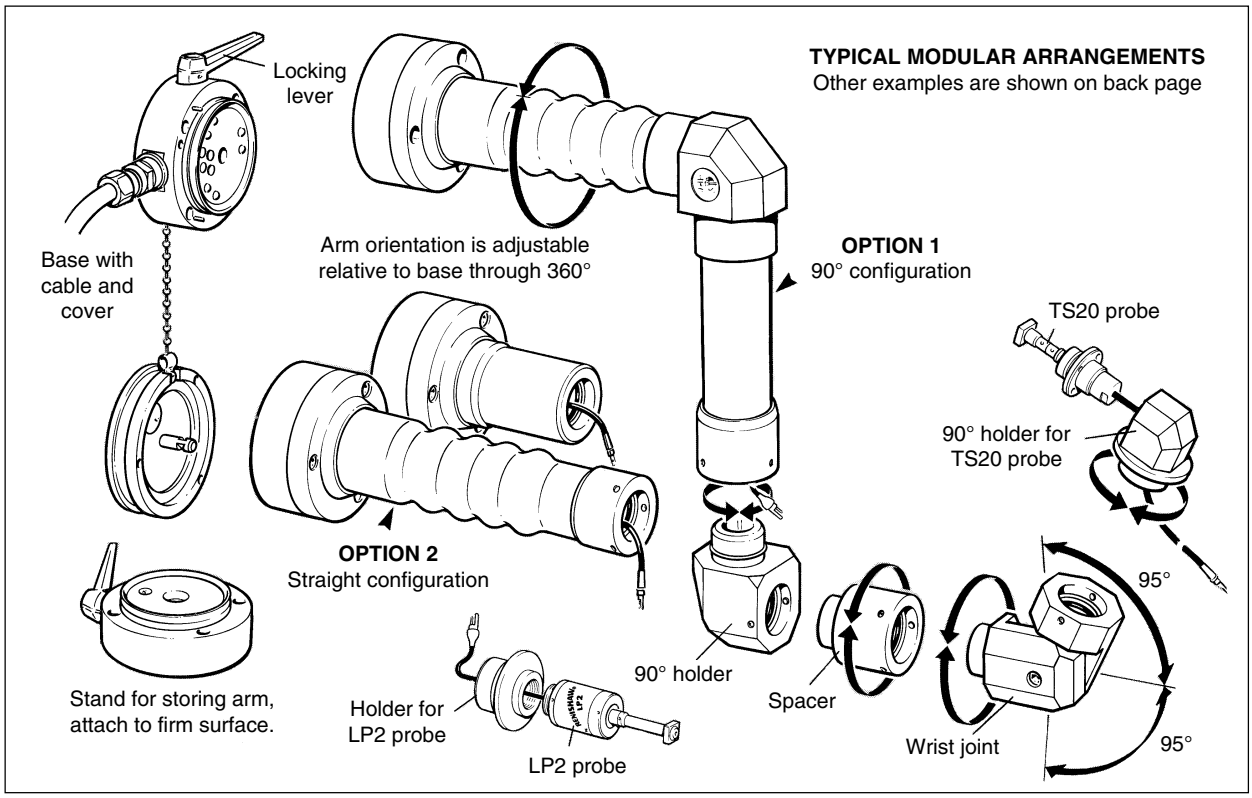
High precision tool setting arm (HPA) for CNC lathes

The HPA combined with a tool setting probe, allows big reductions in tool setting times

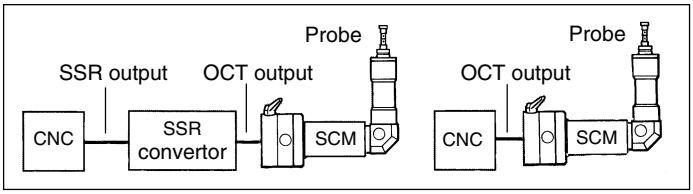


HIGH PRECISION ARM

The HPA is fitted with either a two axis TS20 probe or three axis LP2 probe. The unique HPA base design, ensures highly repeatable stylus positioning each time the HPA is loaded into the machine.

A quick release lever allows the HPA to be removed from the machine's working envelope during metal cutting and stored on a stand. The stand may be conveniently located on top of the CNC machine.

- Tool setting times up to 90% faster, than traditional methods.
- Offset calculation automatic and reliable.
- HPA typical repeatability 5µm (0.0002in) 2 sigma.
- Modular components allow the HPA to be configured to suit specific applications.
- HPA systems are available as original equipment or retrofit.



SYSTEM COMPONENTS

Select modular components with the shortest and most direct configuration, which allow the probe stylus to be correctly positioned for tool setting.

The base assembly and probe signal transmission cable are permanent fixtures on the machine.
A cover protects the base from coolant, chips and debris when the arm is removed.

A **fail safe circuit** is incorporated and can be used to prevent the machine spindle from operating, unless the cover is fitted *(Machine tool builders only).*

To use the HPA, the base cover is removed and the arm placed on the base, then locking lever is turned to secure the arm firmly in position, and the system is ready for use.

HPA output signal

Electrical connection between the probe, the base and the CNC control system is automatic. The arm incorporates a **signal conditioning module (SCM)** which converts probe signals into OCT output.
If an SSR output is required, then a Renishaw SSR convertor must be installed between the SCM and the CNC machine control.

Note: If a Renishaw MI 5 or MI 8 interface is used, then the SCM and SSR convertor must be removed.

Other system components are fully described on separate Data Sheets - see Parts List on back page.

RENISHAW®

DATA SHEET

Installation

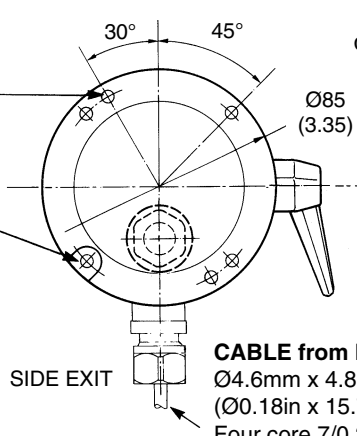
dimensions mm (inches)

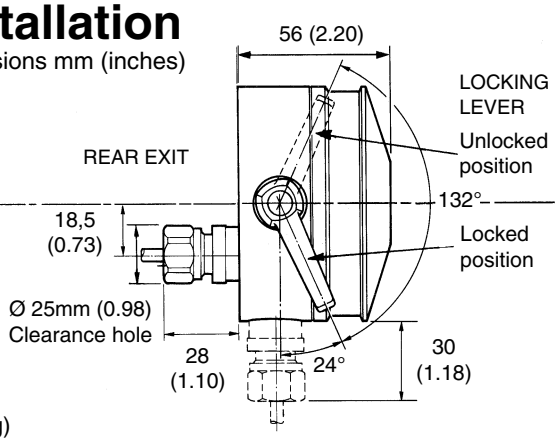
BASE with COVER
Two holes Ø4.5 (0.18) as shown on Ø75 (2.95) PC for dowels or spirol pins - customer to supply.

Four holes to suit M4 capscrews equi-spaced on Ø75 (2.95) PC for mounting base to machine.

There is a choice of either side or rear exit cable from the base.

Each base is supplied complete with cable and a cover.

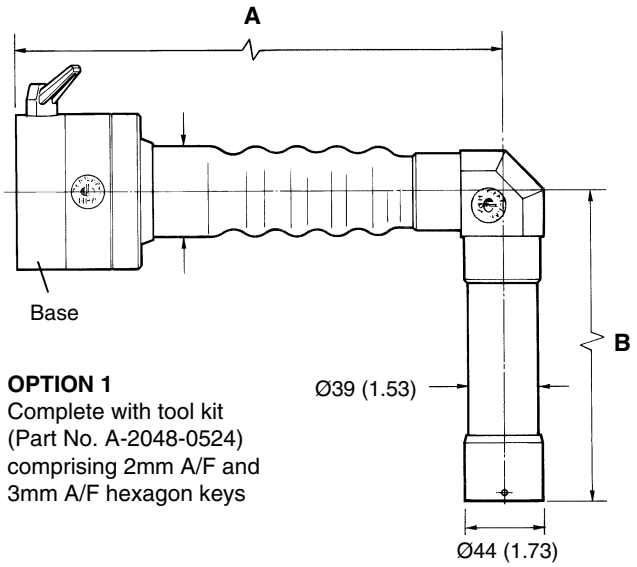




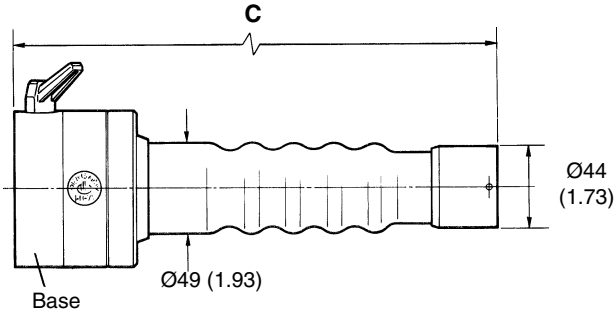
CABLE from BASE
Ø4.6mm x 4.8m long
(Ø0.18in x 15.7ft long)
Four core 7/0.2, insulated, screened cable.
The cable is protected against physical damage by fitting conduit.
The base conduit adaptor is suitable for Ø12mm steel tube or Ø11mm flexible conduit.

DESCRIPTION	PART No.
Base - Side exit	A-2048-0504
Base - Rear exit	A-2048-0503

ARM



OPTION 1
Complete with tool kit (Part No. A-2048-0524) comprising 2mm A/F and 3mm A/F hexagon keys



OPTION 2
Complete with tool kit (Part No. A-2048-0524) comprising 2mm A/F and 3mm A/F hexagon keys.

When ordering OPTION 1 or OPTION 2 add prefix A-2048 - - - - - to each Part No.

Example OPTION 1
Dimension A is 250mm and dimension B is 150mm.

Then the Part No. will be **A-2048-0648**

Note : OPTION 2
Dimension C The 145mm Extension Tube is only available for use with the 21mm or 26mm Holders for TS20.

PART No. OPTION 1

DIMENSION A	DIMENSION B										
	90 (3.54)	110 (4.33)	130 (5.12)	150 (5.91)	170 (6.69)	190 (7.48)	210 (8.26)	230 (9.06)	250 (9.84)	270 (10.63)	290 (11.42)
170 (6.69)	0601	0602	0603	0604	0605	0606	0607	0608	0609	0610	0611
190 (7.48)	0612	0613	0614	0615	0616	0617	0618	0619	0620	0621	0622
210 (8.26)	0623	0624	0625	0626	0627	0628	0629	0630	0631	0632	0633
230 (9.06)	0634	0635	0636	0637	0638	0639	0640	0641	0642	0643	0644
250 (9.84)	0645	0646	0647	0648	0649	0650	0651	0652	0653	0654	0655
270 (10.63)	0656	0657	0658	0659	0660	0661	0662	0663	0664	0665	0666
290 (11.42)	0667	0668	0669	0670	0671	0672	0673	0674	0675	0676	
310 (12.20)	0677	0678	0679	0680	0681	0682	0683	0684	0685		
330 (12.99)	0686	0687	0688	0689	0690	0691	0692	0693			
350 (13.78)	0694	0695	0696	0697	0698	0699	0700				

PART No. OPTION 2

DIMENSION C										
145 (5.71)	165 (6.49)	185 (7.28)	205 (8.07)	225 (8.86)	245 (9.65)	265 (10.43)	285 (11.22)	305 (12.00)	325 (12.80)	345 (13.58)
0560	0561	0562	0563	0564	0565	0566	0567	0568	0569	0570

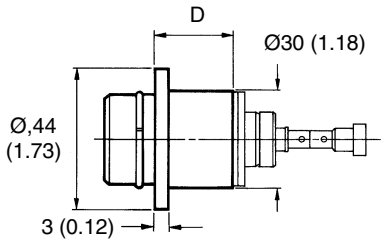
MODULAR COMPONENTS

The arm and modular range of components have common end couplings. This enables selected combinations of parts to be connected together, with the probe stylus positioned parallel to the machine's X and Z axes.

A probe holder plus a maximum of three other components may be added to the arm.

HOLDER for TS20 PROBE

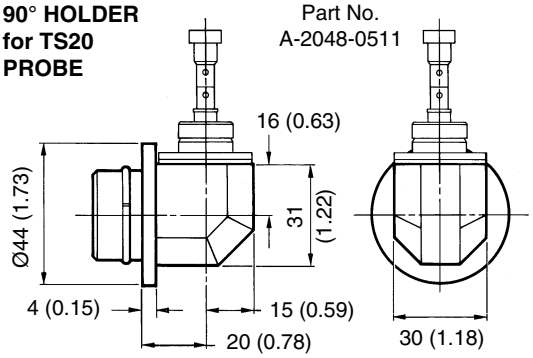
The range of four sizes is designed to increase the overall reach of the arm within the permitted limits.



DIMENSION D	PART No.
11 (0.43)	A-2048-0518
16 (0.63)	A-2048-0519
21 (0.83)	A-2048-0520
26 (1.02)	A-2048-0521

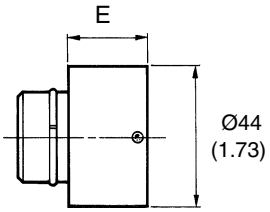
90° HOLDER for TS20 PROBE

Part No. A-2048-0511



SPACER for ARM

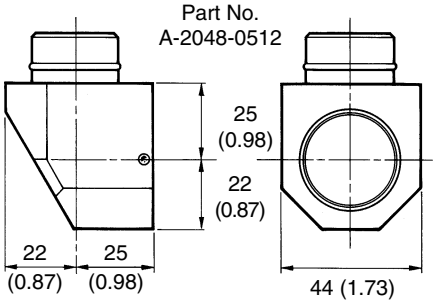
Spacers are used to increase the length of an arm.



DIMENSION E	PART No.
20 (0.79)	A-2048-0514
25 (0.98)	A-2048-0515
30 (1.18)	A-2048-0516
35 (1.38)	A-2048-0517

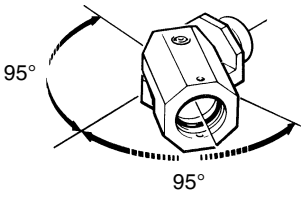
90° HOLDER for SPACER or PROBE HOLDER

Part No. A-2048-0512

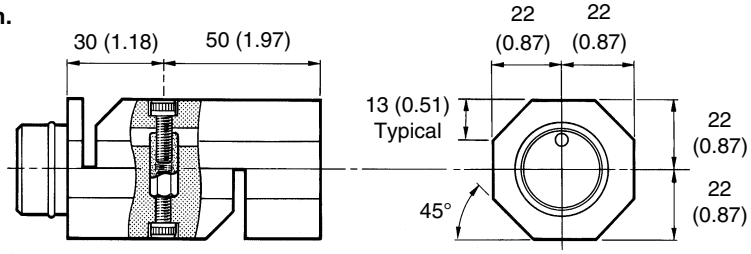


WRIST JOINT

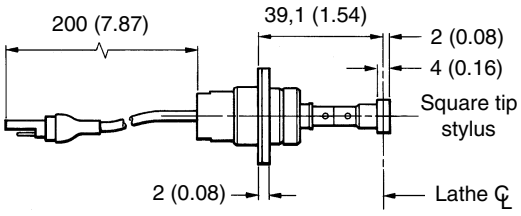
The wrist joint can be set through ±95° allowing the arm to be configured for obtuse angles.
Only one wrist joint should be used per arm.



Part No. A-2048-0513

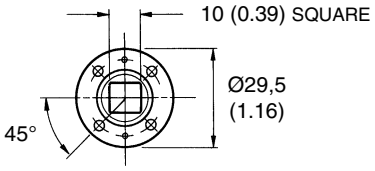


TS20 PROBE



THE FULL RANGE OF TS20 PROBES AND POWER SUPPLY REQUIREMENTS ARE GIVEN IN THE TS20 PROBE DATA SHEET

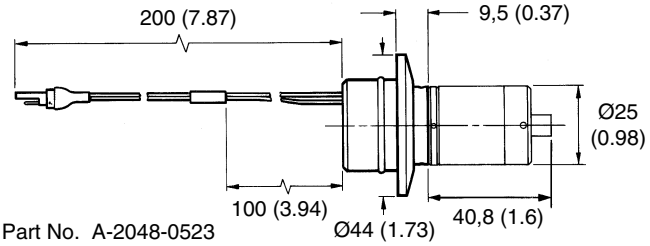
STYLUS ORIENTATION
Relative to
fixing holes
Four tip faces mutally
⊥ or // to 6µm



Part No. A-2048-0500
Complete with kit (Part No. A-2048-0507) comprising four M3 x 8 hexagon head screws and 2.5mm A/F hexagon key

HOLDER for LP2 PROBE

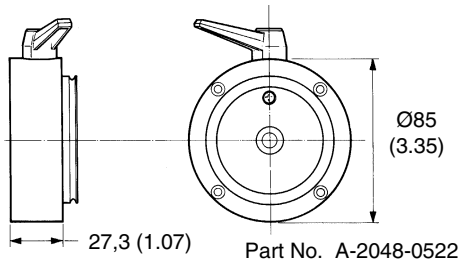
The LP2 probe may also be used on the end of the arm, in which case the LP2 holder is fitted in place of the more usual TS20 holder.



Part No. A-2048-0523

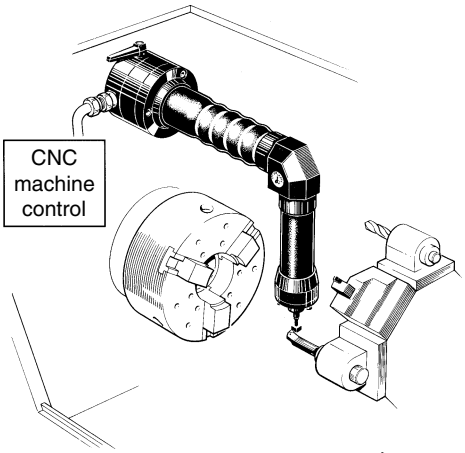
STAND for STORING ARM

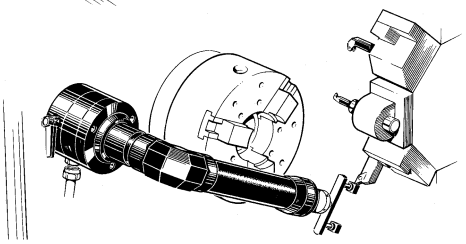
Note: The stand fixing dimensions are identical to the base dimensions - see opposite page.



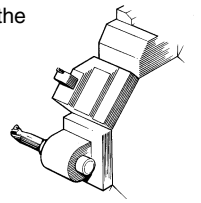
Part No. A-2048-0522

INSTALLATION



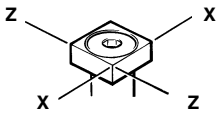


LP2 probe on twin turret lathe

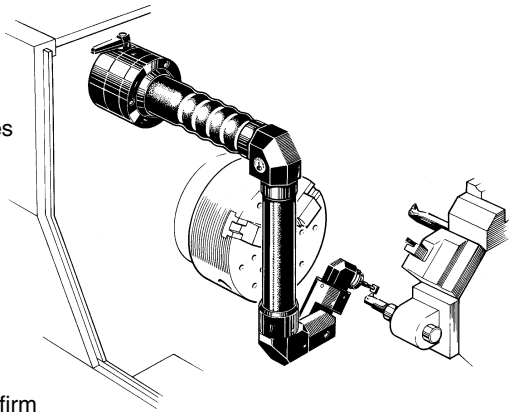


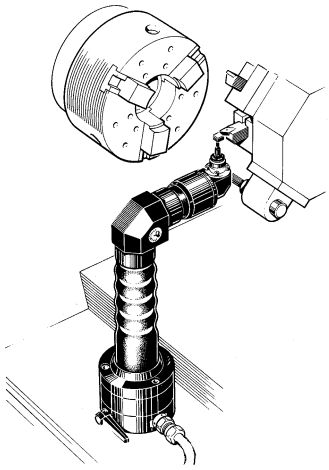
Guide lines

1. The probe stylus must be aligned with its square faces parallel to the machine's axes and must be accessible to each tool and all cutting edges.



2. Mount the HPA base on a firm rigid surface, easily accessible to the operator.
3. The distance from the base to the stylus should be as short and straight as possible, while avoiding contact with the turret, part catchers, and guards.
4. Select the simplest combination of modular components.
5. It is recommended that the basic arm, a probe holder and a maximum of three other components are used to complete an arm.
6. Store the arm in a safe clean place, using a Renishaw stand.





ELECTRICAL SUPPLY for TS20 or LP2 PROBE with signal conditioning module

The probe supply voltage should be regulated through an in-line load resistor, to ensure the current is within the permitted range - see TS20 probe Data Sheet H-2000-2110.

It is recommended that the cover present signal which is active when the cover is fitted, is utilised to inhibit the machine spindle when the cover is removed.

The cover present connections are voltage free, being shorted together when the cover is fitted.

SPINDLE INHIBIT FUNCTION

To avoid the possibility of shorting the CNC control supply, the positive signal should be input on the green wire, exiting on the yellow wire when the cover is present.

ELECTRICAL SUPPLY for TS20 or LP2 Probe without Signal Conditioning Module

Installations adapted for use with an MI 5 or MI 8 interface unit.

It is recommended that the cover present signal which is active when the cover is fitted, is utilised to inhibit the machine spindle when the cover is removed.

The cover present connections are voltage free being shorted together when the cover is fitted.

Probe	Base cable core colours	Connection
TS20 or LP2	Red	Probe supply voltage
	Blue	Probe common 0V
	Green	Cover present +
	Yellow	Cover present –

Parts List - Please quote the Part No. when ordering equipment

Please consult Renishaw if the standard range of modular components does not meet your exact requirements

Type	Part No.	Description
TS20 probe	—	See Data Sheet **H-2000-2110** TS20 probe.
LP2 probe	—	See Data Sheet **H-2000-2100** LP2/LP2H probes.
SSR convertor	—	See Data Sheet **H-2000-2117** SSR convertor.
Software	—	See Data Sheet **H-2000-2289** Probe software for machine tools.

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