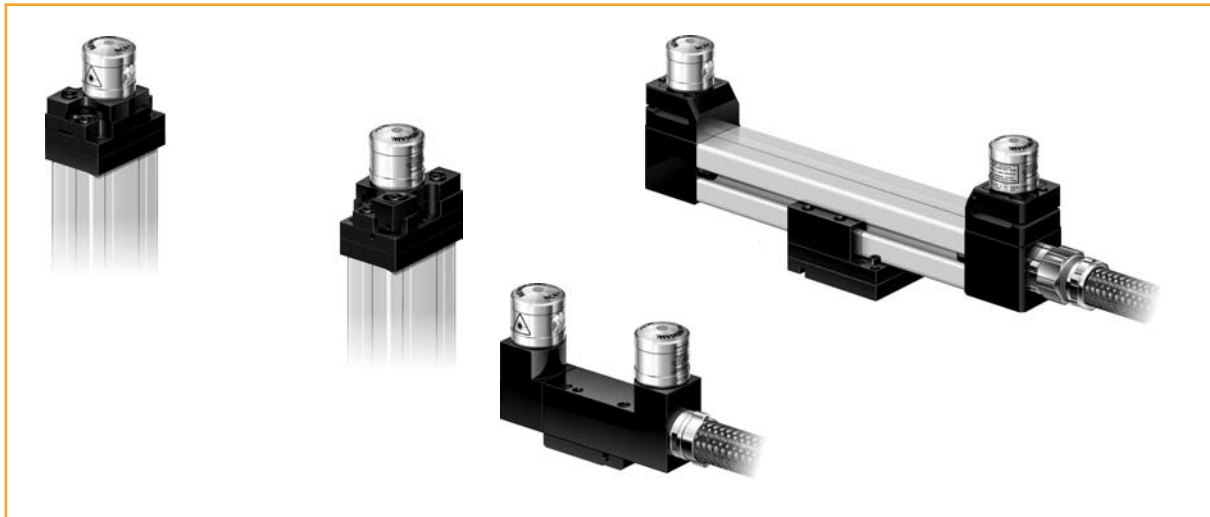


NC4 non-contact tool setting system



Tool measurement and broken tool detection anywhere along the beam

System components

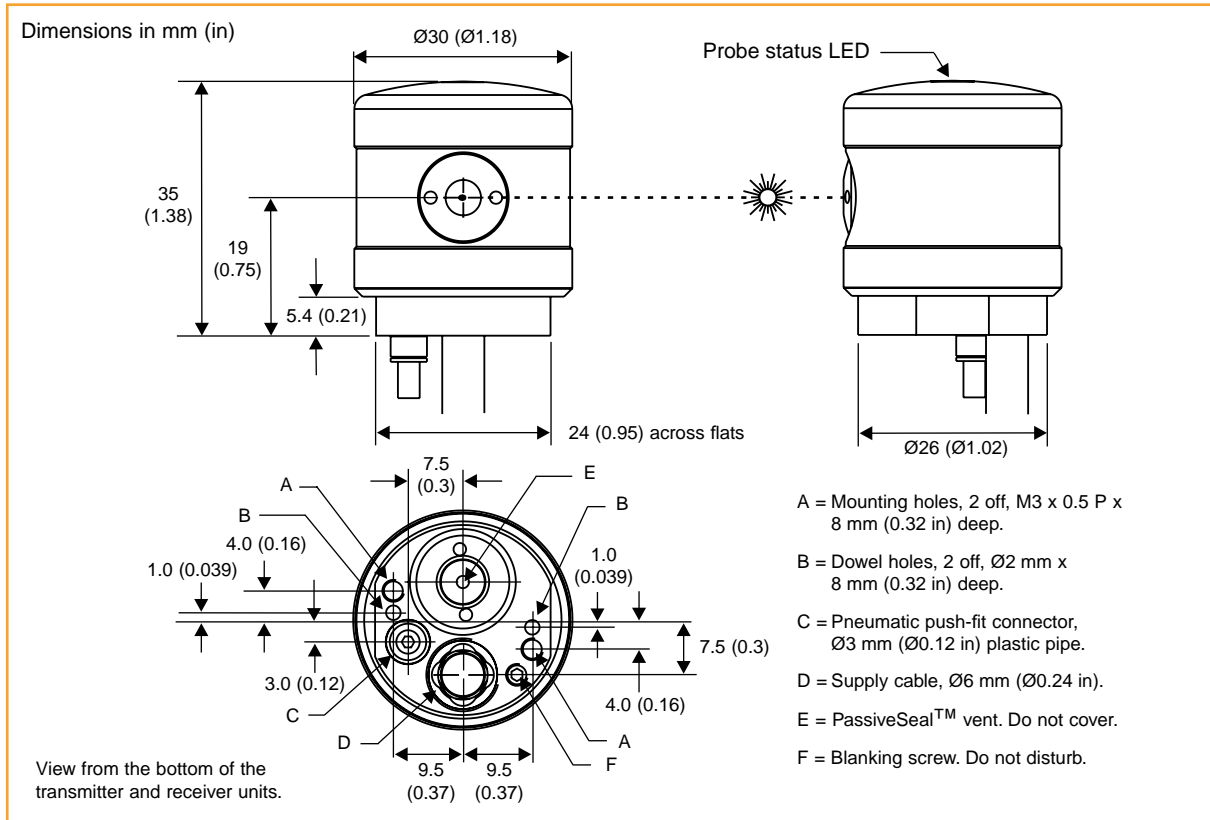
- **NC4 tool setting system**
A compact 2-axis non-contact tool setting system ($\pm X$ or $\pm Y$ and $\pm Z$) that can operate in any orientation.
- **NCi-4 interface**
Processes the signals from the NC4 and CNC machine control.
- **PSU3 power supply**
Used when a 12 V to 24 V supply is not available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

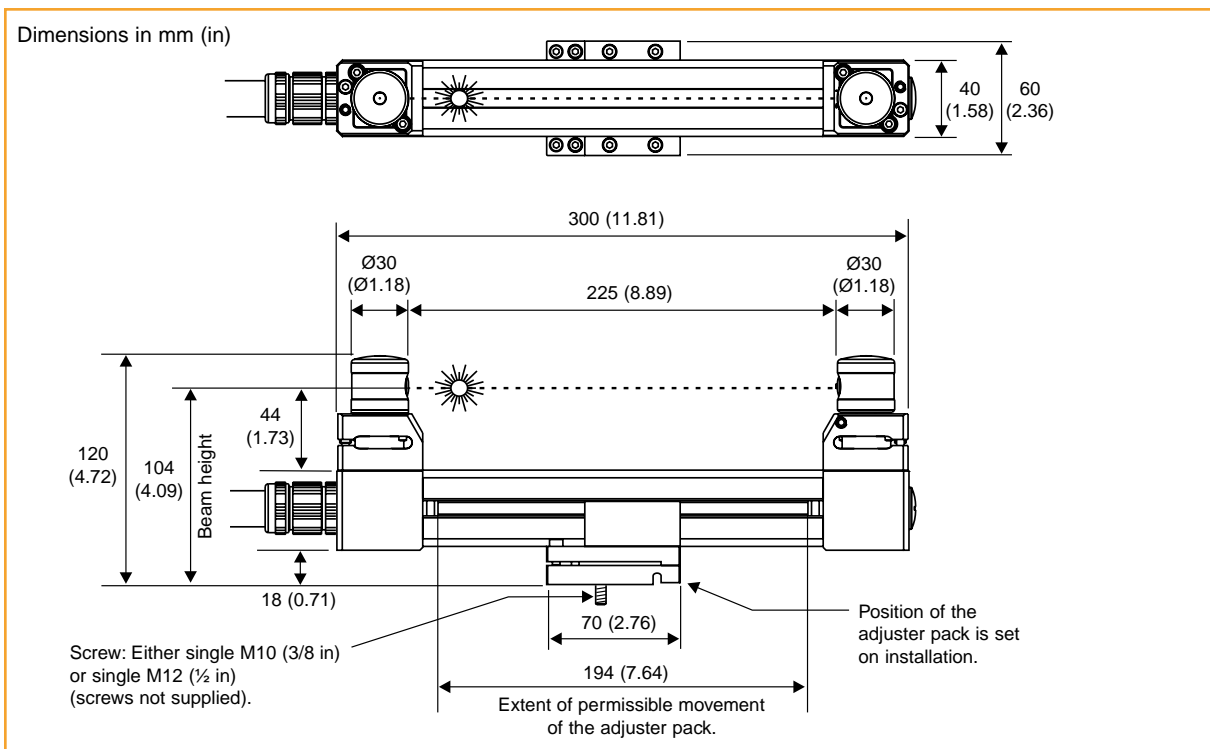
- Compact design $\text{Ø}30$ mm x 35 mm high.
 - Typical repeatability $\pm 0.1 \mu\text{m } 2\sigma$. *
 - Measurement of tools and detection of broken tools $\text{Ø}0.03$ mm and larger. *
 - If the air is switched off, the PassiveSeal™ failsafe sealing device prevents contamination, maintaining IPX8 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

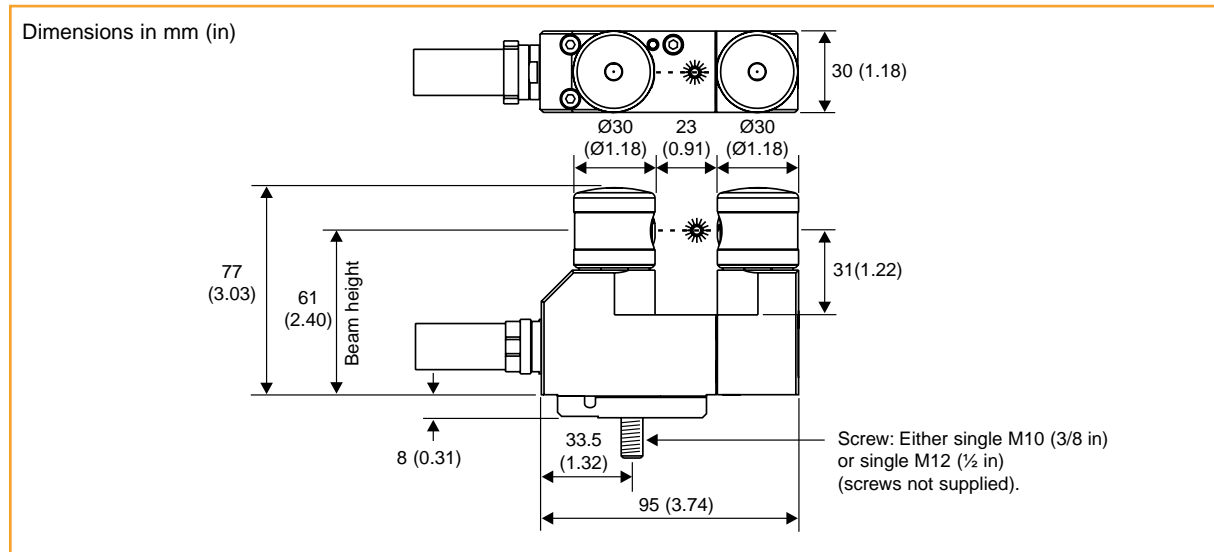
Refer to the NC4 accessories data sheet
 (H-2000-2223) for mounting details.



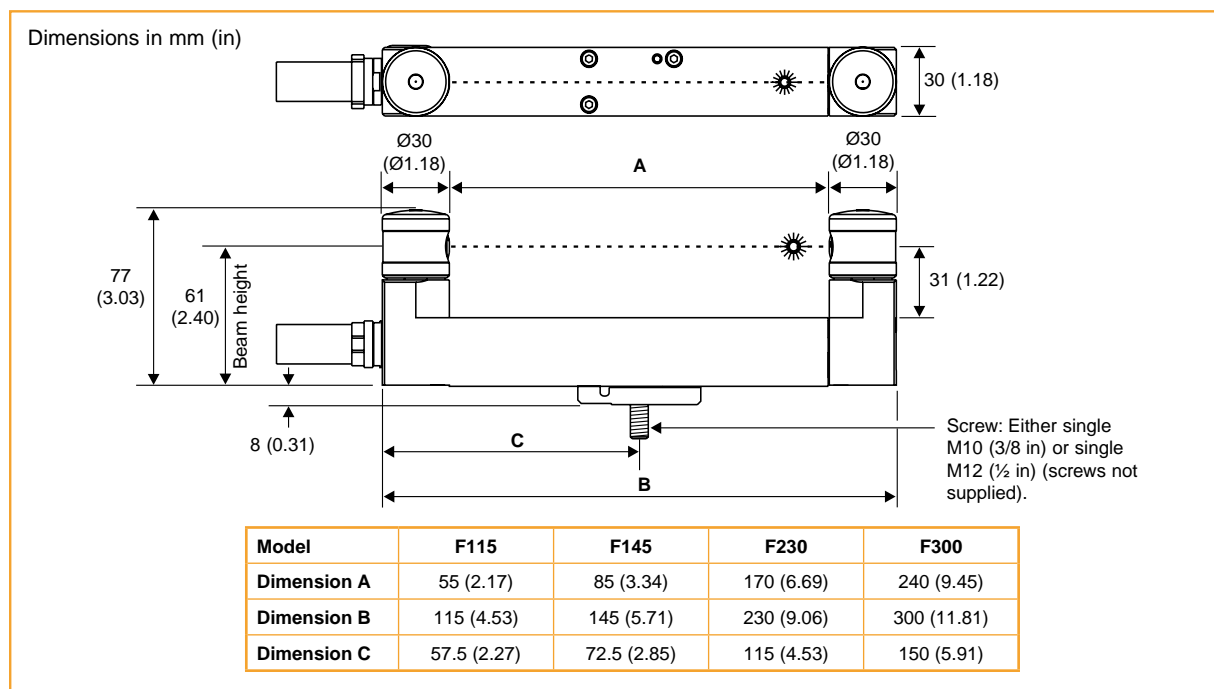
Modular fixed system



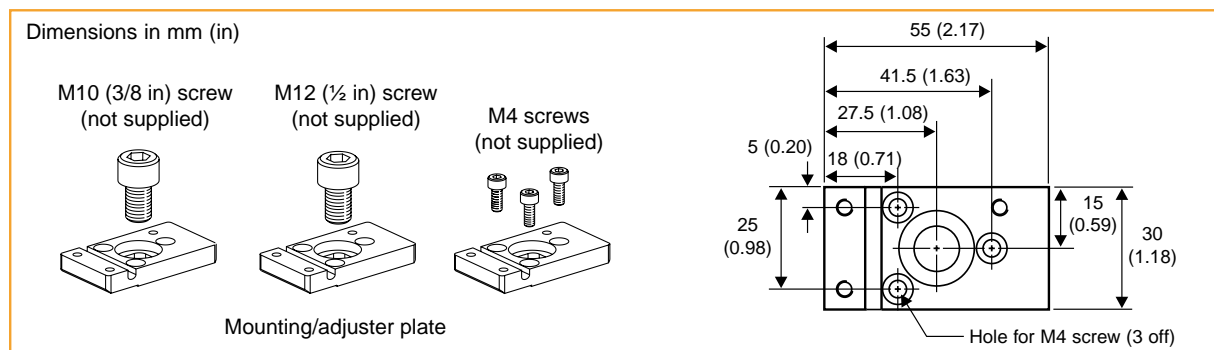
Compact fixed system – F95 model



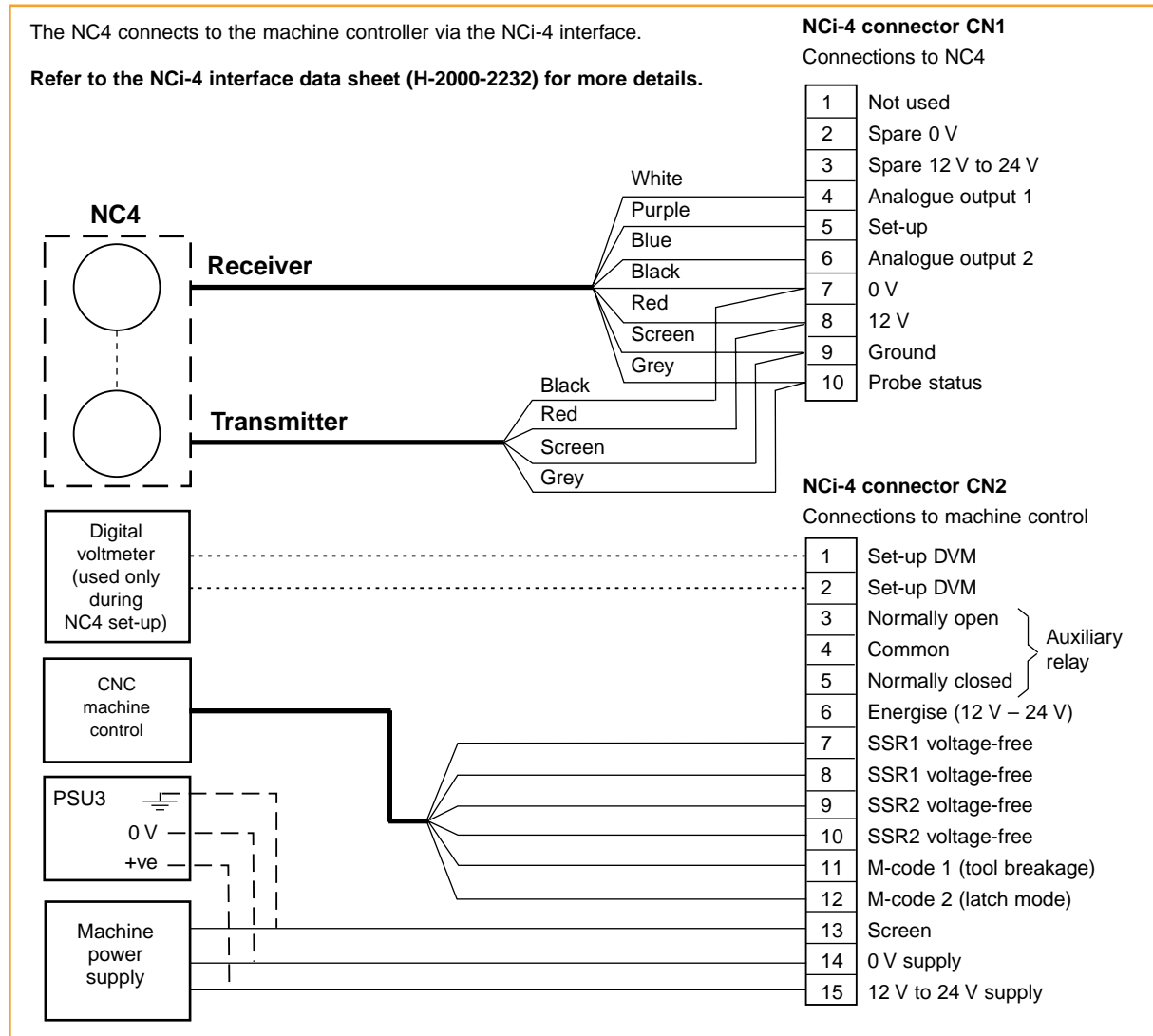
Compact fixed system – F115, F145, F230 and F300 models



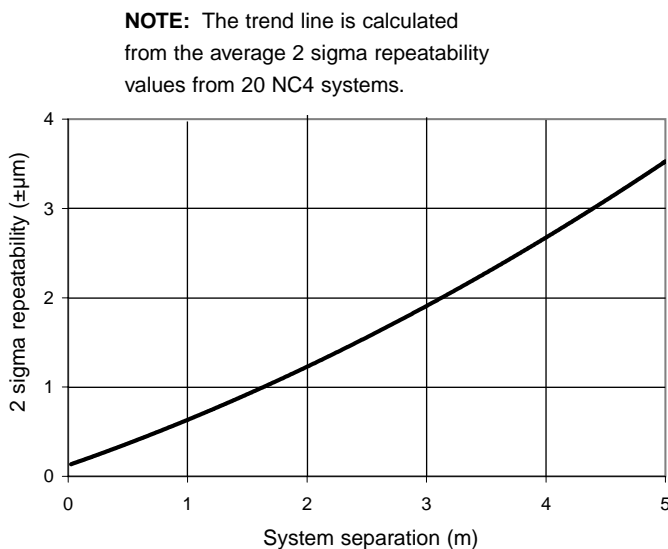
Mounting arrangements



Electrical connections



Performance – typical NC4 repeatability

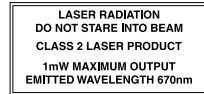


| Transmitter/receiver separation (m) | Minimum tool diameter (mm) when ... | |
|-------------------------------------|-------------------------------------|--------------|
| | ... measured | ... detected |
| Compact fixed system | 0.023 | 0.03 |
| | 0.055 | 0.07 |
| | 0.170 | 0.07 |
| Modular fixed 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 | $\varnothing 0.03$ 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. | |
| 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.

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