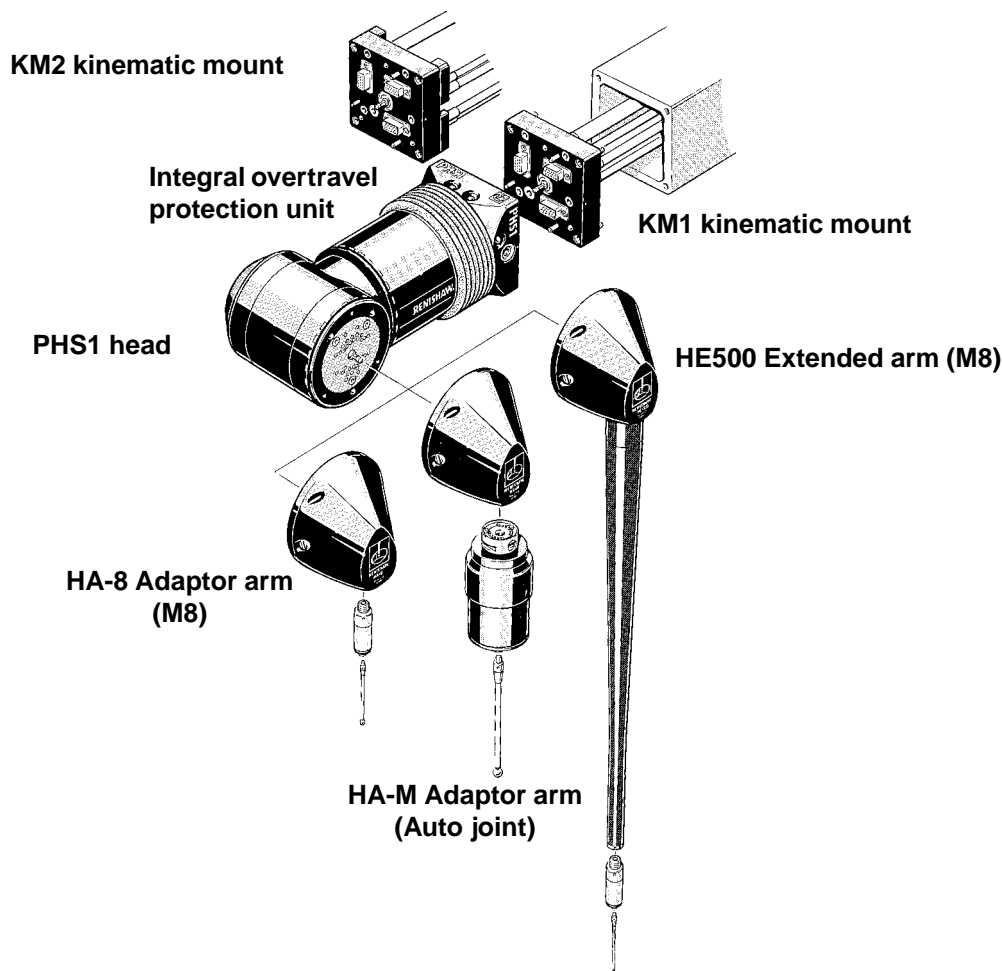


Servo Positioning Head (PHS1)



PHS1 HEAD KIT

The Renishaw servo positioning head (PHS1) is a 2 axis motorised head with continuous servo drive enabling the probe configuration to be positioned at almost any angle.

Extra long extensions allow Renishaw probes to reach normally inaccessible features.

Different probes can be fitted and automatically exchanged. These include touch trigger probes, laser measurement and scanning probes.

The PHS is designed to meet the arduous requirements of "Body in White" measurement where, fine angular positioning and long reach are needed, combined with the use of scanning probes.

System features include:

- Repeatability fitting and exchange of PHS1 probe heads.
- Easy interchangeability with Renishaw's PH10M/T motorised head systems.
- A 2 axis motorised head with continuous $\pm 184^\circ$ servo drive.
- Orientation to almost any angle.
- Long reach up to 750mm (29.53in).
- Automatic extension changing.
- Fitment of a range of sensors - trigger probes, scanning probes, laser probes.

RENISHAW 

DATA SHEET

SYSTEM DESCRIPTION

The **Servo positioning head** orientates a probe in two axes. It is commanded by the machine controller and rotary moves can be synchronised with the machine axes.

It allows probes to be accurately angled to access complex features at any orientation.

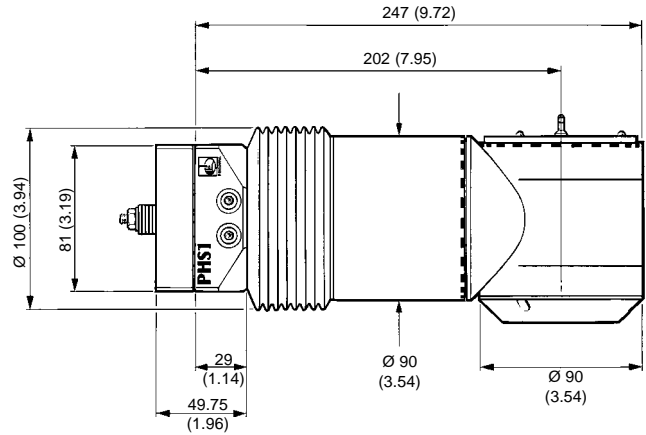
High resolution rotary encoders precisely measure the angle of the head's axes.

The head is protected by a built in **overtravel protection unit** that signals the machine to stop in the event of a collision.

A **kinematic mount** allows quick fixing of the head to the machine and fast changeover to other heads. PH10T or PH10M heads can be fitted instead of PHS in applications where existing parts need to be inspected without the need to rewrite the programs for PHS.

An air supply to the head is recommended for axis motor cooling, for optimum metrology performance.

PHS1 HEAD DIMENSIONS



dimensions mm (in)

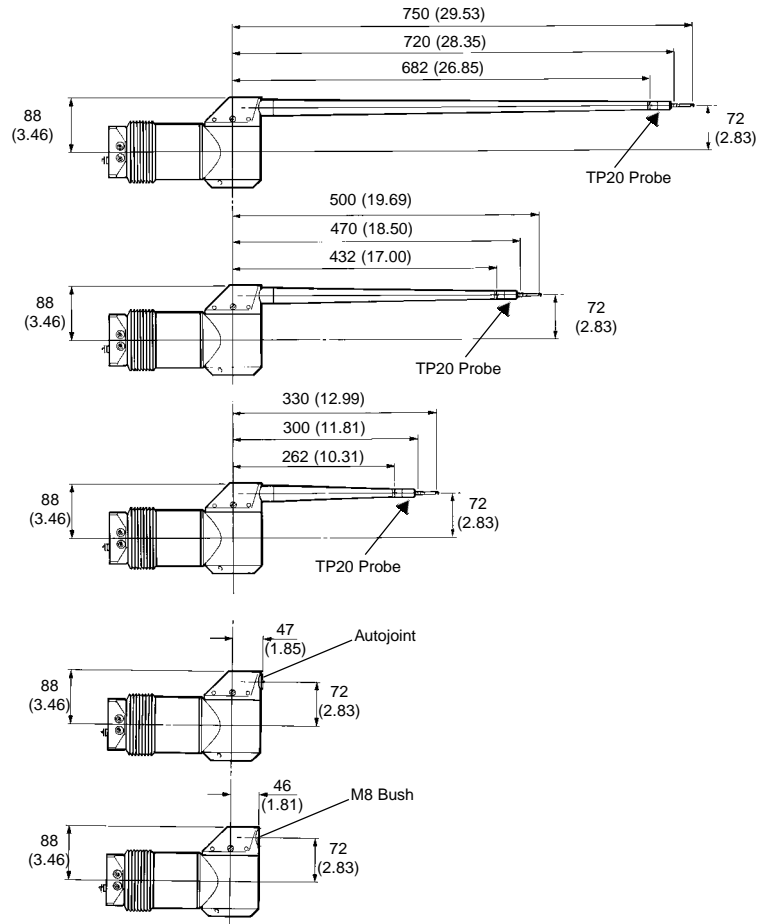
PC INTERFACE CARD

The head is controlled directly from the PC interface card in the CMM controller. The card handles communications and conditions signals between the head and the CMM controller. The PC interface card does not handle probing system signals. Further information is given in the PHS1 programmer's guide (part number H-1000-6005).

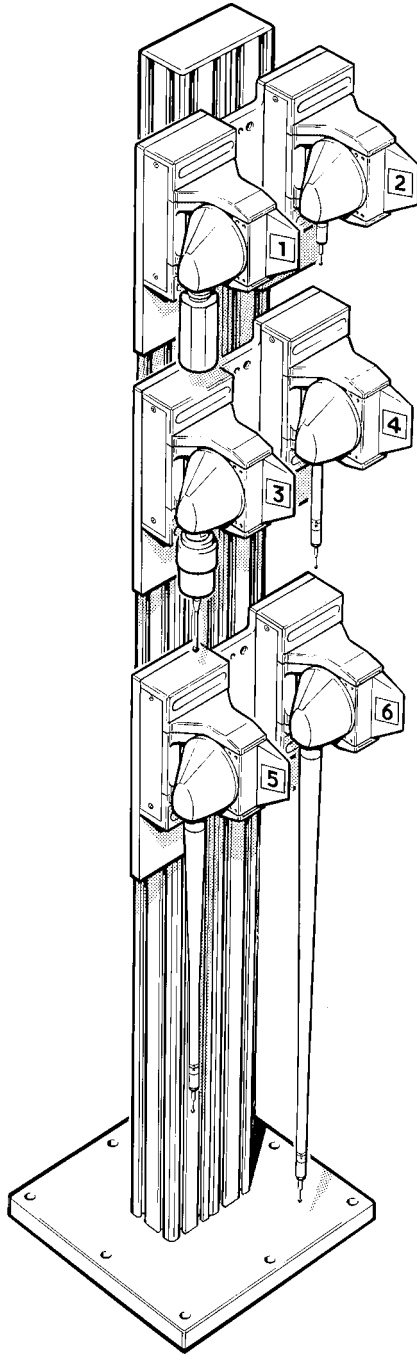
PHS1 ARM KIT

A range of **head extensions (HE)** and **head adaptors (HA)** fit to the PHS and carry the probes. These are mounted to the head either manually using an autojoint key or automatically using an autochange rack (ACR2).

Touch trigger probes can be used to reach up to 750mm (29.53in). The SP600M analogue scanning probe can be fitted to the autojoint-equipped probe arms. Arms are available to fit other Renishaw probing systems (e.g. laser probes) to the servo positioning head. Signals are made available to the PC card interface to indicate that an arm is fitted and that the arm is locked safely into position.



dimensions mm (in)



ACR2 PORT PAIR KIT

The ACR2 autochange rack is an arm changing system for the PHS1 servo positioning head system. It allows probe extensions or probe adaptors to be exchanged to suit the probing task required without manual intervention. Its modular construction and simple operation enable a number of racks to be positioned on a pillar within the machine volume. The rack is unpowered, all locking and unlocking of adaptors and extensions is done by the motion of the CMM. Further information is given in the ACR2 installation guide (part number H-1000-4045).

Note: The pillar and its base to mount the port pair are not normally supplied by Renishaw.

KINEMATIC MOUNTING JOINT

The PHS1 is connected to the CMM quill via an integral kinematic mounting joint (which is locked with the use of a 5mm hexagonal key).

Two quill mounts are available to suit different cabling options i.e. KM1 and KM2 (see front sheet). Cables either pass internally or externally along the machine quill.

MODULAR COMPONENTS

The arms and modular range of components have a common electrical/mechanical connector. This enables the arm combinations to directly mount to the PHS1 head manually and automatically.

PH10M/T FEMALE KINEMATIC ADAPTORS

There are two PH10M/T female kinematic adaptors available - PHA1 and PHA2. The PHA1 enables the PH10M/T to be kinematically mounted to the machine via a standard proprietary cube allowing in-line or 90° mounting (cube not included). The PHA2 enables the PH10M/T to be kinematically mounted to the machine quill in the in-line orientation only (no cube required).

SYSTEM SPECIFICATION

Operating temperature	15° to 40°C (59°F to 104°F)
Weight (head only)	2Kg (4.4lbs)
Carrying Capability	Combined probe and arm mass of 1Kg (2.2lbs)
Maximum torque	2Nm (17.7lbf/in)
Movement speed	150°/sec recommended with 750mm (29.53in) Ebar
Arm rotation angle	D Axis ±184° E Axis ±184°
Angular resolution	0.2 arc/sec (equivalent to 0.1µm at 100mm (3.94in) radius)
Collision protection	Signal for head protection with overtravel unit

ELECTRICAL SUPPLY

The internal interface card receives its electrical supply from the PC's 5V internal power supply, and the head from both the PC's internal 12V supply and an external 24V supply. The table below shows the power supply specifications:

Power supply	Card	+5V via PC bus 500mA max.
	Head logic	+12V via PC bus 400mA typical, 900mA inrush
	Head motors	+24V external supply 2.0A max. This must be supplied from a 24V dc SELV supply complying with the essential requirements of BSEN61010 or similar specification.

Parts list - Please quote the part no. when ordering equipment

Type	Part no.	Description
PHS1 head kit	A-2150-0815	PHS1 head, swash map, levelling tool and keys.
PHS1 PC interface card	A-2150-0824	ISA PC card.
PHS1 male quill kinematic kit	A-2150-0831 A-2150-0832	KM1 - through quill cabling kinematic. KM2 - around quill cabling kinematic.
PH10M/T female kinematic kit	A-2150-0830 A-2150-0834	PHA1 - PH10M/T adaptor mount variant 1 (cube required). PHA2 - PH10M/T adaptor mount variant 2 (in-line orientation only).
PHS1 30m cable kit	A-2150-0823	Cable kit
Power cable PL104 30m	A-2150-0481	Power cable 30m long.
Comms cable PL 105 30m	A-2150-0482	Communication cable 30m long.
Probe cable PL106V 30m	A-2150-0483	Probe cable 30m long.
Overtravel cable PL107 30m	A-2150-0484	Overtravel cable 30m long.
PHS1 arm kit	A-2150-0816	750mm arm, 500mm arm, two autojoint arms, two M8 arms and wooden box.
HE750 PHS Ebar	A-2150-0063	750mm long carbon fibre Extended Arm (M8).
HE500 PHS Ebar	A-2150-0064	500mm long carbon fibre Extended Arm (M8).
HE330 PHS Ebar	A-2150-0078	330mm long carbon fibre Extended Arm (M8).
HA-M PHS multiwire adaptor	A-2150-0065	Autojoint Adaptor Arm.
HA-8 PHS M8 adaptor	A-2150-0066	M8 Adaptor Arm.
Wooden box for PHS Ebars	A-2150-0191	Wooden box for the PHS1 Ebars
S10 autojoint key	A-1051-0040	Arm locking key.
ACR2 port pair kit	A-1383-0003	2 port PHS1 autochange rack.

ASSOCIATED PUBLICATIONS

PHS1	See H-1000-5081	User's guide for PHS1.
PHS1	See H-1000-4044	Installation guide for PHS1.
PHS1	See H-1000-1047	Calibration guide for PHS1.
PHS1	See H-1000-6005	Programmer's guide for PHS1.
ACR2	See H-1000-4045	ACR2 installation guide.
Styli	See H-1000-3200	Brochure for styli and accessories.

Renishaw plc

New Mills, Wotton-under-Edge,
Gloucestershire, GL12 8JR, UK

Tel +44 (0)1453 524524
[07000 RENISHAW]

Fax +44 (0)1453 524901

Telex 437120 RENMET G

email uk@renishaw.com

Renishaw Inc., USA
Tel +1 847 286 9953
Fax +1 847 286 9974
email usa@renishaw.com

Renishaw K.K., Japan
Tel +81 3 5332 6021
Fax +81 3 5332 6025
email japan@renishaw.com

Renishaw GmbH, Germany
Tel +49 7127 9810
Fax +49 7127 88237
email germany@renishaw.com

Renishaw S.A., France
Tel +33 1 64 61 84 84
Fax +33 1 64 61 65 26
email france@renishaw.com

Renishaw S.p.A., Italy
Tel +39 011 9 66 10 52
Fax +39 011 9 66 40 83
email italy@renishaw.com

Renishaw Iberica S.A., Spain
Tel +34 93 478 21 31
Fax +34 93 478 16 08
email spain@renishaw.com

Renishaw A.G., Switzerland
Tel +41 55 410 66 66
Fax +41 55 410 66 69
email switzerland@renishaw.com

Renishaw Latino Americana Ltda., Brazil
Tel +55 11 7295 2866
Fax +55 11 7295 1641
email brazil@renishaw.com

**Renishaw (Hong Kong) Ltd., Hong Kong,
The People's Republic of China**
Tel +852 2753 0638
Fax +852 2756 8786
email hongkong@renishaw.com

**Renishaw Metrology Systems Private Limited,
India**
Tel +91 80 5320 144
Fax +91 80 5320 140
email india@renishaw.com

Renishaw's Representative Offices

Australia **Tel** +61 3 9553 8267
Fax +61 3 9592 6738
email australia@renishaw.com

Indonesia **Tel** +62 21 428 70153
Fax +62 21 424 3934
email indonesia@renishaw.com

Singapore **Tel** +65 897 5466
Fax +65 897 5467
email singapore@renishaw.com

Taiwan **Tel** +886 4 2513665
Fax +886 4 2513621
email taiwan@renishaw.com

The People's Republic of China
Tel +86 10 641 07993
Fax +86 10 641 07992
email china@renishaw.com

Renishaw's Liaison Office

South Korea **Tel** +82 2 565 6878
Fax +82 2 565 6879
email southkorea@renishaw.com

RENISHAW 
www.renishaw.com