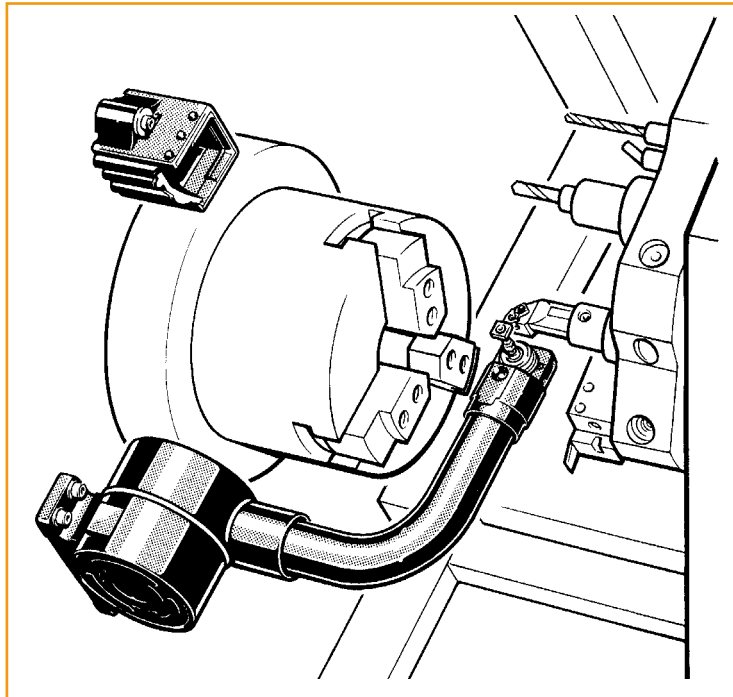


# HPPA high precision pulldown arm

[www.renishaw.com/hppa](http://www.renishaw.com/hppa)



**The HPPA is a manually actuated swing down tool setting arm that features the new RP3 three axis probe.**

**The patented hub assembly design ensures highly repeatable stylus positioning each time the HPPA is swung down into its 'ARM READY' position.**

The patented rotary kinematic hub design also provides a positive engagement into position at both the 'ARM READY' and 'MACHINE READY' positions. A bicolour LED indicates probe status and also informs the operator that the system is ready for use.



HPPA is designed specifically for use with the TSI2 interface. Do not use the HPPA with any other interface.

## System components

- **Arm/hub assembly with probe**

The arm/hub assembly is a fully sealed, compact design available in a range of sizes to suit most machines. Renishaw has recommended arm configurations for all standard chuck sizes. The data sheet includes top level kit numbers for machine chuck sizes 6 in, 8 in, 10 in, 12 in, 15 in, 18 in and 24 in.

Renishaw also has recommended stylus configurations for all standard tooling sizes.

The data sheet includes top level kit part numbers for tooling sizes 16 mm, 20 mm, 25 mm, 32 mm, 40 mm and 50 mm. Where these are not suitable, arms can be configured by Renishaw to suit the particular requirement\*

\* Contact Renishaw plc for information on other arms options.

- **Probe enclosure**

A separate probe enclosure is provided to protect the probe whilst the arm is not in use.

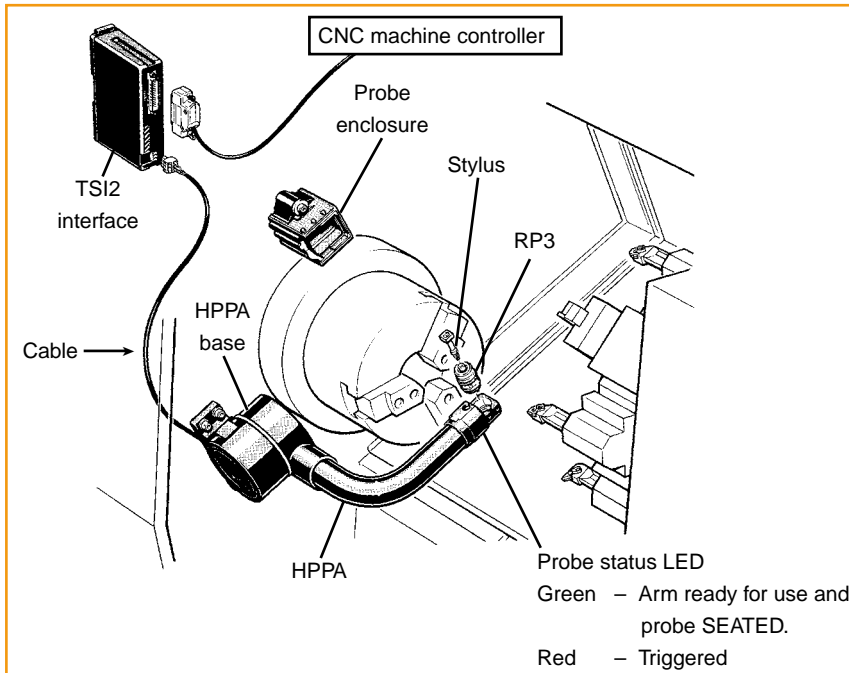
- **TSI2 interface**

The interface processes signals between the probe and machine control and allows simple integration. The unit is DIN rail mounted and features an 'Easy fit' location mechanism. There are two connectors for simple wiring to the HPPA (3-way) and machine controller (25-way 'D' type).

## Data sheet

### HPPA high precision pulldown arm

## HPPA system



#### Standard kit contents

- 1 HPPA arm assembly
- 2 RP3 probe
- 3 Stylus kit
- 4 TSI2 interface
- 5 Probe enclosure
- 6 User and installation guide
- 7 Base fixing kit

#### Cable (optional)

- 1 2 m, 5 m or 10 m cable assembly – arm to TSI2

## Benefits

- Tool setting times up to 90% faster.
- Recommended OEM arm configurations for all standard chuck sizes.
- Positional repeatability typically  $5\ \mu\text{m}$  (0.0002 in)  $2\ \sigma$ .
- Rugged Renishaw design ensures fault free operation in the harshest of machine tool environments.
- Sealed to IPX8 (static).
- LED indicator to show probe status and arm READY FOR USE.
- Stylus “break stem” protects the probe if stylus overtravel limits are exceeded.
- Stylus configurations to suit 16 mm, 20 mm, 25 mm, 32 mm, 40 mm and 50 mm tooling.

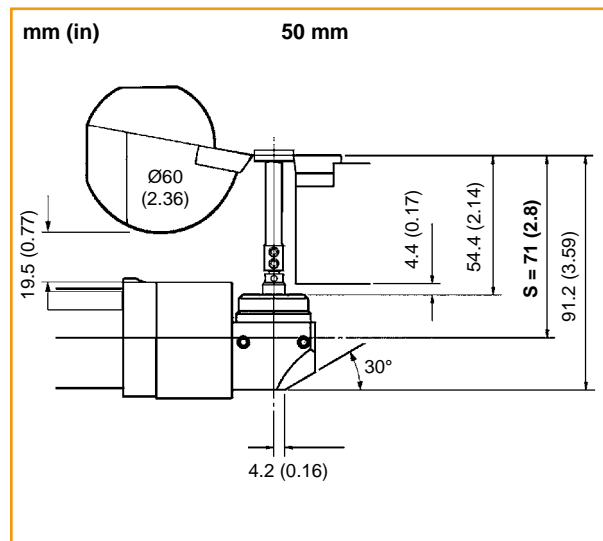
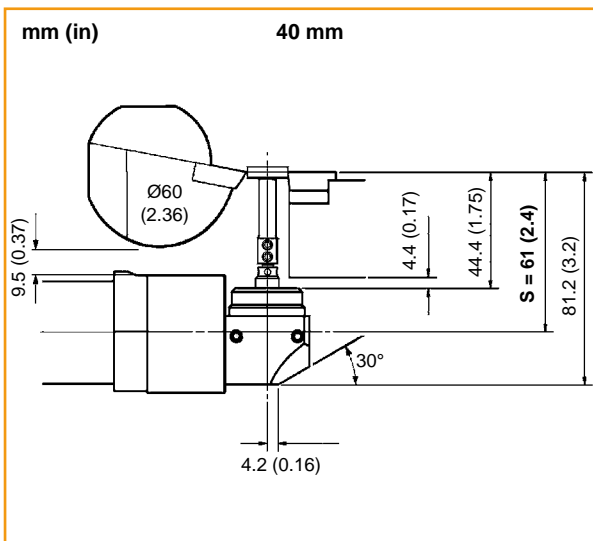
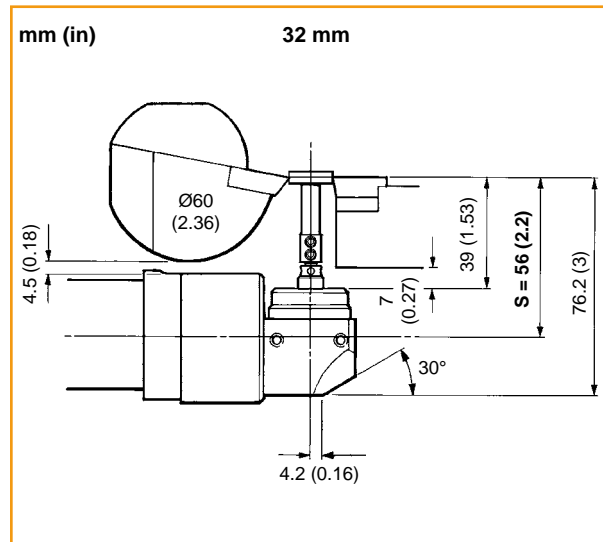
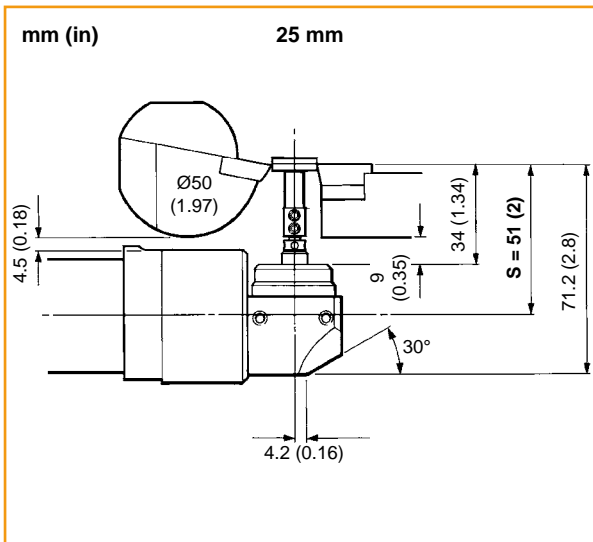
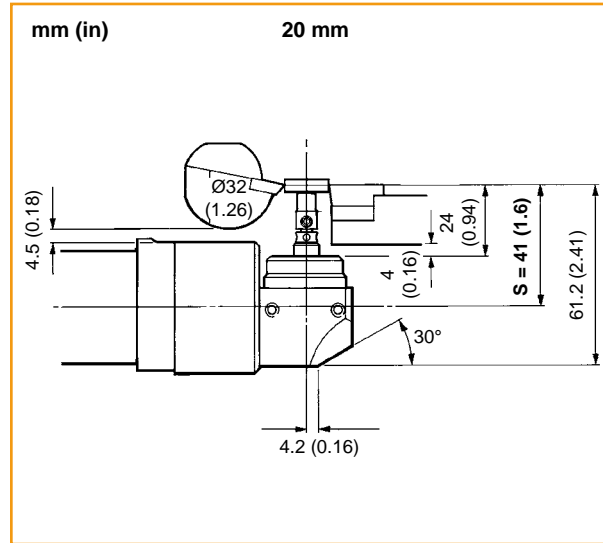
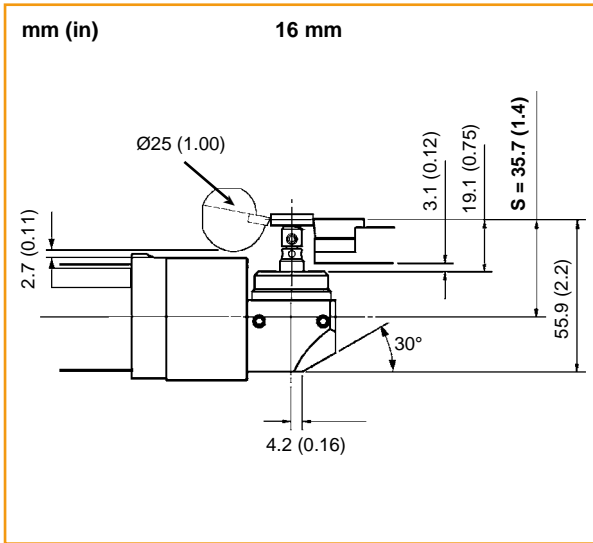
## System specification

<b>Application</b>	CNC lathe tool setting	
<b>Sense directions</b>	<b>Probe</b>	$\pm X, \pm Y, +Z$
	<b>Machine</b>	$\pm X, \pm Z, +Y$
<b>Typical positional repeatability (at gauging speed of 36 mm/min)</b>	<b>6 in - 15 in chuck arms</b>	$5\ \mu\text{m}\ 2\ \sigma\ X/Z$
	<b>18 in - 24 in chuck arms</b>	$8\ \mu\text{m}\ 2\ \sigma\ X/Z$
<b>Environmental protection</b>	IPX8 (static)	
<b>Operating temperature</b>	5 °C to 60 °C (41 °F to 140 °F)	
<b>Storage temperature</b>	-10 °C to 70 °C (14 °F to 158 °F)	
<b>Arm sweep angle</b>	91°/90° (If Renishaw probe enclosure is not used, note maximum arm sweep angle of 91°)	

## RP3 probe data

<b>RP3 stylus trigger force</b>	<b>Machine XZ</b>	3.5 N / 350 gf (12.3 ozf) max. in high force direction.
		1.5 N / 150 gf (5.3 ozf) max. in low force direction.
	<b>Machine Y</b>	12 N / 1200 gf (42.3 ozf) max.
<b>RP3 stylus overtravel</b>	<b>Machine X</b>	9°
	<b>Machine Z</b>	9°
	<b>Machine Y</b>	2 mm (0.08 in)

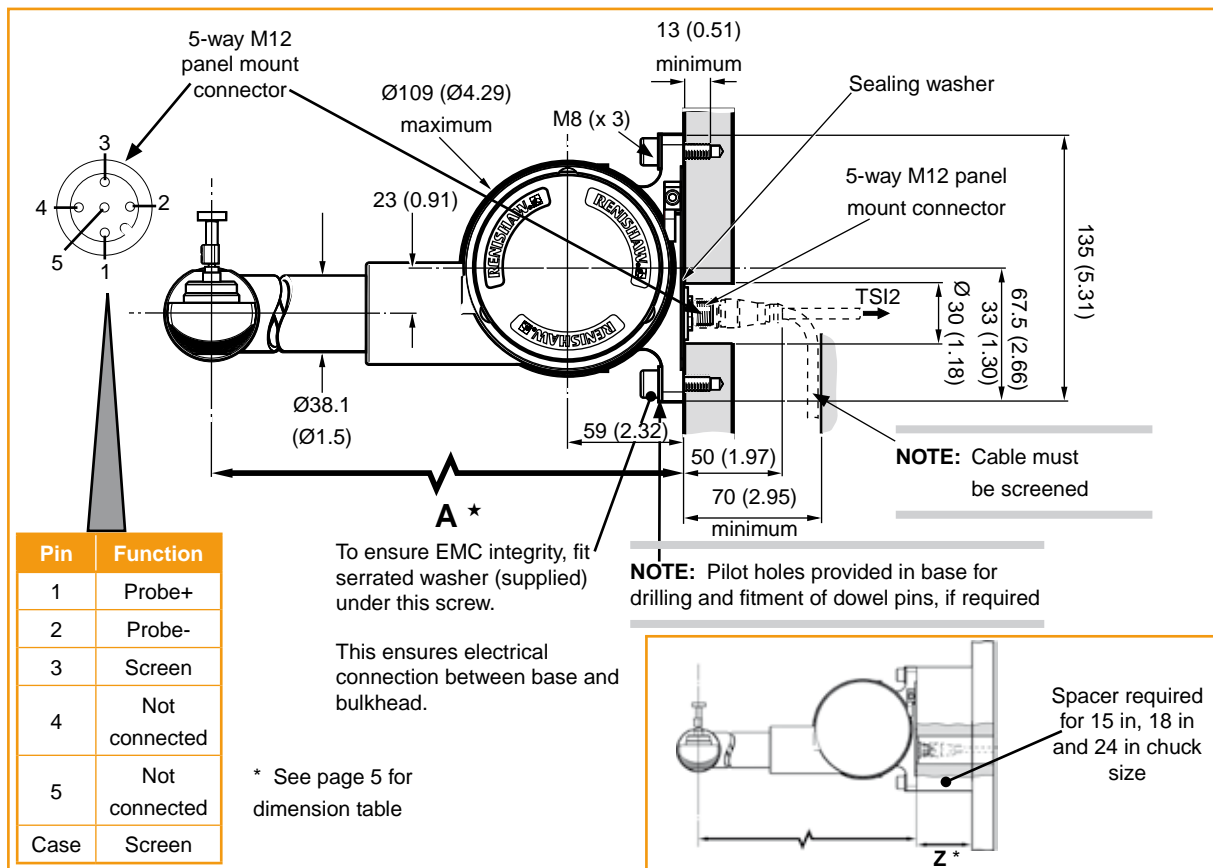
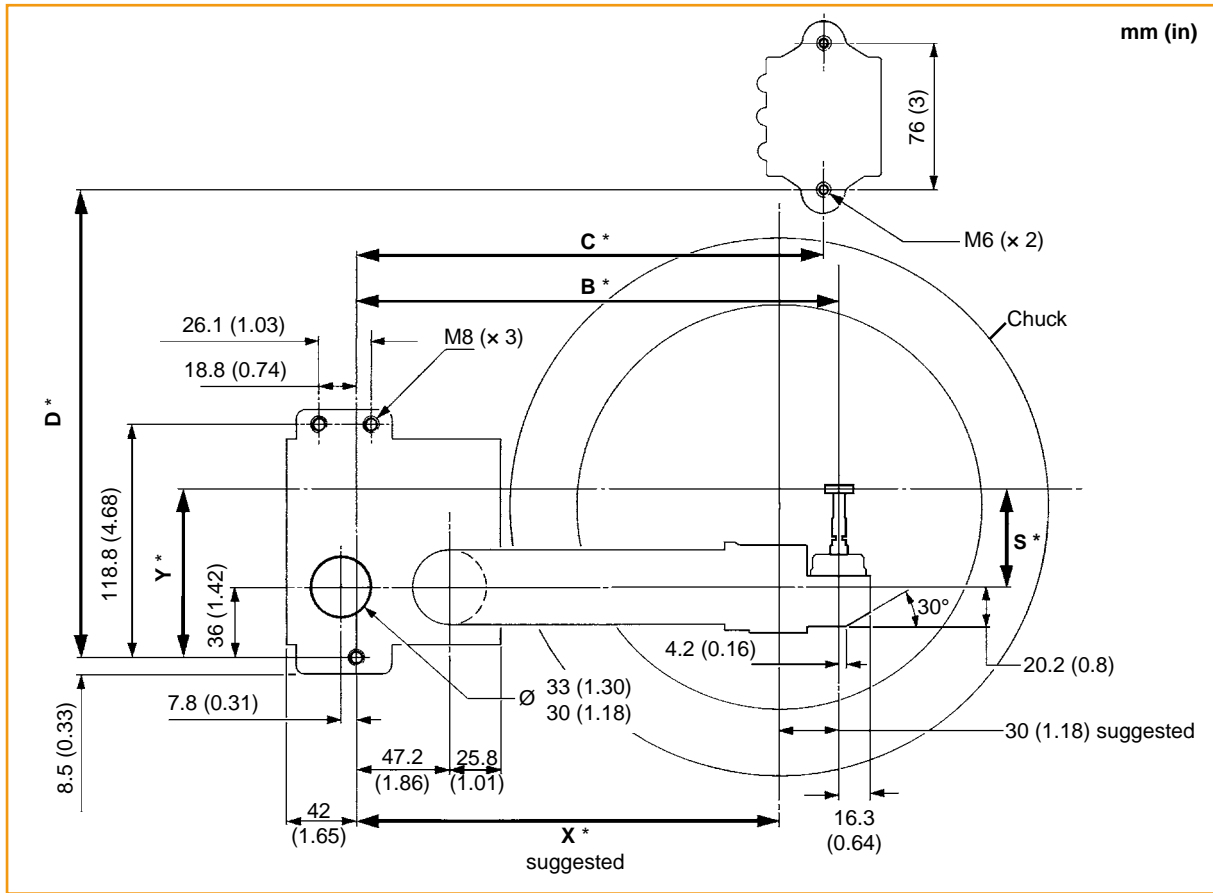
**Stylus dimensions by tool size**



# Data sheet

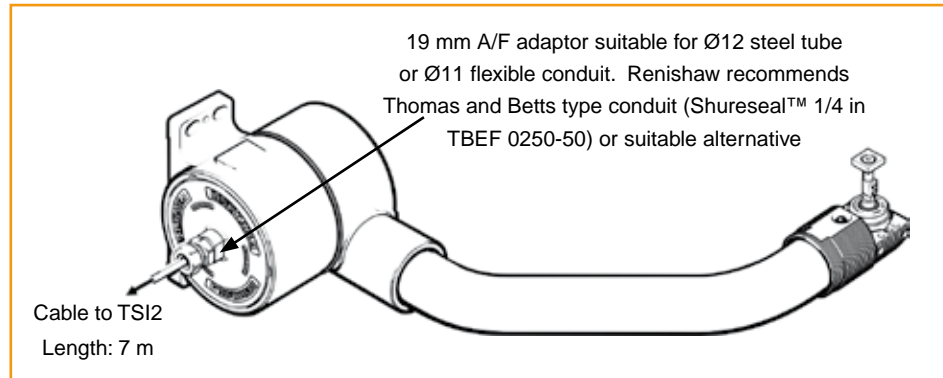
## HPPA high precision pulldown arm

### Mounting dimensions

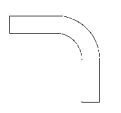

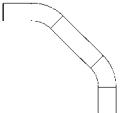

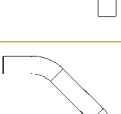
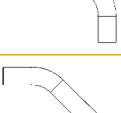


## Side exit version

Colour	Function
Blue	Probe+
Grey/black	Screen
Green	Probe-

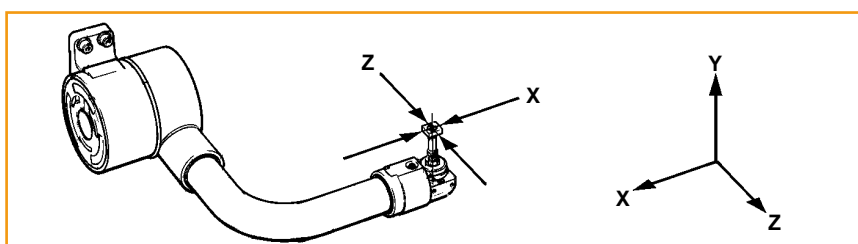


## Dimensions mm (in)

Chuck size	Tooling size	Arm size		C	D	S*	X	Y	Z	Tube shape
		A	B							
6 in	16 mm	250 (9.84)	219.2 (8.63)	212 (8.35)	212 (8.35)	35.7 (1.4) 41 (1.6) 51 (2) 56 (2.2)	189.2 (7.45)	71.7 (2.82) 77 (3.03) 87 (3.42) 92 (3.62)	N/A	
	20 mm									
	25 mm									
	32 mm									
8 in	16 mm	286 (11.26)	249.2 (9.81)	242 (9.53)	248 (9.76)	35.7 (1.4) 41 (1.6) 51 (2) 56 (2.2)	219.2 (8.63)	71.7 (2.82) 77 (3.03) 87 (3.42) 92 (3.62)	N/A	
	20 mm									
	25 mm									
	32 mm									
10 in	16 mm	335 (13.19)	298.2 (11.74)	291 (11.46)	297 (11.69)	35.7 (1.4) 41 (1.6) 51 (2) 56 (2.2) 61 (2.4)	268.2 (10.56)	71.7 (2.82) 77 (3.03) 87 (3.42) 92 (3.62) 97 (3.82)	N/A	
	20 mm									
	25 mm									
	32 mm									
	40 mm									
12 in	16 mm	368 (14.49)	298.2 (11.74)	291 (11.46)	330 (12.99)	35.7 (1.4) 41 (1.6) 51 (2) 56 (2.2) 61 (2.4) 71 (2.8)	268.2 (10.56)	71.7 (2.82) 77 (3.03) 87 (3.42) 92 (3.62) 97 (3.82) 107 (4.21)	N/A	
	20 mm									
	25 mm									
	32 mm									
	40 mm									
	50 mm									
15 in	20 mm	400 (15.75)	343.2 (13.51)	336 (13.23)	362 (14.25)	41 (1.6) 51 (2) 56 (2.2) 61 (2.4) 71 (2.8)	313.2 (12.33)	77 (3.03) 87 (3.42) 92 (3.62) 97 (3.82) 107 (4.21)	60 (2.36)	
	25 mm									
	32 mm									
	40 mm									
	50 mm									
18 in	25 mm	469 (18.46)	383.2 (15.09)	376 (14.80)	431 (16.97)	51 (2) 56 (2.2) 61 (2.4) 71 (2.8)	353.2 (13.91)	87 (3.42) 92 (3.62) 97 (3.82) 107 (4.21)	60 (2.36)	
	32 mm									
	40 mm									
	50 mm									
	24 in									
32 mm										
40 mm										
50 mm										

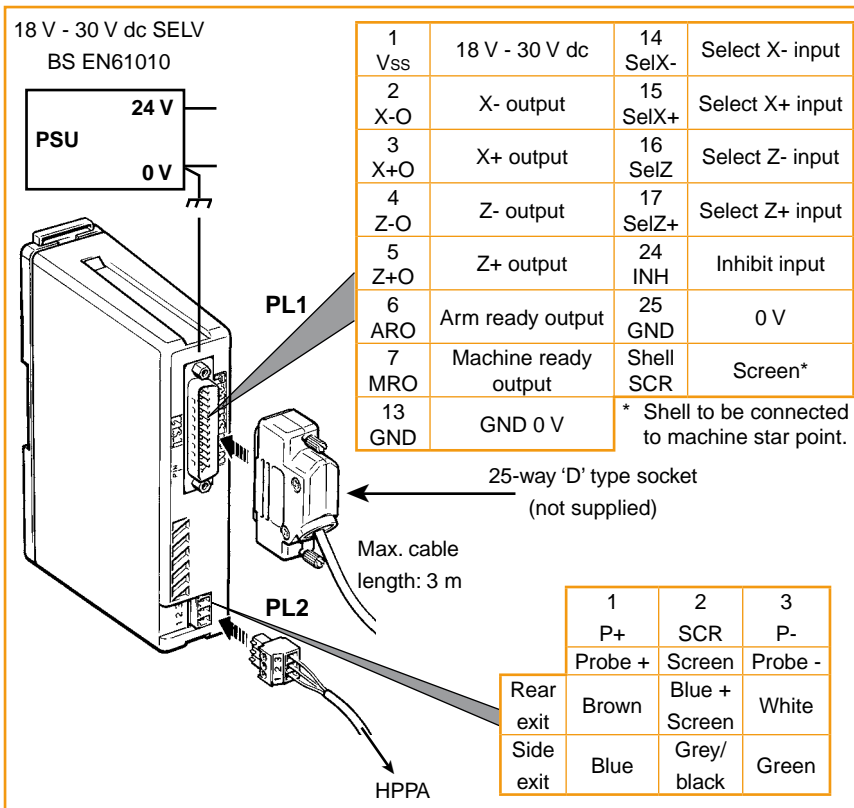
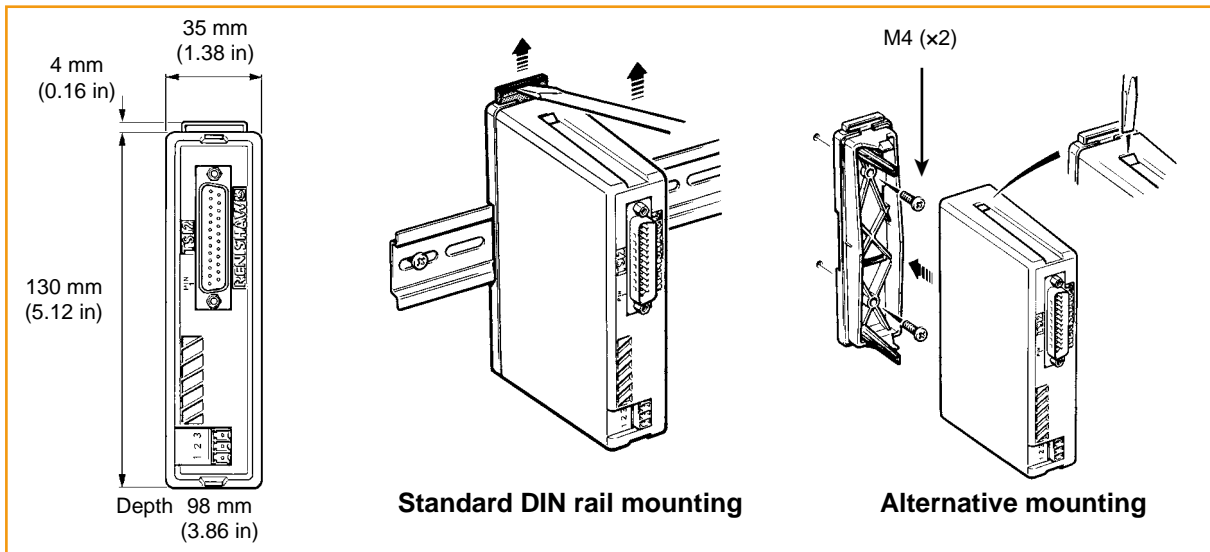
\* Stylus height, S, is adjustable by ±1.5 mm.

## Machine X - Z axis application (standard)



Please contact Renishaw plc for further information regarding machine Y axis applications.

## TSI2 interface



	V <sub>SS</sub>	= 18 V - 30 V dc
	I <sub>max</sub>	= 80 mA All outputs o/c
		= (F) 250 mA (Ø5 × 20 mm)
	Renishaw	= P-FS02-1A25
	Belling Lee	= L1427B

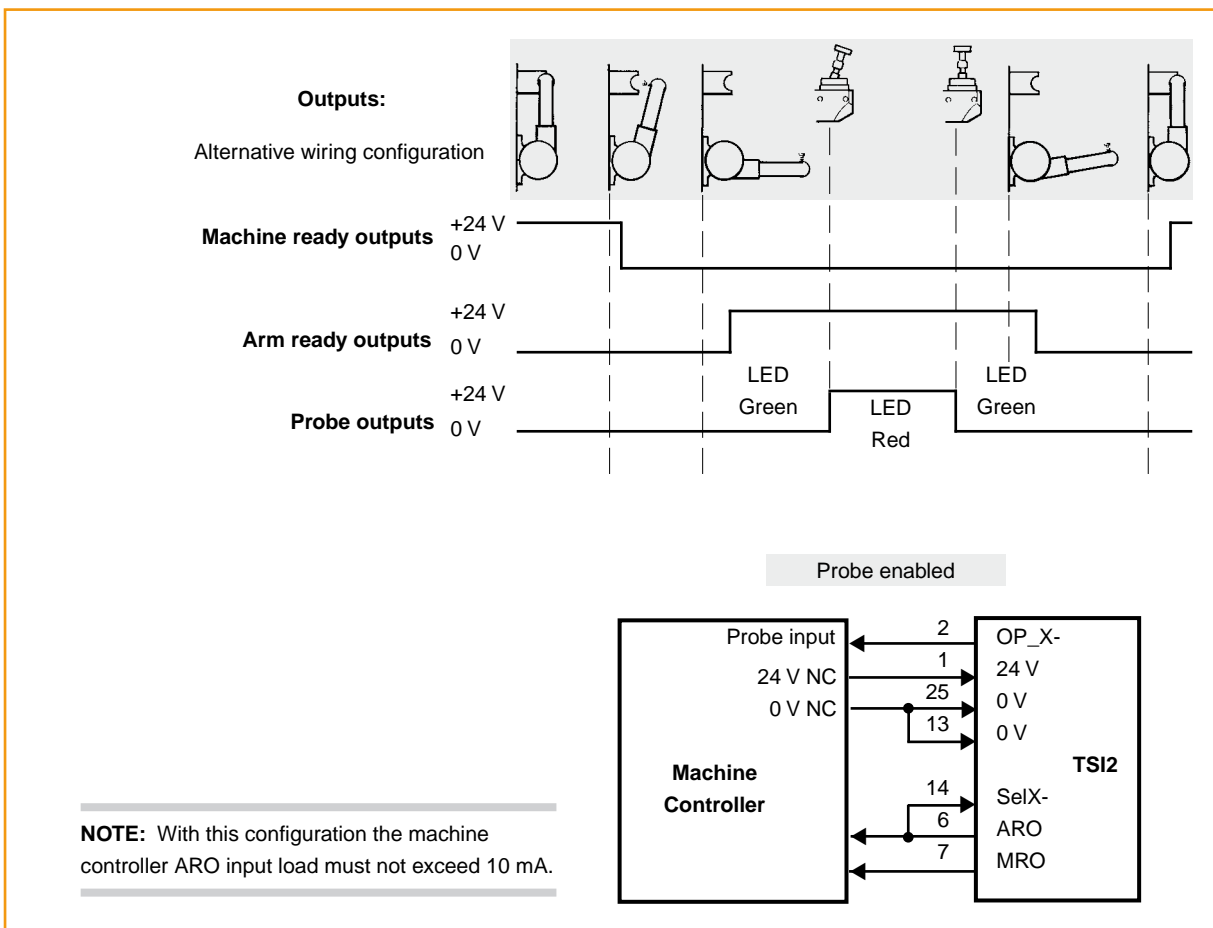
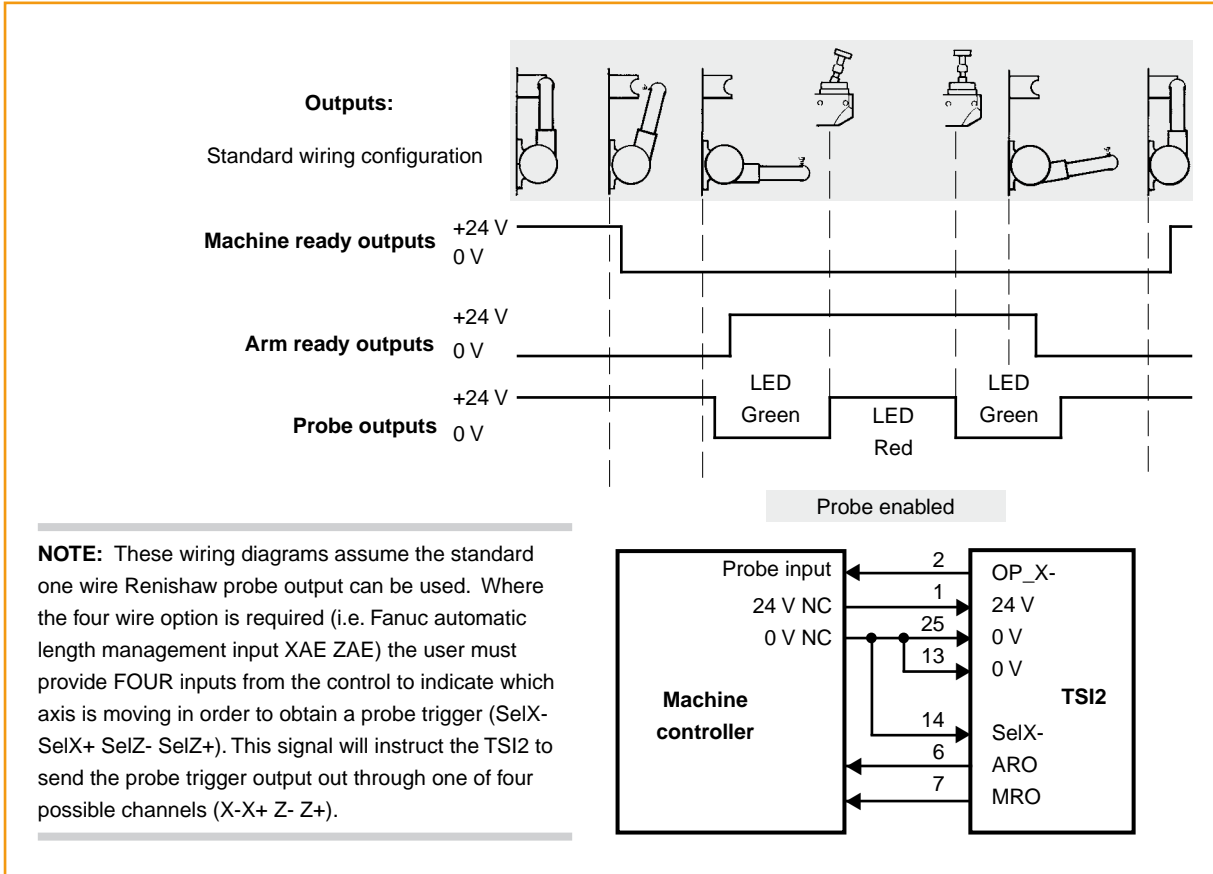
INPUTS: All internally pulled down (2K4) ACTIVE HIGH inputs

### Probe signal outputs

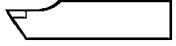
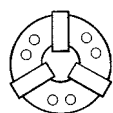
(PL1-2) X-O	} OCT ACTIVE HIGH outputs	V <sub>SS</sub> - 3.8 V @ max. source 120 mA (one probe signal output only)
(PL1-3) X+O		
(PL1-4) Z-O		
(PL1-5) Z+O		

### Arm ready (ARO) / machine ready (MRO) outputs

(PL1-6) ARO	} OCT ACTIVE HIGH outputs	V <sub>SS</sub> - 2.4 V @ max. source 20 mA
(PL1-7) MRO		



## HPPA kit selection list \*

HPPA part number and critical dimension matrix																
																
		16 mm		20 mm		25 mm		32 mm		40 mm		50 mm		'A' mm (in)	'B' mm (in)	
		RE	SE	RE	SE	RE	SE	RE	SE	RE	SE	RE	SE			
	6 in	0241	0262	0200	0263	0201	0264	0202	0265					250 (9.84)	219.2 (8.63)	
	8 in	0244	0266	0203	0267	0204	0268	0205	0269					286 (11.26)	249.2 (9.81)	
	10 in	0247	0270	0206	0271	0207	0272	0208	0273	0248	0274			335 (13.19)	298.2 (11.74)	
	12 in	0250	0275	0209	0276	0210	0277	0211	0278	0251	0279	0252	0280	368 (14.49)	298.2 (11.74)	
	15 in			0212	0281	0213	0282	0214	0283	0254	0284	0255	0285	400 (15.75)	343.2 (13.51)	
	18 in					0216	0286	0217	0287	0257	0288	0258	0289	469 (18.46)	383.2 (15.09)	
	24 in					0219	0290	0220	0291	0260	0292	0261	0293	555 (21.85)	458.2 (18.04)	
	'S' mm (in)	35.7 (1.4)		41 (1.6)		51 (2)		56 (2.2)		61 (2.4)		71 (2.8)				

HPPA kit part no. = A-2275-XXXX (XXXX from above)

\*RE = rear exit SE = side exit

## Parts list – please quote the part number when ordering equipment

Type	Part no.	Description
Stylus kit	A-2197-0157	Stylus kit for 16 mm tooling
Stylus kit	A-2197-0158	Stylus kit for 20 mm tooling
Stylus kit	A-2197-0159	Stylus kit for 25 mm tooling
Stylus kit	A-2197-0160	Stylus kit for 32 mm tooling
Stylus kit	A-2197-0161	Stylus kit for 40 mm tooling
Stylus kit	A-2197-0162	Stylus kit for 50 mm tooling
TSI2 interface	A-2176-0010	TSI2 tool setting arm interface
Fuse	P-FS02-1A25	250 mA quick-blow fuse for TSI2
RP3 probe kit	A-2197-0049	RP3 probe assembly and user's guide
RP3 OEM kit	A-2197-0007	RP3 probe assembly, user's guide and OEM PCB
RP3 front cover kit	A-2197-0006	Front cover, eyelid and eyelid spring
Stylus break stem	M-2197-0150	Stylus break stem for 25 mm - 50 mm tooling styli
Micro break stem	M-2197-0156	Stylus break stem for 16 mm - 20 mm tooling styli
Probe enclosure	A-2275-0098	HPPA probe enclosure
Probe enclosure seal	M-2275-0076	HPPA probe enclosure seal
2 m cable	P-CA82-1010	2 m cable to connect HPPA to TSI2
5 m cable	P-CA82-1009	5 m cable to connect HPPA to TSI2
10 m cable	P-CA82-1011	10 m cable to connect HPPA to TSI2
Tool kit	A-2176-0636	Standard HP arm tool kit
Tool kit	A-2176-0639	Micro HP arm tool kit
Base fixing kit	A-2275-0113	HPPA/HPMA base fixing kit
<b>Publications.</b> These can be downloaded from our web site at <a href="http://www.renishaw.com">www.renishaw.com</a>		
RP3	H-2000-2014	Data sheet
RP3	H-2000-5187	User's guide
HPPA	H-2000-5186	User's guide
Machine tool styli	H-1000-3200	Brochure

For worldwide contact details, please visit our  
main web site at [www.renishaw.com/contact](http://www.renishaw.com/contact)

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