

# Orbit® Digital Measuring Probes

Contact gauge probes often provide the most cost effective solution for a wide range of measuring and positioning applications. These have excellent sideload capabilities and can last over 100 million cycles.



## DP/S - Spring Push

- ▶ 0.5, 1, 2, 5, 10 & 20 mm measuring ranges
- ▶ Accuracy as low as  $< 0.1 \mu\text{m}$
- ▶ Up to  $0.01 \mu\text{m}$  resolution
- ▶ Up to  $0.05 \mu\text{m}$  repeatability
- ▶ Tip force of 0.7 N (options available)
- ▶ IP65 Sealing

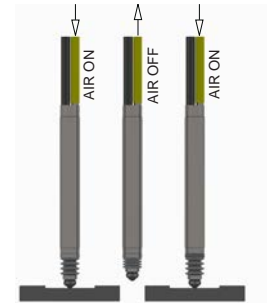


The DP range of spring push probes is the work horse of the gauging industry. Very high resolution, excellent linearity and high data speeds are coupled with outstanding measurement repeatability. Long life precision bearings and IP65 sealing ensures that the probes maintain their performance for millions of measurements.



## DP/P - Pneumatic Push

- ▶ 2, 5, 10, & 20 mm measuring ranges
- ▶ Accuracy as low as  $< 0.1 \mu\text{m}$
- ▶ Up to  $0.01 \mu\text{m}$  resolution
- ▶ Up to  $0.05 \mu\text{m}$  repeatability
- ▶ Tip force of 0.7 N (0.4 bar of pressure)
- ▶ IP65 Sealing
- ▶ Pneumatic gaiter actuation
- ▶ Vacuum retract option available



Pneumatic transducers are ideal for use in automatic gauging applications or for accessing details that would be difficult or impossible to reach with spring push transducers. The standard range of Pneumatic Probes comes with IP65 sealing to ensure a long working life in wet or oily environments.



## DJ/P - Pneumatic Push

- ▶ 2, 5, 10 & 20 mm measuring ranges
- ▶ Actuation is by a built in piston, separate from gaiter
- ▶ Same performance as standard Pneumatic probe

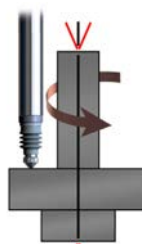
Air Exit



Jet "J Type" probes are similar to standard pneumatic transducers except that actuation is by an inbuilt piston. High tip forces are available but as air is vented through a port close to the front of the probe, they have a lower IP rating. These probes will continue to operate even if the gaiter becomes punctured.



Application: Diameter Check



Application: TIR (Max - Min)



Application: Flatness

# Orbit® Low Tip Force and Rugged Probes



## DT - Feather Touch - Spring and Pneumatic

- ▶ Low tip force as low as 0.18 N (options available)
- ▶ 2, 5, 10, 20 & 30 mm Measuring Ranges
- ▶ Full range of tips available
- ▶ Pneumatic or Spring actuation
- ▶ IP50 Sealing
- ▶ Excellent sideload capability

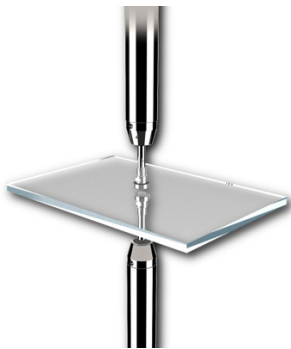
Feather Touch transducers have been designed especially to gauge or measure delicate surfaces such as car windscreens, pharmaceutical bottles, electro-mechanical components and plastic parts. Where as a traditional transducer exerts a tip force of approximately 0.7 N, the Feather Touch can exerts a mere 0.18 N when used in the horizontal position. This reduction is achieved by replacing the gaiter with a close tolerance gland. Despite the low volume of air flow the bearing is constantly purged, avoiding the build up of dust.



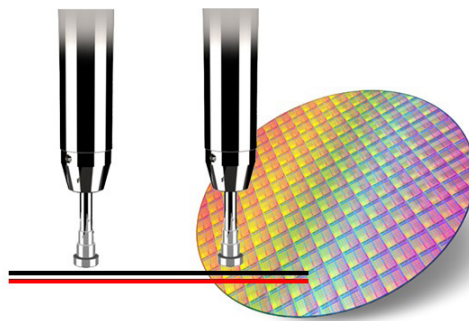
## DW - Ultra Feather Touch - Spring and Pneumatic

- ▶ Ultra Low tip force of 0.03 to 0.06 N
- ▶ 10 mm Measuring Range
- ▶ Nylon and Ruby tips available
- ▶ Pneumatic or Spring actuation
- ▶ IP50 Sealing

The Ultra Feather Touch probe has so light a tip force, it is a viable alternative to a non-contact sensor in many applications. With various tips available in ruby and nylon, the UFT is already being used to check glass, rubber, semi-conductor wafers and other delicate materials.



Application: Glass Thickness



Application: Semi Conductor Wafer



Application: Hard Disk Drive Case



## D12P - Rugged probes for harsh environments

- ▶ Thicker, more rugged design for harsh environments
- ▶ 5 mm diameter shaft inside 12 mm diameter body
- ▶ Excellent strength and sideload capability
- ▶ IP65 Sealing

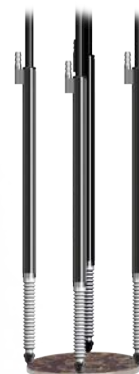
The Rugged digital probe is an option for environments where a standard probe may be easily damaged. The base performance of these products is identical to the ø8 mm range. Contact Solartron for details.

# Orbit® Compact Probes

## D6P - 6 mm Diameter - Spring and Pneumatic



- ▶ 2, 5, and 12 mm Measuring Ranges
- ▶ 6 mm Diameter body
- ▶ Same resolution and repeatability as 8 mm probes
- ▶ Excellent when points are in close proximity
- ▶ IP65 Sealing



With the D6P probes, a 25% diameter reduction over conventional probes has been achieved, yet performance and life expectancy has been maintained. Long life precision bearings ensure that probes maintain their performance for millions of cycles.

## D3P/D3T - 3mm Diameter - Spring Push



- ▶ 1 mm Measuring Range
- ▶ 3 mm Diameter body
- ▶ IP50 Sealing

6 mm probes checking the thickness of a coin

Quite possibly the world's thinnest probe, the tiny 3 mm diameter allows for even tighter packing densities for measuring features on intricate parts.

## DZ - Ultra Short Spring



- ▶ 1 or 2 mm measuring ranges
- ▶ Tip force 0.7 N (options available)
- ▶ IP65 Sealing
- ▶ Spring actuation
- ▶ R/A Outlets available
- ▶ Use where space is a premium



8, 6 and 3 mm diameter probes

The DZ range of probes are probably the shortest available on the market with a full calibrated measuring range of 1 mm or 2 mm. The unique bearing design creates a very short probe body while still maintaining the performance of a standard probe.

## Digital Probes with in line connectors

A complimentary range to the standard hard wired digital transducer, where the Orbit® electronics and the transducer have an in-line connector. The connector can be mounted close to the probe so that the probe can be replaced without having to unthread / thread the cable.

Probes can be replaced without any re-programming of the controlling software. The small diameter of the connector allows easy machine installation.



# Orbit® Digital Measuring Probes

Products (Note 4)	Standard, Spring, Pneumatic and Feather Touch					
Spring Push Axial Cable	DP/0.5/S	DP/1/S	DP/2/S	DP/5/S	DP/10/S	DP/20/S
Spring Push Axial Cable Feather Touch	N/A	N/A	DT/2/S	DT/5/S	DT/10/S	DT/20/S
Pneumatic Axial Cable			DP/2/P	DP/5/P	DP/10/P	DP/20/P
Pneumatic Axial Cable Feather Touch			DT/2/P	DT/5/P	DT/10/P	DT/20/P
Pneumatic Axial Cable Jet			DJ/2/P	DJ/5/P	DJ/10/P	DJ/20/P
Diameter	8h6					
Measurement Performance						
Measurement Range (mm)	0.5	1	2	5	10	20
Accuracy (% of Reading) (Note 1)	0.05	0.05	0.05	0.05	0.06	0.07
Accuracy (% of Reading) (Note 1) - with In line Connector	N/A	0.20	0.20	0.15	0.15	0.15
Repeatability (worst case) $\mu\text{m}$ (Note 2)	0.10	0.15	0.15	0.15	0.15	0.25
Repeatability (typical) $\mu\text{m}$ (Note 3)	0.05	0.05	0.05	0.05	0.07	0.10
Resolution ( $\mu\text{m}$ )	0.01	0.01	0.01	0.05	0.05	0.1
Pre Travel (mm)	0.03	0.15	0.15	0.15	0.15	0.15
Post Travel (mm)	0.05	0.35	0.85	0.85	0.85	0.85
Tip Force (N) at Middle of Range $\pm 20\%$						
Spring Push	0.70	0.70	0.70	0.70	0.70	0.70
Spring Push Feather Touch	0.30	0.30	0.30	0.30	0.30	0.30
Pneumatic at 0.4 bar Minimum	N/A	N/A	0.70	0.70	0.70	0.70
Pneumatic at 1 bar Maximum	N/A	N/A	2.60	2.60	2.60	2.60
Pneumatic Feather Touch $\pm 30\%$ at 0.3 bar	N/A	N/A	0.18	0.18	0.18	0.18
Pneumatic Feather Touch $\pm 30\%$ at 1 bar	N/A	N/A	1.10	1.10	1.10	1.10
Pneumatic Jet $\pm 30\%$ at 1 bar (Note 6)	N/A	N/A	0.85	0.85	0.85	0.85
Temperature Coefficient %FS/ $^{\circ}\text{C}$	0.01	0.01	0.01	0.01	0.01	0.01
Environmental						
Sealing for Probe	IP65 with gaiter or IP50 without gaiter					
Sealing for Probe Interface Electronics	IP43 for module and TCON					
Storage Temperature ( $^{\circ}\text{C}$ )	-20 to +80					
Probe Operating Temperature with Gaiter ( $^{\circ}\text{C}$ )	+5 to +80					
Probe Operating Temperature without Gaiter ( $^{\circ}\text{C}$ )	-10 to +80					
Electronics Operating Temperature ( $^{\circ}\text{C}$ )	0 to 60					
EMC Emission	EN61000-6-3					
EMC Immunity	EN61000-6-2					
Probe life (Operating Cycles)	100 million cycles (no side load), > 10 million cycles in most applications					
Material						
Probe Body						
Probe Tip (options)						
Gaiter (Note 5)	Fluoroelastomer or Silicon					
Cable						
Electronics Module						
Electronics Interface (Orbit®)						
Orbit® Interface options	USB, Ethernet®,					
Reading Rate						
Bandwidth of Electronics (Hz) user selectable						
Power						

- ▶ Note 1: Accuracy 0.1  $\mu\text{m}$  or % reading whichever is greater
- ▶ Note 2: Repeated operation against a carbide target with side load applied to the bearing using max-min
- ▶ Note 3: Repeated operation against a carbide target standard deviation from average (68%)
- ▶ Note 4: Right angle outlet versions of all of the standard 8h6 diameter probes for measuring ranges 2 mm to 20 mm are available, part description add R after first two letters e.g DPR/2/S is right angled version of DP/2/S
- ▶ Note 5: Different gaiter materials available for specific applications - Fluoroelastomer standard option
- ▶ Note 6: D6P/2/P @ 0.8 bar, D6J/5/P and D6J/12/P at 0.9 bar

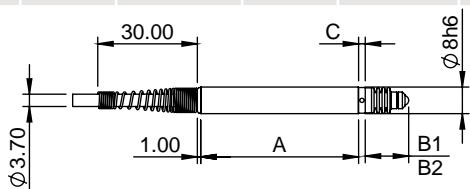
# Technical Specifications

		Ultra Feather Touch	Ultra Short		Narrow Body			
DP/30/S	DP/10/2/S	DW/10/S	DZ/1/S	DZ/2/S	D6P/2/S	D6P/5/S	N/A	D3P/1/S
	DT/10/2/S	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DT/30/P	DP/10/2/P	DW/10/P	N/A	N/A	N/A	N/A	N/A	N/A
	DT/10/2/P	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	DJ/10/2/P	N/A	N/A	N/A	D6J/2/P	D6J/5/P	D6J/12/P	N/A
		8h6			6h6			3h6
30	2	10	1	2	2	5	12	1
0.1	0.05	0.06	0.10	0.10	0.05	0.05	0.10	0.20
0.2	0.20	0.15	0.15	0.15	0.15	0.15	0.50	0.30
0.5	0.15	0.15	0.05	0.05	0.05	0.05	0.25	0.5
0.25	0.05	0.05	0.01	0.01	0.01	0.05	0.1	0.25
0.2	0.01	0.01	0.15	0.15	0.15	0.15	0.15	0.01
0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.075
0.85	8.85	0.85	0.35	0.35	0.85	0.85	0.85	0.30
0.85	0.70	0.03 to 0.06	0.70	0.70	0.70	0.70	N/A	0.50
N/A	0.30	0.03 to 0.06	0	N/A	N/A	N/A	N/A	N/A
N/A	0.70	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	2.60	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	0.18	0.06	N/A	N/A	N/A	N/A	N/A	N/A
0.85	1.10	0.25	N/A	N/A	N/A	N/A	N/A	N/A
N/A	0.85	N/A	N/A	N/A	0.70	0.70	0.50	N/A
0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.03
		IP50	IP65 with gaiter IP43 for module and TCON -20 to +80					IP50
		N/A	+5 to +80					+5 to +65
		-10 to +80						N/A
		0 to 60						
		EN61000-6-3						
		EN61000-6-2						
		> 10 million						
		Stainless Steel						
		Nylon, Ruby, Silicon Nitride, Tungsten Carbide						
		N/A	Fluoroelastomer					
		PUR						
		ABS						
		RS232, R5485, Modbus®, EtherNet/IP®, Bluetooth™, Profinet®, EtherCat®						
		3906 readings per second						
		460, 230, 115, 58, 29, 14, 7, 4						
		5±0.25 VDC @ 0.06 A typical						

# Orbit<sup>®</sup> Transducer Dimensions

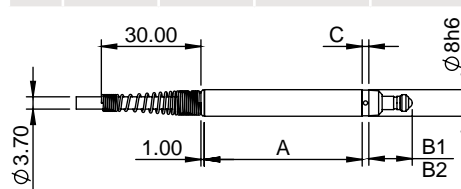
## Standard Spring Push (DP/S)

	DP/2/S	DP10/2/S	DP/5/S	DP/10/S	DP/20/S
A	47.50	75.00	66.50	90.50	127.00
C	2.00	4.00	2.00	2.00	3.00
B1	14.25	25.50	18.00	25.50	45.00
B2	11.25	14.50	12.00	14.50	24.00
D	33.50	61.50	52.50	76.50	113.50

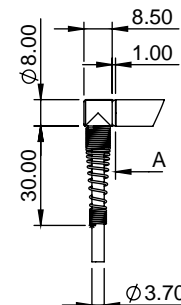


## Feather Touch Spring Push (DT/S)

	DT/2/S	DT/5/S	DT/10/S	DT/20/S
A	47.50	66.50	90.50	127.00
C	2.00	2.00	2.00	3.00
B1	14.25	18.00	25.50	34.00
B2	11.25	12.00	14.50	13.00
D	33.50	52.50	76.50	113.50

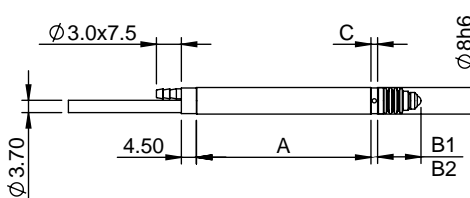


## Radial Cable Outlet Plastic Adapter



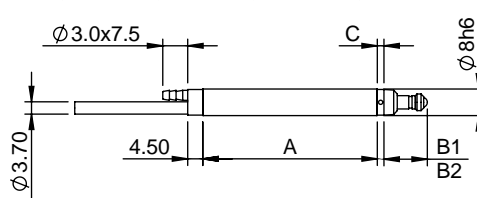
## Pneumatic Push (DP/P)

	DP/2/P	DP10/2/P	DP/5/P	DP/10/P	DP/20/P
A	52.50	84.00	71.00	96.00	127.00
C	2.00	2.00	2.00	2.00	3.00
B1	14.25	25.50	18.00	25.50	45.00
B2	11.25	14.50	12.00	14.50	24.00
D	38.50	70.50	57.50	82.50	113.50

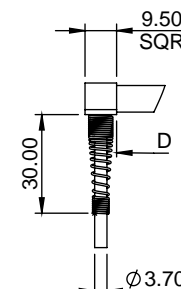


## Feather Touch Pneumatic Push (DT/P)

	DT/2/P	DT/5/P	DT/10/P	DT/20/P
A	52.50	71.00	96.00	127.00
C	2.00	2.00	2.00	3.00
B1	14.25	18.00	25.50	34.00
B2	11.25	12.00	14.50	13.00
D	38.50	57.50	82.50	113.50

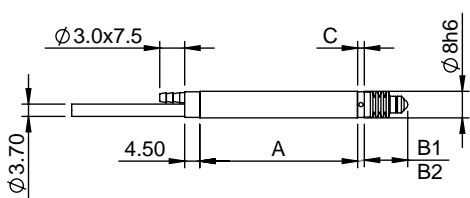


## Radial Cable Outlet Fixed / Spring Push



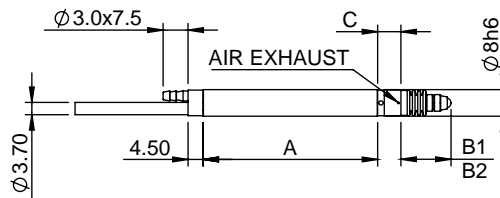
## Vacuum Retract (DP/V)

	DP/2/V	DP/5/V	DP/10/V	DP/20/V
A	47.50	66.50	90.50	127.00
C	2.00	2.00	2.00	3.00
B1	14.25	18.00	25.50	45.00
B2	11.25	12.00	14.50	24.00
D	33.50	52.50	76.50	113.50

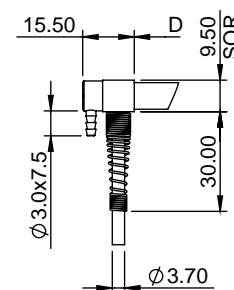


## Gaiter Independent Pneumatic (DJ/P)

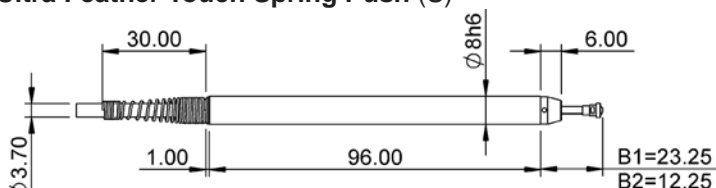
	DJ/2/P	DJ/5/P	DJ/10/P	DJ/20/P
A	52.50	71.00	96.00	127.00
C	7.00	7.00	7.00	4.00
B1	16.25	20.00	27.50	46.00
B2	13.25	14.00	16.50	25.00
D	38.50	57.50	82.50	113.50



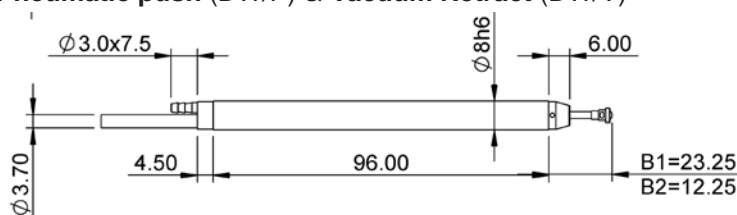
## Radial Cable Outlet Fixed / Pneumatic Push



## Ultra Feather Touch Spring Push (S)



## Pneumatic push (DW/P) & Vacuum Retract (DW/V)

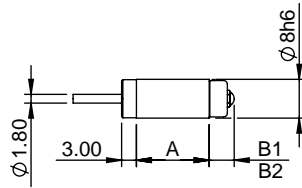


- A - Case length for axial cable outlet
- B1 - Fully extended bearing assembly
- B2 - Fully retracted bearing assembly
- C - Lock ring dimension
- D - Case length for radial cable outlet

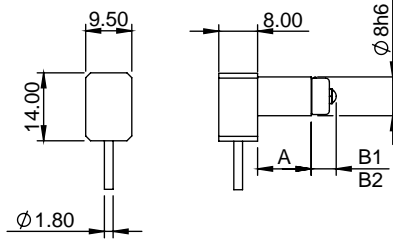
# Orbit<sup>®</sup> Transducer Dimensions

## Ultra Short Spring Push (DZ/S)

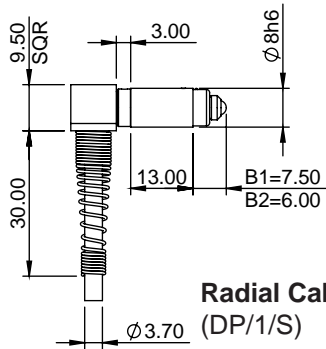
	DZ/1/S	DZ/2/S	DZR/1/S	DZR/2/S
A	15.00	19.50	11.00	15.50
B1	5.15	6.25	5.15	6.25
B2	3.65	3.65	3.65	3.65



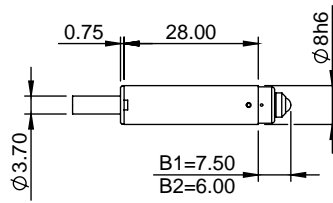
## Radial Cable Outlet (DZR/S)



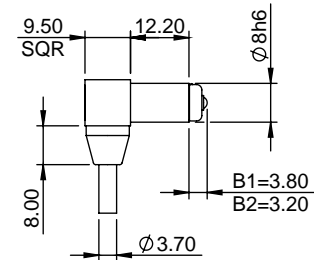
## Miniature Spring Push (DP/0.5/S & DP/1/S)



Radial Cable Outlet (DP/1/S)



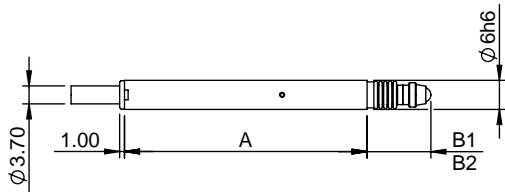
Axial Cable Outlet (DP/1/S)



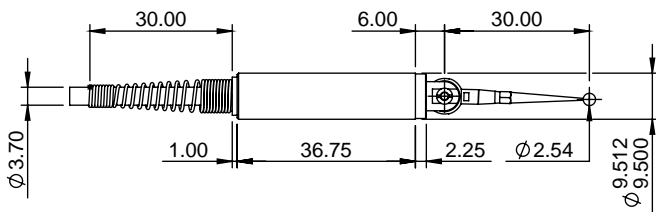
Radial Cable Outlet (DP/0.5/S)

## 6 mm Diameter Body Spring Push (D6P/S)

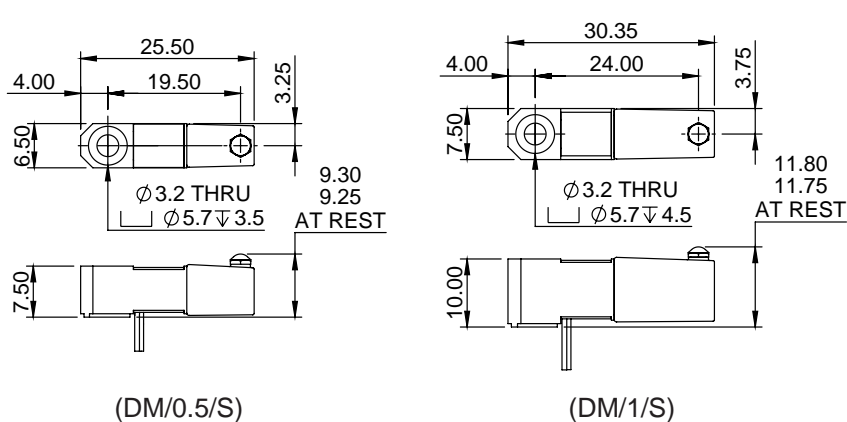
	D6P/2/S	D6P/5/S
A	50.00	74.00
B1	14.30	29.50
B2	11.80	23.50



## Lever Probe (DL)

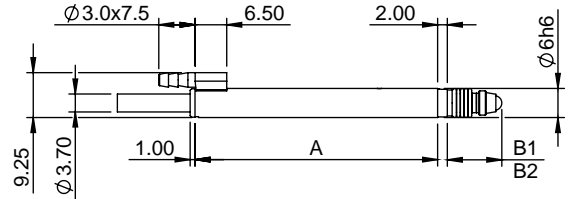


## Mini Probe (DM)

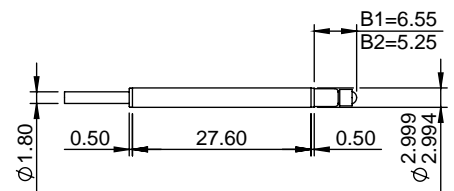


## 6 mm Diameter Body Gaiter Independent Pneumatic (D6J/P)

	D6J/2/P	D6J/5/P	D6J12P
A	50.00	80.00	87.00
B1	14.00	30.00	37.00
B2	11.00	24.00	24.00



## 3 mm Diameter Body (D3P/S)



## Mini Single Leaf Flexure (DUSM)

