plating	Version
<b>Material:</b>	B = BeCu		
<b>Tip-Ø:</b>	100 = 1,00 mm (e.g.)		
<b>Plating:</b>	G = Gold plated		
<b>Note:</b>	Additional receptacle and position sensor required, order code according to drawing		



Sensor element with integrated Molex-connector 51021-0400 and 4x 250 mm flexible wire

The position sensor system consists of a special spring contact probe PS175..., a receptacle H175PSRD and a sensor element PS075.... These three elements are mounted into a fixture plate. The position sensor is screwed at the receptacle from backwards after the receptacle is mounted.

\* The values for current and resistance are only valid for a soldered connection at the receptacle. The blue wire of the Molex connector only allows a maximum current of 1,0 A and  $R_{typ}$  500 mOhm.

Tip Style	Number	Material	Plating	Ø in mm	Version
	06	B	G	1,20	-
	11	B	G	0,64	-
	17	B	G	1,20	-

# PROBES FOR SPECIAL APPLICATIONS

## Position Sensor System

### Contact Probe with Integrated Potentiometer

The position sensor system has been developed to enable an exact measurement of the travel of the plunger additionally to contacting the test item.

The system has a modular design and consists of a contact probe, a receptacle and a sensor element with integrated potentiometer. The potentiometer is galvanically isolated from the probe.

After applying an operating voltage, the sensor supplies a measurement voltage that is linear to the travel of the plunger (potentiometric operation). Alternatively, with restrictions regarding accuracy and life cycle, also the resulting resistance can be used as measurement value (resistive operation). FEINMETALL recommends the potentiometric operation for all position sensor systems. The measurement results can be analyzed by the available tester environment, commonly.

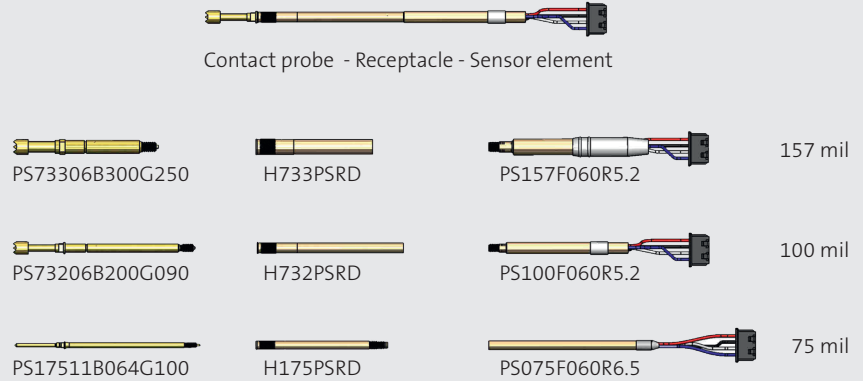
#### Variants

The position sensor system is available for different centers of 75 mil, 100 mil and 157 mil. For 100 mil centers a twist proof version is available (PS756). The system for 157 mil is suitable for airtight modules or fixtures (i.e. leakage rate  $< 0,5 \text{ cm}^3 / \text{min}$  at 0,7 bar).

#### Measuring ranges

PS175: 0...6,4 mm (75 mil)  
 PS756: 0...4,4 mm (100 mil)  
 PS732: 0...5,0 mm (100 mil)  
 PS733: 0...5,0 mm (157 mil)

### Modular Design of the Position Sensor System



#### Specification sensor element

Measuring principle: potentiometric  
 Accuracy:  $\leq 2\%$   
 Reproducibility: typ.  $\leq \pm 0,05 \text{ mm}$   
 Therm. resist. coeff.  $5 \times 10^{-5} / \text{K}$   
 Nominal spring force: 60 cN  
 Preload: 40 cN  
 Nominal: 4,0 mm

#### Connections

**Red:** Operating voltage  $U_0$   
**Black:** Measuring signal  $U_m$  or  $R_m$   
**White:** Mass  
**Blue:** Test point of contact probe tip (maximum current 1 A)

#### Calibration

Due to test principle with a certain initial and final resistance and due to electrical and mechanical tolerances the exact plunger position in millimeter requires a calibration of the position sensor system after assembly.

#### Measurement of relative values

By calculating the difference between two measurement values of one probe deviations related to a required position can be determined in positive or negative travel direction.

#### Reference measurement

By calculating the difference between two measurement values of different probes deviations related to a reference position can be determined.

The reference can either be a certain reference point of the test item or a special "golden device".

#### Zero balance

Depending on the hard- and software of the test system the measurement signal can be zeroed at user-defined positions. This method allows positive or negative deviations without calculating any differences.

**FEINMETALL recommends periodic calibration and zeroing of the system.**

- $U_0$  Operating voltage (maximum 10 VDC)
- $U_m$  Measuring voltage (potentiometric op.) ( $U_1 < U_m < U_p - U_3$ )
- $R_m$  Measuring resistance (resistive op.) ( $R_1 < R_m < R_p - R_3$ )
- $R_1$  Initial resistance
- $U_1$  Initial voltage ( $U_1 = I \cdot R_1$ )
- $R_3$  Final resistance
- $U_3$  Final voltage ( $U_3 = I \cdot R_3$ )
- $R_p$  Potentiometric resistance ( $4,5 \text{ k}\Omega \pm 20\%$ ) ( $R_p = R_1 + R + R_3$ )
- $R_s$  Slider resistance
- $R_L$  Load resistor (optional to protect against over-current at the slider)

