

# Hydraulic ring force transducer Geotechnical version to 1,500 kN Model F6148

WIKA data sheet FO 52.21

## Applications

- Civil engineering and special construction
- Tunnel construction
- Mining (surface and underground)
- Surveying and bridge building
- Slope stabilisation, retaining walls and excavations

## Special features

- Measuring ranges 0 ... 150 kN to 0 ... 1,500 kN  
[0 ... 33,721 lbf to 0 ... 337,213 lbf]
- Relative linearity error  
±1.0 %  $F_{nom}$  with analogue pressure gauge,  
±0.5 %  $F_{nom}$  with digital pressure gauge or pressure sensor
- Piston stroke  $\leq 0.5$  mm [ $\leq 0.02$  in]
- Operates without supply voltage
- Case and piston made of galvanised steel



Hydraulic ring force transducer, model F6148

## Description

The model F6148 hydraulic ring force transducer, geotechnical version, is available in nominal size NS 146 to 1,500 kN [337,213 lbf].

A cylinder-piston combination, filled with hydraulic medium, in a steel version with surface coating or in stainless steel version (option), forms the basis of the anchor force measuring system.

For nominal size NS 146, the force-bearing surface of the piston is 146 mm<sup>2</sup> [0.23 in<sup>2</sup>] and the rated displacement of the piston does not exceed 0.5 mm [0.02 in].

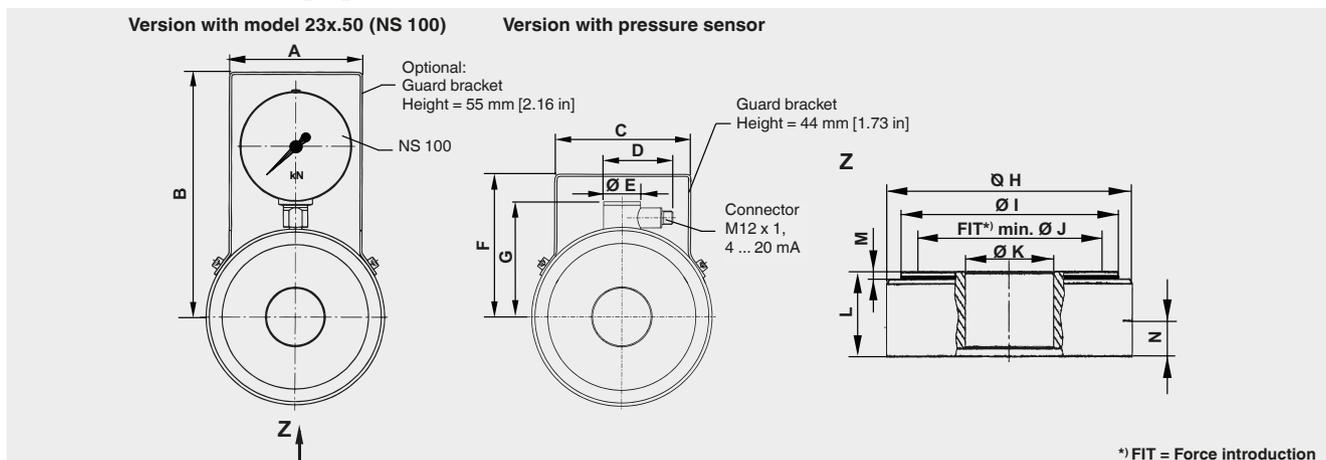
Both the mechanical and the electrical version are optionally available with directly attached measured value pick-up/display (capillary line or adapter “separation without any losses”) as well as with an external version. It is an extremely robust design, in line with the requirements of geotechnical engineering.

With these hydraulic force measuring units, clamping forces are detected at the anchor head in a simple way and brought directly to the display. The force measuring units are used for continuous monitoring of anchors and other bracing rods/cables. Applications for hydraulic force measuring units can be found in the field of geotechnology in various fields such as tunnel construction, bridge building and slope stabilisation.

## Specifications per VDI/VDE/DKD 2638

Model F6148	
<b>Rated force <math>F_{nom}</math></b>	0 ... 150 kN to 0 ... 1,500 kN [0 ... 33,721 lbf to 0 ... 337,213 lbf]
<b>Nominal size</b>	NS 146
<b>Display</b>	<ul style="list-style-type: none"> <li>■ Pressure gauge, model 23x.50 (NS 100)</li> <li>■ Digital pressure gauge, model DG-10</li> <li>■ Pressure sensor (on request)</li> </ul>
<b>Relative linearity error <math>d_{lin}</math></b>	
Pressure gauge	$\leq \pm 1.0 \% F_{nom}$
Pressure sensor/digital pressure gauge	$\leq \pm 0.5 \% F_{nom}$
<b>Temperature effect on</b>	
the characteristic value $TK_C$	$1 \% F_{nom} / 10 K$
the zero signal $TK_0$	$1 \% F_{nom} / 10 K$
<b>Force limit <math>F_L</math></b>	$100 \% F_{nom}$
<b>Breaking force <math>F_B</math></b>	$> 130 \% F_{nom}$
<b>Rated displacement <math>s_{nom}</math></b>	$< 0.5 \text{ mm } [ < 0.02 \text{ in}]$
<b>Rated temperature range <math>B_{T, nom}</math></b>	$-30 \dots +60 \text{ }^\circ\text{C } [-22 \dots 140 \text{ }^\circ\text{F}]$
<b>Ingress protection (per IEC/EN 60529)</b>	
Pressure gauge	IP65
Pressure sensor	IP67
Digital pressure gauge	IP65
<b>Case</b>	<ul style="list-style-type: none"> <li>■ Steel, electrogalvanised</li> <li>■ Stainless steel (option)</li> </ul>
<b>Piston</b>	<ul style="list-style-type: none"> <li>■ Steel, electrogalvanised</li> <li>■ Stainless steel (option)</li> </ul>
<b>Guard bracket</b>	
Pressure gauge	Yes
Digital pressure gauge/pressure sensor	Optional
<b>Mounting type</b>	
Pressure gauge	Direct mounting
Digital pressure gauge/pressure sensor	Direct mounting
Option	<ul style="list-style-type: none"> <li>■ Capillary</li> <li>■ Measuring hose for "separation without any loss less connection"</li> </ul>
<b>Output signal</b>	4 ... 20 mA, 2-wire
<b>Analogue output</b>	
Supply voltage	DC 0 ... 30 V for current output
Load	$\leq (UB - 6V) / 0.024 \text{ A}$
Electrical connection	<ul style="list-style-type: none"> <li>■ Circular connector M12 x 1, 4-pin Hand-held</li> <li>■ Measuring instrument ViSens E3908 (option)</li> </ul>
<b>Fill fluid</b>	Glycerine 70 % / water 30 %
<b>Force introduction (FIT)</b>	As full-faced as possible, min. 75 % of the piston diameter
<b>Weight</b>	13.5 kg [29.76 lbs]

# Dimensions in mm [in]



Dimensions in mm [in]													
A	B	C	D	ØE	F	G	ØH	ØI	ØJ	ØK	L	M	N
120 [4.7]	255 [10]	132 [5.2]	71 [2.8]	33 [1.3]	164 [6.45]	133.5 [5.25]	220 [8.7]	194 [7.6]	168 [6.6]	90 [3.5] 105 [4.1]	55 [2.16]	5 [0.2]	19 [0.75]

Version		Pressure gauge
Rated force	System pressure	Model 23x.50 (NS 100)
kN [lbf]	bar	
150 [33,721]	100	■
250 [56,202]	160	■
350 [78,683]	250	■
450 [101,164]	315	■
600 [134,885]	400	■
750 [168,607]	500	■
900 [202,328]	600	■
1,000 [224,809]	700	■
1,200 [269,771]	800	■
1,400 [314,733]	950	■
1,500 [337,213]	1,000	■

Other rated loads and versions on request

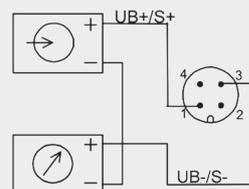
■ = possible selection

## Pin assignment, analogue output

4...20 mA (2-wire)		
	Pin	Connection identification
Supply UB+/S+	1	Brown
Supply UB-/S-	3	Blue
Signal S+	1	Brown
Signal S-	3	Blue
Shield	case	case

### Output 4...20 mA, 2-wire

Circular connector M12 x 1, 4-pin



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