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Strain-bridge-amplifier SBB 1616

Supplying max. 6 DMS-strain bridge sensors

Features

- Bridge supply 2 ... 10 V
- max. 6 DMS-strain bridge sensors ≥ 300Ω at 10 V connectable
- Output current max. 200 mA (short-circuit-protection)
- Line compensation (Sense) up to max. voltage drop 1 V
- Temperature coefficient 0.002 %/K
- Case aluminium, IP65

General

Strain-bridge-Booster SBB 1616 will be used if more than one strain bridge sensor (DMS-sensor) is necessary. The device can supply max. 6 DMS-sensors. The total force or weight results from the sum of single loads or weights. It must be ensured, that all used DMS-sensors have the same measuring range and sensitivity (mV/V). Tolerance-conditioned differences in sensitivities are considered, by operating with the arithmetic average value of the used DMS-sensors (see example page 3).

Projecting notes

When constructing a force measurement with two or more DMS-sensors, it must be take under consideration, that no forces from the side will be applied to the sensor. For example, if sensors would be mounted directly on the ground under the legs of a tripod container, side forces will occur, when filling the container or the temperature is changing. To protect this, DMS-sensor should be mounted on vibration-absorbers (rubber-bonded metals)

For power transmission between container / DMS-sensor we offer suitable assembly saddles. Depending upon application, we adapt these to the customer application.

In case of cable length more than 2m between DMS-sensor and SBB1616 or 10m between SBB1616 and measuring device its recommended to use the sense line to compensate the voltage drop on the cable. The additional measuring error without line compensation can be calculated as follows:

$$\text{Additional measuring error (\%)} = \frac{\text{Voltage drop compl.}}{\text{bridge voltage}} \times 100$$

Example

Bridge voltage 10 V DC	
Line voltage drop:	
Measurind device → SBB1616	20mV
SBB1616 → DMS-strain bridge	5mV
Voltage drop compl. gesamt	25mV

$$\text{Additional measuring error (\%)} = \frac{0.025\ \text{V}}{10\ \text{V}} \times 100 = 0{,}25\%$$

Technical data

Power supply

Supply voltage	: 230 V AC ±10 %; 115 V AC ±10 %, 24 V AC ±10 % or 24 V DC ±15 %
Power consumption	: max. 8 VA
Working temperature	: -10 ... +55 °C
Rated voltage	: 250 V~ acc to VDE 0110 to the supply voltage Degree of pollution 2, Over voltage categoric III
CE - conformity	: EN55022, EN60555, IEC61000-3/4/5/11/13

Input

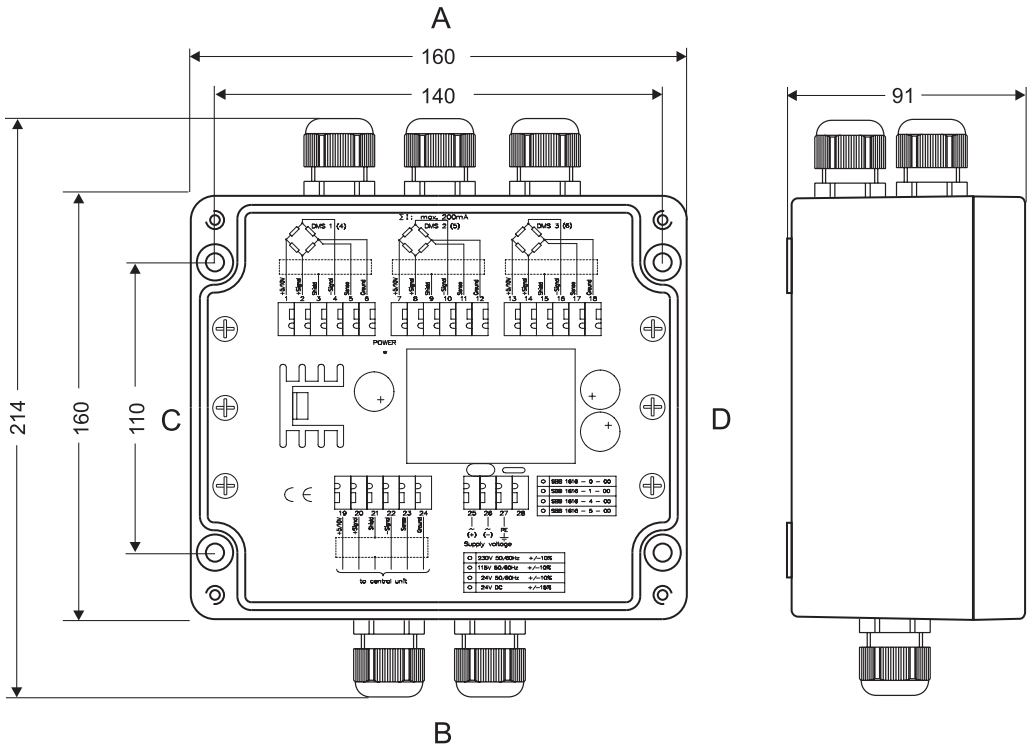
Input voltage	: 2 ... 10 V DC (bridge supply)
Voltage drop between -input / output	: maximum 2 mV
Input resistance	: 10 kOhm
Number of strain bridges	: max. 6 x 300 Ω at 10V
Connection	: 3 sensors directly, with 6 sensors in case 2 sensors parallel at one terminal

Output

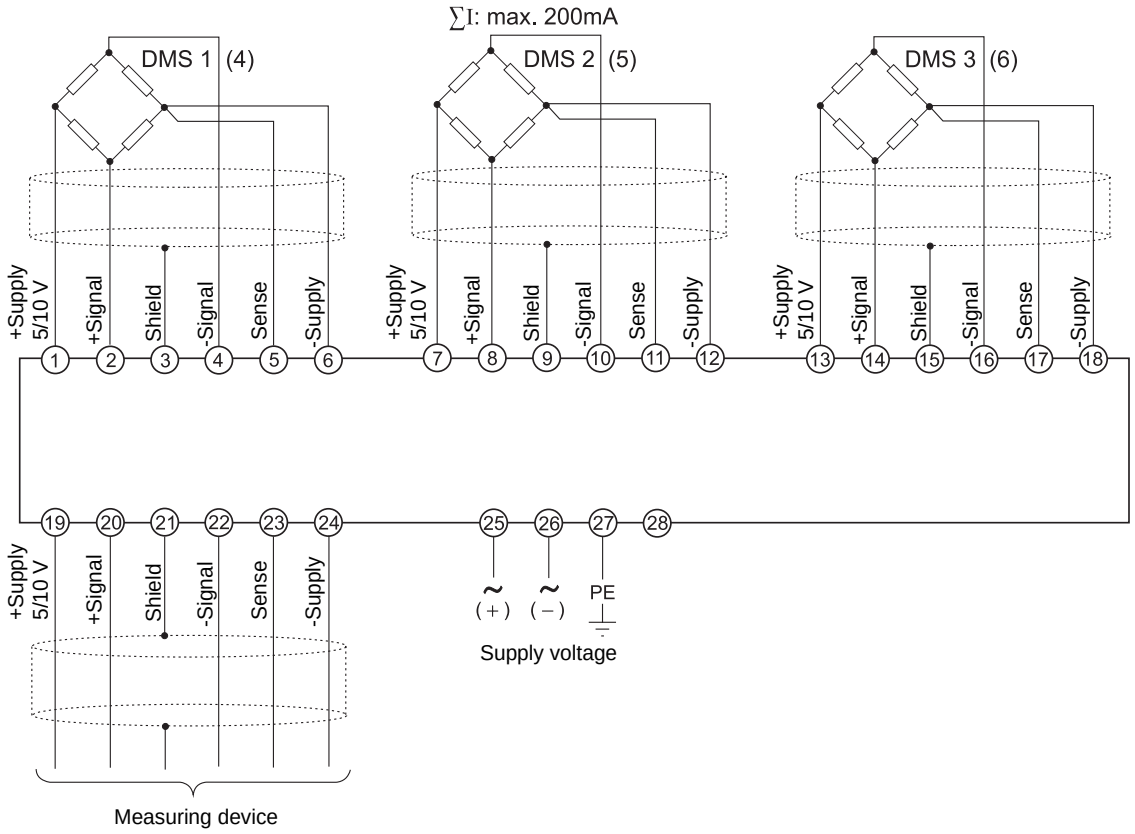
Bridge voltage	: 2 ... 10 V DC amplified bridge supply voltage of the measuring device
Line compensation	: up to 1 V
Output current	: max. 200 mA, short circuit proof
Temp.- coefficient	: 0.002 %/K

Case	: Aluminium, field mounting
Dimensions	: 160 x 160 x 91mm (WxHxD)
Weight	: max. 1900 g
Electrical connection	: Clamp terminal, 2 mm² single wire, 1.5 mm² flexible wire, AWG14
Protection	: IP65, terminals IP20, finger safe acc. to BGV A3 side A: 3/6 x M16x1.5; side B: 2 x M16x1.5

Dimensions



Connection diagram



Notes:

All connected DMS-sensors must have the same measuring range and sensitivity. The output signal of the SBB1616 is connected to the input of a measuring device, e.g. the Strain-Bridge-Panelmeter DMS9648. The resulting measuring range of the system can be calculated by multiplying the number of used DMS-sensors with its range. When programming the DMS-sensors sensitivity on the measuring device, please use the arithmetic average value of the sensitivities from the installed DMS-sensors. If the SENSE line will be used only for line compensation between measuring device and SBB1616, a link between terminal 23-24 must be installed.

Example: A tripod container has a total weight of 50 t. The installed DMS-sensors have a measuring range of 20 t and a bridge sensitivity of 2,211 mV/V; 1,987 mV/V and 2,093 mV/V.
Arithmetic average value: (2,211 + 1,987 + 2,093) : 3 = 2,097 mV/V

Configuration of the measuring device:

Input sensitivity :	2,097 mV/V
Indicating range:	0 ... 60 t

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Ordering code

SBB1616 - 1. ☐ **-** 2. ☐

1. Supply voltage

0	230 V AC	±10%	50-60Hz
1	115 V AC	±10%	50-60Hz
4	24 V AC	±10%	50-60Hz
5	24 V DC	±15%	

2. Options

00	without option
01	3 aditional cable glands M16x1.5 at the housing side A

Excerpt of the available DMS- load cells

Series PK Force from 0 ... 2 kg up to 0 ... 1000 kg

Series KR Force and traction from 0 ... 50 kg up to 0 ... 30 t

Series KS Force from 0 ... 50 kg up to 0 ... 100 t

06/05-00