

Calibration Divider XKC 115

Manual



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1. Application

The type XKC 115 Calibration Divider is a high-precision voltage divider used for precisely simulating force transducers or load cells operating by the principle of a passive four-arm strain gauge bridge.

This is what it can be used for:

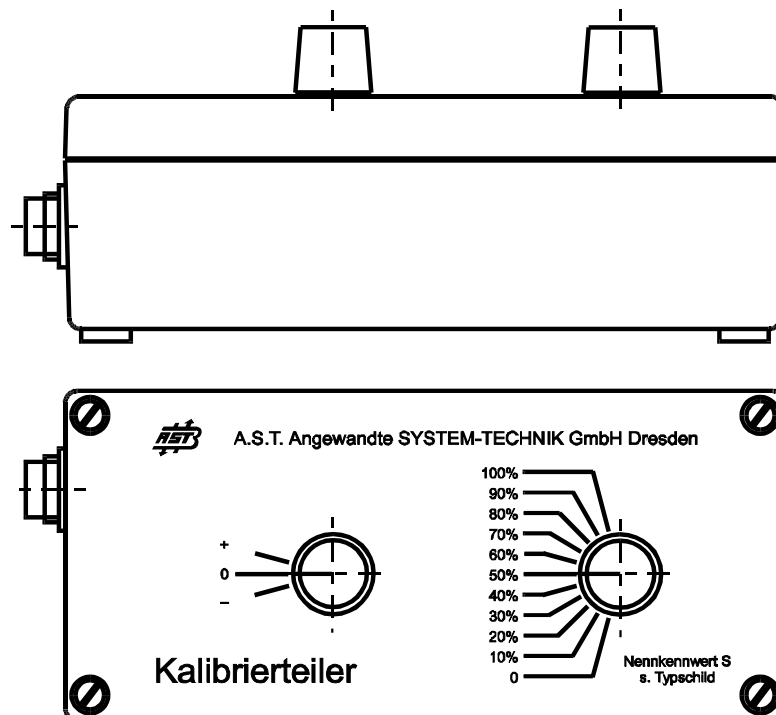
1. to calibrate a measuring set-up such as a force measuring or load-weighing equipment with sensors as mentioned above whenever there is no precisely known reference load or force available.
2. to test the proper operation of the equipment.

Input and output resistances are each adapted to a 350 Ohm strain-gauge bridge. Depending on bridge supply voltage, the measuring output can provide a signal of between 0.2 mV/V and 2 mV/V in 10 steps. The Calibration Divider can be operated on DC voltage or AC voltage of up to 225 Hz. The polarity of the output signal can be reversed.

The characteristics stated in the technical specification apply only when a cable XKC 116 or XKC 117 as supplied with the equipment is used.

Connecting cable XKC 116 shall be used for connecting the Calibration Divider with a type AE 702, AE 703, KMG 702, und BA 626, A 810.

Connecting cable XKC 117 shall be used for connecting to all measuring devices with suitable terminal strips.



2. List of Items Supplied

- Calibration Divider **XKC 115**
- type **XKC 116** cable with 6-pin DIN cable plug
- type **XKC 117** cable with open ends
- Transportation case.

3. Technical Specification

Specific characteristics		XKC 115.01	XKC 115.02	XKC 115.03
- rated sensitivity (=S)	mV/V	1	2	3
- setting range of output voltage	%S	0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100		
- rated bridge supply voltage	V	10		
- admissible range of supply voltage	V	2 ... 12		
- frequency range	Hz	0 ... 225		
- input resistance	Ω	350 \pm 5		
- output resistance	Ω	350 \pm 5		
Reference conditions				
- temperature	$^{\circ}$ C	23 \pm 2K		
- relative humidity of the air	%	45 to 75		
Ambient conditions				
- operating temperature range	$^{\circ}$ C	-10 ... 50		
- storage temperature range	$^{\circ}$ C	-40 ... 70		
- maximum relative humidity	%	90		
- maximum water vapour partial pressure	kPa	4		
Errors				
calibration error in rated and reference conditions	%S	\leq 0.02		
linearity error in reference conditions and in operating temperature range	%S	\leq 0.02		
temperature-induced error of sensitivity per 10 K	%S	\leq 0.01		
temperature-induced error of zero per 10 K	%S	\leq 0.01		
General information				
enclosure protection to DIN 40 0 50		IP 42		
dimensions	mm	175 x 80 x 85		
cable length	m	1,5		
weight	kg	0,8		

4. Operating Instructions

4.1. How to Connect the Calibration Divider

Use Connecting Cable XKC 116 with 6-pin cable plug or type XKC 117 with 4 open ends for a terminal box to connect the Calibration Divider via interconnecting socket or terminal with the electronic indicator / processor unit in place of the force transducer or load cell.

4.2. Calibration

1. Disconnect transducer from interconnecting socket or terminal.
2. Connect Calibration Divider in its place.
3. Set Calibration Divider to 0 mV/V and align electronic equipment to zero.
4. Read rated transducer sensitivity S off its type plate or calibration certificate.
5. Rated sensitivity is the ratio of signal voltage to bridge supply voltage at nominal load F_n .
6. Set the Calibration Divider to a value equal to or less than rated sensitivity S observing polarity (for force transducers: + for compressive and - for tensile force; for weighing equipment: + only).
7. Calibrate or adjust electronic equipment to value to which Calibration Divider has been set.
8. Determine the force or weight which the electronic unit shall indicate by calculating the ratio of rated sensitivity to Calibration Divider value. Replace Calibration Divider with force transducer and once more align the electronic equipment to zero with the transducer being without load.

When a sensor is connected with an electronic display / processing unit via terminal box and connecting cable, this connecting cable is included in the calibration of transducer and electronic equipment.

4.3. Examples of Application

Example No 1

The rated sensitivity of a force transducer is assumed to be 2.00 mV/V and the rated force value is 100 kN. When the force transducer is replaced with the Calibration Divider, the Calibration Divider has to be set to 2,0 mV/V.

Example No 2

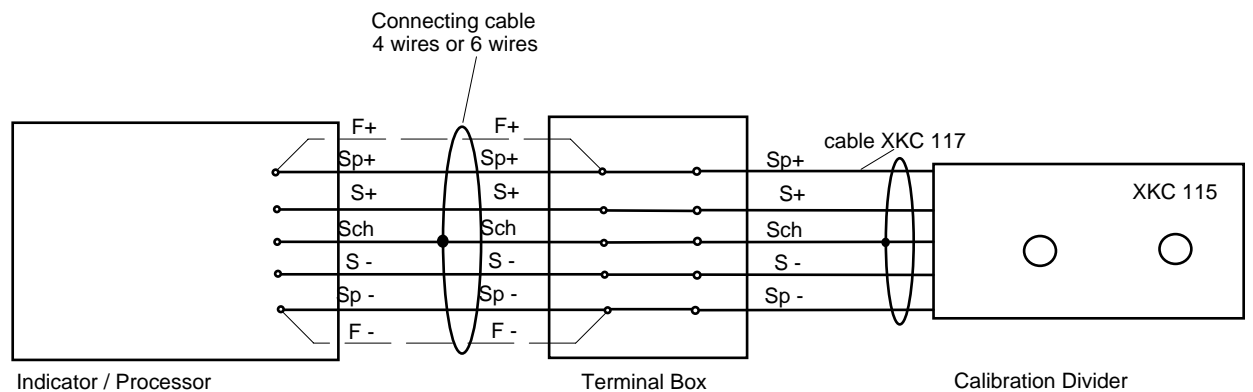
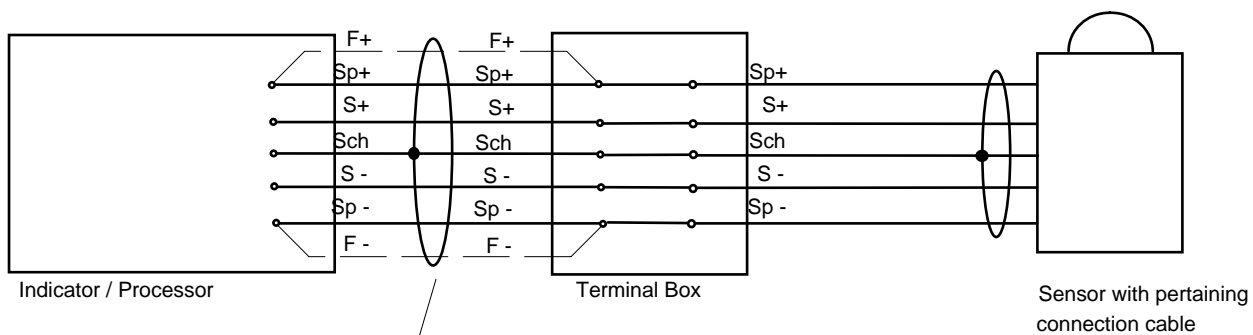
The rated sensitivity of a force transducer is assumed to be 1,9 mV/V and the rated force value is 100 kN. The force transducer is replaced with the Calibration Divider. Because the Calibration Divider cannot be set to 1,9 mV/V, it shall be set to the next lower value of 1,8 mV/V in this case. The value E_{kal} to which the electronic indicator / processor unit has to be set is equal to

$$E_{kal} = \frac{1.8 \text{ mV/V}}{1.9 \text{ mV/V}} \times 100 \text{ kN}$$

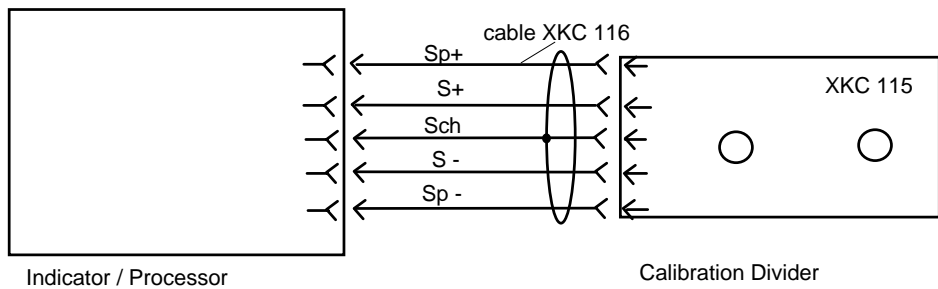
After zero has been aligned, the indicator shall be set to 94,74 kN.

We recommend to take down notes on the Calibration Divider settings and the corresponding indications when bringing the equipment into service. This is vital information helpful for maintenance and repair since it allows the stability of your equipment to be evaluated and helps you locate a fault should any trouble occur.

We advise to take down two values, one between 0 and 25% and another one between 80% and 100% of rated transducer sensitivity.



Sp+	supply voltage +	Sp-	supply voltage -
F+	sensing lead	F-	sensing lead
S+	measuring signal +	S-	measuring signal -
Sch	shield		



4.4. Pin Configuration

contact	XKC 116		XKC 117	
		Pin	Pin	colour to DIN
supply voltage (+)		2, 3	2, 3	brown
supply voltage (-)		1, 6	1, 6	yellow
measuring signal (+)		4	4	green
measuring signal (-)		5	5	white
shield				black