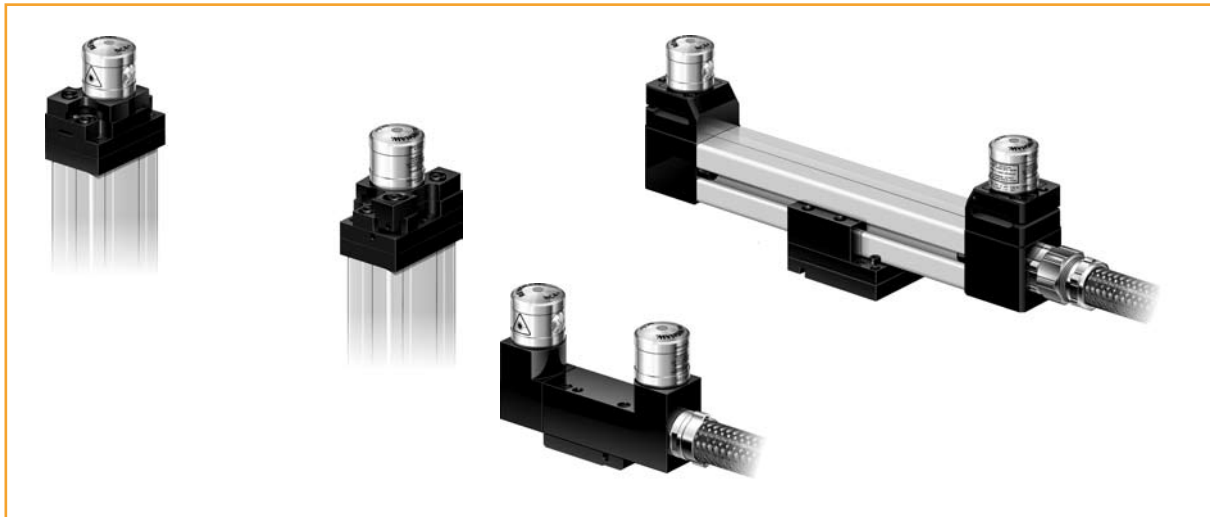


NC4 non-contact tool setting system



Tool measurement and broken tool detection anywhere along the beam

System components

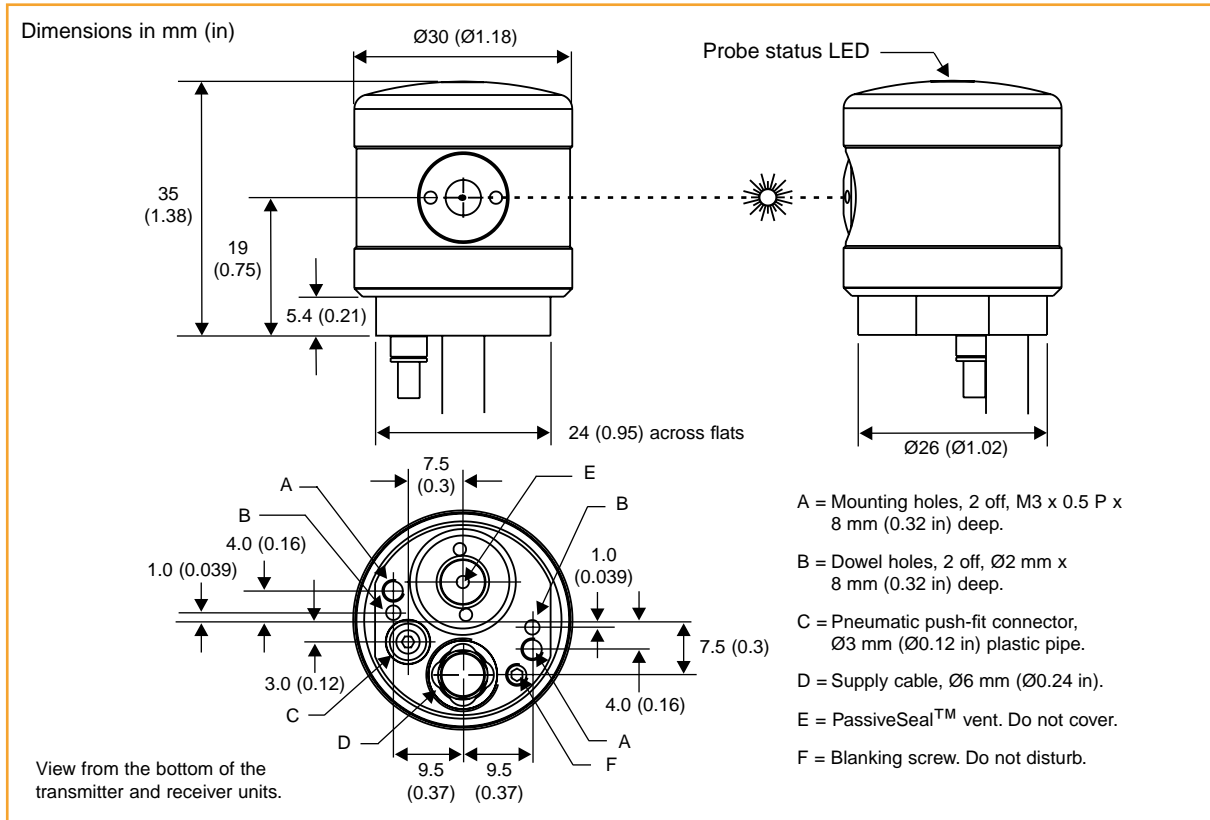
- **NC4 tool setting system**
A compact 2-axis non-contact tool setting system ($\pm X$ or $\pm Y$ and $\pm Z$) that can operate in any orientation.
- **NCi-4 interface**
Processes the signals from the NC4 and CNC machine control.
- **PSU3 power supply**
Used when a 12 V to 24 V supply is not available from the machine.
- **Air filter/regulator**
Provides the NC4 with clean dry air to protect it against coolant and swarf.
- **Software for tool setting/broken tool detection**
Suitable for use with Renishaw non-contact tool setting cycles.

System features

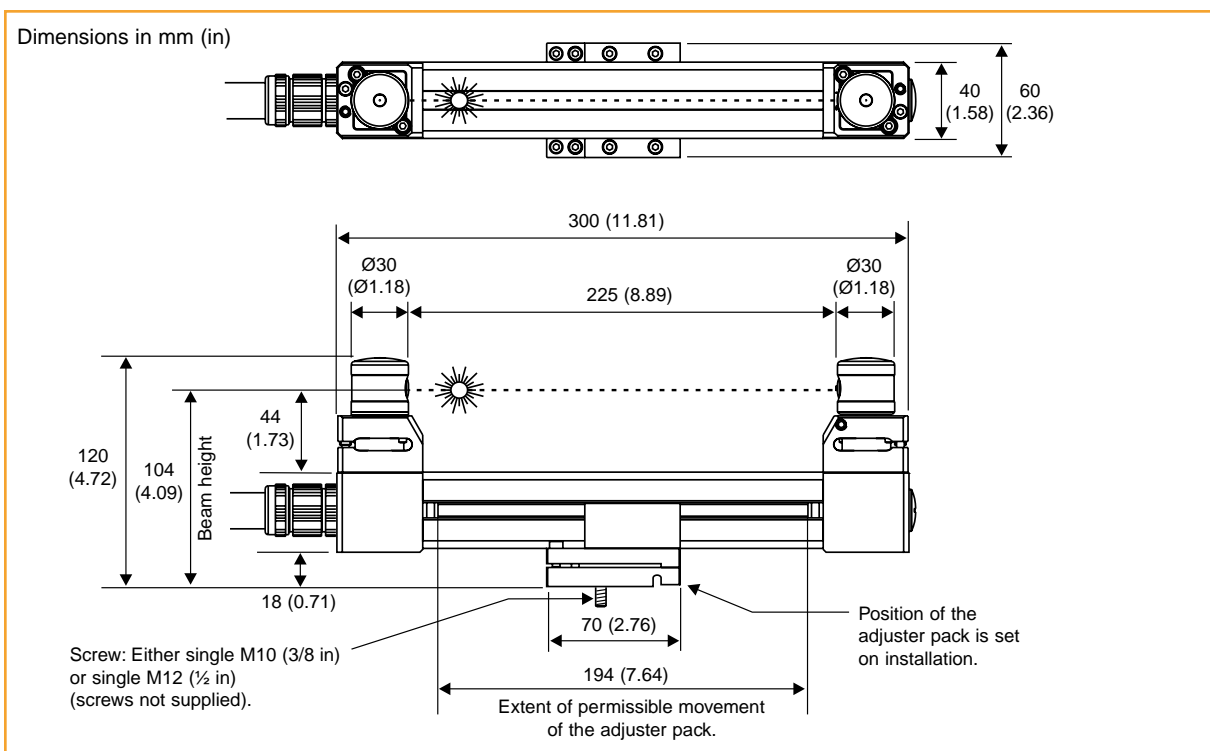
- Compact design $\varnothing 30$ mm x 35 mm high.
 - Typical repeatability $\pm 0.1 \mu\text{m } 2\sigma$. *
 - Measurement of tools and detection of broken tools $\varnothing 0.03$ mm and larger. *
 - If the air is switched off, the PassiveSeal™ failsafe sealing device prevents contamination, maintaining IPX8 protection.
 - Stainless steel body – resistant to the hostile machining environment.
 - Proven MicroHole™ technology – no moving parts.
 - Single conduit exit from product – electrical and pneumatic cables enter via single conduit.
 - Measurement of tool length and diameter at normal spindle cutting speeds.
 - Drip rejection mode – rejects signals from random drops of coolant falling through the beam.
 - Up to 5 m separation (separate system only).
 - Modular and compact fixed systems – 95 mm to 300 mm overall length. Other ranges available on request.
- * dependent on separation and mounting.

Technical data
Separate system

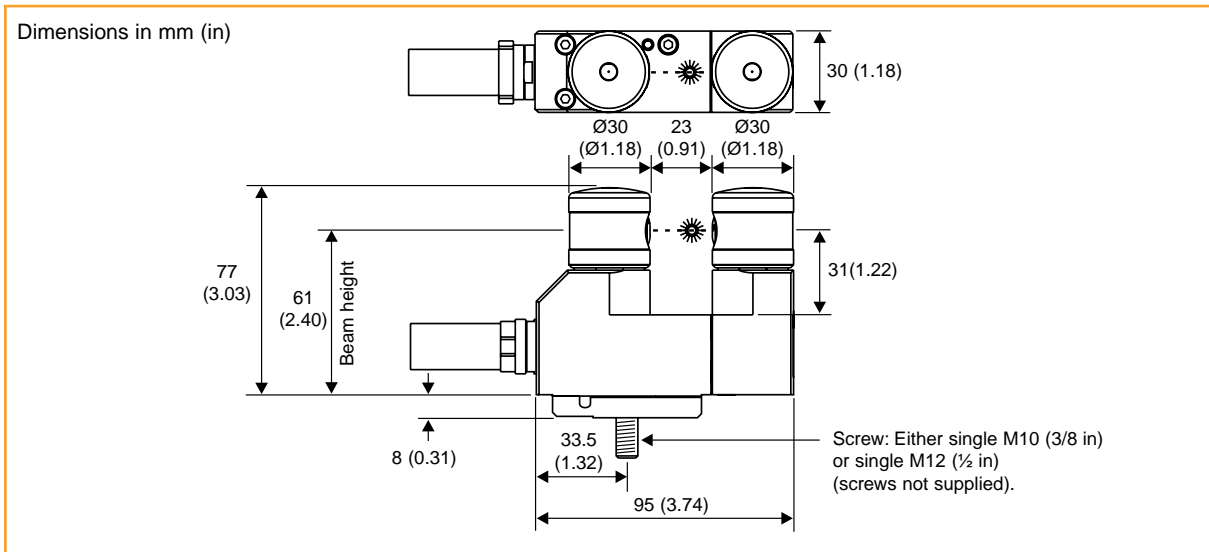
Refer to the NC4 accessories data sheet
 (H-2000-2223) for mounting details.



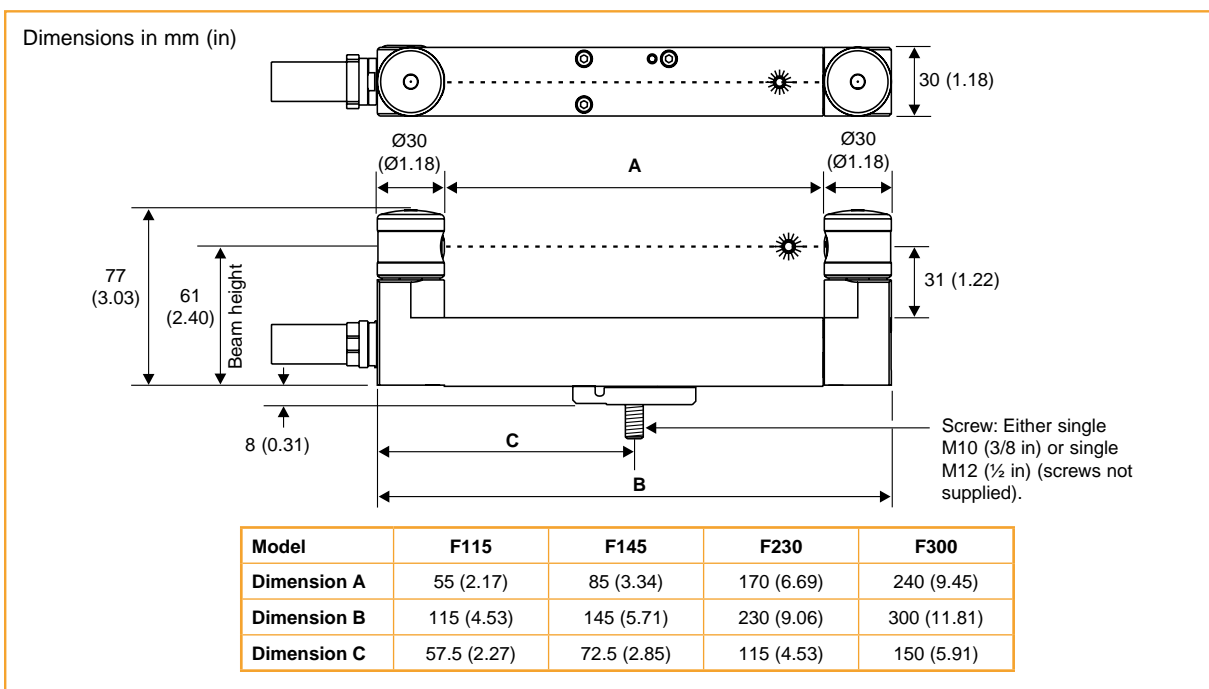
Modular fixed system



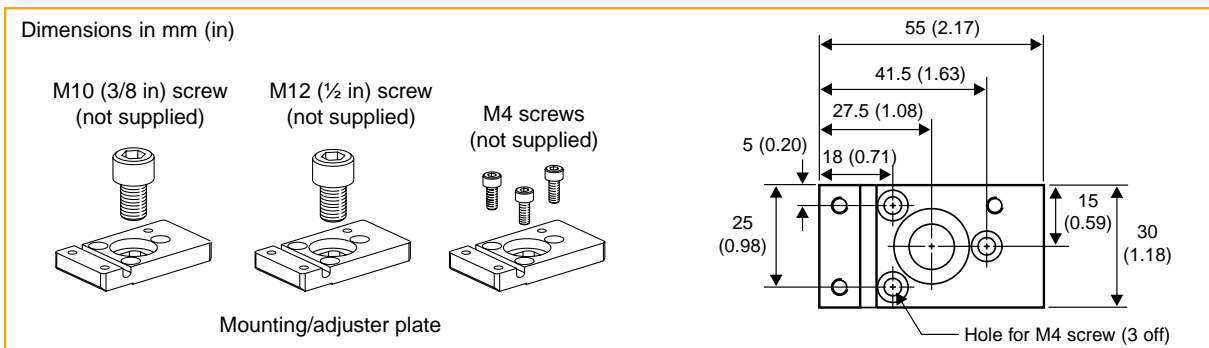
Compact fixed system – F95 model



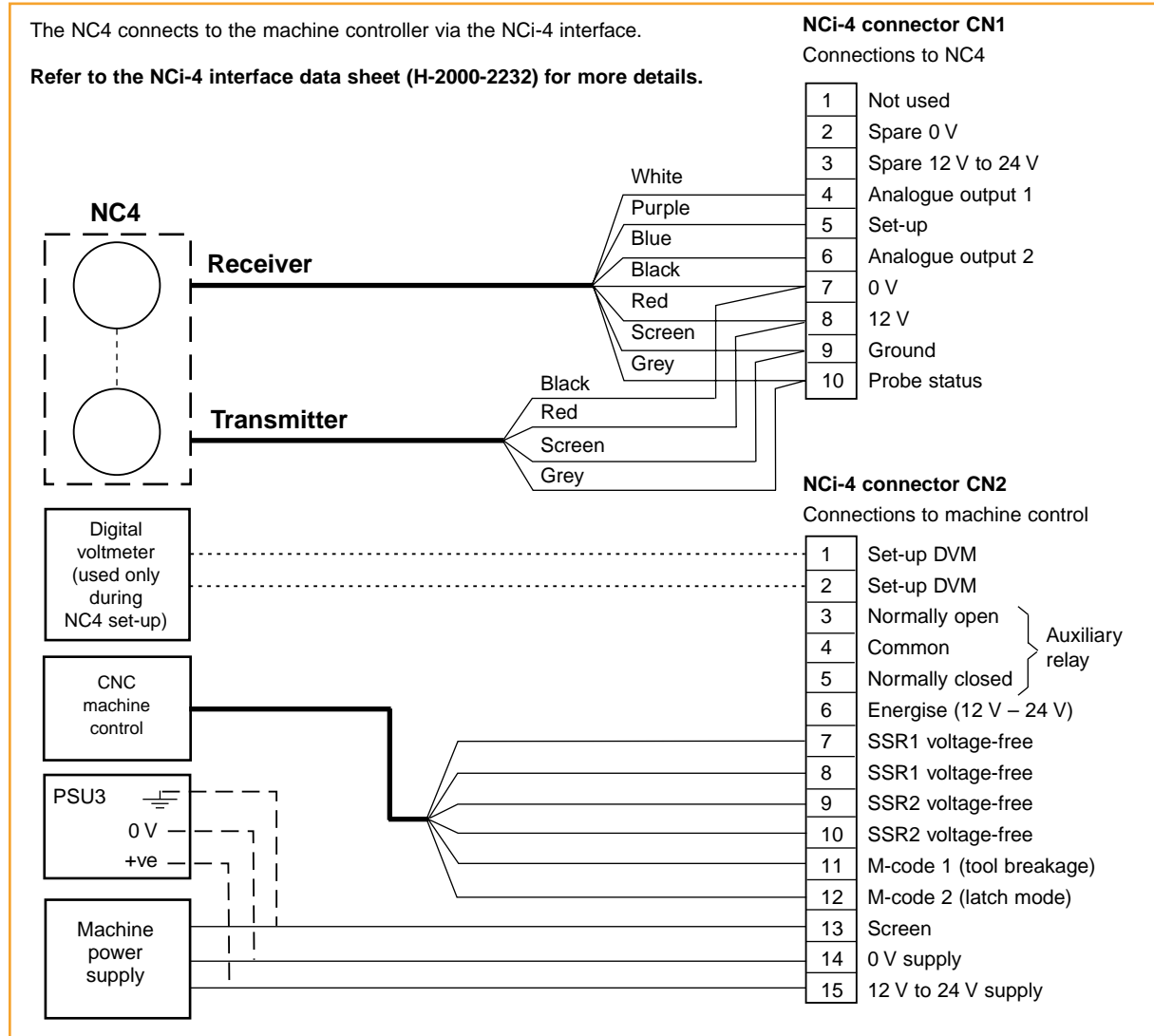
Compact fixed system – F115, F145, F230 and F300 models



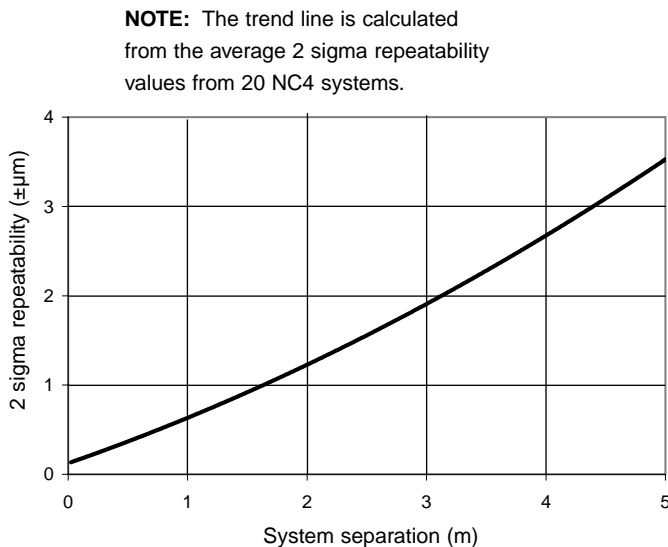
Mounting arrangements



Electrical connections



Performance – typical NC4 repeatability

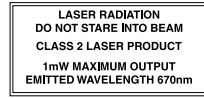


Transmitter/receiver separation (m)	Minimum tool diameter (mm) when ...	
	... measured	... detected
Compact fixed system	0.023	0.03
	0.055	0.07
	0.170	0.20
Modular fixed system	0.225	0.10
Separate system	0.50	0.10
	1.00	0.20
	2.00	0.20
	3.00	0.30
	4.00	0.30
5.00	0.30	

For guidance purposes only.

Specification

Principal application	High-precision, high-speed, non-contact tool measuring and broken tool detection on vertical and horizontal machining centres.	
Laser type	Visible red light <1 mW 670 nm Conforms to American (21 CFR 1040.10 and 1040.11 except for deviations pursuant to laser notice no. 50 dated July 26, 2001) and European (IEC 60852-1:1993 + A1:1997 + A2:2001) laser safety standards.	
Electrical connection	Separate system:	Hardwired cable on the underside of the unit.
	Fixed systems:	Hardwired cable on the end of the unit. Other configurations are available on request.
Sealing	IPX8 (air on or off).	
Laser beam alignment	Separate system:	Various optional mounting brackets are available.
	Fixed systems:	The unit is supplied with an adjustable mounting pack or plate on the underside.
Repeatability	Each transmitter and receiver is tested at 1 m separation. The specified repeatability is $\pm 1 \mu\text{m } 2\sigma$.	
Tool measurement	$\text{\O}0.03$ mm or larger depending on the separation and set-up (see previous page).	
Tool breakage detection	$\text{\O}0.03$ mm or larger depending on the separation and set-up (see previous page).	
Power supply	120 mA @ 12 V, 70 mA @ 24 V	
Output signal (from interface unit)	Two voltage-free, solid state relays (SSR). Each can be either normally open or normally closed (selectable via a switch). Current (max.) 50 mA, voltage (max.) ± 50 V. The interface contains an auxiliary relay which can be used for switching the output between the NC4 and a spindle probe.	
Temperature limit	Operating:	5 °C to 50 °C.
	Storage:	-10 °C to 70 °C.
Life	Tested to >1 million on/off cycles.	
Pneumatic supply	$\text{\O}3$ mm air pipe, 3 bar (43 psi) min., 6 bar (87 psi) max. The air supply to the NC4 must conform to ISO 8573-1: Class 1.7.2.	
Cable	Two twisted pairs, 2 individual cores plus screen. Each core 18/0.1 insulated. $\text{\O}6.0$ mm x 12.5 m long.	
Weight (single transmitter or receiver unit with cable)	0.5 kg (1.1 lb)	
Mounting	Separate system:	2 off M3 x 0.5 P fixing holes plus 2 off $\text{\O}2$ mm dowel holes.
	Fixed systems:	Single M10 (3/8 in) or M12 (1/2 in) fixing. Alternative fixing arrangements available.
Supply protection	Resettable fuses. Reset by removing power and cause of fault.	



Parts list – please quote the part number when ordering equipment

Separate systems

Type	Part number	Description
S300 to 500 assembly	A-4114-5005	Transmitter and receiver, laser warning sign, installation and maintenance guide
S500 to 800 assembly	A-4114-5010	Transmitter and receiver, laser warning sign, installation and maintenance guide
S800 to 1500 assembly	A-4114-5015	Transmitter and receiver, laser warning sign, installation and maintenance guide
S1500 to 2000 assembly	A-4114-5020	Transmitter and receiver, laser warning sign, installation and maintenance guide
S2000 to 3000 assembly	A-4114-5025	Transmitter and receiver, laser warning sign, installation and maintenance guide
S3000 to 5000 assembly	A-4114-5030	Transmitter and receiver, laser warning sign, Installation and maintenance guide
S300 to 500 kit	A-4114-5055	S300 to 500 assembly, NCi-4 interface, air filter kit, conduit kit, tool kit, laser warning sign, installation and maintenance guide
S500 to 800 kit	A-4114-5060	S500 to 800 assembly, other items as A-4114-5055
S800 to 1500 kit	A-4114-5065	S800 to 1500 assembly, other items as A-4114-5055
S1500 to 2000 kit	A-4114-5070	S1500 to 2000 assembly, other items as A-4114-5055
S2000 to 3000 kit	A-4114-5075	S2000 to 3000 assembly, other items as A-4114-5055
S3000 to 5000 kit	A-4114-5080	S3000 to 5000 assembly, other items as A-4114-5055

Modular fixed system

Type	Part number	Description
F300 assembly	A-4114-5100	F300 modular fixed unit, laser warning sign, installation and maintenance guide
F300 kit	A-4114-5110	F300 assembly, NCi-4 interface, air filter kit, conduit kit, tool kit, laser warning sign, installation and maintenance guide

Compact fixed system

Type	Part number	Description
F95 assembly	A-5299-5210	F95 compact fixed unit, laser warning sign, installation and maintenance guide
F115 assembly	A-5299-5010	F115 compact fixed unit, laser warning sign, installation and maintenance guide
F145 assembly	A-5299-5310	F145 compact fixed unit, laser warning sign, installation and maintenance guide
F145 90-degree assembly	A-5299-5410	F145 90-degree compact fixed unit, laser warning sign, installation and maintenance guide
F230 assembly	A-5299-5110	F230 compact fixed unit, laser warning sign, installation and maintenance guide
F300 assembly	A-5299-5710	F300 compact fixed unit, laser warning sign, installation and maintenance guide
F95 kit	A-5299-5200	F95 assembly, NCi-4 interface, air filter kit, conduit kit, tool kit, laser warning sign, installation and maintenance guide
F115 kit	A-5299-5000	F115 assembly, other items as A-4114-5200
F145 kit	A-5299-5300	F145 assembly, other items as A-4114-5200
F145 90-degree kit	A-5299-5400	F145 90-degree assembly, other items as A-4114-5200
F230 kit	A-5299-5100	F230 assembly, other items as A-4114-5200
F300 kit	A-5299-5705	F300 assembly, other items as A-4114-5200

See data sheet part number H-2000-2223 for all NC4 accessories.

See data sheet part number H-2000-2232 for the NCi-4 interface.

See data sheet part numbers H-2000-2289 and H-2000-2298 for probe software for machine tools.

See data sheet part number H-2000-2200 for the PSU3 power supply unit.

For worldwide contact details, please visit our main web site at www.renishaw.com/contact