

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 tecs is 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	$\pm 1,0\%$ of final value when using pressure measuring devices NG 100, class 1.0 and reference temperature of 23°C	$\pm 0.5\%$ of final value when using pressure sensors with accuracy of 0.5%
Limit load	130% F_{nom}	
Breaking load	$> 150\% F_{nom}$	
Combined error	$\leq \pm 1\%$ 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	

Measuring range			Pressure range in bar	The force transducer size specifies the area of the piston in cm ²
Mod. F1103 chucking Ø 70 mm 3x ND 6 [kN]	Mod. F1112 chucking Ø 90 mm 3x ND 16 [kN]	Mod. F1122 chucking Ø 110 mm 3x ND 33 [kN]	Mod. P2325 and Mod. P3276 [bar]	
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	

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Configuration

Hydraulic force measuring unit, consisting of:

Force transducer Mod. F1103, 3x ND 6

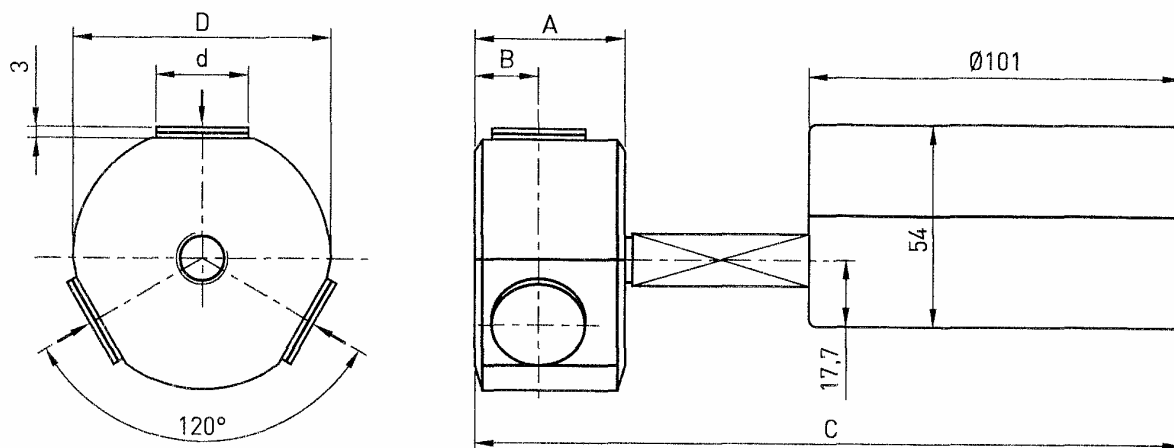
Force transducer Mod. F1112, 3x ND 16

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	70	70	25	40	20	approx. 190
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						
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	90	90	42	57	28.5	approx. 200
F1112 – Self-cent.–80	3x 26.67	80						
F1112 – Self-cent.–100	3x 33.33	100						
F1112 – Self-cent.–130	3x 43.33	130						
F1112 – Self-cent.–160	3x 53.33	160						
F1122 – Self-cent.–160	3x 53.33	160	110	110	65	77	38.5	approx. 220
F1122 – Self-cent.–200	3x 66.67	200						
F1122 – Self-cent.–260	3x 86.67	260						
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

Force transducer
for
self-centring chuck



or

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

Force transducer
for
self-centring chuck

Measuring
cable



Digital display with
microprocessor
– Storage battery operated
– RS232C interface

Subject to technical changes