Strain Sensor DA68

Description

The strain sensor DA68 is suitable for high-resolution detection of forces and deformation of structural works such as bridges, silo legs, offshore wind farms, railway lines, etc.

With these models in an anodised aluminium or stainless steel housing, the same performance features are achieved as when applying strain gauges (DMS) directly. These features include a high resolution, very low drift effects and the options for both static and dynamic measurement.

The strain sensor includes a completely wired DMS that is pressed onto the component by a specially formed pressing mechanism when screwing on the extension sensor. An integrated seal provides an initial layer of protection against dust and damp.
The strain sensor has two filler pipes for casting with cable resin after installation.

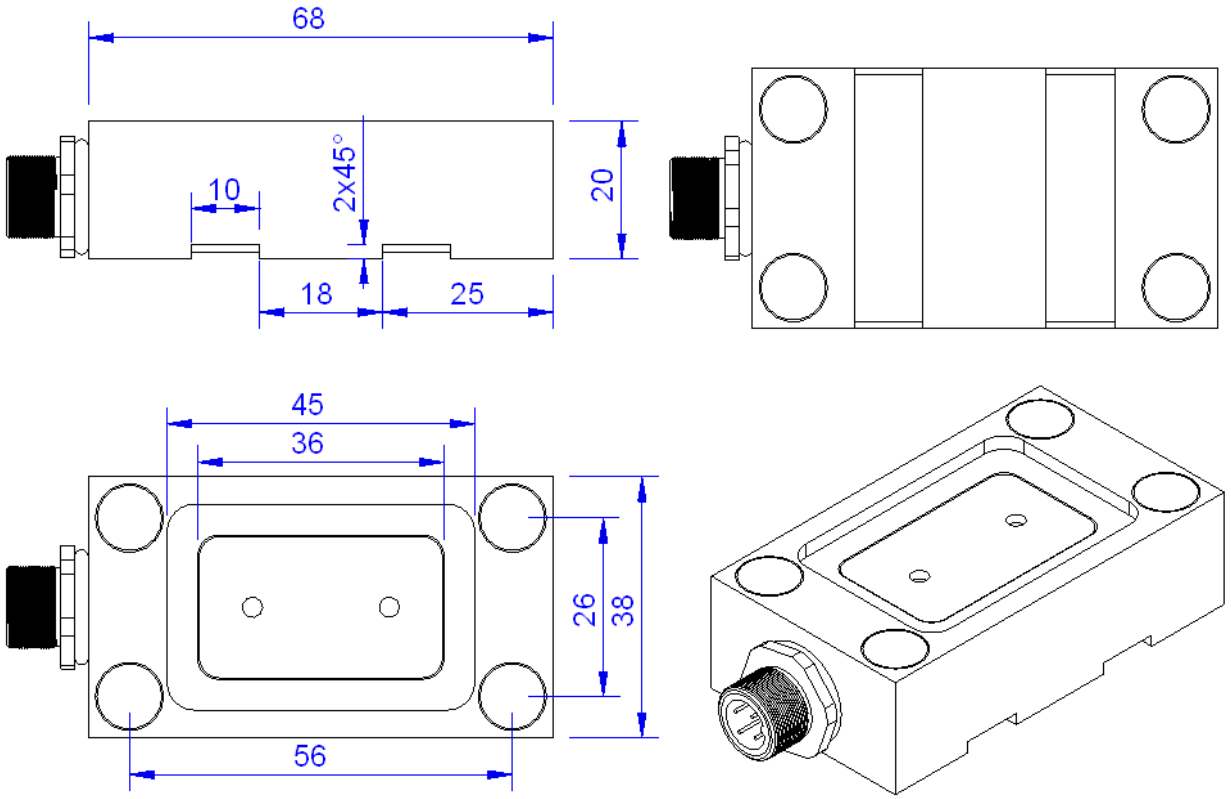
Depending on the planned duration of use, additional measures to protect against damp, such as waterproofing the joints with silicone, encapsulation with additional surrounding hoods, etc. are applied after installation.

Unlike strain sensors DA40 and DA54, the pressure strength is generated by integrated high-performance magnets or cable ties. Time-consuming drilling of threads is not required as a result.

The strain sensor can also be used for stress analysis in offshore applications. The strain gauges are also evaluated as active quarter bridges and are supplemented with passive precision resistors within the strain sensor.

The strain sensor is available with integrated electronic evaluator.

Dimensions



Technical Data

Measurements / Material		
Design		Strain sensor (push-pull)
Material		Aluminium alloy or stainless steel
IP protection class		IP65
Attachment DA68		M-Bond 31 + magnets + stainless steel binder
Mechanical data		
Nominal strain (F_N)	µm/m	±1300
Working strain	%F_N	±150
Electrical data DMS		
k-factor		01.02.00
Input sensitivity (with v=0.28)	µm/m @ 1 mV/V	766
Zero signal	mV/V	< ± 1.0
Max. supply voltage	V	10
Input resistance	Ohm	350 ± 7
Output resistance	Ohm	350 ± 7
Insulation resistance	Ohm	> 5 · 10

ME-Meßsysteme GmbH, Neuendorfstr. 18a, DE-16761 Hennigsdorf
Tel +49 (0)3302 78620 60, Fax +49 (0)3302 78620 69, info@me-systeme.de, www.me-systeme.de

Pin DA68		4-pin Flange connector M12
Pin DA68e		8-pin Flange connector M12
Accuracy		
Temperature coefficient of the zero signal (typical)	mV/V / 10K	< 0.005
Temperature coefficient of the parameter	% v.S. /10K	< 1
Temperature		
Nominal temperature range	°C	-10…+65
Working temperature range	°C	-20…+85
Storage temperature range	°C	-20…+85

Configuration

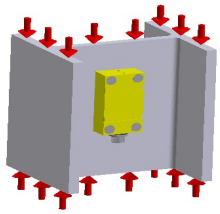
Type DA68e with integrated Electronic GSV-15L

Ub	Supply voltage (24V or 12V DC optional)	brown
GNDb	Connect ground, supply voltage	white
Ua	Output signal 4...20mA or 0...10V	green
GNDa	Connect ground signal	blue
Tara	Control input for zero balance	yellow
Scale	Control input for amplification factor	grey
SW	Threshold output	pink
	Shield (is not connected with the housing)	

Type DA68

+Us	positive bridge supply	brown
-Us	negative bridge supply	white
+Ud	positive bridge output	green
-Ud	negative bridge output	yellow

Installation position

Compressive stress of the DA68 sensor in the longitudinal axis results in a negative signal. The sensor DA68 can also be installed across the compression direction. In this case, a positive output signal is received during compression. The sign of the DA68 output signal can be inverted by switching the cables +Ud and -Ud.	 negative signal

Options

•Cable outlet in transverse direction for DA68
•Strain gauge type S120P with 1000 ohm terminal resistance;
•Strain gauge type 125US for shear stress measurements;
•Integrated temperature sensor PT100 or PT1000 for DA68 with 8-pin connector;

Type designations

Designation	Function
DA68 VA	Stainless steel housing;
DA68 AL	Aluminium housing, anodized;
DA68e 010-5/M12L/10s/VA	With integrated electronics; stainless steel housing; analogue output 0...10V; zero adjustment via 5V control line.
DA68e 010-5/M12L/10s/AL	With integrated electronics; stainless steel housing, anodized; analogue output 0...10V; zero adjustment via 5V control line.

Installation instructions

The full pressure strength of the magnets is only achieved on a flat surface. If there are small surface irregularities, air gaps occur between the magnet and the component meaning that the pressure strength is potentially insufficient to compress the strain gauge and the seal.

Therefore please check whether the pressure strength of the integrated magnets is sufficient before applying the adhesive.

For series DA68e, the following should be observed in particular:

•The strain gauge AND the housing bottom are coated with adhesive; it is only on the seal that no adhesive is applied.

•The same adhesive, “M-bond 30”, is recommended for the strain gauge AND housing bottom.

•Alternatively, adhesive “M-bond 31” is recommended. This adhesive is characterised by a longer working life and a higher final strength.

•The extension sensor is put down with light pressure. Excessive adhesive is squeezed on the gap by means of a light, oscillating (±1mm) movement.

•Stop the oscillating movement when the metal surface of DA68-mag rubs noticeably on the surface of the component.

•It is recommended that an additional sealing gap with silicone TSE397C or similar silicone is laid around the housing.

•The sensor can also be attached to the designated pockets using stainless steel cable ties.

•After attaching, the sensor must be filled with casting compound (cable resin). Two M4 threaded holes (sealed with round-headed screws) are provided for filling and ventilation.

•The cable resin must be mixed thoroughly before being drawn into the syringe. In doing

so, the centre bar (Image 1) must be loosened in the middle by pulling apart (Image 2) and both liquids must be mixed for approximately 3 minutes by kneading, moving and spreading out from the corners (Image 3).



- Fill syringe and inject the cable resin with the syringe;
- the pot life of cable resin is approximately 10 minutes.