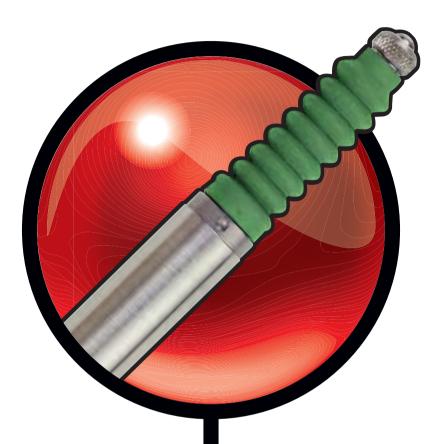
Gauge probes



Solartron is the world's largest manufacturer of 'pencil' style electronic gauging probes.

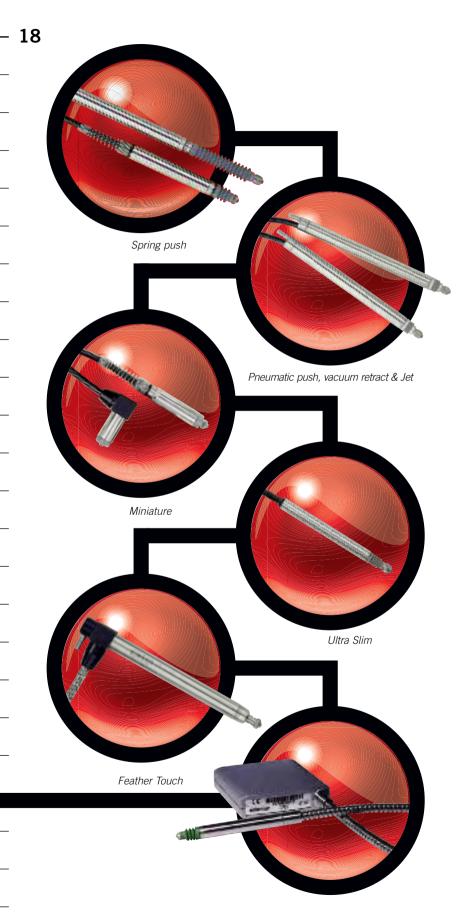
Probes are either spring or pneumatically actuated with Feather Touch (low tip force) variants available.

The extensive range includes Analogue Probes (LVDT & Half Bridge), Digital Probes and probes with integrated electronics.

- > Wide range of measurement ranges; 0.5mm to 20mm
- > Traceability to NPL (National Physical Laboratory, UK)
- > Spring push; standard or with vacuum retract
- > Pneumatic push; standard, Feather Touch and Jet range
- > Spring push with integral DC:DC electronics
- > Special application probes
- > LVDT, Half Bridge or Digital (Orbit Network) interface
- > Tungsten Carbide, Nylon, Ruby or Silicon Nitride tips
- > Accuracy to 0.1% of reading
- > Precision linear bearings



Finest quality...



Spring Push, Pneumatic Push or Vacuum Retract (AX & DP)

In a conventional 'pencil' probe the tip pushes outwards under the influence of an internal spring. When installed in a fixture it is frequently required to design a mechanism to bring the probe into contact with the piece part being gauged.

In contrast, pneumatic operation (pneumatic push or vacuum retract) allows the number of moving parts in a fixture to be reduced, resulting in improved reliability and reduced fixture costs. It also enables fast and safe automatic loading of components into a gauge when required. Probe types AX/5/1 and DP/10/2 feature an extended movement of 9 mm before entering the total measurement range of 2 mm.

Feather Touch Probes (AT & DT)

Feather Touch probes have been designed especially to gauge delicate surfaces such as car windscreens, TV tubes, pharmaceutical bottles, electro-mechanical components and plastic parts. Whereas a traditional probe exerts a tip force of approximately 0.7N, the Feather Touch exerts a mere 0.18N when used in the horizontal position. This reduction is achieved by replacing the naturally elastic traditional gaiter with a close tolerance gland. On pneumatic versions the air leakage through the gland is restricted to less than 2.5 millilitres per second at 1 bar to minimise the possibility of contamination to the surface being gauged. Despite the low volume of air flow the bearing within the probe is constantly purged, avoiding the build up of dust (use of filtered air is recommended).

Replaceable nylon tips are used to guard against surface damage, although, for measuring hot glass, tungsten carbide tips can be fitted. Woven steel braid covering on the cable provides additional protection for applications where down time is critical. For ultimate low force, Feather Touch probes can be supplied without a spring. Forward and return movements are activated by pneumatic/vacuum retract, but adjustment of air pressure allows all probes to have identical tip force, constant over the entire measurement range. If the probe is mounted vertically (tip up), retraction is by the dead weight of the moving parts, eliminating the need for vacuum.

...widest choice

Special Application Probes

When space is at a premium the extremely compact dimensions of the AX/0.25, DP/0.5, AX/0.5 and DP/1 can be exploited whilst retaining standard 8 mm diameter fixings. Also, when it is required to stack a number of probes close to each other, the A6G/1 and D6P/2 are only 6 mm in diameter, but still incorporate a precision linear ball bearing.

New Jet range Pneumatic Gauging Probes (AJ & DJ)

With conventional pneumatic transducers, the air pressure is contained within the gaiter. The new Jet range pneumatic gauging transducers are designed so that the gaiter is not pressuried. This has the advantage that gaiter damage will not effect transducer performance, resulting in less down-time and reduced cost of ownership

Environmental Protection

A6G/1, D6P/2 and the AX and DP series of probes are all fitted with Viton® gaiters to exclude moisture and dust.

Viton® is chemically inert and does not degrade when subjected to cutting fluids.

Probes in the Feather Touch range (AT, DT series) have glands instead of gaiters, and therefore should only be used in a dry environment.

Absolute Measurement

All Solartron gauge probes are absolute measuring devices, which means that when switched on they return the correct output, regardless of movements during the off period.

Multi-dimensional gauging

An LVDT or Half Bridge gauge probe delivers its best performance close to its null point, requiring dedicated fixtures for each size of component being gauged. In contrast, the Digital Probe can be used at any point over its entire measuring range. This permits different sizes of components to be gauged in one fixture

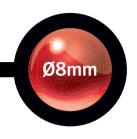
Customer Specials

Other options are available Please contact us with your requirements.

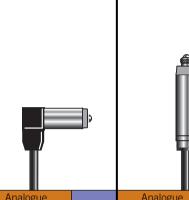




20 Specification Spring push









Product type	Anal	ogue	Digital	Anal	ogue	Digital	Anal	ogue	Digital	Anal	ogue	Digital
Floudet type	LVDT	H/B	Digital	LVDT	H/B	Digital	LVDT	H/B	Digital	LVDT	H/B	Digital
Axial cable outlet: Standard Spring		A6G/1/SH	D6P/2/S	AX/0.25/S	AX/0.25/SH	DP/0.5/S	AX/0.5/S	AX/0.5/SH	DP/1/S	AX/1/S	AX/1/SH	DP/2/S
Feather Touch		-	-	-	-	-	-	-	-	AT/1/S	AT/1/SH	DT/2/S
Vacuum	-	-	-	-	-	-	-	-	-	AX/1/V	AX/1/VH	=
Radial cable outlet: Standard Spring Feather Touch	-	-	-	-	-	-	-	-	-		AXR/1/SH ATR/1/SH	
Measurement												
Measurement Range (mm)	±	1	2	±0.	25	0.5	±C).5	1	±	1	2
Accuracy ¹ (% of reading or μm)	0.5,	1µm	0.1	0.5, 0).5µm	0.1	0.5,	1μm	0.1	0.5,	1μm	0.1
Resolution								Anal	logue: Dep	endent or	electronic	CS
Repeatability (µm)		0.15			0.1			0.15			0.15	
Pre-travel (mm)		0.15		0.03			0.15			0.15		
Post-travel (mm)		0.35		0.05			0.35				0.35	
Pre-travel Adjustment range (mm)		None		None			0	.5	None		1	None
Tip Force: Standard/Vacuum ±20% (N)	0.7	@ mid pos	sition	0.7 @ mid position			0.7 @ mid position			0.7 @ mid position		
Tip Force: Feather Touch ±20% (N)	0.3	@ mid pos	ition	0.3 (@ mid pos	ition	0.3 @ mid position			0.3 @ mid position		
Temperature Coefficient %FS/°C		0.02			0.03			0.03			0.01	
Mechanical												
Body Diameter (mm)		6h6			8h6		8h6			8h6		
Electrical Interface (Plugged) ²												
Sensitivity (mV/V/mm ±5%)	200	73.5	-	200	73.5	-	200	73.5	-	200	73.5	-
Energising Current (mA/V±5%)	3	1.2	-	2.2	1.2	-	2.2	1.2	-	1.8	1	-
Electrical Interface (Unplugged) ²												
Sensitivity (mV/V/mm ±5%)	269	88	-	262	82	-	262	82	-	210	83	-

Mater	als
Case:	Stainless Steel
Tip:	Nylon or Tungsten Carbide*
Gaiter ³ :	Viton®
Cable ⁴ :	PUR
*Other op	tions available

nless Steel	Storage Temp (°C):	-40 to +10
on or Tungsten Carbide*	Operating Temp ⁶ with gaiter (°C):	+5 to +80
n®	Operating Temp ⁶ without gaiter (°C):	-10 to +80
R	IP rating:	IP65
available	IP rating not applicable to Feather Touch	

Operating Pressure Range

Vacuum operation: 0 to 0.27 Bar absolute

Environmental (Probe Head Only)

Digital Probe Interf	ace Electronics ⁵
Reading Rate:	Up to 3906 readings/second
Bandwidth:	Up to 460Hz dependent on noise performance required
Output:	Serial communication-RS485 signal level (Solartron Orbit Protocol)
Power:	5 ±0.25 VDC @ 0.06A (includes power for probe)
Storage Temp (°C):	-20 to +70
Operating Temp (°C):	0 to +60
IP Rating:	IP43

			Analogue			Analogue										
Anal LVDT	ogue H/B	Digital	Anal LVDT	ogue H/B	Digital	Anal LVDT	ogue H/B	Digital	Anal LVDT	ogue H/B	Digital	Analo LVDT	ogue H/B	Digital		
		DP10/2/S - -	AX/1.5/S AT/1.5/S	AX/1.5/SH AT/1.5/SH AX/1.5VH	- - -	AX/2.5/S AT/2.5/S	AX/2.5/SH AT/2.5/SH AX/2.5/VH	DP/5/S DT/5/S	AX/5/S AT/5/S AX/5/V	AX/5/SH AT/5/SH AX/5/VH	DP/10/S DT/10/S	AX/10/S AT/10/S	AX/10/SH AT/10/SH AX/10/VH	DP/20/S DT/20/S		
- -	- -	- -	- ATR/1.5/S	- ATR/1.5/SH	- -	- ATR/2.5/S	- ATR/2.5/SH	- DTR/5/S	- ATR/5/S	- ATR/5/SH	- DTR/10/S	- ATR/10/S	- ATR/10/SH	- DTR/20/S		
	-						_	_								
± 0.5,		2 0.1	±1 0.5, 1		-	±2 0.5, 2		5	± 0.5,		10 0.2	±1 0.7, 1		20 0.2		
	igital: User					0.5, 2	2.5μπ	0.2	0.5,	Эµп	0.2	0.7,	ισμπι	0.2		
	0.15	SCICCIADI			_	l	0.15			0.15			0.15			
				0.15			0.15			0.15						
	0.15		0.				0.10				0.85			0.85		
	0.15						0.15									
			0.			1		None	1.	0.85	None					
	0.85 None mid pos		0.7 0.7 @ mi	85 .5 d position	-	0.7	0.85 .5	ition	0.7	0.85 .5 @ mid pos	sition		0.85 None @ mid pos			
	0.85 None mid pos mid pos		0.7 @ mir 0.3 @ mir	85 .5 d position d position	-	0.7	0.85 .5 @ mid pos @ mid pos	ition	0.7	0.85 5 @ mid pos @ mid pos	sition		0.85 None @ mid pos @ mid pos			
	0.85 None mid pos		0.7 0.7 @ mi	85 .5 d position d position		0.7	0.85 .5	ition	0.7	0.85 .5 @ mid pos	sition		0.85 None @ mid pos			
	0.85 None @ mid pos @ mid pos 0.01		0.7 1 0.7 @ mi 0.3 @ mi 0.	5 d position d position 01	- - - -	0.7	0.85 .5	ition	0.7	0.85 5 @ mid pos @ mid pos 0.01	sition		0.85 None @ mid pos @ mid pos 0.01			
	0.85 None mid pos mid pos		0.7 @ mir 0.3 @ mir	5 d position d position 01	- - -	0.7	0.85 .5 @ mid pos @ mid pos	ition	0.7	0.85 5 @ mid pos @ mid pos	sition		0.85 None @ mid pos @ mid pos			
0.3 (0.85 None mid pos mid pos 0.01 8h6		0.1 1 0.7 @ mi 0.3 @ mi 0.1	85 .5 d position d position 01	- - - - -	0.7	0.85 .5 @ mid pos @ mid pos 0.01 8h6	ition	0.7 (0.85 5 @ mid pos @ mid pos 0.01 8h6	sition	0.3 (0.85 None @ mid pos @ mid pos 0.01 8h6			
	0.85 None @ mid pos @ mid pos 0.01	ition	0.7 1 0.7 @ mi 0.3 @ mi 0.	5 d position d position 01	- - - -	0.7	0.85 .5	ition	0.7	0.85 5 @ mid pos @ mid pos 0.01	ition		0.85 None @ mid pos @ mid pos 0.01	ition		
200	0.85 None mid pos mid pos 0.01 8h6	ition -	0.1 0.7 @ mi 0.3 @ mi 0.1 81	85 5 d position d position 01 6 d position 01	- - - - -	0.7	0.85 .5	ition ition	0.7 (0.85 .5 @ mid pos @ mid pos 0.01 8h6	ition ition -	0.3 (0.85 None @ mid pos @ mid pos 0.01 8h6	ition		
200	0.85 None mid pos mid pos 0.01 8h6	ition -	0.1 0.7 @ mi 0.3 @ mi 0.1 81	85 5 d position d position 01 6 d position 01	- - - - -	0.7	0.85 .5	ition ition	0.7 (0.85 .5 @ mid pos @ mid pos 0.01 8h6	ition ition -	0.3 (0.85 None @ mid pos @ mid pos 0.01 8h6	ition		

1 Probe Accuracy

The accuracy of the LVDT and Half Bridge probes is quoted as % of reading or μm, which ever is greater.

The accuracy of the Digital Probe range is quoted as [(resolution) + (accuracy %) x D] where D is the distance from the setting master.

(Please refer to the Glossary for definitions)

2 LVDT and Half Bridge Probe Performance

Accuracy, sensitivity and energising current are valid for the following calibration conditions: LVDT probes calibrated at 3 V, 5 kHz frequency into a $10 \text{ k}\Omega$ load or $100 \text{ k}\Omega$ for the unplugged versions. Half Bridge probes calibrated at 3 V, 10 kHz frequency into a $2 \text{ k}\Omega$ load or $1 \text{ k}\Omega$ for the unplugged versions. The probes will be provide the probability values in the result $1 \text{ k}\Omega$ for $1 \text{ k}\Omega$ load or $1 \text{ k}\Omega$ for the unplugged versions. The probes will be precisely unless that the provide $1 \text{ k}\Omega$ for $1 \text{ k}\Omega$ for 1operate with energising voltages in the range $1~\rm V$ to $10~\rm V$ and with frequencies in the range $2~\rm kHz$ to $20~\rm kHz$ but the performance is not specified.

3 Viton is a trademark of DuPont Dow Elastomers.

4 Cables

All probes are supplied with 2 m of PUR cable as standard. Other lengths and options such as nylon braided, metal braided and armoured are available on request.

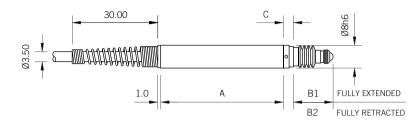
5 Digital Probe Termination

Digital Probes are terminated with Solartron's Probe Interface Electronics (PIE) module. Please refer to the Orbit Network for details on this module and methods of integration for Digital Probes.

6 Below 0°C environment must be dry

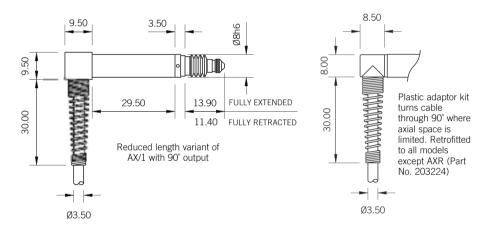
22

Standard Spring Push (AX/S and DP/S)

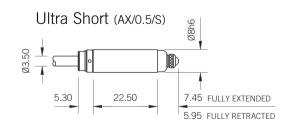


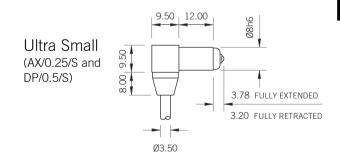
	AX/1/S	DP/2/S	AX/1.5/S	AX5/1/S	AX/2.5/S	DP/5/S	AX/5/S	DP/10/S	AX/10/S
				DP10/2/S					DP/20/S
Α	43.00	46.00	58.00	75.00	63.00	65.00	87.00	89.00	127.00
С	3.5	2.00	4.00	4.00	4.00	2.00	4.00	2.00	3.00
В1	13.9	13.9	15.40	25.40	17.40	17.40	25.40	25.40	44.90
B2	11.4	10.9	11.40	14.40	11.40	11.40	14.40	14.40	23.90

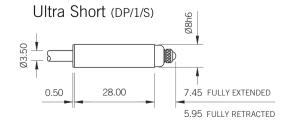
Right Angle Spring Push (AXR and DPR)

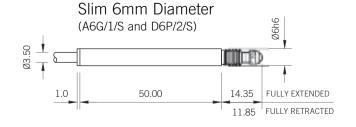


Special Spring Push Probes



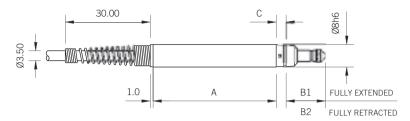






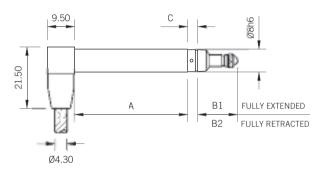


Feather Touch Spring Push (AT/S and DT/S)



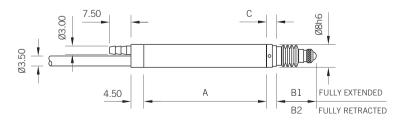
	AT/1/S	DT/2/S	AT/1.5/S	AT/2.5/S	DT/5/S	AT/5/S	DT/10/S	AT/10/S
								DT/20/S
Α	43.00	46.00	58.00	63.00	65.00	87.00	89.00	127.00
С	3.50	2.00	4.00	4.00	2.00	4.00	2.00	3.00
В1	13.90	13.90	15.40	17.40	17.40	25.40	25.40	33.90
B2	11.40	10.90	11.40	11.40	11.40	14.40	14.40	12.90

Right Angle Feather Touch Spring Push with braided cable (ATR/S and DTR/S)

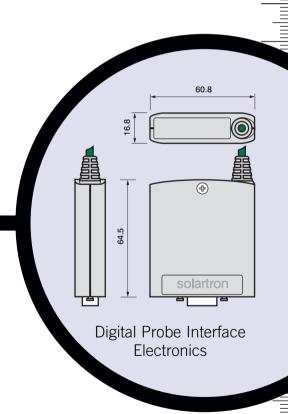


	ATR/1/S	DTR/2/S	ATR/1.5/S	ATR/2.5/S	DTR/5/S	ATR/5/S	DTR/10/S	ATR/10/S
								DTR/20/S
Α	29.50	33.50	44.50	49.50	52.50	73.50	76.50	113.50
С	3.50	2.00	4.00	4.00	2.00	4.00	2.00	3.00
В1	13.90	13.90	15.40	17.40	17.40	25.40	25.40	33.90
B2	11.40	10.90	11.40	11.40	11.40	14.40	14.40	12.90

Vacuum Retract (AX/V and DP/V)

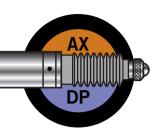


	AX/1/V	DP/2/V	AX/5/1/V	AX/1.5/V	AX/2.5/V	DP/5/V	AX/5/V	DP/10/V	AX/10/V
									DP/20/V
Α	43.00	46.00	84.00	58.00	63.00	65.00	87.00	96.00	127.00
С	3.50	2.00	4.00	4.00	4.00	2.00	4.00	2.00	3.00
В1	13.90	13.90	25.40	15.40	17.40	17.40	25.40	25.40	44.90
B2	11.40	11.40	14.40	11.40	11.40	11.40	14.40	14.40	23.90

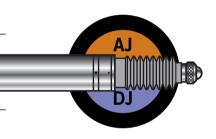


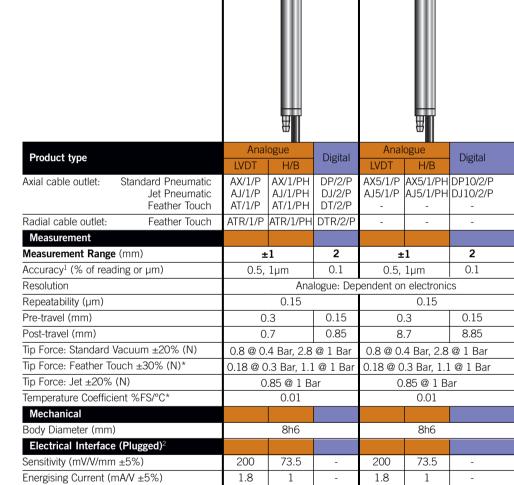


24 Specification Pneumatic push









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^{*(}at mid position)

Materials							
Case:	Stainless Steel						
Tip:	Nylon or Tungsten Carbide*						
Gaiter ³ :	Viton®						
Cable ⁴ :	PUR						
+							

Electrical Interface (Unplugged)² Sensitivity (mV/V/mm ±5%)

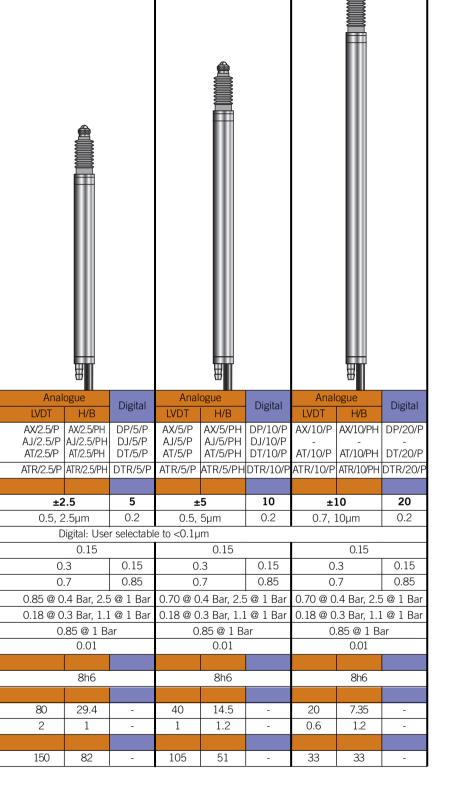
Environmental (Probe Head Only)	
Storage Temp (°C):	-40 to +100
Operating Temp ⁶ with gaiter (°C):	+5 to +80
Operating Temp ⁶ without gaiter (°C):	-10 to +80
IP rating:	IP65

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^{*}Other options available

IP rating not applicable to Feather Touch or Jet



1 Probe Accuracy

The accuracy of the LVDT and Half Bridge probes is quoted as % of reading or µm, which ever is greater. The accuracy of the Digital Probe range is quoted as [(resolution) + (accuracy %) x D] where D is the distance from the setting master.

(Please refer to the Glossary for definitions)

2 LVDT and Half Bridge Probe Performance

Accuracy, sensitivity and energising current are valid for the following calibration conditions: LVDT probes calibrated at 3 V, 5 kHz frequency into a 10 k Ω load or 100 k Ω for the unplugged versions. Half Bridge probes calibrated at 3 V, 10 kHz frequency into a 2 k Ω load or 1 k Ω for the unplugged versions. The probes will operate with energising voltages in the range 1 V to 10 V and with frequencies in the range 2 kHz to 20 kHz but the performance is not specified.

 ${\bf 3} \ \ {\bf Viton} \ \hbox{is a trademark of DuPont Dow Elastomers}.$

4 Cables

All probes are supplied with 2 m of PUR cable as standard. Other lengths and options such as nylon braided, metal braided and armoured are available on request.

5 Digital Probe Termination

Digital Probes are terminated with Solartron's Probe Interface Electronics (PIE) module. Please refer to the Orbit Network for details on this module and methods of integration for Digital Probes.

6 Below 0°C environment must be dry

Operating Press	sure Range
Standard:	0.4 to 1 Bar relative
Feather Touch:	0.3 to 2 Bar relative
Jet:	0.6 to 2 Bar relative

Pneumatic actuation: For continual reliable operation and to maximise working life, the air supply should be clean and dry. 60% maximum relative humidity, filtered to better than 5µm particle size.

Digital Probe Intering Reading Rate:	Up to 3906 readings/second
Bandwidth:	Up to 460Hz dependent on noise performance required
Output:	Serial communication-RS485 signal level (Solartron Orbit Protocol)
Power:	5 ±0.25 VDC @ 0.06A (includes power for probe)
Storage Temp (°C):	-20 to +70
Operating Temp (°C):	0 to +60
IP Rating:	IP43



Dimensions (mm) Pneumatic push

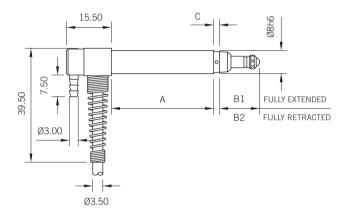


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A.50 A B1 FULLY EXTENDED B2 FULLY RETRACTED

Pneumatic Push (AX/P and DP/P)

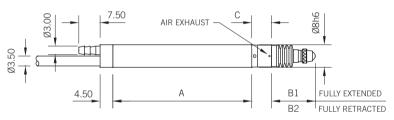
	AX/1/P	AX5/1/P	DP/2/P	AX/2.5/P	AX/5/P	AX/10/P
		DP/2/PE		DP/5/S	DP/10/P	DP/20/P
Α	49.00	84.00	52.00	71.00	96.00	127.00
С	2.00	2.00	2.00	2.00	2.00	3.00
B1	13.90	25.40	13.90	17.40	25.40	44.90
B2	10.90	14.40	10.90	11.40	14.40	23.90



Right Angled Pneumatic Push

with 90° output and non braided cable (ATR/P and DTR/P)

	ATR/1/P	DTR/2/P	ATR/2.5/P	ATR/5/P	ATR/10/P
			DTR/5/P	DTR/10/P	DTR/20/P
Α	35.50	38.50	57.50	82.50	113.50
С	2.00	2.00	2.00	2.00	3.00
В1	13.90	13.90	17.40	25.40	33.90
В2	10.90	10.90	17.40	14.40	12.90



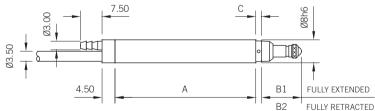
Gaiter Independent Pneumatic Push (AJ/P and DJ/P)

	AJ/1/P	DJ/2/P	AJ5/1/P	AJ/2.5/P	AJ/5/P
			DJ10/2/P	DJ/5/P	DJ/10/P
Α	49.0	52.0	84.0	71.0	96.0
B1	15.4	15.4	26.9	18.9	26.9
B2	12.4	12.4	15.9	12.9	15.9
С	7.0	7.0	7.0	7.0	7.0

During mounting, care must be taken not to clamp over the air exhaust

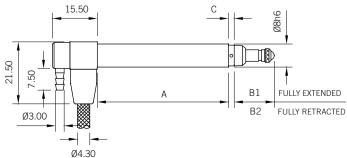
Feather Touch Pneumatic Push (AT/P and DT/P)

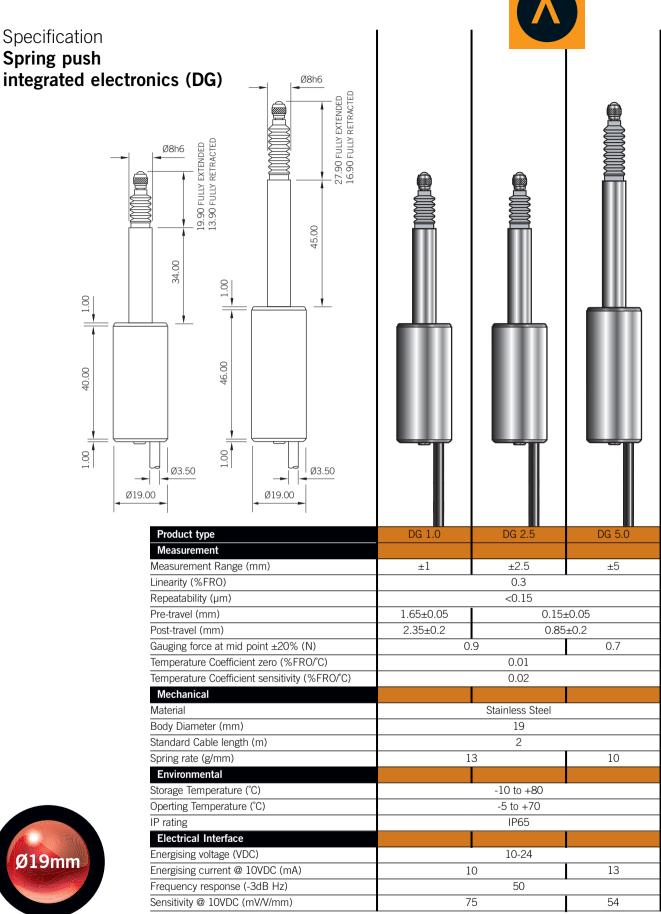




Right Angle Feather Touch Pneumatic Push with 90° output and braided cable (ATR/P and DTR/P)









DC: The specifications provided are for a transducer energised with 10 VDC and a calibration load of 20 k Ω at 20°C. Variation of these parameters will result in changes in performance. Please refer to manuals for electrical connections.



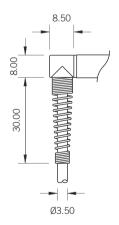
28 Accessories and spares



Standard extension cables are fitted with a 5 pin 270° DIN socket and a 5 pin 270° plug, and are designed to be used with Solartron Metrology standard product

Radial outlet

To convert cable outlet from axial to radial on analogue and digital gauging probes



Springs WWWW

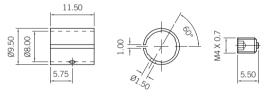
Replacement springs for analogue gauging probes

Calibration equipment

A combination of Solartron Metrology's successful linear encoder LE/25/S, the DR600 digital readout and a precision micrometer, provides a comprehensive kit for checking and inspection of readings from a linear transducer.

Handy and easy-to-use, Solartron calibration equipment will rapidly and precisely test any linear transducer with a stroke from ± 0.25 mm to ± 10 mm.

The kit includes an adaptor for testing smaller range transducers and comes with a comprehensive user manual.



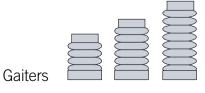
Clamping collet

For mounting 8mm analogue and digital gauging probes



Adjusting spanner

For adjusting the pre-travel on gauging probes



Replacement gaiters for analogue and digital gauging probes and linear encoders