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20-SA4 Weighing sensor summing unit for precision measurement

- **Serial connection prevents the nonlinearity caused by the imbalance**
- **Four galvanically isolated 10 V sensor supplies**
- **Wire resistanse compensation for each sensor separately**
- **Larger output signal using serial connection**
- **Power supply 24 VDC**

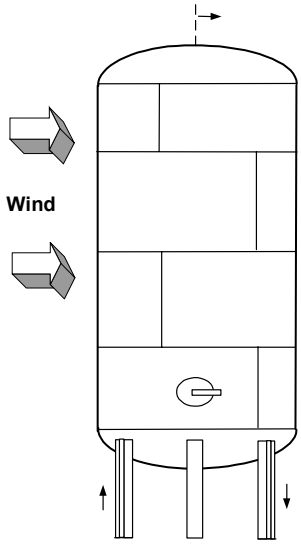
Serial connection of weighing sensors gives four times larger output signal than paraller connection and thus it's suitable for solutions where light loads are measured using overated sensors.

Normal parallel connection gives an average of the bridge voltage. Serial connection does not only give four times bigger bridge voltage but also gives a better protection against interference and more linear bridge voltage output than parallel connection.

To make it possible for serial connection to operate on single 24V power supply, each sensor must be supplied by a galvanically isolated voltage supply. Measurement accuracy is in direct correlation to voltage supply of bridge and thus voltage loss in wires decreases accuracy and causes unlinearity without using 6-wire connection provided by 20-SA4. Voltage loss in wires is cancelled by using 6-wire connection for each sensor separately.

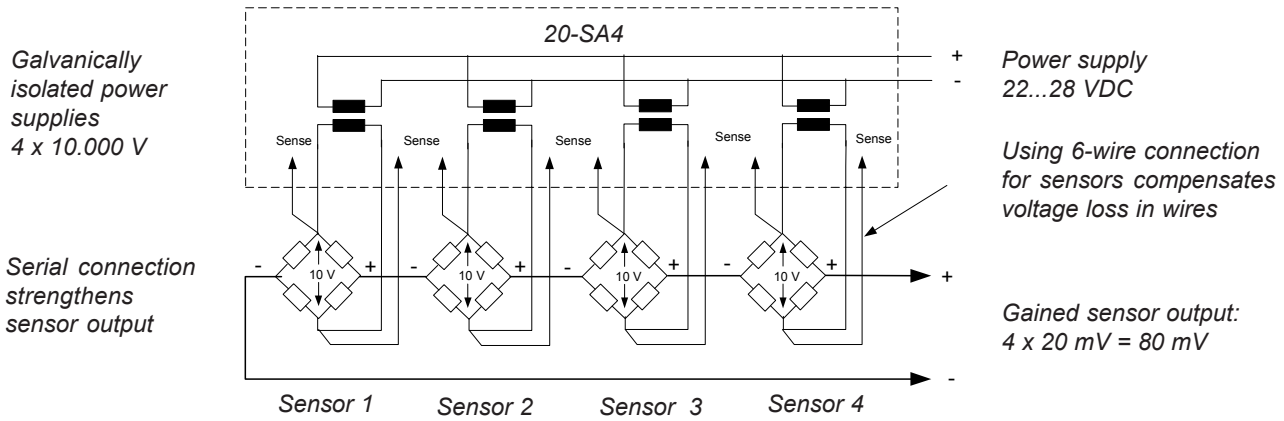
Using serial connection of sensors gives accurate deviation voltage regardless of wiring length. Without compensation a typical error caused by wires is 1-2% depending of wire lenght.

Suitable display for serial connected sensors is model 2041-SA4.



In tank applications the wind decrease accuracy when sensors are connected in parallel. The serial connection of signals gives exact sum of sensors in all loading conditions.

Principle for serial connection of bridge sensors

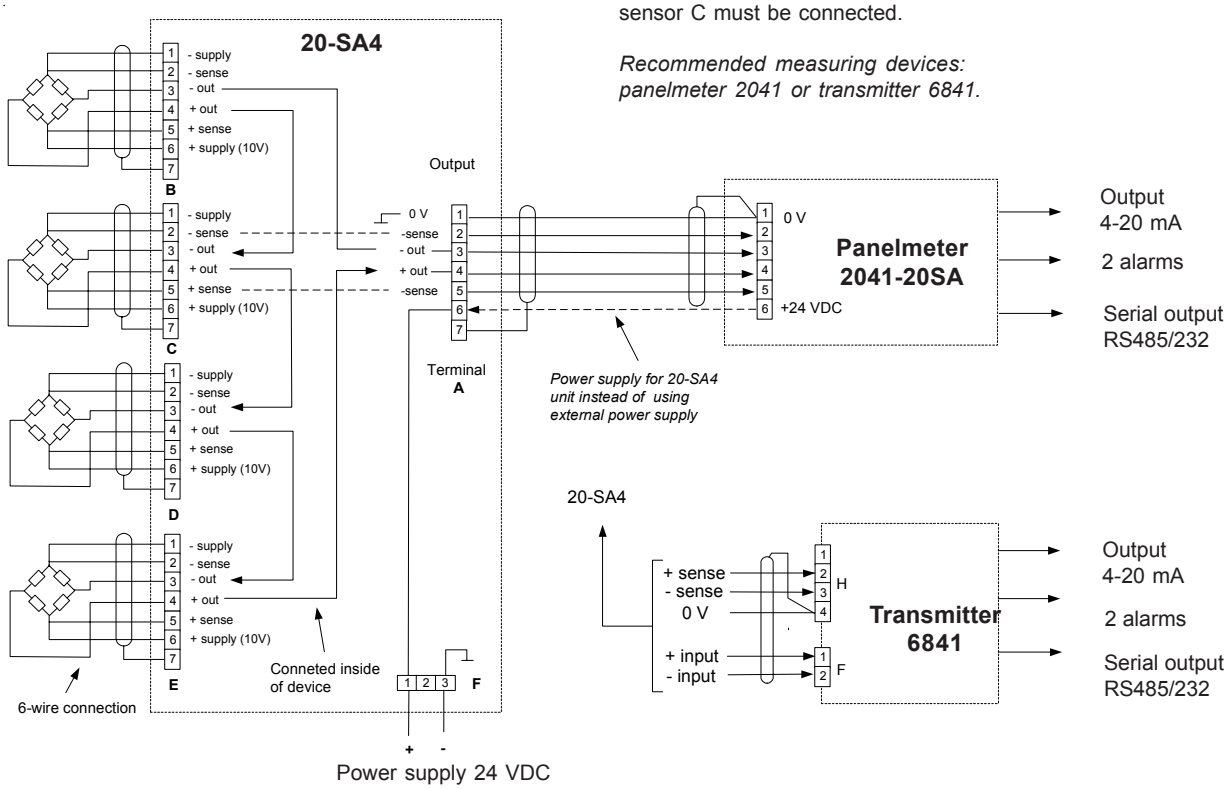


Connections

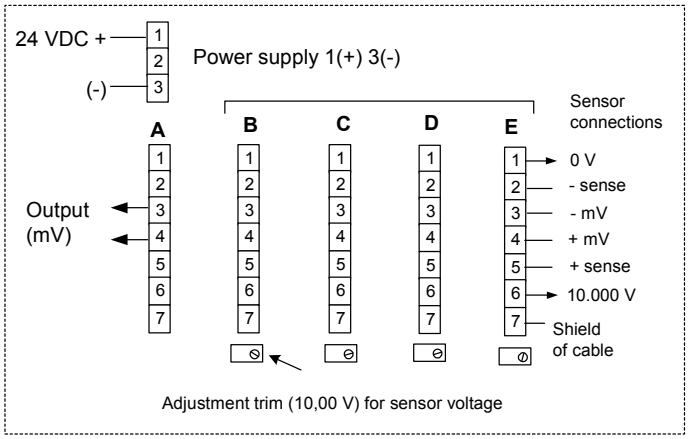
Sensor connections

Any unused sensor must be bybassed by shorcircuiting terminal 3 and 4. The excitation voltage of sensor C is connected to the display or transmitter representing all sensors therefore sensor C must be connected.

Recommended measuring devices: panelmeter 2041 or transmitter 6841.



Terminal block



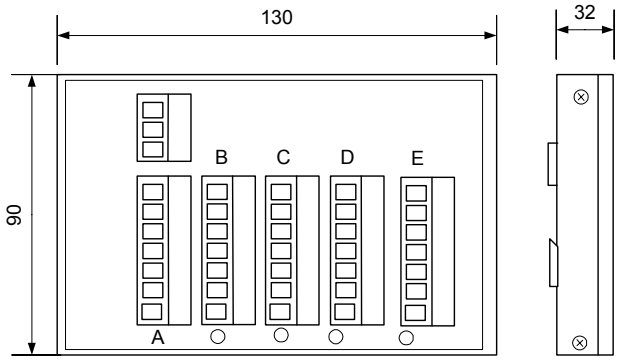
Each sensor is connected separately to terminal block (B-E) using 6 wires. Panelmeter is connected to terminal block A. In case that all 4 bridges are not used, terminals 3 and 4 must be shortcircuited in unused terminal blocks.

Voltage for each bridge is adjustable using potentiometer B-E and measuring in terminals 2 and 5. An external 24VDC power supply is required for the unit.

Sensitivity of measuring devices must be changed to correspond the amount of sensors. For example 4 serial connected sensors corresponds to sensitivity of 8 mV/V , if sensitivity of one sensor is 2 mV/V.

Dimensions

Din rail mounting (35 mm)



Technical data:

Power supply	22...28 V VDC
Supply current	200 mA (4 x 350 Ω)
Sensor voltage	10,000 V ± 0.005V
Bridge	320....1250 Ω
Wire resistance	< 15 Ω
Shortcut protection	Momentary
Polarity	Protected

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