ALF257

Axial Compensated Load Cell

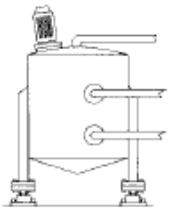
- **Measurement ranges 0 … 80 kN to 0 … 240 kN**
- **Tension / compression**
- **Non-linearity ±0.1 % RL**
- **Output signal rationalised 2.0 mV/V ±0.1 %**
- **Supply voltage 10 VDC, max. 20 VDC**
- **Optional with integrated electronics**

Geometry:
Beam and diaphragm combination. Tension, compression and bi-directional options are available. All standard bi-directional load cells are calibrated in both modes.

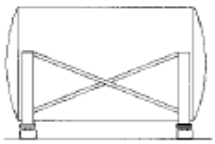
The load cell's unique strain system compensates for typical force misalignment in force measurement rigs and industrial weighing systems. Its various end fixing options are all inert and easily modified for direct inclusion in mechanical assemblies.

The basic versions of the ALF257 are all sealed to IP65. If better sealing is required IP67 is available as an option. Integral 4 to 20 mA or ±10 V output amplifiers can be fitted as an option.

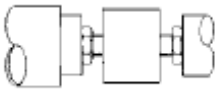
Typical Applications



Load cell with flat base:
particularly suitable for mounting on vessels, tanks, silos, mixing systems etc.;
compression on a flat surface;
accessory: bottom and top mounting plates



Load cell with convex base:
particularly suitable for mounting on load frames, platforms or other structures where loads are measured; due to a spherical load foot the measured load is applied axial, free of torsion and tension.



Load cell with stud base:
particularly suitable for tension and compression measurement in test and research;
for compression an additional load button is available

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Specification

Rated load, stat.:	80 kN / 120 kN / 160 kN and 240 kN
Calibration:	compression, tension, bi-directional
Non-linearity, terminal:	±0.1 % RL
Hysteresis:	±0.1 % RL
Creep, 20 min:	±0.05 % AL
Repeatability:	±0.02 % RL
Rated output, rationalised:	2.0 mV/V ±0.1 % RL Rationalisation tolerance applies to single direction calibrations only
Zero load output:	±4 % RL
Temperature effect on rated output:	±0.002 % AL/K
Temperature effect on zero load output:	±0.005 % RL/K
Compensated temperature range:	-10 … +50 °C
Operating temperature range:	-10 … +80 °C
Supply voltage, recommended:	10 V
Supply voltage, max.:	20 V
Bridge resistance:	700 Ω
Insulation resistance, minimum at 50 VDC:	500 MΩ
Inclined load error – concentric at 3°:	±0.25 % RL
Overload, safe:	150 % RL
Overload, ultimate:	200 % RL
Dynamic load capacity:	70 % RL
Environmental sealing:	IP 65 (Option R), IP67 (Option S)
Weight without cable	approx. 5.5 to 6.5 kg
Material	Stainless steel

Rated load	Structural stiffness, nom.	Rated load	Structural stiffness, nom.
80 kN	8.0 x 10^8 N/m	160 kN	1.6 x 10^9 N/m
120 kN	1.2 x 10^9 N/m	240 kN	2.4 x 10^9 N/m

Notes:
1. RL = rated load
2. AL = applied load
3. Temperature coefficients apply over the compensated range.
4. Optional the load cell is available with integrated amplifier (4 ... 20 mA 2-/ 3-wire)!

Electrical Connections

The load cell is fitted with 2 m of PVC insulated 4 core screened cable type 16-2-4C.

Wiring: load cell with mV output	
+ supply voltage:	red
- supply voltage:	blue
+ output signal:	yellow
- output signal:	green
screen:	orange

Reverse the signal connections to obtain a positive signal in tension mode.
The screen is not connected to the load cell body.

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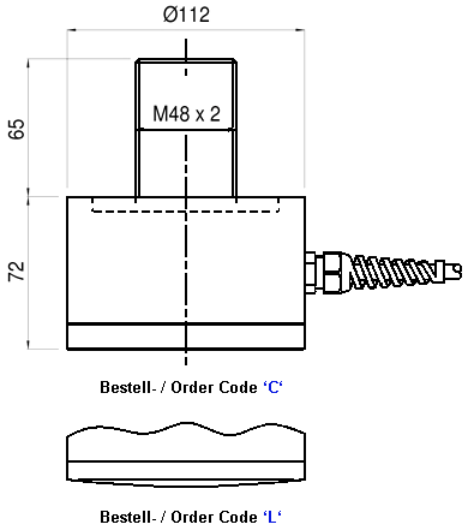
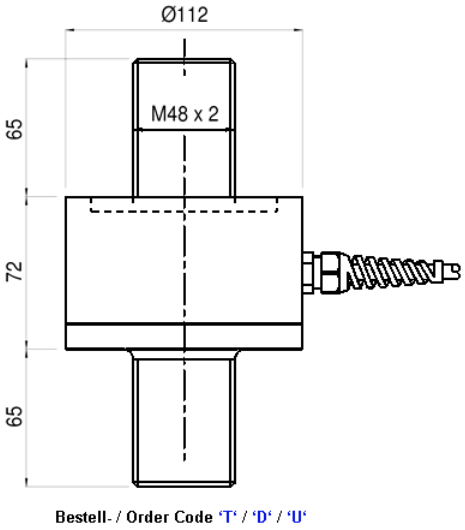
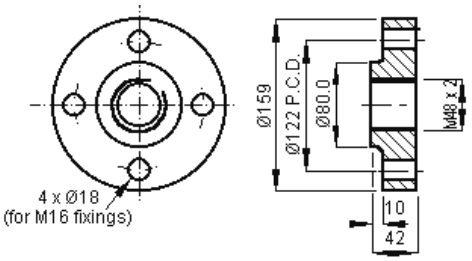
Dimensions Load Cell



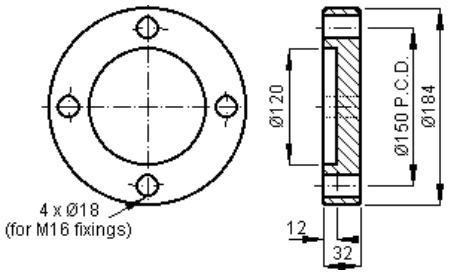


Dimensions Accessory

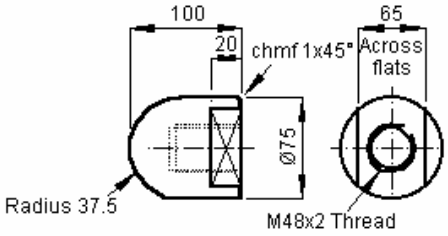
Top mounting plate
(Part No.: 257 207)



Bottom mounting plate
(Part No. : 257 208)



Load button
(Part No.: 257 205)



Dimensions in „mm“, approx. values

These drawings are for information only and not intended for construction purpose.
Please contact us for detailed drawings.

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Option Integrated Amplifiers

The strain gauge amplifiers are designated for a direct integration into the load cell type ALF257. Due to the very small design of this type of amplifier the outer dimensions of the load cell will not change.

Amplifier	4 … 20 mA 2-wire Code -Q	4 … 20 mA 3-wire Code -Z	4 … 20 mA 3-wire Code –Y	Voltage output Code –D*
Supply voltage	24 VDC (20 … 36 VDC)	12 VDC (11.5 … 12.5 VDC)	24 VDC 15 … 30 VDC)	14 … 27 VDC
Ripple	<10 mV_{rms}	<10 mV_{rms}	<10 mV_{rms}	<10 mV_{rms}
Standard output	4 … 20 mA	4 … 20 mA	4 … 20 mA	±10 V
Zero load bi-direct. output	12 mA	12 mA	12 mA	0 V
Loop resistance	max. 600 Ohm at 24 VDC	max. 400 Ohm	max. 400 Ohm	min. 5.000 Ohm
Calibration configuration	24 VDC and 250 Ohm	12 VDC and 250 Ohm	24 VDC and 250 Ohm	24 VDC and 10 MOhm
Non-linearity typical	<±0.05 % RL.	<±0.05 % RL	<±0.05 % RL	±0.02 % RL
Operating temp. range	0 ... 50 °C	0 ... 50 °C	0 ... 50 °C	-40 … +85 °C
Verpolungsschutz				-30 V

***Notes**
- The voltage between the power supply connections and the load cell shield should not exceed 50V.
- The supply should be current limited externally.
- The output cable length can be up to 50 m using suitable screened cable.

Wiring:

Output 4 … 20 mA 2-wire code -Q		Output 4 … 20 mA 3-wire code -Z, -Y		Output ±10 V 4-wire Code -D	
+ loop:	red	+ supply voltage	red	+ supply voltage:	red
- loop:	blue	- supply voltage:	blue	- supply voltage:	blue
screen:	orange	output signal:	yellow	+ output signal:	yellow
		screen:	orange	- output signal:	green
				screen:	orange

The supply connections must not be reversed!

Use good quality screened cable for the output with the screen only earthed at one point. This will usually be at the electronics powering the amplifier.

The body of the load cell must be connected to a good quality earth to maintain the EMC performance of the product. This product complies with the requirements of the European EMC directive.

Ordering Codes

Ordering codes	Load cell without amplifier
ALF257**C**FR0KN	compression, flat base, IP65
ALF257**L**FR0KN	compression, convex base, IP65
ALF257**T**FR0KN	tension, stud base, IP65
ALF257**D**FR0KN	compression, stud base, IP65
ALF257**U**FR0KN	bi-directional, stud base, IP65
ALF257**E**FR0KN	tension, eye base, IP65

Option IP67: change -R- to an -S-
Option integrated amplifier: change -N to an -Q, -Z, -Y or -D (please see amplifier description in table above)
Please add required rated load.

Safety note:
When using the load cell in tension mode it is essential to provide additional safety precautions like safety chains etc. for catching the load in a breakage, which cannot be excluded completely.

Our policy is to improve specification of our products continuously, so technical and production details can be changed without any notice.

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