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HPMA-X and TSI 3-X motorised arm and interface



HPMA-X specification

Principal application		Tool measurement and broken tool detection, primarily for use on large CNC machines
Transmission type		Hard-wired transmission
Weight		≈ 3 kg (106 oz), without tube or probes (total weight dependent on arm configuration)
Probe(s)		RP3 (capacity for one or two probes) [1]
Cable (arm to interface)	Type	Ø6.9 mm (0.27 in), 12-core screened cable, 0.22 mm^2 per core
	Length	30 m (98.43 ft) maximum
Sense directions		±X, ±Y, +Z (refer to **page 2**, "HPMA-X dimensions", for axes definition)
Typical positional repeatability [2] [3]		8 µm (315 µin) 2σ X/Y (tighter repeatability will be achieved on shorter tube lengths)
Stylus trigger force [4] [5] XY low force XY high force +Z direction		 1.5 N, 153 gf (5.4 ozf) 3.5 N, 357 gf (12.59 ozf) 12 N, 1224 gf (43.16 ozf)
Arm sweep motion		Motorised
Arm sweep time		Typically 3 seconds in each direction
Arm sweep angle		90°
Mounting		M8 bolts (× 3)
Probe pocket mounting		M6 bolts (× 2 per probe pocket)
Environment	IP rating	IPX6 and IPX8, BS EN 60529:1992+A2:2013 (IEC 60529:1989+A1:1999+A2:2013)
	Storage temperature	–25 °C to +70 °C (–13 °F to +158 °F)
	Operating temperature	+5 °C to +55 °C (+41 °F to +131 °F)

[1] Where the RP3 is to be used in the probe's Z-axis, a five-faced stylus is available to order from the Renishaw Online store at **www.renishaw.com/shop**.

[2] Test conditions: Stylus length: 22 mm (0.87 in)
Stylus velocity: 36 mm/min (1.42 in/min)

[3] Repeatability performance is not specified in the arm rotational axis. Refer to **page 2**, "HPMA-X dimensions", to identify this axis.

[4] Trigger force, which is critical in some applications, is the force exerted on the stylus by the tool when the probe triggers. The maximum force applied will occur after the trigger point (overtravel). The force value depends on related variables including measuring speed and machine deceleration.

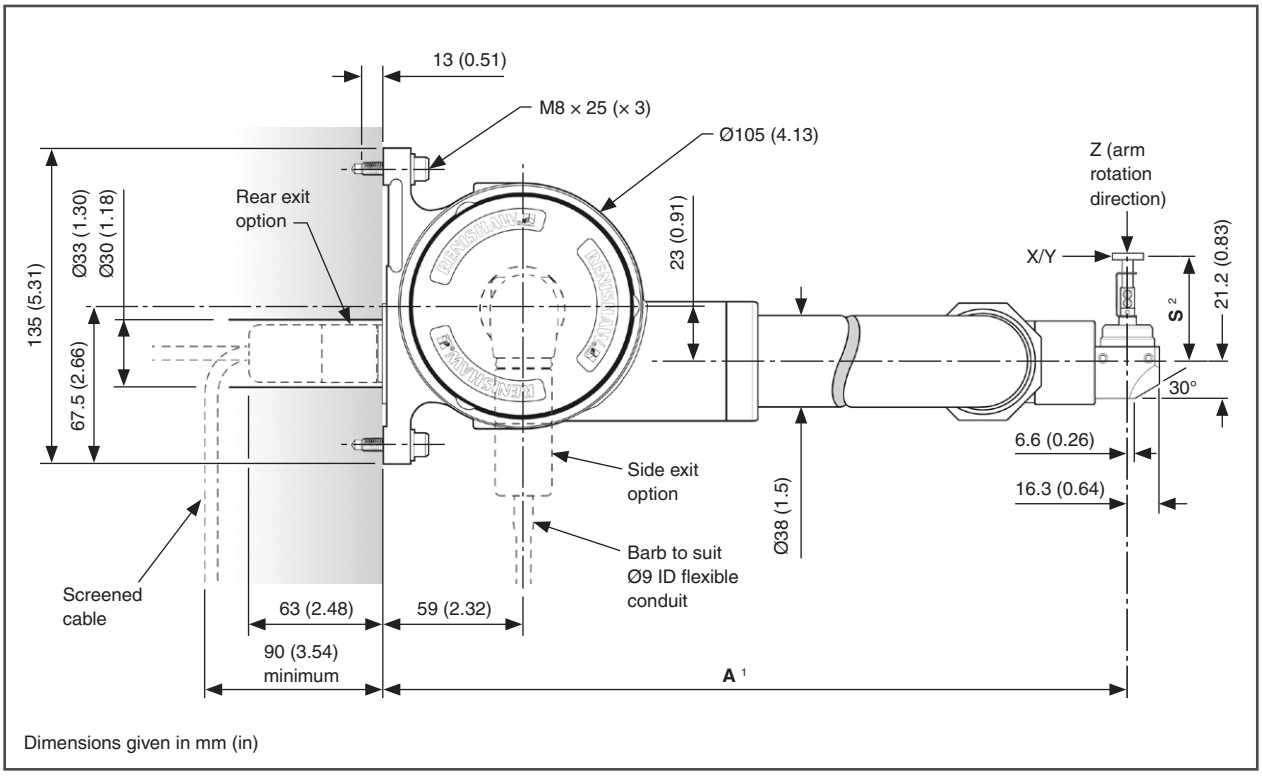
[5] These are the factory settings; manual adjustment is not possible.

TSI 3-X specification

Principal application		Input and output interfacing between the HPMA-X arm and the host CNC controller
Weight		≈ 0.2 kg (7 oz)
Mounting		DIN rail preferred; alternatively M4 screw (× 2)
Status reporting		Four LEDs to identify command status, arm position, probe status and arm status
I/O connector type		25-way D-sub
Inputs		Opto isolated drive commands and probe inhibit command, 15 Vdc to 30 Vdc
Outputs		Voltage-free SSRs for probe status, arm ready and arm stowed
Four-wire I/O probe option (for example, Fanuc automatic length measurement input XAE, ZAE)		Four internally pulled down active high inputs, four OCT active high outputs
Power supply requirement	Voltage	24 Vdc
	Current	3 A
Environment	IP rating	IP20, BS EN 60529:1992+A2:2013 (IEC 60529:1989+A1:1999+A2:2013)
	Storage temperature	–25 °C to +70 °C (–13 °F to +158 °F)
	Operating temperature	+5 °C to +55 °C (+41 °F to +131 °F)

HPMA-X dimensions

Options are available for a rear exit or a side exit cable. The arm arrangement shown is for illustration purposes only and will vary depending on the configuration required.

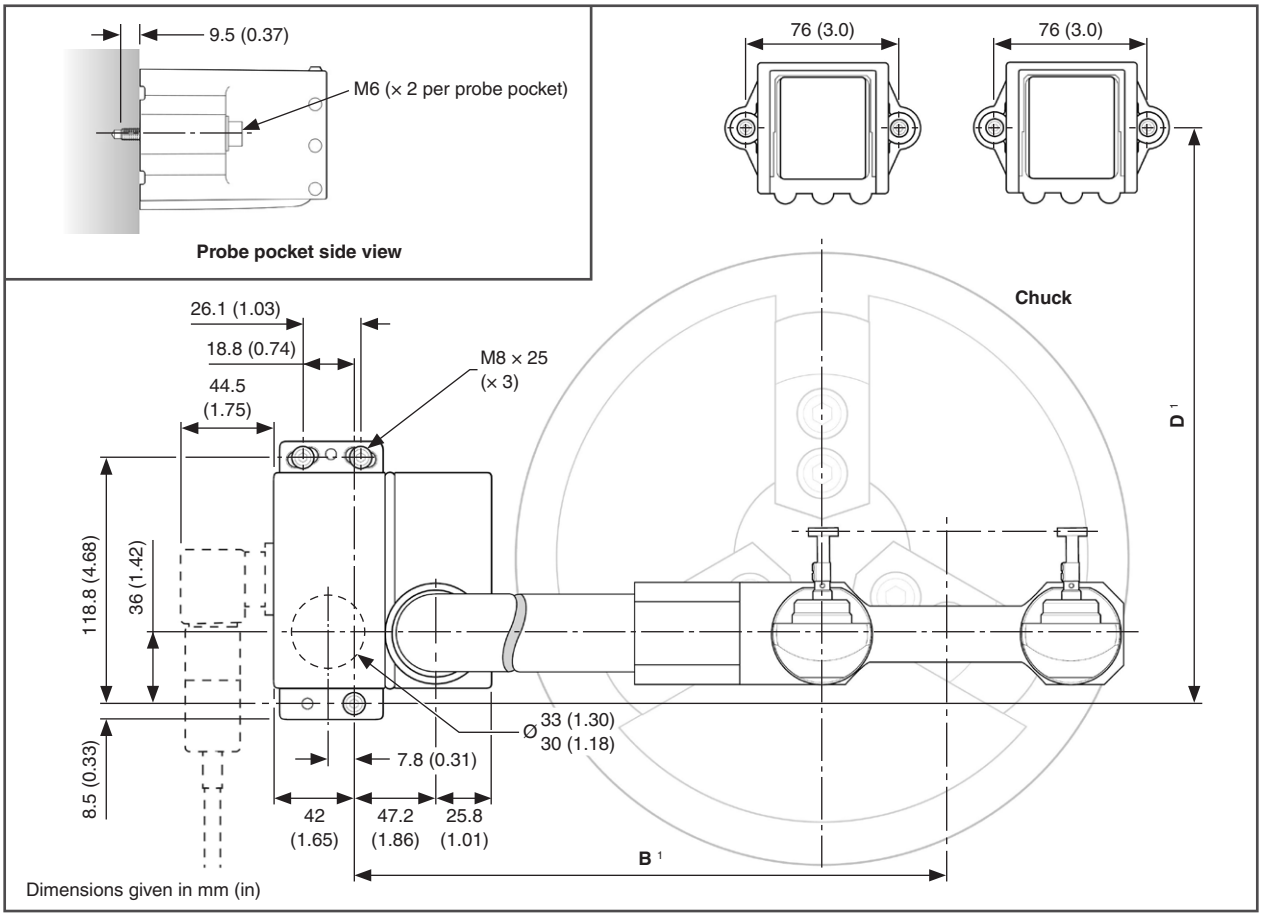


Dimensions given in mm (in)

1 Dimension A is dependent on the configuration of the arm and probe(s).
2 A wide range of custom and standard stylus options are available.

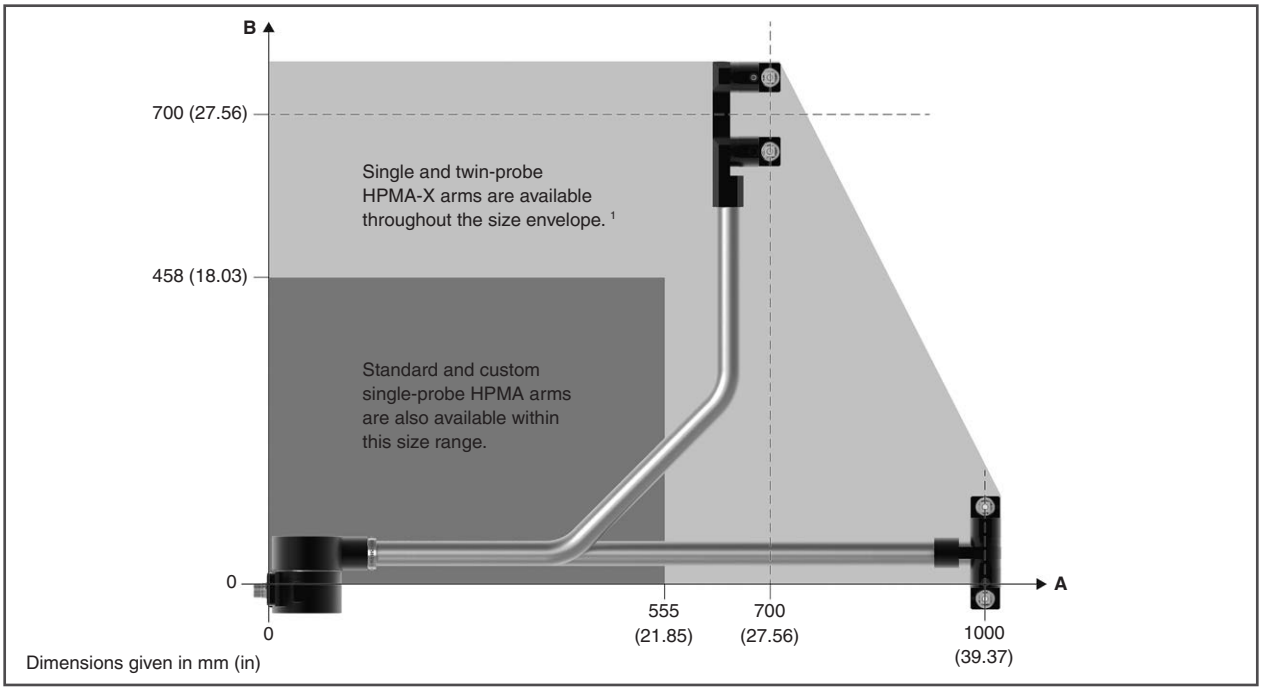
HPMA-X mounting details

The arm and probe holder arrangement shown is for illustration purposes only and will vary depending on the configuration required.



1 Dimension dependent on the configuration of the arm and probe(s).

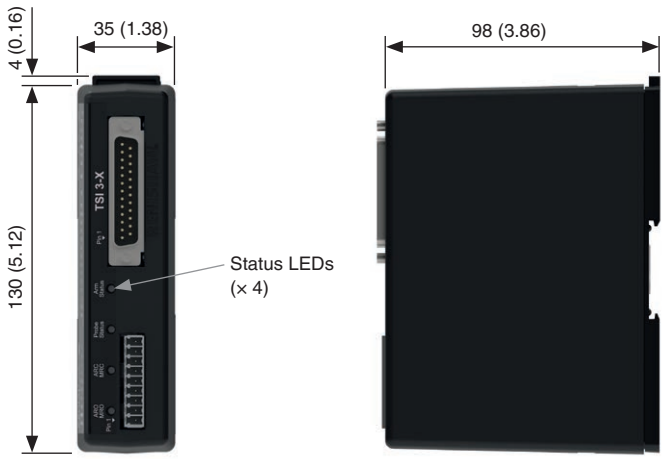
HPMA-X size guidance



1 For applications outside of this range, contact Renishaw.

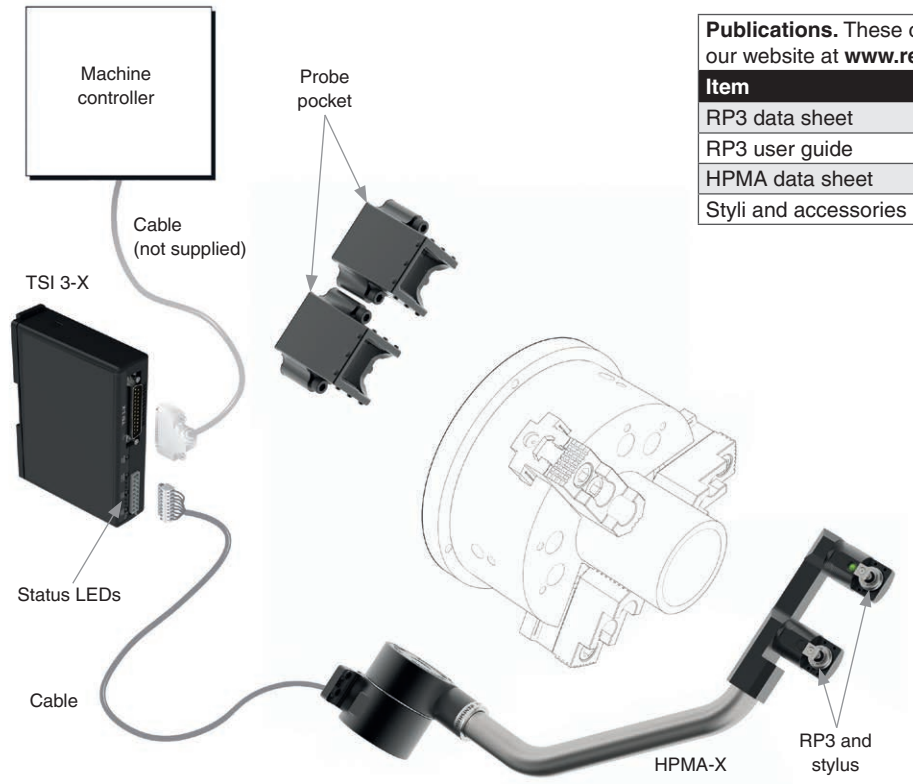
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TSI 3-X dimensions



Dimensions given in mm (in)

Typical system



Publications. These can be downloaded from our website at **www.renishaw.com**.

Item	Document number
RP3 data sheet	H-2000-2014
RP3 user guide	H-2000-5187
HPMA data sheet	H-2000-2037
Styli and accessories	H-1000-3200

www.renishaw.com/hpma-x

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Part no.: H-6671-8200-01-A
Issued: 11.2022