Force

Load pin Up to 10,000 kN Model F5802

WIKA data sheet FO 51.55

For further approvals see page 2

Applications

- Crane systems and hoists
- Industrial weighing technology
- Machine building and plant construction
- Manufacturing automation

Special features

- Measuring ranges 20 ... 10,000 kN [204 tf ... 101,972 tf]
- Corrosion-resistant stainless steel version
- Existing non-measuring bolts are simply replaced by the measuring axes
- For overload protection in cranes and hoists
- Good reproducibility, easy installation



Load pin, model F5802

Description

Load pins of the model F5802 are suitable for static and dynamic measuring tasks as a replacement for non-measuring bolts. They serve for determining tension and/or compression forces under harsh operating conditions.

The load pin is very often used in hoists and crane systems, e.g. used in construction cranes or in port and offshore cranes, as well as in the field of industrial weighing technology and special machine construction. There it is installed in particular in deflection pulleys, cable winches, fork or roller bearings.

Load pins of this model serve as reliable overload protection in mechanical and plant engineering.

The corresponding technical and regional approvals of these force transducers are, of course, available as options.

The load pin is made of high-strength, corrosion resistant 1.4542 stainless steel, the properties of which are ideal for the application areas.

As output signals, the common active current and voltage outputs are available (4 \dots 20 mA, 0 \dots 10 V). Redundant output signals and CANopen[®] protocols are also possible.





Data sheets showing similar products of load pin models: Load pins standard and ATEX; up to 200 kN; models F5301, F53C1; see data sheet FO 51.18 Load pin "Heavy duty" version; models F5308, F53C8, F53S8; see data sheet: FO 51.43 Load pin standard version; model F5280; see data sheet FO 51.54

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Technical data in accordance with VDI/VDE/DKD 2638

Model	F5802
Bated force E kN [tf]	20 10 000 [204 101 972]
Relative linearity error d., d., ¹)	0.5 % 1 % F
Relative linkehrspanne v	0.5% 1% F
Relative repeatability error in unchanged mounting position b	0.5 % 1% E
Tomporature effect on	0.5 /8 1 /8 1 nom
characteristic value TK	0.2 % Enom /10 K
	0.2 % From /10 K
	150 % F _{nom}
Breaking force F _B	300 % F _{nom}
Material of measuring device	Corrosion-resistant stainless steel
Rated temperature B _{T, nom}	-10 +40 °C [14 +104 °F]
Operating temperature B _{T, G}	-20 +80 °C [-4 +176 °F]
Electrical connection	M12 x 1, 4-pin or 5-pin
Output signal (rated output) C _{nom}	 4 20 mA, 2-wire 4 20 mA, 3-wire 2 x 4 20 mA, redundant DC 0 10 V, 3-wire 2 x DC 0 10 V redundant 1 2 mV/V CANopen[®] Protocol in accordance with CiA[®]301, device profile CiA[®]404, communication services LSS (CiA[®]305), configuration of the instrument address and baud rate Sync/Async, Node/Lifeguarding, heartbeat; zero and span ±10 % adjustable via entries in the object directory ²)
Input resistance R _e	$750 \pm 30 \Omega$
Output resistance R _a	$700 \pm 5 \Omega$
Isulation resistance R _{iS}	≥ 5,000 MΩ
Supply voltage UB	 DC 9 36 V for current output DC 13 36 V for voltage output DC 5 10 V for mV/V DC 9 36 V for CANopen[®]
Ingress protection (acc. to IEC/EN 60529)	IP67

1) Relative linearity error accordance with VDI/VDE/DKD 2638 chapter 3.2.6.

 2) Protocol in accordance with CiA[®]301, device profile CiA[®]404, communication service LSS (CiA[®]305) CANopen[®] and CiA[®] are registered community trademarks of CAN[®] in Automation e. V.

Approval

Logo	Description	Region
CE	EU declaration of conformity EMC directive RoHS directive	European Union
EAC	EAC EMC directive	Eurasian Economic Community

 \rightarrow Approvals and certificates, see website.

Dimensions/mounting situation of the load pin



Exemplary illustration. Dimensioning: The customer-specific load pin drawing of the respective order number has priority.

Pin assignment cable

Electrical connection				~	f	E	Exc+	(Red)
Supply voltage +	Exc+	Red		NN M			Sig+	(Groop)
Supply voltage -	Exc-	Black		Mr. M				(Green)
Signal +	Sig+	Green		The M			xc-	(Black)
Signal -	Sig-	White		N.		 • S	Sig-	(White)
Shield 🕀	Shield	Yellow-green			[Js	hield	(Yellow-green)

Output signal 1 ... 2 mV/V Connector M12 x 1, 4-pin or 5-pin





Cable colours only apply when using the WIKA standard cable, e.g. order number 14259454

Pin assignment of analogue output

Abbreviations, definitions

Signal	Description
UB	Voltage source for sensor
UB+	Sensor-supply voltage (+)
UB-	Sensor-supply voltage (-)
S+	Output signal (+)
S-	Output signal (-)
0 V	0 V potential

Signal	Description
A	Ammeter
V	Voltmeter
(+ -	Voltage source
~-	Switch
Ð	Shield (grounding)

Output 4 ... 20 mA, 2-wire

Connector M12 x 1, 5-pin



Signal	4 20 mA, 2-wire	Cable colour
UB+/S+	1	Brown
0 V/S-	3	Black
Shield 🖶	Case / connector	-

Cable colours only apply when using the WIKA standard cable, e.g. order number $14259454\,$

Output 4 ... 20 mA, 3-wire Connector M12 x 1, 5-pin



Signal	4 20 mA, 3-wire	Cable colour
UB+	1	Brown
S+	4	Black
0 V/S-	3	Blue
Shield 🕀	Case / connector	-

Cable colours only apply when using the WIKA standard cable, e.g. order number: 14259454

Output 0...10 V, 3-wire Connector M12 x 1, 5-pin



Signal	0 10 V, 3-wire	Cable colour
UB+	1	Brown
S+	4	Black
0 V/S-	3	Blue
Shield 🕀	Case / connector	-

Cable colours only apply when using the WIKA standard cable, e.g. order number 14259454 $\,$

Pin assignment with signal jump

Abbreviations, definitions

Signal	Description
UB	Voltage source for sensor
UB+	Sensor-supply voltage (+)
UB-	Sensor-supply voltage (-)
UR	Voltage source for den signal jump
UR+	Signal jump-supply voltage (+)
UR-	Signal jump-supply voltage (-)
S+	Output signal (+)
S-	Output signal (-)
0 V	0 V potential

Signal	Description
A	Ammeter
V	Voltmeter
+	Voltage source
~-	Switch
۲	Shield (grounding)

Output 4 ... 20 mA, 2-wire

Circular connector M12 x 1, 4-pin



Output 4 ... 20 mA, 3-wire

Circular connector M12 x 1, 4-pin



UB+/S+1Brown0 V/S-3BlueUR+2WhiteUR-4BlackShield ()Case / connector-

4 ... 20 mA, 2-wire

Cable colour

Signal

Cable colours only apply when using the WIKA standard cable, e.g. order number 14259454 $\,$

Signal	4 20 mA, 3-wire	Cable colour
UB+	1	Brown
0 V/S-	3	Blue
UR+	2	White
UR-	3	Blue
S+	4	Black
Shield 🖶	Case / Connector	-

Cable colours only apply when using the WIKA standard cable, e.g. order number $14259454\,$

Output 0...10 V, 3-wire Circular connector M12 x 1, 4-pin



Signal	0 10 V, 3-wire	Cable colour
UB+	1	Brown
0 V/S-	3	Blue
UR+	2	White
UR-	3	Blue
S+	4	Black
Shield 🕀	Case / Connector	-

Cable colours only apply when using the WIKA standard cable, e.g. order number 14259454

Pin assignment for CANopen®

Abbreviations, definitions

Signal	Description
CAN-SHLD, Shield 🕀	Shield
CAN-V+	External positive voltage supply for the supply of the sensor
CAN-GND	External 0 V Potential for the supply of the sensor
CAN-High	CAN_H Bus line (dominant high)
CAN-Low	CAN_L Bus line (dominant low)

Output CANopen[®] in according to CiA[®]303-1 Circular connector M12 x 1, 5-pin



Signal	Pin	Cable colour	
CAN-SHLD, Shield 🖶	1 / Case / connector	Brown	
CAN-V+	2	Blue	
CAN-GND	3	White	
CAN-High	4	Blue	
CAN-Low	5	Black	

Cable colours only apply when using the WIKA standard cable, e.g. order number 14259454

Short description of the signal jump electronics

Amplifier 4 ... 20 mA or 0 ... 10 V for signal jump applications with 2-channel computer control.



With these force transducers, four variable resistors (R1 ... R4) are connected together to form a Wheatstone bridge. When the measuring body deforms, the opposing resistors are stretched or compressed in the same way. This leads to a detuning of the bridge and a diagonal voltage U0.

The test resistor R7 is now important in connection with checking the subsequent amplifier circuit and the subsequent signal paths. This is switched parallel to the resistor R5 via the relay contact (a) as soon as the excitation voltage Ur of the relay A is present. The connection of the resistor R7 causes a defined, always constant, detuning of the zero point (diagonal voltage) of the Wheatstone bridge.

An external controller that is independent of the force transducer must monitor the safe functioning of the force transducer. The functional test with a signal jump of 4 mA / 2 V is executed at an interval of 24 hours. The controller activates the relay A, thus changing the output signal of the force transducer in a defined manner.

If the expected change in the output signal occurs, it can be assumed that the entire signal path from the Wheatstone bridge per the amplifier through to the output is functioning correctly. If no signal change occurs, then it can be concluded that there is an error in the signal path.

Furthermore, the measuring signal should be checked by the controller for min. (A) and max. (B) signal values in order to detect any cable breaks or short circuits that may occur.

The default setting of the force transducers with a current output of 4 ... 20 mA for overload detection is, for example:



With a fixed signal jump of, for example, 4 mA, the test cycle can then be triggered, in any operating state, by activating the test relay. The upper measuring range limit of 20 mA will never be reached and thus the checking of the signal jump is enabled.

Accessories

Connector M12 x 1, model EZE53 with moulded cable								
Model	Description	Temperature range	Cable diameter	Cable colour	Order number			
Straight version, or length, 4-pin, PUF UL listed, IP67	Straight version, cut to	-20 +80 °C	4.75 mm 5.7 mm [0.18 in 0.22 in]	2 m [6.6 ft]	14259451			
	UL listed, IP67	[5 m [16.4 ft]	14259453			
				10 m [32.8 ft]	14259454			
Straight version, cut to length, 5-pin, PUR cable, UL listed, IP67	Straight version, cut to	-20 +80 °C [-4 +176 °F]	4.75 mm 5.7 mm	2 m [6.6 ft]	14259458			
	[+	[0.10	5 m [16.4 ft]	79100672				
				10 m [32.8 ft]	14259472			
Angled ver length, 4-p UL listed, l	Angled version, cut to length. 4-pin, PUR cable.	-20 +80 °C [-4 +176 °F]	5.05 mm 6 mm [0.2 in 0.24 in]	2 m [6.6 ft]	14259452			
	UL listed, IP67			5 m [16.4 ft]	14293481			
				10 m [32.8 ft]	14259455			
9	Angled version, cut to length, 5-pin, PUR cable, UL listed, IP67	-20 +80 °C [-4 +176 °F]	5.05 mm 6 mm [0.2 in 0.24 in]	2 m [6.6 ft]	79101493			
				5 m [16.4 ft]	79100686			
				10 m [32.8 ft]	On request			

Further cable lengths and cable types are available on request.

WIKA accessories can be found online at www.wika.com.

Ordering information

Model / Rated force / Relative linearity error / Temperature range / Output signal / Electrical connection / Approvals, certificates / Pin assignment / Accessories

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WIKA Alexander Wiegand SE & Co. KG Alexander-Wiegand-Straße 30 63911 Klingenberg/Germany Phone +49 9372 132-0 info@wika.de www.wika.de

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