

Compression force transducers for measurement of tension forces in lathe chucks

hydraulic NG 6, NG 16, NG 33



Description

Chucking power measuring devices made by tectsis are hydraulic force measuring devices that display the measurements in analogue or digital form in combination with measuring and display equipment.

The force measuring devices, which are prepared for static chucking force measurement at self-centring chucks, are extremely accurate.

Chucking force is recorded in a simple, low-cost way in self-centring chucks using these hydraulic force measuring devices, and directly displayed.

European standard EN 1550 prescribes the use of static chucking force measuring devices in order to make the chucking and chip removal processes safe. All users must ensure that their chucking equipment is operated in accordance with the stipulations of EN 15505 at all times. This includes regular checking of the chucking force using static chucking force measuring devices.

The hydraulic force measuring devices are exclusively intended for measuring static chucking force at rotating chucks. The chucking force measurements must be compared with the target values specified in the operating instructions for the respective chuck. The chucking force loss of chucks at high speeds is determined from the relevant chuck operating instructions.

In accordance with the measuring task, three force introduction pistons have been installed that convert the force acting upon the pistons into a hydraulic pressure and transfer it to the attached measuring and display device. The measuring device scales can have different units such as kN, daN or others. The maximum piston stroke is 0.5mm.

Note

Hydraulic force measuring units are filled with a pressure-transmitting fluid under pressure. For this reason, perfect operation can only be guaranteed for fully assembled force measuring units. Sealing screw connections must not be undone.

Features

- For compressive force
- Chucking force measurements at self-centring chucks
- Ambient temperature -10 ... +50°C
- Housing and piston made from rust-resistant steel
- Accuracy $\pm 1.0\%$ of final value when using pressure measuring devices class 1.0 and 23°C
- Accuracy $\pm 0.5\%$ of final value when using pressure sensors accuracy 0.5% and 23°C
- Maximum piston stroke 0.5 mm
- Operation without auxiliary power

Measuring range

- 2.5 kN ... 350 kN

Applications

- Lathes with self-centring chucks
- measuring and control equipment
- special machinery

Model: F1103, F1112, F1122

Technical data

| Model series | F1103, F1112, F1122 | Options |
|---------------------------|---|---|
| Nominal size | 3x NG 6 / 3x NG 16 / 3x NG 33 | |
| Accuracy | ± 1,0% of final value when using pressure measuring devices NG 100, class 1.0 and reference temperature of 23°C | ± 0.5% of final value when using pressure sensors with accuracy of 0.5% |
| Limit load | 130% F_{nom} | |
| Breaking load | > 150% F_{nom} | |
| Combined error | ≤± 1% of F.S. | |
| Nominal deflection | < 0.5 mm | |
| Nominal temperature range | -10 ... +50°C | |
| Protection type | IP 65 | |
| Housing | Rustproof stainless steel | |
| Piston | Rustproof stainless steel | |
| Connection: | - connected using connecting piece | - DN 2 measuring hose for „loss-free disconnection“ Length = 0.5 m. |
| Display equipment | -NG 100 in stainless steel version BR 2324, (analogue display) | - Max.value indicator (maximum pointer) -Pressure sensors BR P3276 and Portable display unit BR E3907 with digital display, with min./max, value memory and PC interface RS 232 |
| Filling fluid | Silicon oil, FFI no.2 | |
| Carrying case | -Optional | -Plastic case, 350 x 250 x 100 mm [L x W x H] |
| Dimensions | See dimension diagrams | |

| Mod. F1103 chucking Ø 70 mm 3x ND 6 [kN] | Measuring range | | Pressure range in bar Mod. P2325 and Mod. P3276 [bar] | The force transducer size specifies the area of the piston in cm ² |
|--|---|--|---|---|
| | Mod. F1112 chucking Ø 90 mm 3x ND 16 [kN] | Mod. F1122 chucking Ø 110 mm 3x ND 33 [kN] | | |
| 2.5 | --- | --- | 0 ... 40 | |
| 4 | --- | --- | 0 ... 60 | |
| 6 | --- | --- | 0 ... 100 | |
| 10 | --- | --- | 0 ... 160 | |
| 16 | --- | --- | 0 ... 250 | |
| 20 | --- | --- | 0 ... 315 | |
| 25 | --- | --- | 0 ... 400 | |
| 50 | --- | --- | 0 ... 800 | |
| 60 | --- | --- | 0 ... 1000 | |
| --- | 60 | --- | 0 ... 400 | |
| --- | 80 | --- | 0 ... 500 | |
| --- | 100 | --- | 0 ... 600 | |
| --- | 130 | --- | 0 ... 800 | |
| --- | 160 | --- | 0 ... 1000 | |
| --- | --- | 160 | 0 ... 500 | |
| --- | --- | 200 | 0 ... 600 | |
| --- | --- | 260 | 0 ... 800 | |
| --- | --- | 320 | 0 ... 1000 | |
| --- | --- | 350 | 0 ... 1000 | |

Configuration

Hydraulic force measuring unit, consisting of:

Force transducer Mod. F1103, 3x ND 6

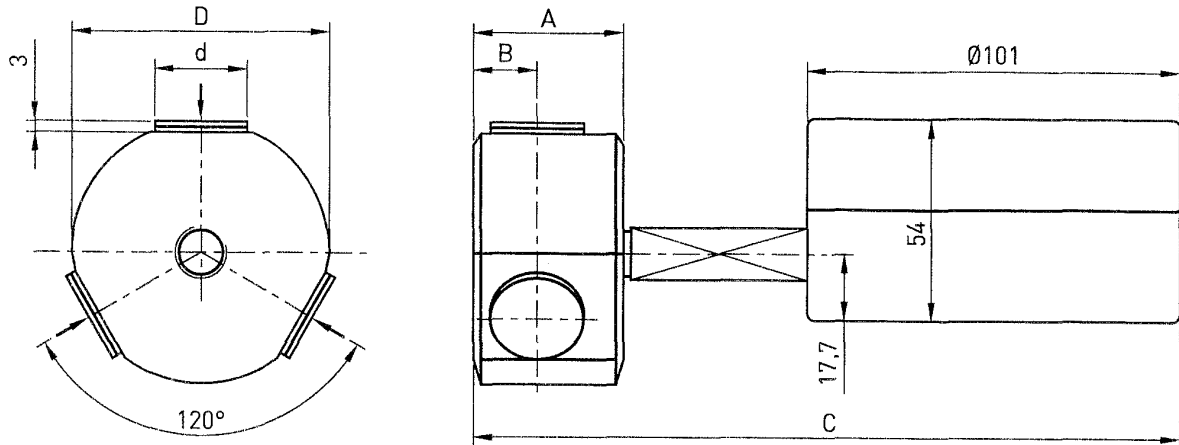
Force transducer Mod. F1112, 3x ND 16

Force transducer Mod. F1122, 3x ND 33

with directly attached pressure measuring device Mod. P2325, ND 100;

pressure sensors Mod. P3276 with output: 4 ... 20 mA, and 0 ... 10 VDC, can be optionally attached.

Dimension diagram



| Configuration | [kN] | Nom.load [kN] | Chuckin | Ø D | Ø d | A | B | C |
|------------------------|-----------|--------------------|---------|-----|-----|----|------|----------------|
| F1103 – Self-cent.–2.5 | 3x 0.83 | 2.5 | | | | | | |
| F1103 – Self-cent.–4 | 3x 1.33 | 4 | | | | | | |
| F1103 – Self-cent.–6 | 3x 2.00 | 6 | | | | | | |
| F1103 – Self-cent.–10 | 3x 8.33 | 10 | | | | | | |
| F1103 – Self-cent.–16 | 3x 5.33 | 16 | 70 | 70 | 25 | 40 | 20 | approx. 190 |
| F1103 – Self-cent.–20 | 3x 6.67 | 20 | | | | | | |
| F1103 – Self-cent.–25 | 3x 8.33 | 25 | | | | | | |
| F1103 – Self-cent.–50 | 3x 16.67 | 50 | | | | | | |
| F1103 – Self-cent.–60 | 3x 20.00 | 60 | | | | | | |
| F1112 – Self-cent.–60 | 3x 20.00 | 60 | | | | | | |
| F1112 – Self-cent.–80 | 3x 26.67 | 80 | | | | | | |
| F1112 – Self-cent.–100 | 3x 33.33 | 100 | 90 | 90 | 42 | 57 | 28.5 | approx. 200 |
| F1112 – Self-cent.–130 | 3x 43.33 | 130 | | | | | | |
| F1112 – Self-cent.–160 | 3x 53.33 | 160 | | | | | | |
| F1122 – Self-cent.–160 | 3x 53.33 | 160 | | | | | | |
| F1122 – Self-cent.–200 | 3x 66.67 | 200 | | | | | | |
| F1122 – Self-cent.–260 | 3x 86.67 | 260 | 110 | 110 | 65 | 77 | 38.5 | approx. 220 |
| F1122 – Self-cent.–320 | 3x 116.67 | 320 | | | | | | |
| F1122 – Self-cent.–350 | 3x 116.67 | 350 | | | | | | |

Configuration variants

| | |
|--------------------------------------|---|
| Force transducer: | Mod. F1103 – chucking Ø 70 Mod. F1112 – chucking Ø 90 Mod. F1122 – chucking Ø 110 with |
| Pressure measuring device ND 100: | Mod. P2325, pressure measuring device in standard chemical system, with analogue display optionally with |
| Pressure sensor: | Mod. P3276 optionally with one output 4 to 20 mA, 0 to 10 VDC, 0 to 50 VDC; and optionally with |
| digital display with microprocessor: | Mod. E3907 – 4-digit, - battery operated; - RS232C interface, Optional - Powered by batteries |

Pressure gauge
NG 100
with
analogue display



or

Pressure sensor with
4 to 20 mA,
0 to 10 VDC,
0 to 5 VDC
output

Force transducer
for
self-centring chuck

Force transducer
for
self-centring chuck

Measuring
cable



Digital display with
microprocessor
– Storage battery operated
– RS232C interface

Subject to technical changes