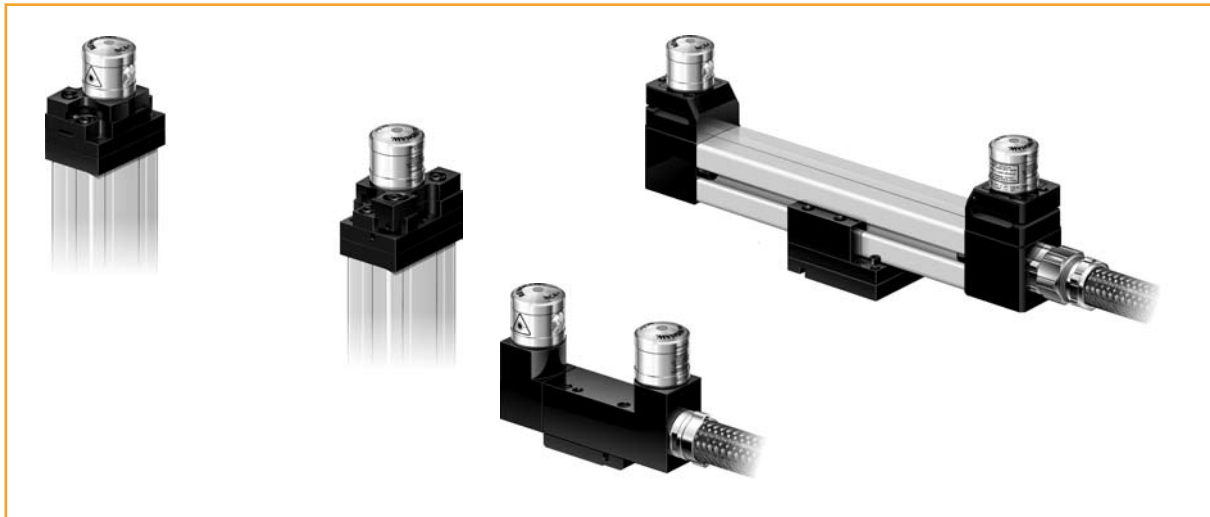


NC4 non-contact tool setting system



Tool measurement and broken tool detection anywhere along the beam

System components

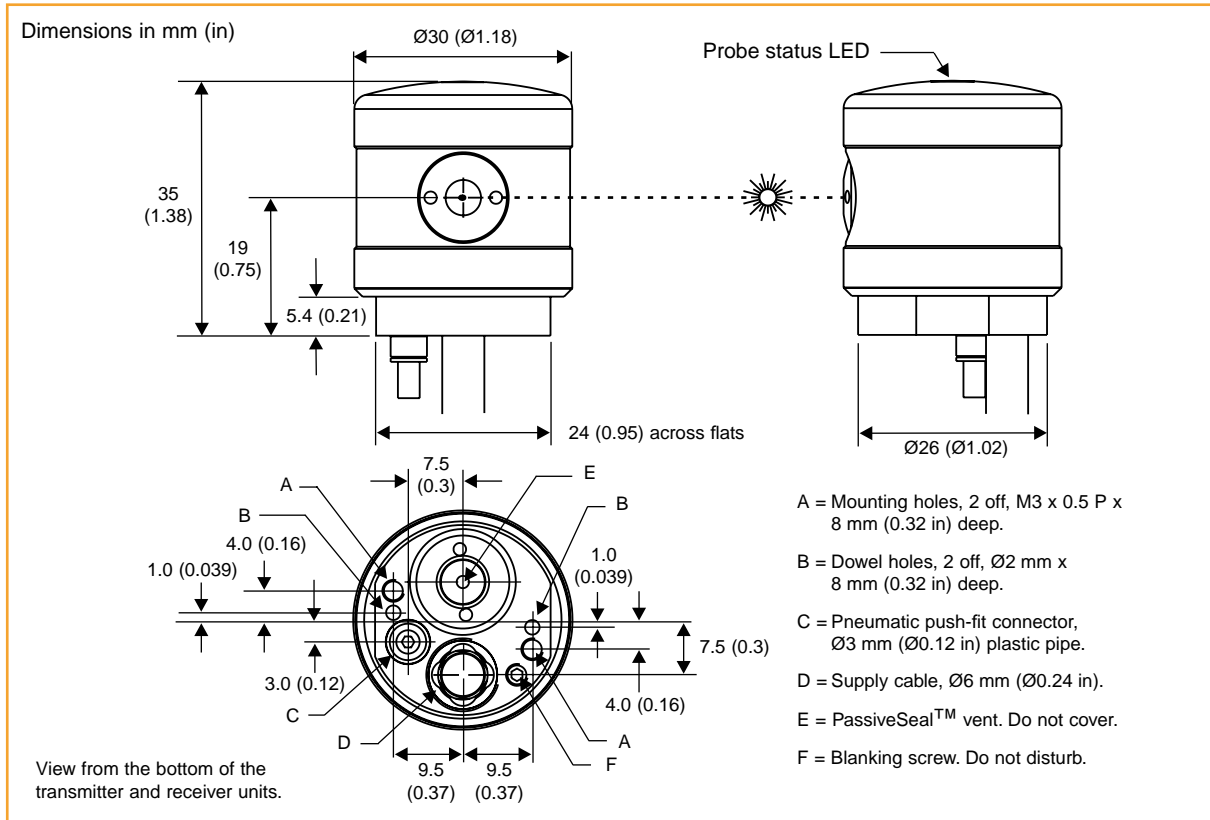
- **NC4 tool setting system**
A compact 2-axis non-contact tool setting system ($\pm X$ or $\pm Y$ and $\pm Z$) that can operate in any orientation.
- **NCi-4 interface**
Processes the signals from the NC4 and CNC machine control.
- **PSU3 power supply**
Used when a 12 V to 24 V supply is not available 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

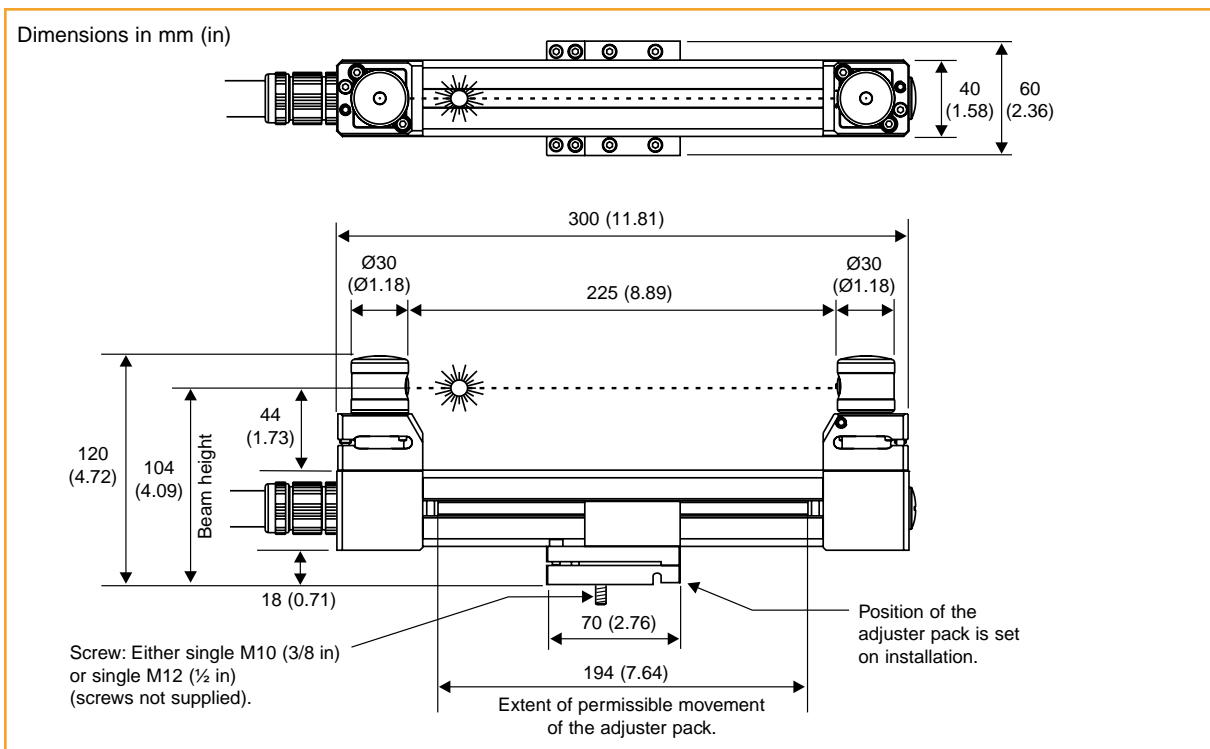
- Compact design $\varnothing 30$ mm x 35 mm high.
 - Typical repeatability $\pm 0.1 \mu\text{m } 2\sigma$. *
 - Measurement of tools and detection of broken tools $\varnothing 0.03$ mm and larger. *
 - If the air is switched off, the PassiveSeal™ failsafe sealing device prevents contamination, maintaining 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

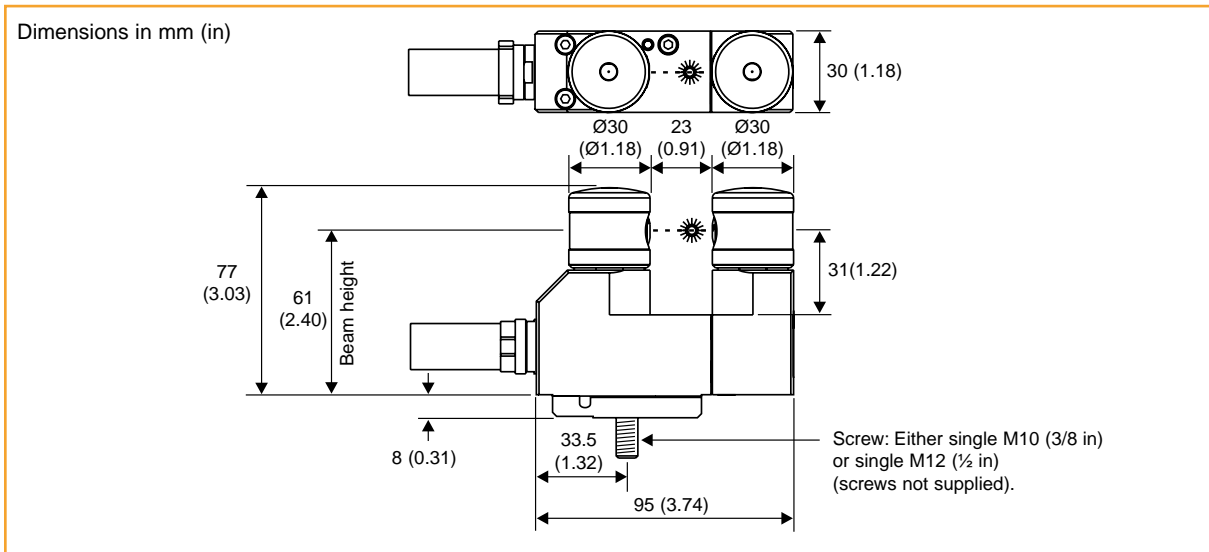
Refer to the NC4 accessories data sheet
 (H-2000-2223) for mounting details.



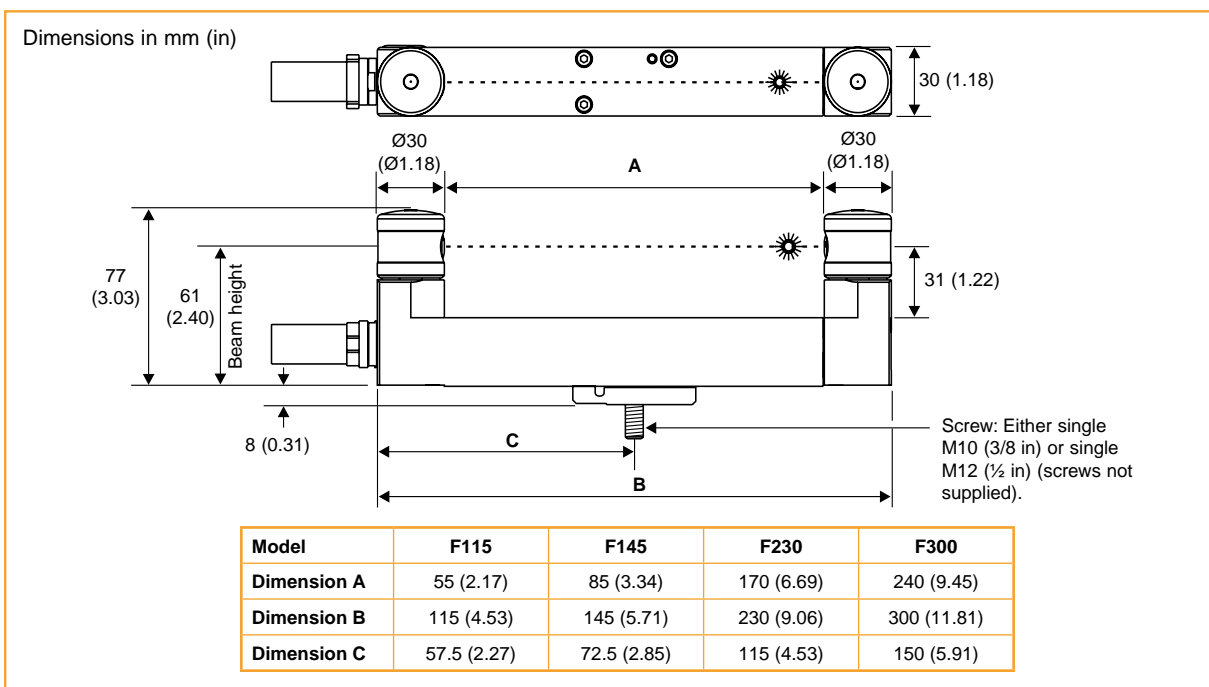
Modular fixed system



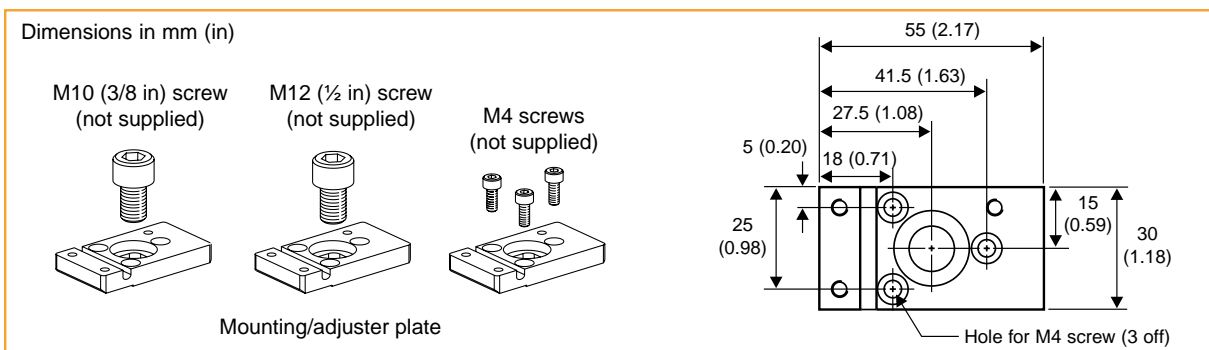
Compact fixed system – F95 model



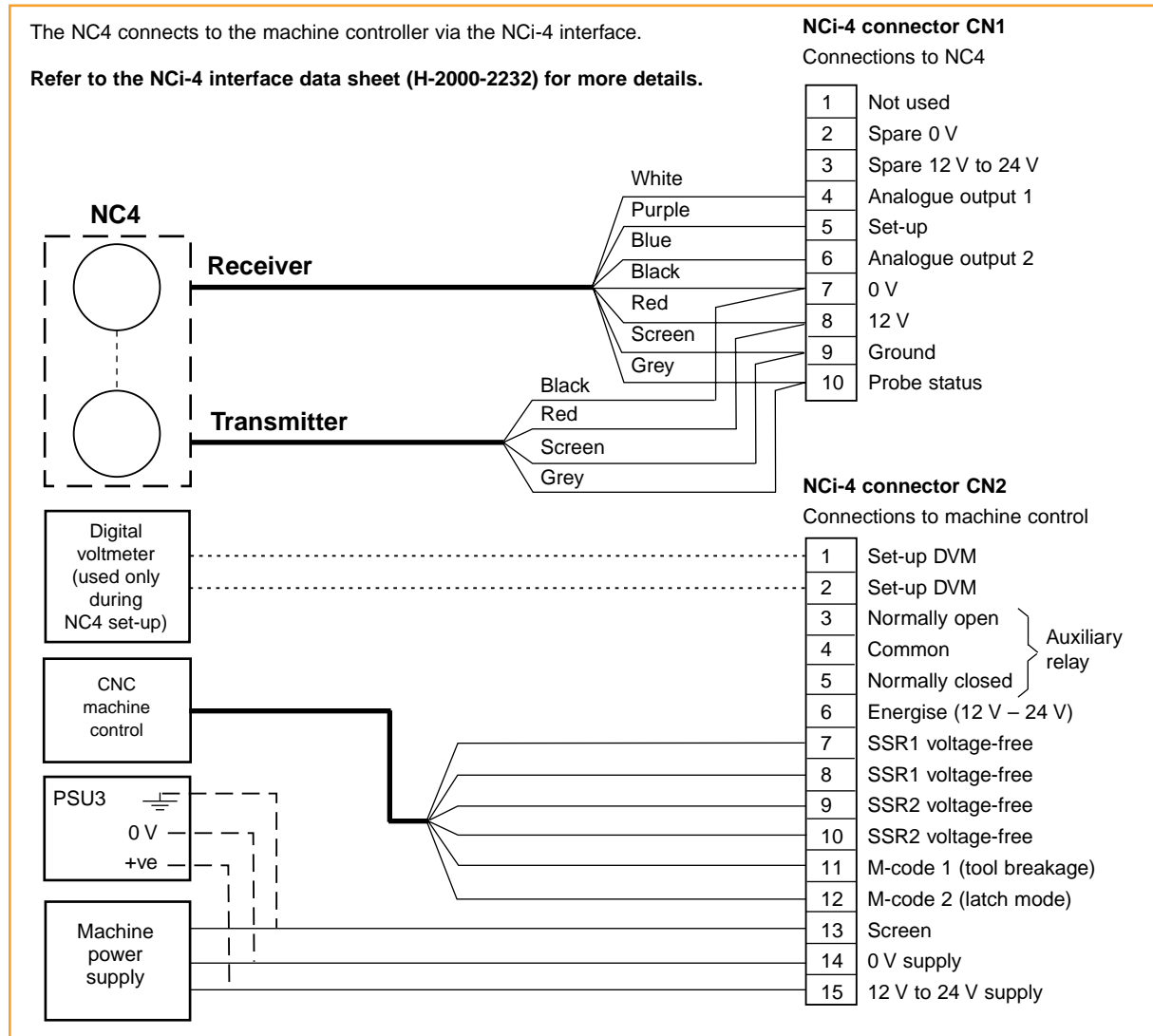
Compact fixed system – F115, F145, F230 and F300 models



Mounting arrangements

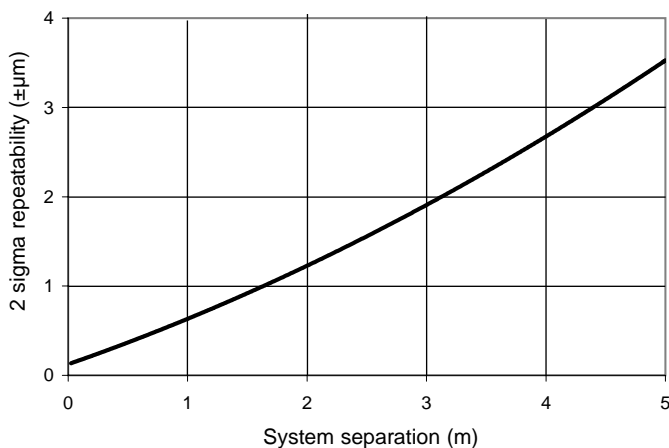


Electrical connections



Performance – typical NC4 repeatability

NOTE: The trend line is calculated from the average 2 sigma repeatability values from 20 NC4 systems.

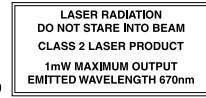


Transmitter/receiver separation (m)	Minimum tool diameter (mm) when ...	
	... measured	... detected
Compact fixed system	0.023	0.03
	0.055	0.07
	0.085	0.08
	0.170	0.20
Modular and compact fixed system	0.225/0.24	0.20
Separate system	0.50	0.30
	1.00	0.40
	2.00	0.50
	3.00	0.60
	4.00	1.00
	5.00	1.00

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	$\varnothing 0.03$ mm or larger depending on the separation and set-up (see previous page).	
Tool breakage detection	$\varnothing 0.03$ 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. This relay could also be used to control an air blast kit (not supplied).	
Temperature limit	Operating:	5 °C to 50 °C.
	Storage:	-10 °C to 70 °C.
Life	Tested to >1 million on/off cycles.	
Pneumatic supply	$\varnothing 3$ 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. $\varnothing 6.0$ 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 $\varnothing 2$ 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.

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