

Block Gauge Family

Digital and Analogue Universal Gauges

Datasheet
502624
Issue 4.1



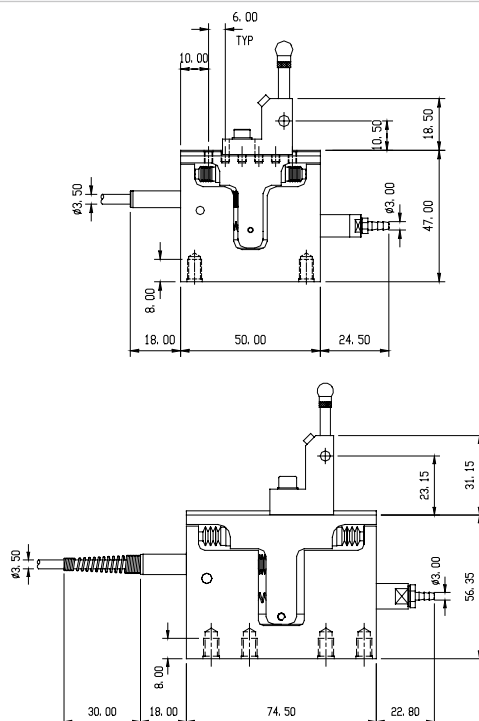
Features

- 2 mm, 5 mm and 10 mm Total Measuring Range
- Repeatability: $< 0.25 \mu\text{m}$
- Compact size 2 mm unit
- Digital, LVDT and Half Bridge
- Pneumatic or Spring Actuation
- Adjustable Anti-rotation Guide
- All Stainless Steel Construction
- Large Range of Changeable Tips
- IP65 Protection
- Good linearity over the full measuring range
- High Accuracy
- Traceable calibration

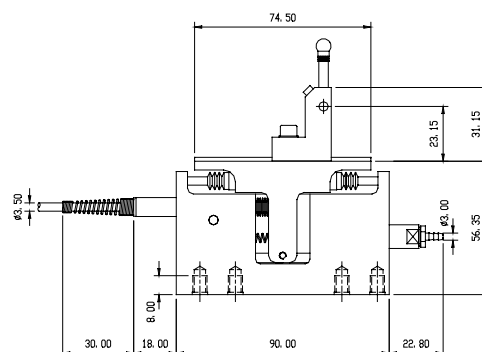
Description

Solartron's new family of Block Gauges makes precision measurements of bores and cavities a simple and reliable process. More generally, the use of these devices is recommended in applications where space is limited and where the use of axial probes is not possible. The family of universal gauges includes 2 mm, 5 mm and 10 mm measurement ranges, the 5 mm unit is used in most gauging applications and the 10 mm unit is designed for applications requiring a longer range. The 2 mm unit is a miniaturised version in length, height and thickness and is recommended for applications where space is very restricted. The block gauges are available in LVDT, half bridge or digital variants, and offer unrivalled ruggedness, accuracy and repeatability. All three units are extremely versatile and provide datum surfaces and all the adjustments required for precision gauging applications.

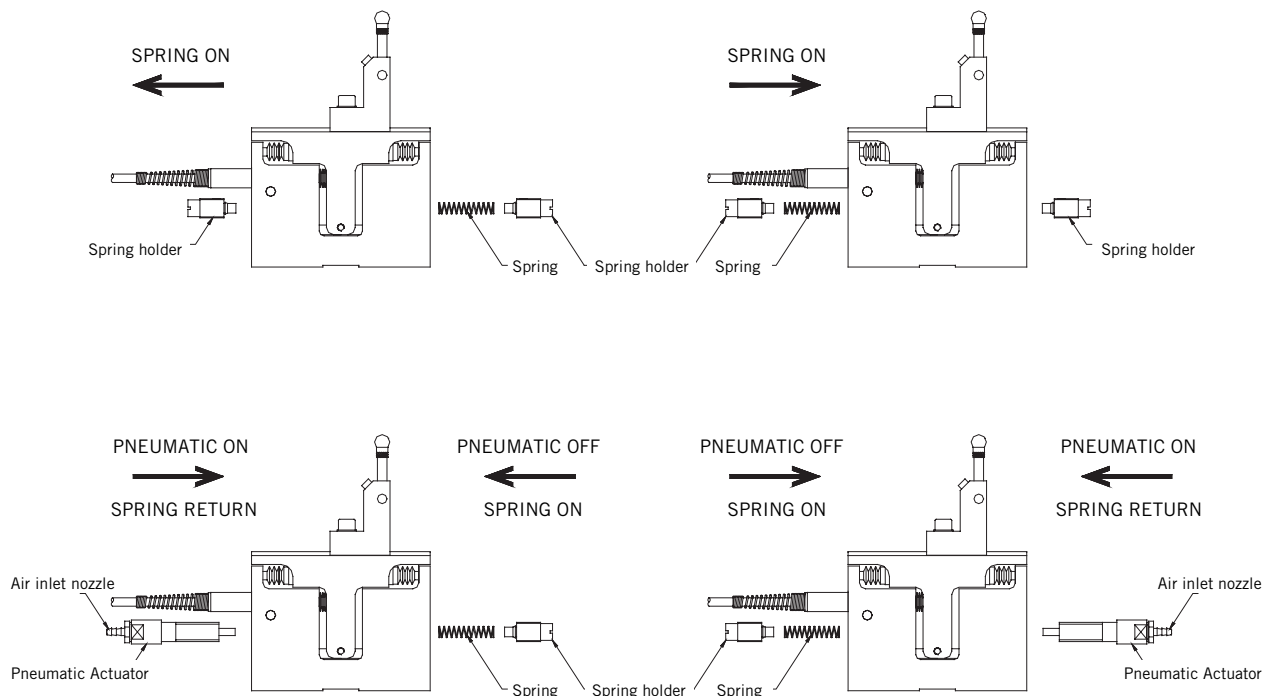
Mechanical Outline



Diagrams showing general dimensions and datum surfaces for 2 mm, 5 mm and 10 mm block gauges
(Please refer to the technical drawing for the complete set of dimensions)



Configuration Drawing



The Block Gauge pneumatic kit enables automatic loading of components. Pneumatic actuation coupled with a spring to control the tip force ensures repeatable measurement results (fig.1)

The 5 mm and 10 mm block gauges are equipped with an industry standard tool holder. This ensures that the gauge is rigid yet easy to adjust. The tip carriers have an M2.5 fitting that accepts all standard tips. Due to its size, the 2 mm gauge has a modified adjustment system that provides equal rigidity and ease of adjustment (fig.2)

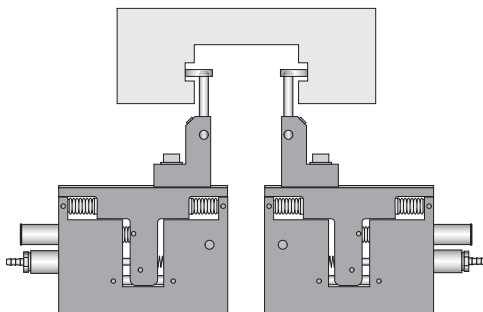


fig.1

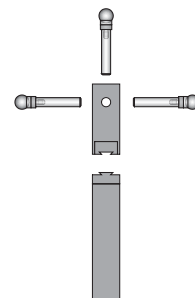


fig.2

As many Block Gauges as required can be banked close together. The compact configuration and the ability to gauge off the centreline is useful when tightly packed points need to be measured (fig.3)

Measurements with offset tip are possible with all the units, so to reduce the footprint of the gauge, adjustment along the frame is provided (fig.4)

A range of springs is available to ensure that the Block Gauge can be used in any attitude. IP65 protection helps to extend the life of the gauge in dirty environments (fig.5)

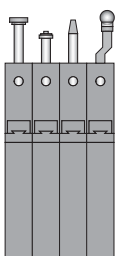


fig.3

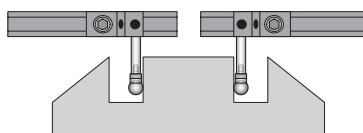


fig.4

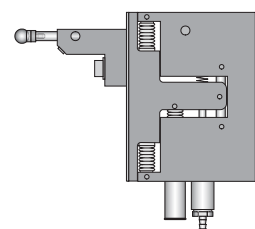


fig.5

Technical Specification

Measurement

	Analogue	Digital
Measurement Range (mm)	±1.0, ±2.5 and ±5.0	2, 5 and 10
Mechanical Travel (mm)	3, 6 and 11	3, 6 and 11
Accuracy ¹	(whichever is greater) at 5 kHz for LVDT at 10 kHz for Half Bridge	
2 mm	±1.0 µm or ±0.5% x D	±0.1 µm ±0.1% x D
5 mm	±2.5 µm or ±0.5% x D	±0.1 µm ±0.15% x D
10 mm	±5.0 µm or ±0.5% x D	±0.1 µm ±0.15% x D
Repeatability (on-axis at 70 g tip force)		
2 mm	< 0.25 µm	
5 mm	< 0.25 µm	
10 mm	< 0.50 µm	
Resolution	Dependant on associated electronics	User selectable to < 0.1µm
Null Position	Adjustable	Not applicable
Tip Force		
2 mm	0.75 N	
5 mm	0.75 N	
10 mm	0.75 N	
Temperature Coefficient		
2 mm	±0.2 µm/°C	
5 mm	±0.5 µm/°C	
10 mm	±1.0 µm/°C	
Life	Better than 5 million measuring cycles (dependant on application)	

Mechanical

	Analogue	Digital
Mass (less tool holder)		
2 mm	160 g (0.232 lbs)	
5 mm	390 g (0.858 lbs)	
10 mm	385 g (0.847 lbs)	
Mass of moving part (less tool holder)		
2 mm	35 g (0.077 lbs)	
5 mm	90 g (0.198 lbs)	
10 mm	95 g (0.209 lbs)	
Material	Stainless Steel (300 series) with Viton® Gaiters	
IP Rating	IP65	IP65 for gauge IP43 for electronics
Operating Pressure	1 bar to 3 bar	

Environmental

	Analogue	Digital
Storage Temperature (°C)	-40 to +85	-20 to +70
Operating Temperature (°C)	+5 to +85	+5 to +65
Shock	To maintain best performance the Block Gauge should be protected from excessive shock loads and dropping	

Electrical Interface

	Analogue		Digital
	LVDT	Half Bridge	
Energising Voltage	1 to 10 V rms		5 V ±0.25 VDC
Energising Frequency	2 to 20 kHz		Not applicable
Energising Current	2 mA/V at 5 kHz	2 mA/V at 10 kHz	55 mA at 5 VDC
Calibration Voltage	3 V		Not applicable
Calibration Frequency	5 kHz	10 kHz	Not applicable
Calibration Load	10 kΩ	2 kΩ	Not applicable
Sensitivity (mV/V/mm)	(at 5 kHz)	(at 10 kHz)	Not applicable
2 mm	200 ±0.5%	73.5 ±0.5%	
5 mm	80 ±0.5%	29.4 ±0.5%	
10 mm	40 ±0.5%	14.7 ±0.5%	

¹ Accuracy includes both linearity and sensitivity errors (D is the distance from setting master)

² Maximum Tip Force is 3.5 N, a selection of springs is supplied for attitude and dead weight compensation.
Care should be taken as the probe performance (accuracy and repeatability) may degrade at high tip forces.

Ordering Guide for Block Gauge Components

All gauges are supplied configured as spring push. A customer fit pneumatic actuator is required to convert spring push to pneumatic operation. The Block Gauge is inclusive of integral sensor but does not include the pneumatic actuator, additional springs, tool holder (4 mm and 6 mm bore), tip carrier (4 mm and 6 mm diameter) or tips. These must be ordered separately.



Tips

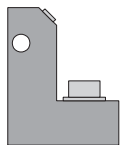
With industry standard M2.5 thread.

See page 98/99 of Solartron Metrology Catalogue 02 or download the PDF file for the tips from www.solartronmetrology.com



Tip Carrier

	4 mm Ø Tip Carriers (for use with 4 mm bore Tool Holder)	6 mm Ø Tip Carriers (for use with 6 mm bore Tool Holder)
	Part Number	Part Number
Length		
20 mm	208221/20	-
30 mm	208221/30	208453/30
40 mm	208221/40	208453/40
50 mm	-	208453/50



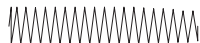
Tool Holder

	4 mm bore Tool Holder	6 mm bore Tool Holder
	Part Number	Part Number
Block Gauge		
2 mm	804797-SX	-
5 & 10 mm	804448-SX	804798-SX



Pneumatic Actuator

	Pneumatic Actuator
	Part Number
Block Gauge	
2 mm	804878
5 & 10 mm	804574



Replacement Spring Kits

	Replacement Spring Kit Part Number		
	2 mm Kit 208574-SX comprising:	5 mm Kit 208212-SX comprising:	10 mm Kit 208418-SX comprising:
70 g (0.68 N)	208574/070	-	-
75 g (0.74 N)	-	208212/075	-
100 g (0.98 N)	208574/100	208212/100	-
150 g (1.47 N)	208574/150	208212/150	208418/150
250 g (2.45 N)	-	208212/250	208418/250
350 g (3.43 N)	-	208212/350	208418/350

Ordering Guide for Block Gauges

Digital or Analogue Block Gauge

Digital	2.0 mm		5.0 mm		10.0 mm	
	Product	Part N°	Product	Part N°	Product	Part N°
Standard	DK/2/S	973025	DK/5/S	973000	DK/10/S	973008
Standard Radial	-	-	DKR/5/S	973005	DKR/10/S	973009

LVDT	±1.0 mm		±2.5 mm		±5.0 mm	
	Product	Part N°	Product	Part N°	Product	Part N°
Standard (Plugged)	BG/1/S	925165	BG/2.5/S	924750	BG/5/S	924992
Standard Radial (Plugged)	-	-	BGR/2.5/S	924886	BGR/5/S	924996
Standard (Unplugged)	BG/1/S	925099	BG/2.5/S	924713	BG/5/S	924990
Standard Radial (Unplugged)	-	-	BGR/2.5/S	924884	BGR/5/S	924994

Half Bridge	±1.0 mm		±2.5 mm		±5.0 mm	
	Product	Part N°	Product	Part N°	Product	Part N°
Standard (Plugged)	BG/1/SH	925166	BG/2.5/SH	924751	BG/5/SH	924993
Standard Radial (Plugged)	-	-	BGR/2.5/SH	924887	BGR/5/SH	924997
Standard (Unplugged)	BG/1/SH	925100	BG/2.5/SH	924714	BG/5/SH	924991
Standard Radial Unplugged)	-	-	BGR/2.5/SH	924885	BGR/5/SH	924995



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