



# We make forces visible!

High precision force measurement for every requirement

**The A.S.T as an traditional and innovative company, has been developing, manufacturing and producing in the field of force measurement and system technology more than 25 years in Dresden.**

We offer our well-known partners a broad spectrum of force transducers, load cells, transmitter electronics and OEM products. The location is supplemented by the business and production areas of electronics and mechanics, which implement both internal orders and external customer orders - from development and design to a serial production. In addition to the manufacture of sensors and electronic devices, A.S.T. also is well known as an supplier of customer-specific systems and complete solutions in railway technology. Systems for measuring corner and wheel contact forces are used worldwide in the production of modern railway vehicles..



**A.S.T. - Angewandte System Technik GmbH,  
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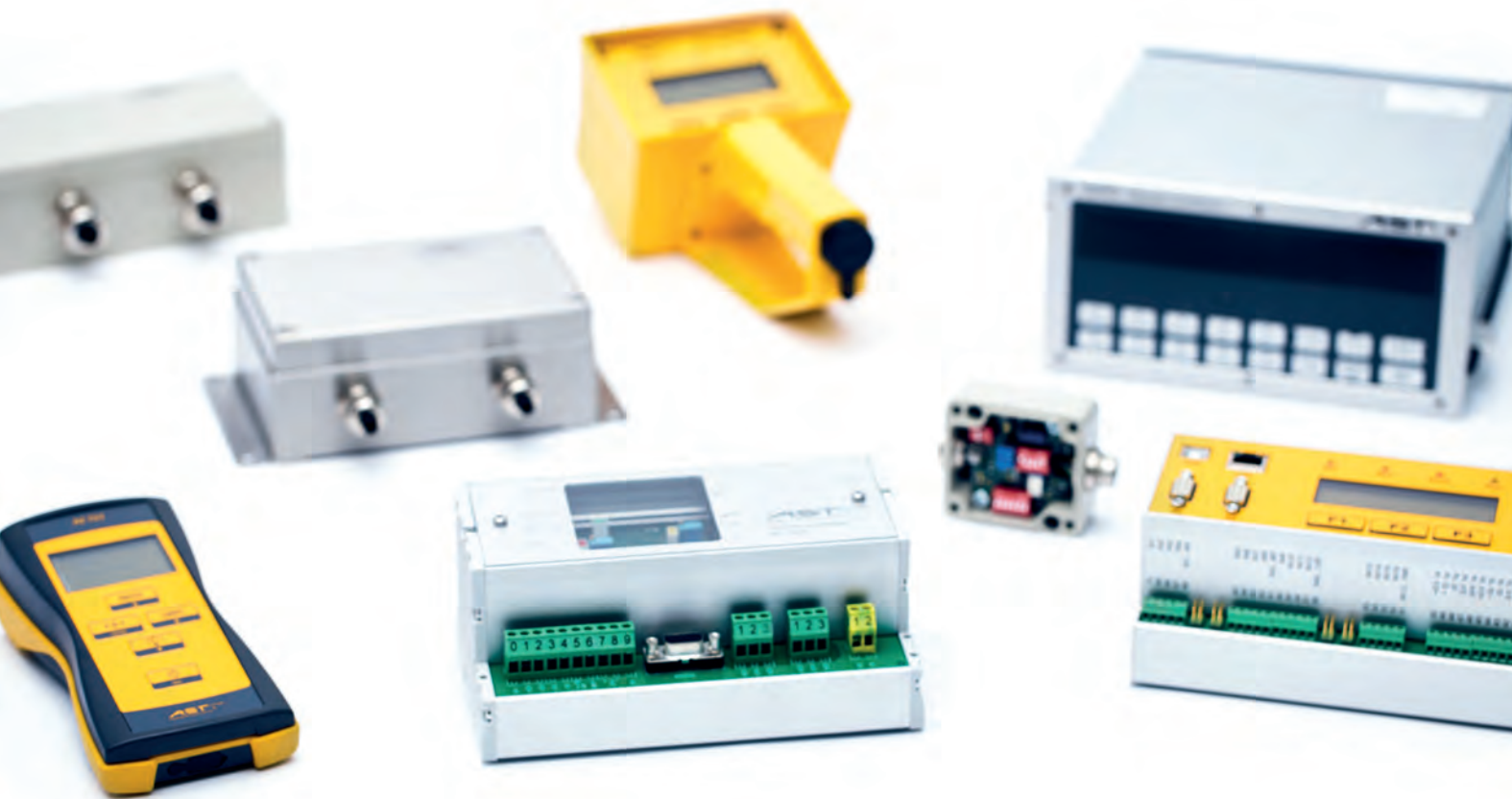


We measure and monitoring your heaviest loads.



# Evaluation Units

## Measure the measurements



### For example:

During the moving of a crocodile at the Animal Park, the people take change to weight the crocodile with our measuring instruments.

## Mobile Indicator / Data Logger ADL 280 RFID



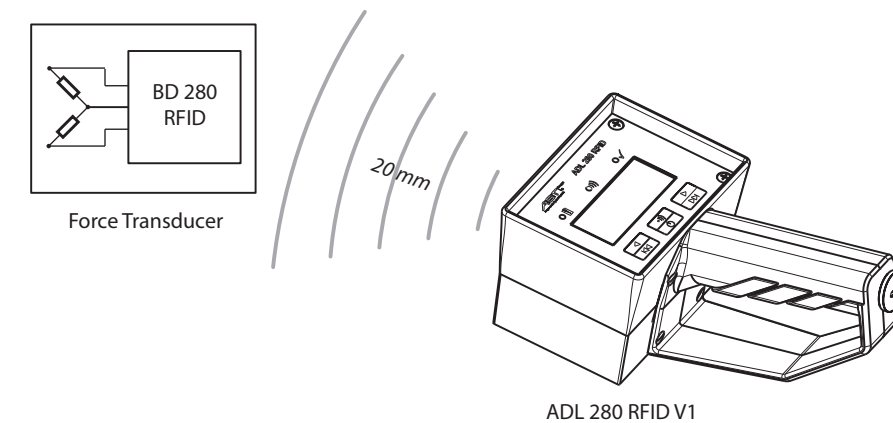
### Applications

- Mobile indicator for strain gauge sensors with A.S.T.-RFID-transponder
- Data logger

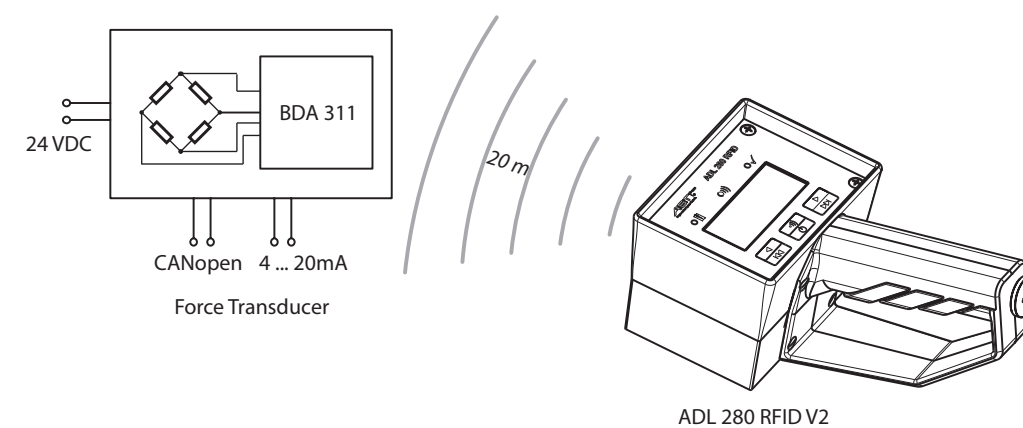
### Features

- Easy to use
- Sensor detection
- Display measured value, date, time
- Memory for 500 measurement values
- Software XKS 280

### Option 1: Power supply of the sensor via handset ADL 280 RFID



### Option 2: Power supply of the sensor via 24 VDC - external



## Mobile Display AE 703



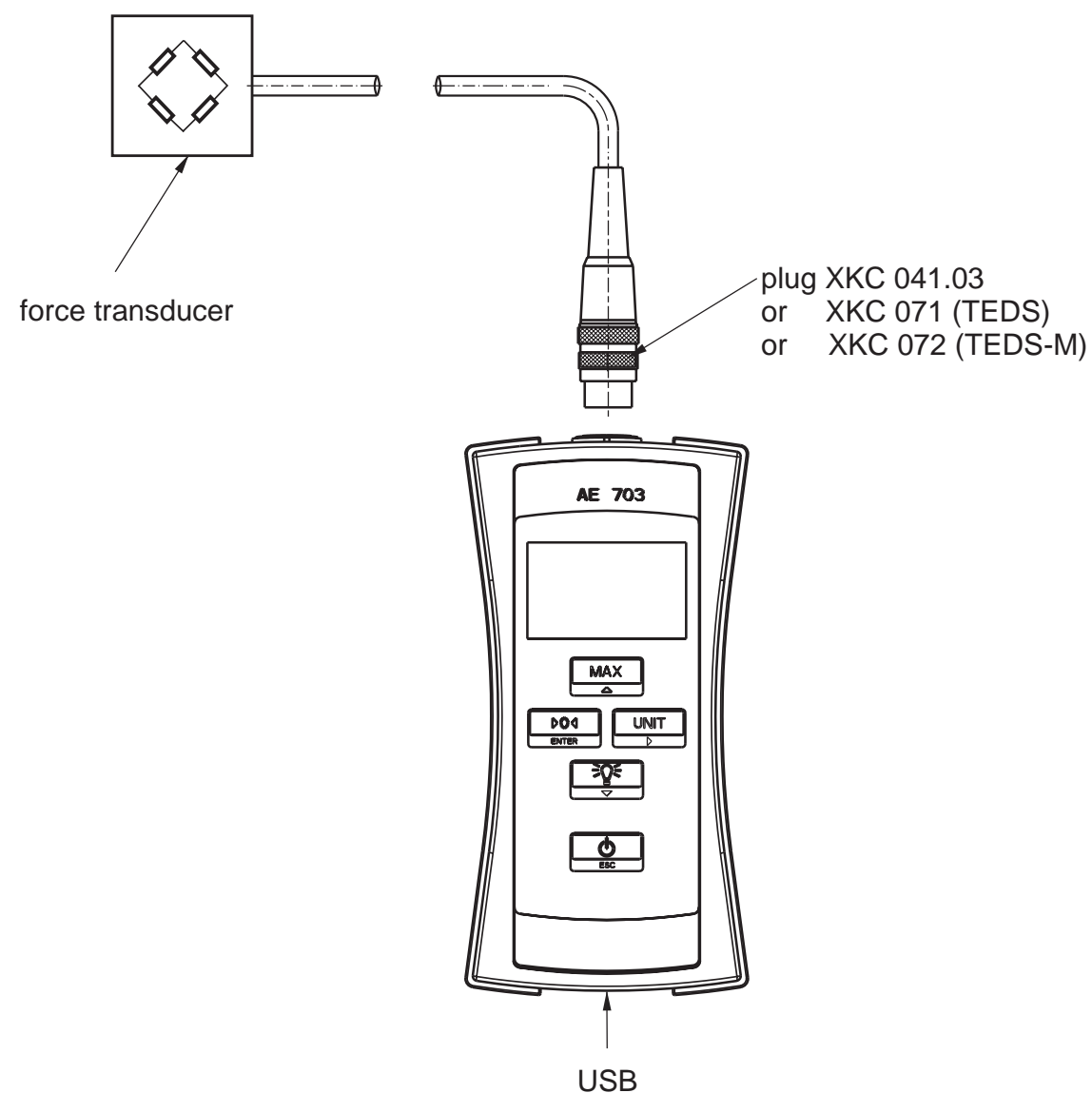
### Applications

- Mobile display for force transducers
- Measuring systems

### Features

- Rigid versatile handheld instrument
- Minimal- and maximal value display
- 16 programmable measurement range
- Measuring rate up to 1600 value/ s
- Multiple force transducers connected
- 0.01 % accuracy class
- USB 2.0- interface
- Sensor detection of TEDS and TEDS-M transducers

### Dimensions/ Connections



## Strain Gauge Amplifier BA 627



BA 627-KL



BA 627-ST

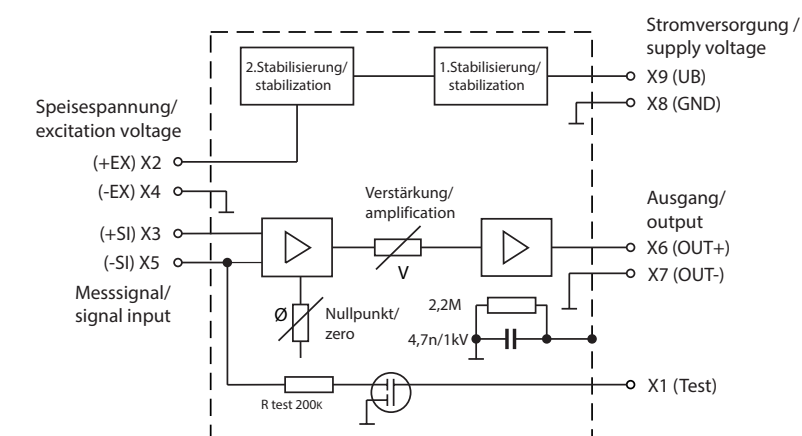
### Applications

- Detection of tensile and compressive forces

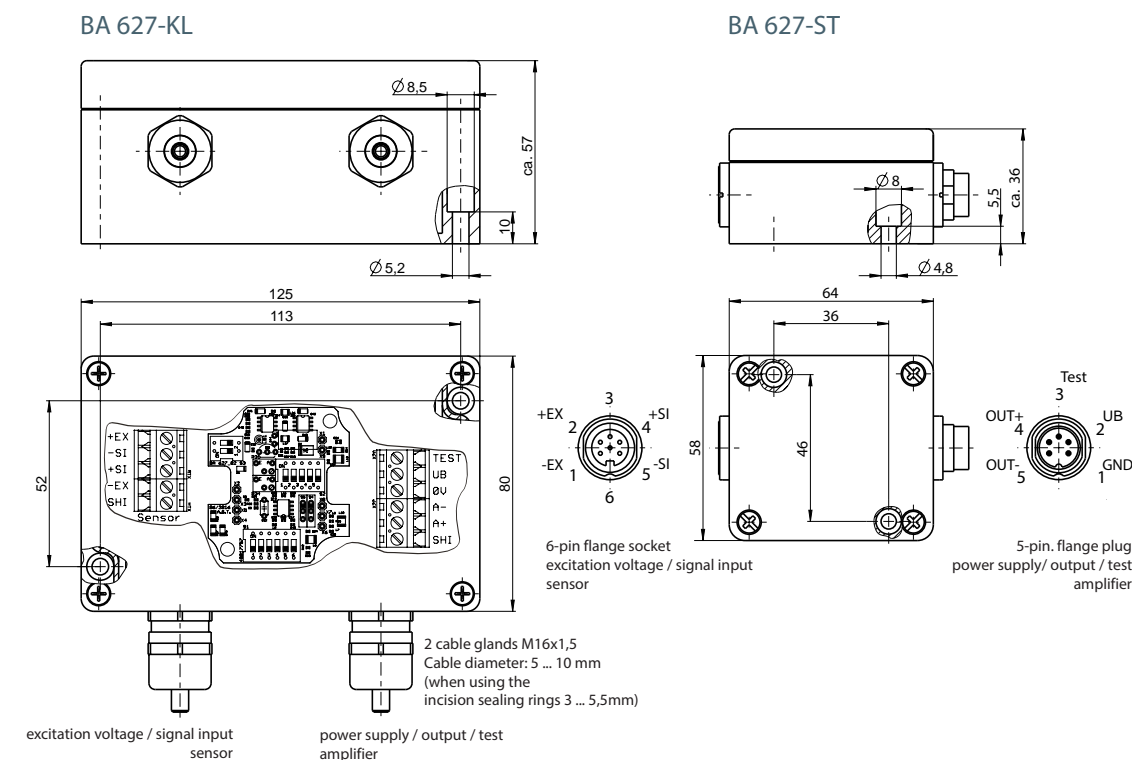
### Features

- Input signal range 0.28mV/V ... 3.6 mV/V
- Power supply 24V
- Environmental protection IP65
- Rugged die cast chassis
- Highly flexible
- Easy set up

### Principle Overview BA 627



### Dimensions / Connections



Strain Gauge Measuring Amplifier BA 662



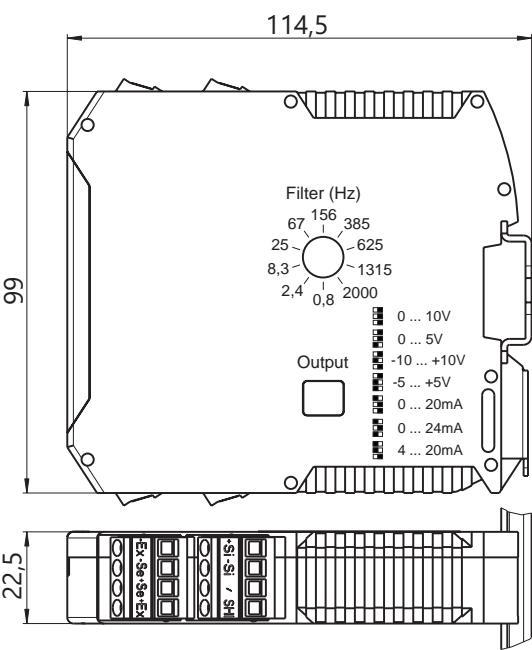
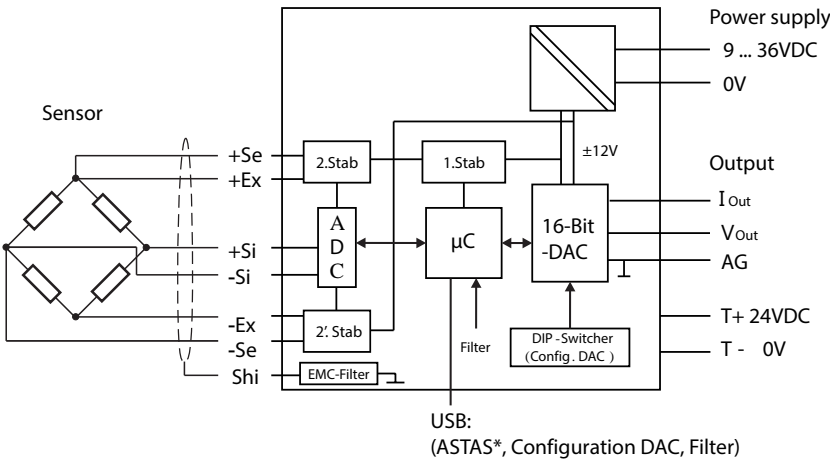
Applications

- Strain gauge measuring
- Process control
- Industrial automation
- Testing machines

Features

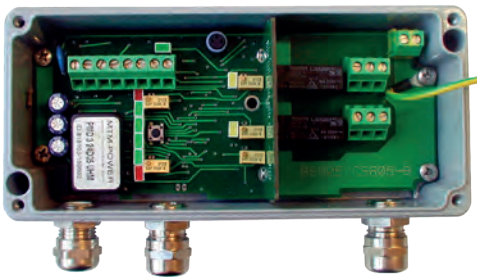
- Universal applicable
- High accuracy by 24 bit A/D-converter
- Configurable including multipoint calibration via USB interface and PC with AST AS®
- Conversion rate up to 3.2 kHz
- Filter from 0.8 Hz to 2.0 kHz
- Power supply 9 to 36 V galvanic isolated
- 4- or 6-wire technology
- Trigger input for zero point adjustment
- Simple handling

Dimensions/ Connections



Terminal connection	Description	
-Ex	neg. Excitation voltage	Sensor with 6 wire
-Se	neg. Sense signal	
+Se	pos. Sense signal	
+Ex	pos. Excitation voltage	
+Si	pos. Signal	
-Si	neg. Signal	
NC	not connected	Output signal
SHI	Shield	
AG	Ground for output signal	
V-Out	Voltage output	
I-Out	Current output	Power supply
NC	not connected	
+24V	Supply voltage	
0V	Supply voltage ground	
Tr+	Trigger 24V	electrically isolated input
Tr-	Trigger 0V	

Switching Amplifier BS 805



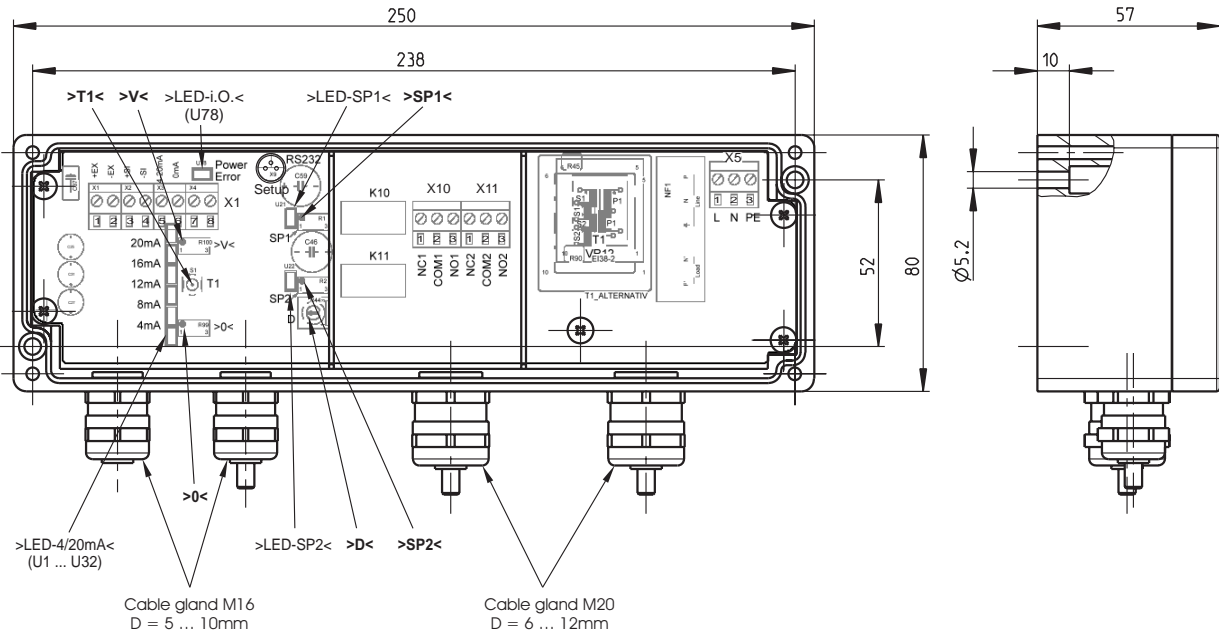
Application

- Truck and hoist with two adjustable switching points
- Safety mode according to DIN EN 13849-1: Performance-Level PLc

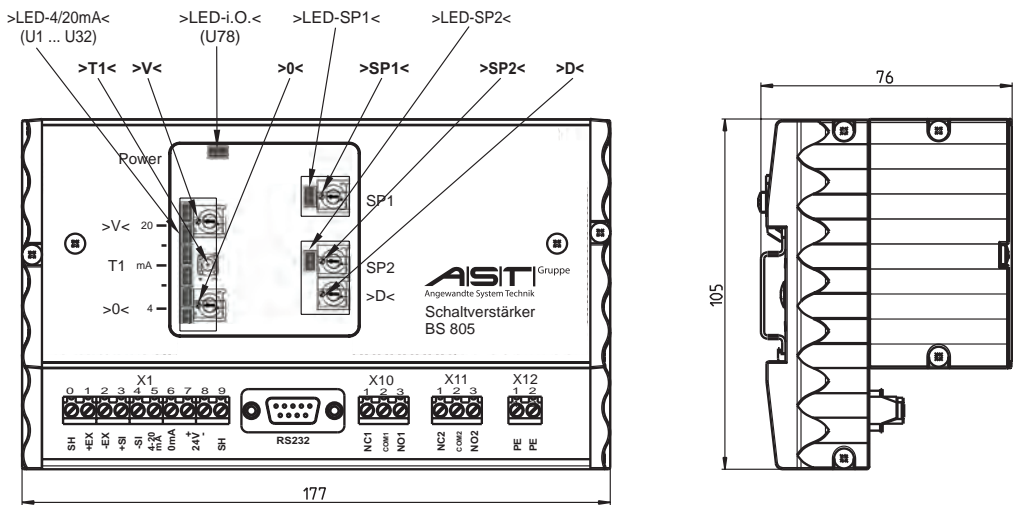
Features

- Input: Strain gauge respectively 4/20mA
- Output: 4/20mA, two switching points
- Supply voltage: 24VDC respectively 230VAC
- Case: IP65 respectively DIN rail IP 40
- Software XKS805: Setup, parameterisation, storage

BS 805.1x



BS 805.2x



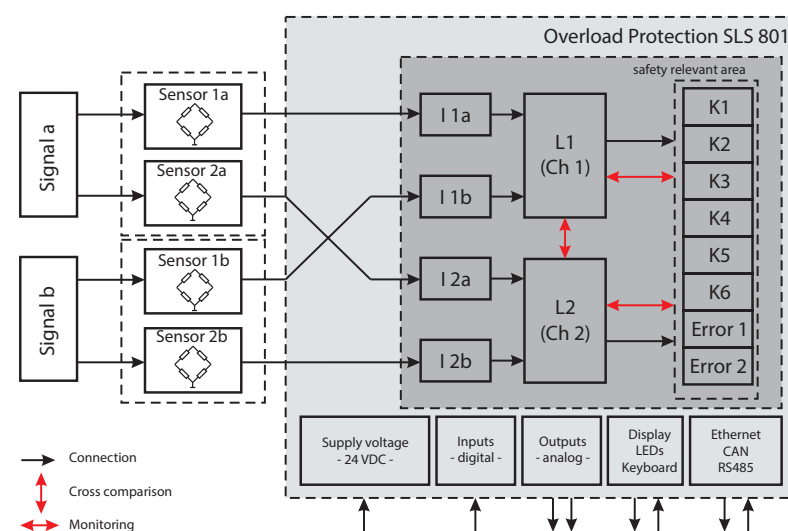




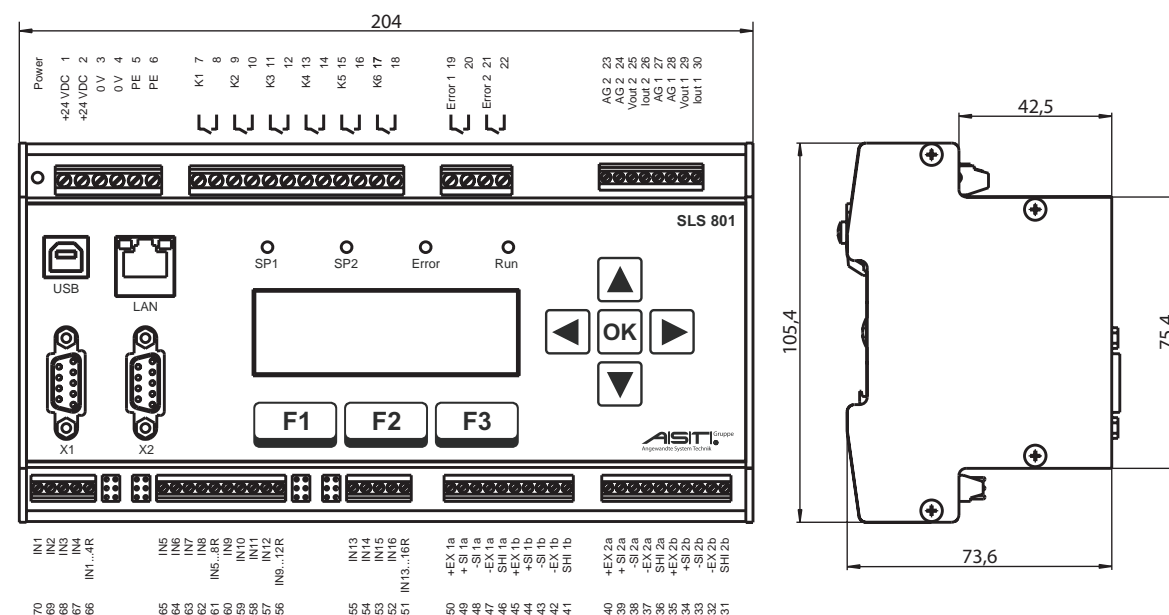
## Features

- Protection: EN ISO 13849-1:
- available for performance level PLd
- Sensor inputs:  
SLS 801.01: 2x2 Strain gauge Sensors  
SLS 801.02: 2x2 4...20mA-Sensors
- Digital inputs: 16 channels optically isolated
- Output control panel: 8x DC1: 24V/2A
- Interfaces: LAN// X1: RS-485/ RS-232 optional//X2: CAN

## Principle Overview



### Dimensions/ Connections

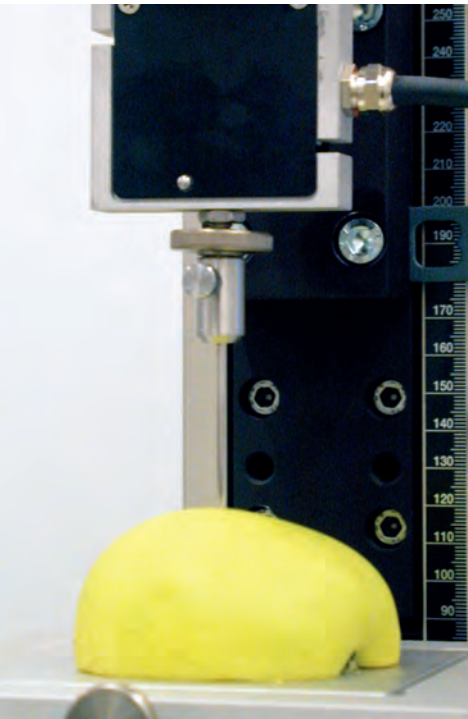


**Take a look into our mechanical prefabrication:**  
Accuracy is everything! Strict quality controls in every step for our high quality requirements.



# Material testing

Explore the limits of resilience



**For example:**  
How crisp such an apple could be was measured with our force transducer.

## Miniature Force Transducer with Overload Protection KA-LF

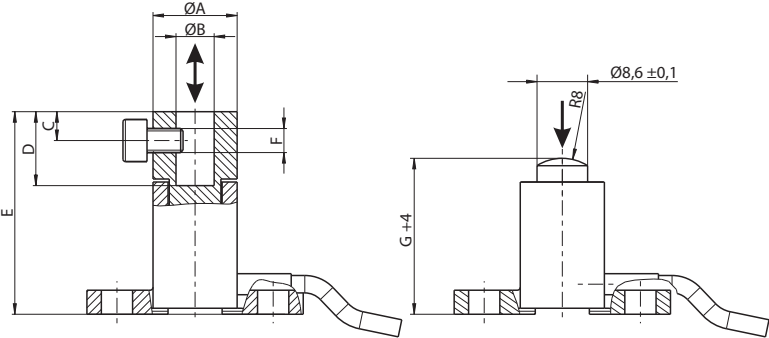
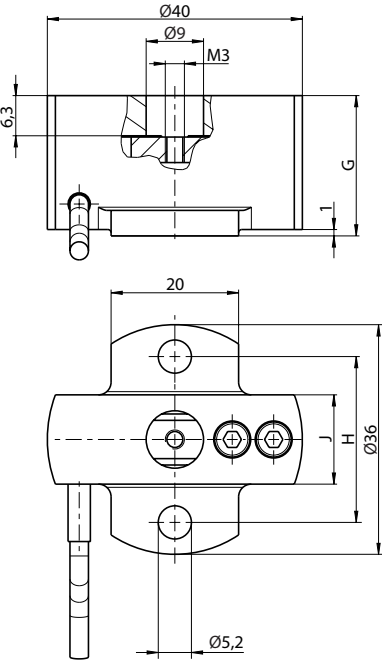
- Applications**
- Accurate measurement of small forces
  - Assembly technology, robotics
  - Automation technology
  - Material testing equipment

- Features**
- 2.5N up to 100N
  - Integrated overload protection of up to 1000%
  - Thin film technology
  - Small dimensions
  - Made from stainless steel
  - Environmentel protection IP 42
  - Nominal displacement 0.05-0.1mm

- Options**
- integrated amplifier - analog output 4 ... 20mA
  - with CANopen-Schnittstelle



Dimension (mm)



KA-LF with XKM 131/XKM 132 for tensile and compressive force

KA-LF with XKM 130 for compressive force

Type	G	H	J
KA-LF	22	26	14
KA-LF-E/CANopen	26	28	14
KA-LF-E/4...20mA	26	28	16

Force Application	A	B	C	D	E	F
XKM 131 (bis 20N)	14	6,35 <sup>H6</sup>	4,8	12,3	G+11,7	M4
XKM 132 (50N/ 100N)	10	4 <sup>H6</sup>	3	12	G+10	M3



Force Transducer KAB



Applications

- Mechanical engineering
- Measurement of bending forces

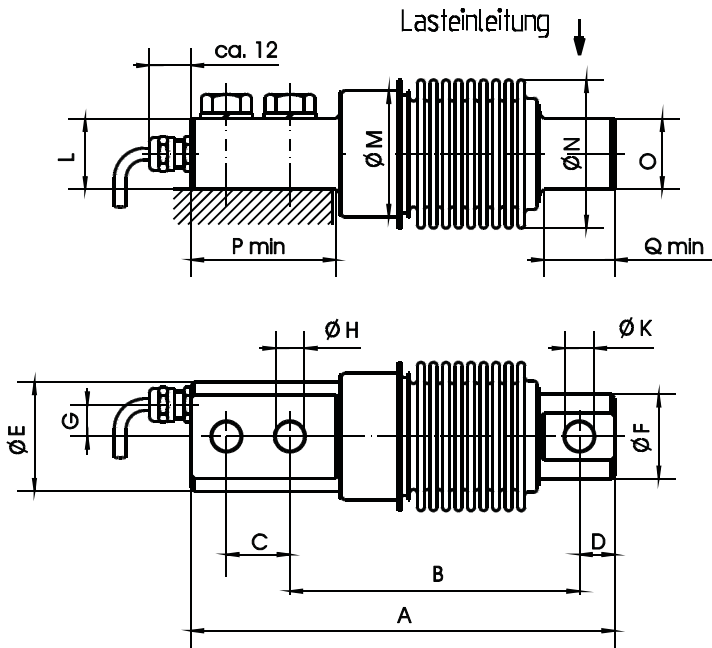
Features

- 100N up to 10kN
- Made from stainless steel
- Hermetically sealed enclosure (IP 67)

Options

- Integrated amplifier with standard signal
- ATEX-Certificate

Dimensions (mm)



Rated Load	A	B	C	D	E	F	G	H	K	L	M	N	O	P	Q	Rated display- ment/ mm	Weight
100N ... 500N																	
1kN	120	82±0,1	18±0,1	10	Ø31	Ø24	9	Ø8.2	Ø8.2 <sub>-0,1</sub>	20	Ø35.8	Ø42±0,5	20	41	20	0.3	0.6 kg
2kN																0.24	
5kN																0.28	
10kN	210	133±0,1	40±0,1	22	Ø48	Ø34	15	Ø13	Ø11±0,1	40	Ø55	Ø55±0,6	25	68.5	42.5	0.4	2.3 kg
																0.6	

Force Transducer KAF



KAF/10kN

Applications

- Material testing
- For testing machines and systems
- For monitoring of forces at hydraulic cylinders

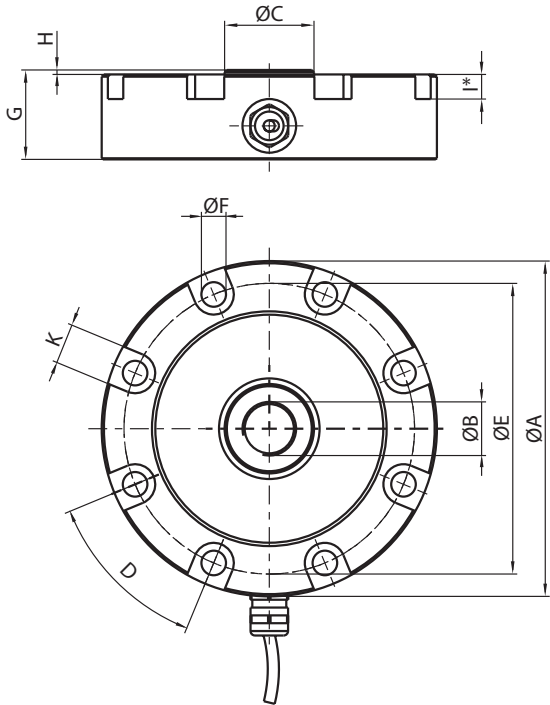
Features

- 1kN up to 500kN
- High accuracy
- For measuring of tensile and compressive forces
- Made of stainless steel
- Environmental protection IP 67

Option

- ATEX-Certificate

Dimensions (mm)



Tightening Torque of Fixing Screws

Rated Load (kN)	Size	Tightening Torque
1/ 2/ 5/ 10	8 x M8x35-10.9 (DIN 912)	30 Nm
20/ 50	8 x M10x40-10.9 (DIN 912)	60 Nm
100/ 200	8 x M12x40-10.9 (DIN 912)	100 Nm
250/ 500	16 x M12x80-10.9 (DIN 912)	85 Nm

Rated Load (kN)	A	B	C	D	E	F	G	H	I	K	Weight
1/ 2/ 5/ 10	105	M12	31,5	8 x 45°	89	8,4	35	3	9	15	1,3 kg
20/ 50	150	M24x2	40	8 x 45°	130	11	40	2	11	18	3,7 kg
100/ 200	165	M36x3	50	8 x 45°	145	13	42	2	13	20	4,9 kg
250/ 500*	203	M45X3	94	16 x 22,5°	165	13	64	6,5	-	-	11,4 kg

\*without milled slots for screw heads

# Overload protection

The load always under control



**Application:**  
Our Rope Guard for overload protection of a crane.

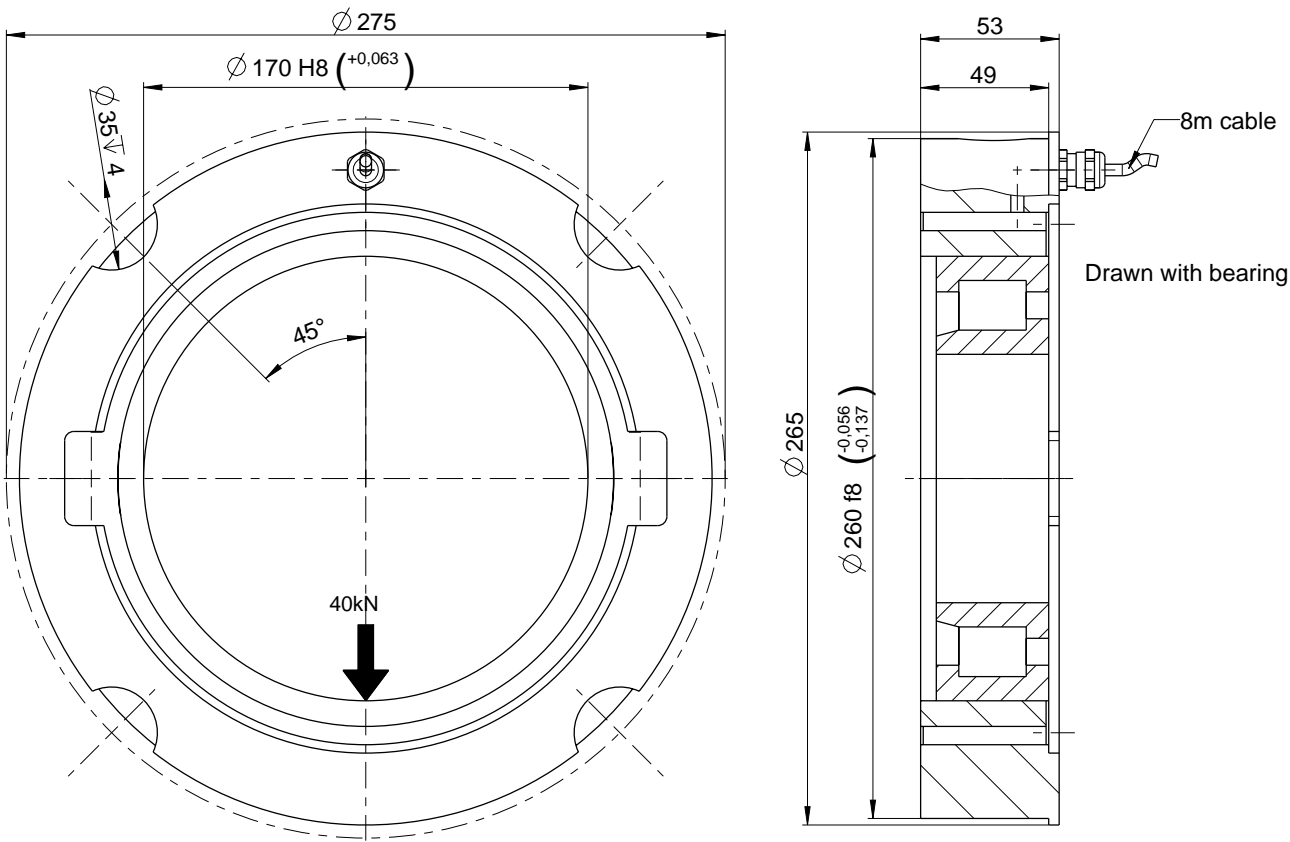
## Radial force transducer KAR

- Applications**
- Bearing locations for load pins

- Features**
- 40kN
  - Accuracy class <0,5%
  - Output 4 ... 20mA
  - Power supply 10 ... 30V DC
  - Limit load 150%
  - Fracture load >400%
  - with integrated amplifier
  - Environmental protection IP 67
  - Made of stainless steel

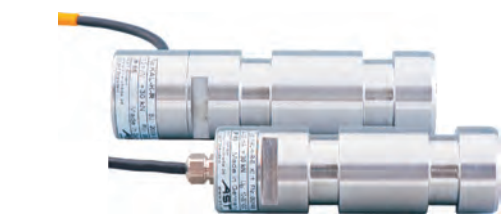


**Dimensions (mm)**





Load Pin with Standard Dimensions KAL-K

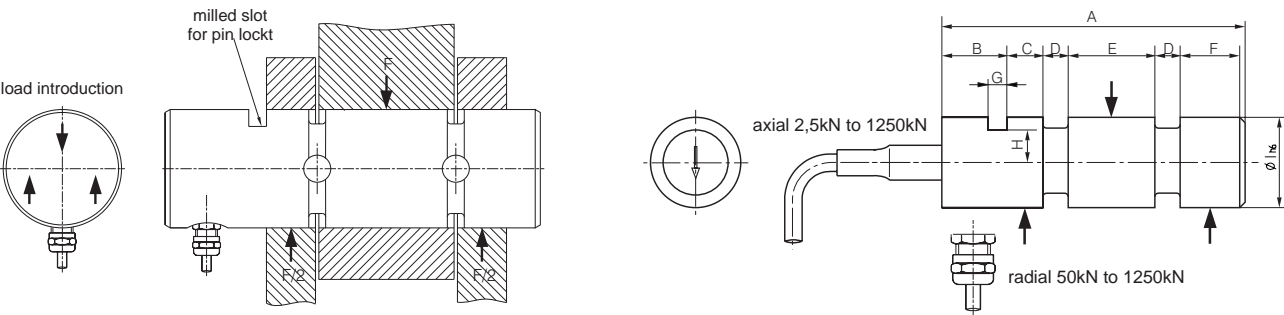


- Applications**
- Overload protection
  - Cranes and hoisting devices
  - Elevators and wire rope winches
  - Direct load measurements such as pins, axle or shafts

- Features**
- Made of stainless steel
  - Ultimate overload 500% F<sub>nom</sub>
  - With standard dimensions
  - HHermetically sealed (IP 67)

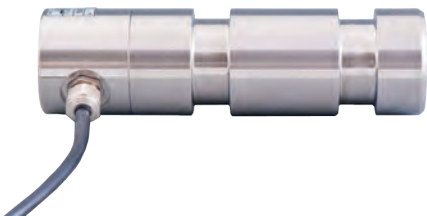
- Options**
- Amplifier options for standard signal output 0/4 ... 20mA, -10 ... 0 ... +10V
  - Redundant system with two measuring bridges and two amplifiers

Dimensions (mm)/ Installation Example



Rated Load (kN)	Cable Output	Ø I h6	A	B	C	D	E	F	G	H	Weight
5 bis 20	axial	25	84	18	10	7	24	16	5.2	9	0.2 kg
50	radial or axial	35	112	25	12	12	35	14	6.3	11.5	0.7 kg
100	radial or axial	50	161	32	18	18	48	24	10.5	20	2.0 kg
200	radial or axial	65	196	32	20	25	65	26	10.5	22.5	4.5 kg
500	radial or axial	85	258	34	35	28	89	39	10.5	28	10.5 kg
1000	radial or axial	100	347	36	55	35	120	61	10.5	36	19.5 kg
1250	radial or axial	120	347	36	55	35	120	61	12.5	40	28.5 kg

Load Pin with Customizable Dimensions KAL



Special solutions with any standard shackles

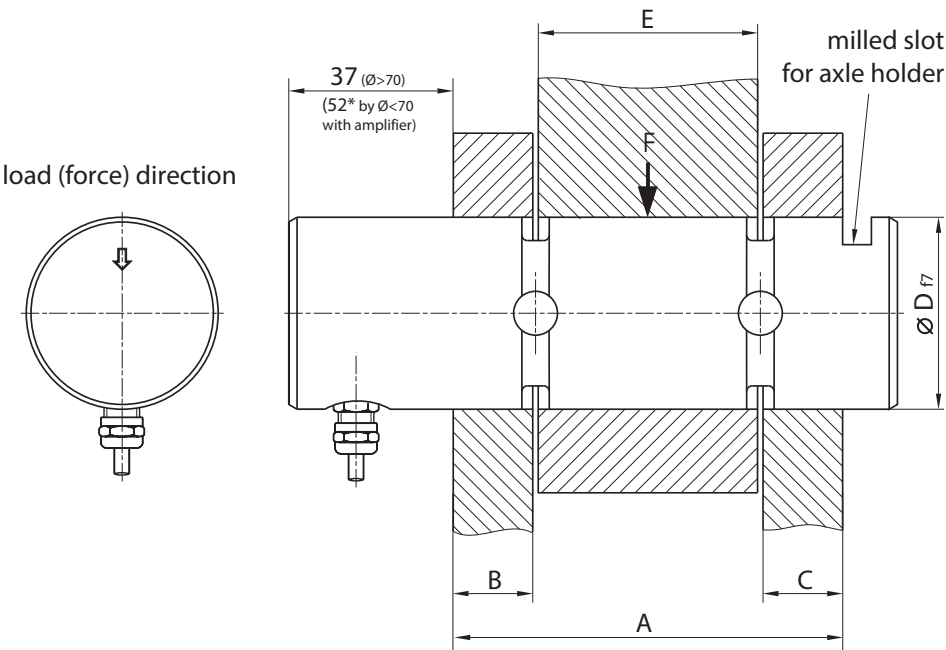


- Applications**
- Overload protection
  - Cranes and hoisting devices
  - Elevators and wire rope winches
  - Direct load measurements such as pins, axle or shafts
  - Oil production facilities
  - Coal mining

- Features**
- Made of stainless steel
  - Customizable dimensions
  - Hermetically sealed (IP 67)

- Options**
- Integrated amplifier with standard signal output 0/4 ... 20 mA, -10 ... 0 ... +10 V
  - Redundant system with two measuring bridges and two amplifiers
  - CAN Bus/ CANopen interface
  - ATEX for 10kN ... 5000kN (without amplifier)

Typical Dimensions (mm)



	Rated Load in kN						
	20	50	100	200	400	800	1200
Recommended Ø D <sub>r7</sub>	25 - 40	30 - 50	40 - 65	50 - 80	65 - 110	80 - 125	110 - 156

Wire Rope Overload Guard KSW-2R



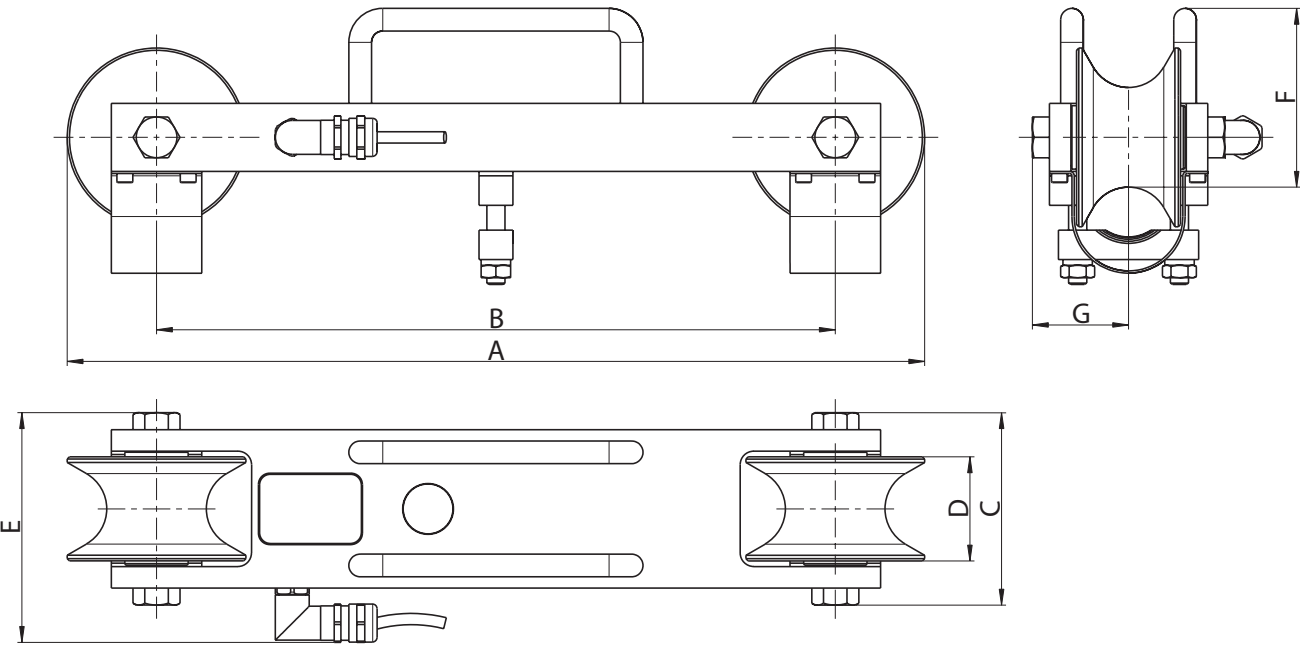
Applications

- Sensor for measuring of loads at fixed wire ropes

Features

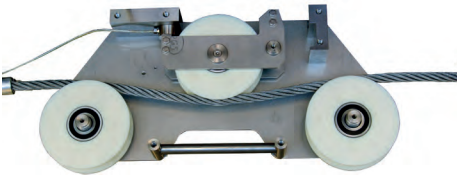
- Size KSW-2R36 for rope diameter 16mm to 36mm, maximum rope load 160kN
- Size KSW-2R44 for rope diameter 36mm to 44mm, maximum rope load 250kN
- Standard output signal 4 ... 20mA
- Made of stainless steel

Dimensions (mm)



Type code	A	B	C	D	E	F	G	Weight
KSW-2R36	379	300	85	46	102	79	42.5	approx. 7,5 kg
KSW-2R44	534	440	115	51	131	93	57.5	approx. 16 kg

Wire Rope Overload Guard KSW-3R



Applications

- Tension sensing on running rope

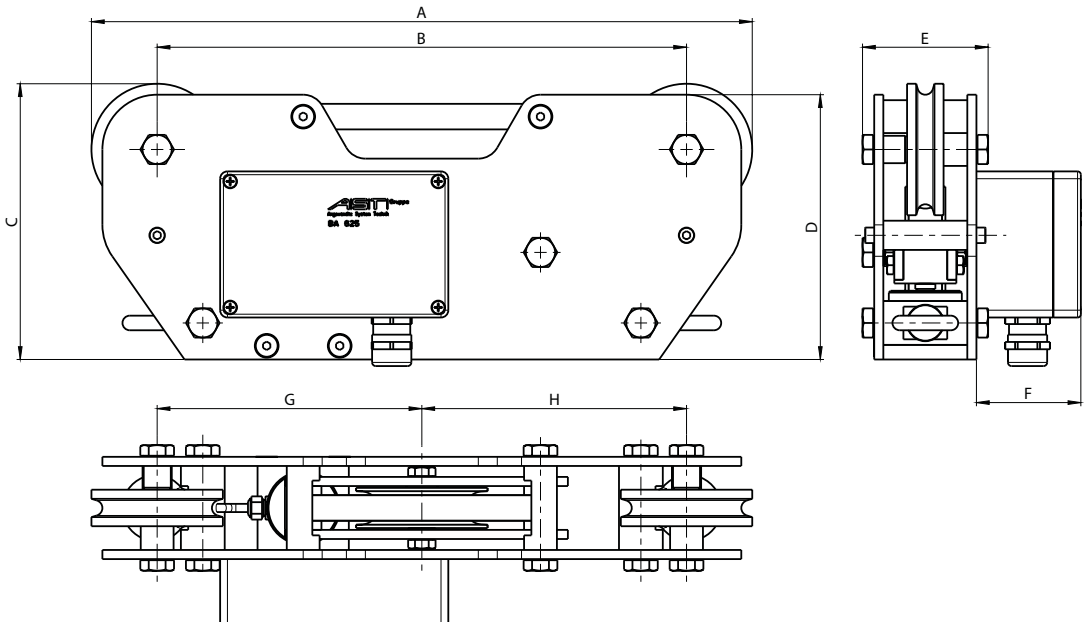
Features

- Size KSW-3R16 to 16mm rope diameter
- Size KSW-3R38 to 38mm rope diameter
- Standard output signal 4 ... 20mA
- Made of stainless steel
- Can be mounted on tensioned rope

Options

- Impuls transmitter for measuring rope displacement for KSW-3R38

Dimensions (mm)



Type code	A	B	C	D	E	F	G	H	Weight
KSW-3R16	approx. 400	290	approx. 200	165	76	57	145	145	approx. 7.0 kg
KSW-3R38	approx. 700	520	approx. 300	295	95	57	260	260	approx. 39 kg

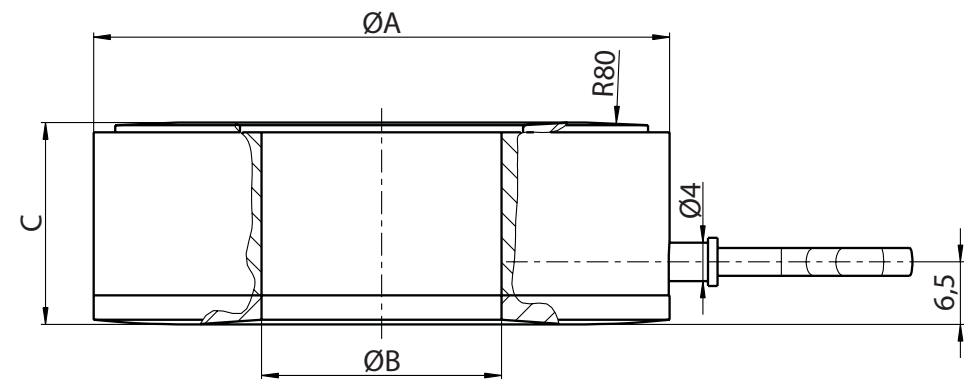


Force Transducer KUS



- Applications
- For measuring of forces on screw
  - Force measuring washer
  - Overload- detection for cranes
- Features
- Wide load range of 100kN to 3MN
  - Made of stainless steel
  - Adjustment and dimensions according to customer request possible

Dimensions (mm)



Example: KUS 100kN/5/60x25x21

Examples of ring force transducer - other dimensions on request

Typ Number	Type Code	Rated Load	Rated Characteristic Value	A	B	C
3572004	KUS/100kN/2	100kN	approx. 1mV/V	126	101	40
3571706	KUS/100kN/5	100kN	2mV/V ± 0.5	60	25	21
3571972	KUS/100kN/5	100kN	2mV/V ± 0.5	37	21	10.5
3572735	KUS/150kN/2	150kN	approx. 1mV/V	168	108	40
3571973	KUS/150kN/5	150kN	2mV/V ± 0.5	37	21	10.5
3573487	KUS/200kN/5	200kN	approx. 1mV/V	47	21	21
3573766	KUS/300kN/5	300kN	approx. 2mV/V	90	60	21
3571650	KUS/300kN/5	300kN	2mV/V ± 0.5	68	31	21
3573071	KUS/350kN/2	350kN	approx. 1mV/V	270	206	66
3570705.01	KUS/500kN/5	500kN	approx. 2mV/V	90	60	21
3570705.02	KUS/500kN/5	500kN	2mV/V ± 0.5	80	38	21
3573756	KUS/500kN/5	500kN	approx. 1.5mV/V	99.9	68	21
3572054	KUS/1000kN/5	1000kN	approx. 2mV/V	196	120	66
3573765	KUS/1500kN/5	1500kN	approx. 2mV/V	196	120	66
3570637	KUS/3000kN/5	3000kN	2mV/V ± 0.5	196	120	66



Planing is everything!



# Add technologies

That everything really fits



**For example:**  
Strictly Qualitysecure by add technologies are no problem  
with our special force transducers!

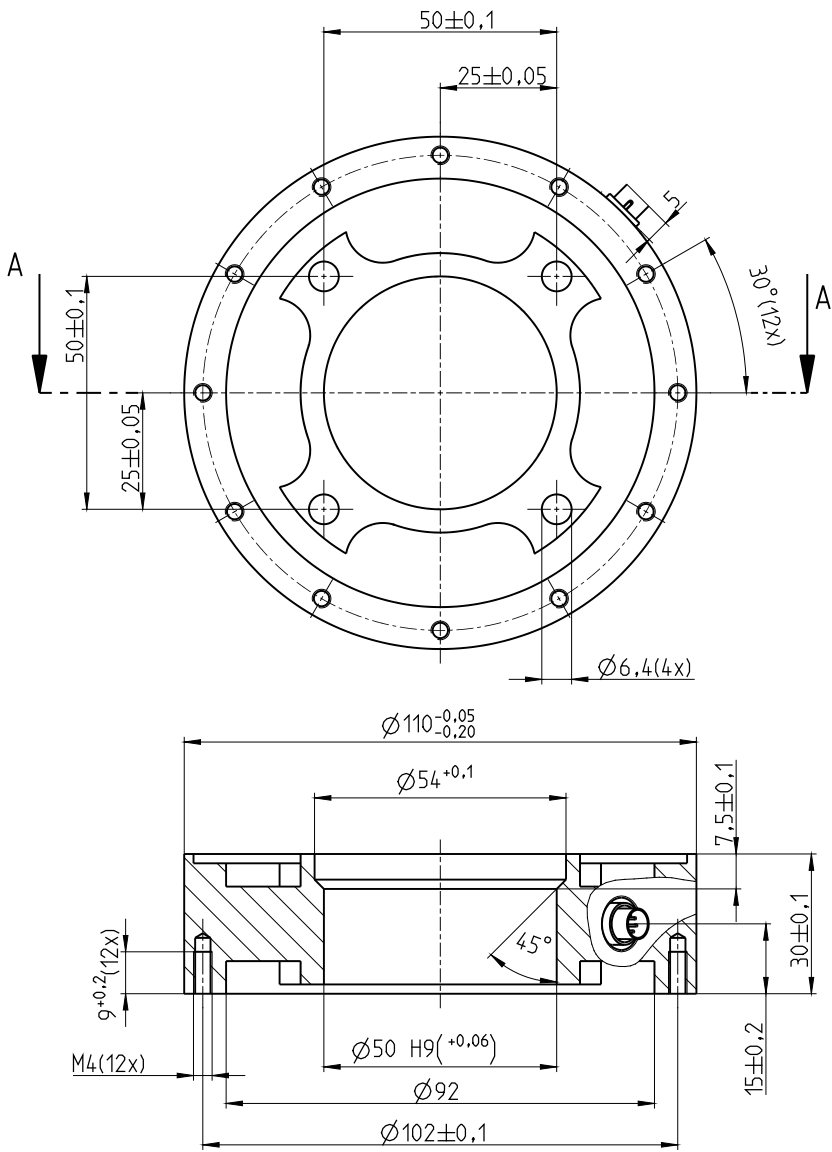
## Ring force transducer KMR-F



- Applications**
- Force measuring washer
  - For measuring of forces at the cable ends and screw connections

- Features**
- 30kN
  - Made of stainless steel
  - Accuracy class 0.5 %

### Dimensions (mm)



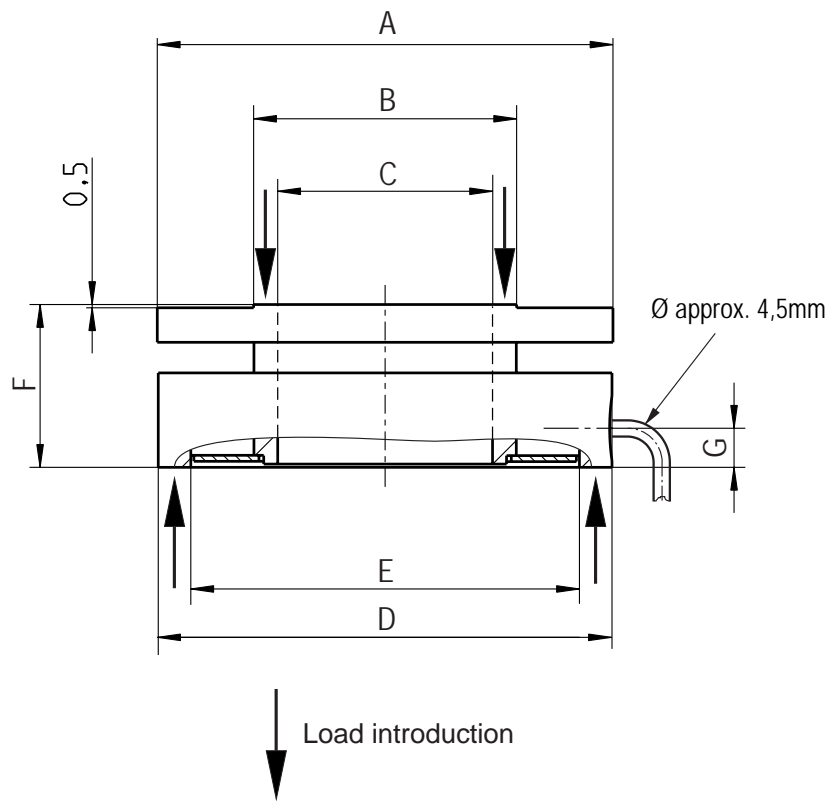




- Applications**
- Ring force transducer or measuring shim
  - Joining processes and pressing operations
  - Lifting equipment
  - Spindle drives

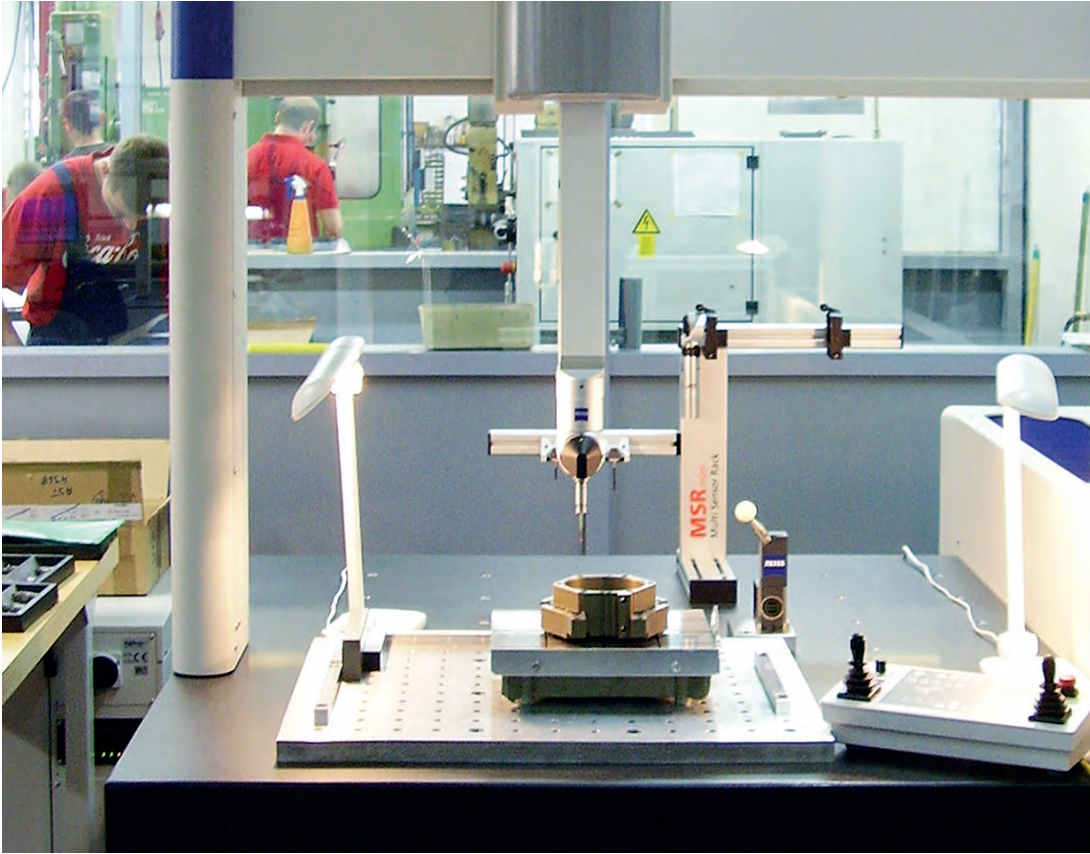
- Features**
- 1kN up to 50kN
  - Accuracy class 0.5 %
  - Made of stainless steel

Dimensions (mm)



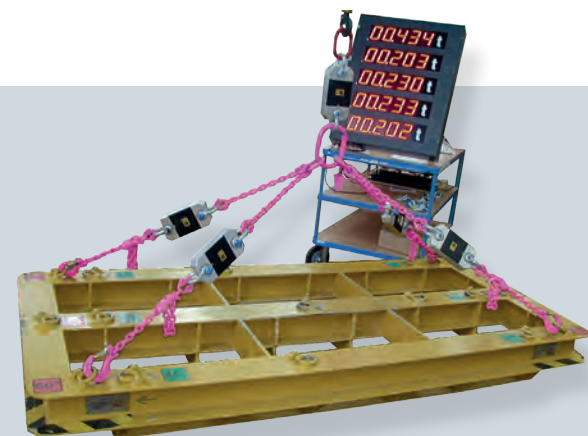
Rated Load (kN)	Ø A (mm)	Ø B (mm)	Ø C (mm)	Ø D (mm)	Ø E (mm)	Ø F (mm)	Ø G (mm)	Weight
1/ 3/ 6	65 <sup>-0,03 -0,08</sup>	37.6-0.1	30 +0.2	64±0.2	56.4	23±0.1	4.5	approx. 0.3kg
10/ 20	70±0,05	40.4-0,1	33 ±0.1	69.7±0.2	59.7	25±0.1	6	approx. 0.4kg
30/ 50	112 <sup>-0,03 -0,09</sup>	80-0.1	70 ±0.1	111.5±0.2	100.5	35±0.1	6	approx. 1.2kg

# Our Experts during work on modern machines



# Lifting technologies

Take control



## For example:

Typical application include the measurement of chain forces when connected off-key from the main crane lifting force.

## Load Link with Wireless Remote Control KAK-F

### Applications

- Under hook crane weighing
- Measurements of cable tension
- Determination of loads in wire rope



The load link model KAK-F is a compact measuring device for the determination of loads in wire rope and cranes. With the assistance of shackles, hooks and master links the load link will be completed to a crane scale. The load link is equipped with RRF remote control unit operates at 868 MHz and allows complete control of the scale. The measuring data can be transferred to a PC. The load link operates independent of mains and its operation time, with a fully charged battery, amounts to at least 140 hours.

### Features

- 1.0t to 100t capacities
- Accuracy class 0.2 %
- For use with standard lifting shackles
- Wireless data transmission
- USB Interface
- Anodised aluminium alloy and stainless steel brushes
- Low weight



Typical applications include the measurement of chain forces when connected off-key from the main crane lifting force. In this application the KAK-F is sending the individual tension of each chain to the remote display. The serial interface allows the direct communication with a PC or another large display. Through this measurement the user can ensure that no overload occurs in the individual chains during the operation. The remote control FFB 204 can be used in this case to control up to 4 load links..



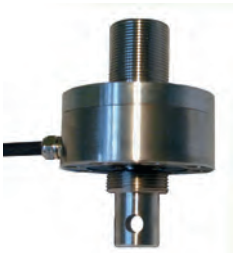
# Complete Systems

Measure with system

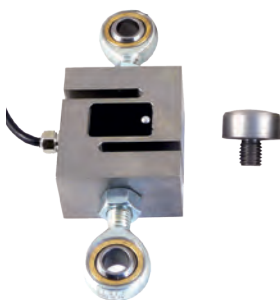


**For example:**  
Measuring system for the checking of force generating systems.  
This picture shows the verification of a pressing cylinder.

KAF-W



KAP-S



KAN-G



KAM



**Applications**

- Industrial automation
- Machine testing
- System calibration

**Features**

- Portable and ready to use
- Fast setup through built-in sensor recognition and multipoint calibration (TEDS-M)
- High accuracy through calibrate the complete measurement chain
- Traceable calibration certificate, optionally DAkkS calibration certificate
- Industrial quality
- Data-logging with PC-software (included)

**Short description**

The force measurement system Masterforce® iis very easy to use and useful for testing or calibrating machines and installation equipped. This helps to comply with quality regulations, i.e. ISO 9001. The instrument provides an USB-interface to our PC- softwareAST AS®, which allows additional programming and multipoint calibration of the sensor. The software also features a data logging to PC function which stores up to 1600 values per second directly into a Microsoft-Excel file. The Masterforce® system can be extended by an infinite number of other strain gauge sensors. With AST's TEDS function every sensor is recognized with its nominal value and calibration data. The stable transportation case contains the instrument, sensor, USB-cable, CD-ROM with software and documentation and a printed documentation. Software and manual are in English and German language. Our factory calibration as well as the optionally according to ISO 376 calibration includes the calibration for tension and compression for our bi-directional force sensors. The new Masterforce® iis a measurement kit containing one of the most accurate handheld force measurement instruments on the market, a calibrated force transducer to measure loads with TEDS-M function and our PC software AST AS®.

The integrated TEDS-M function makes the setup very fast and easy: The sensor data are stored in a chip that is part of the sensor plug. The data contain information such as:

- Rated load and up to 5 calibration points
- Sensitivity
- Name of the sensor
- Manufacturer
- Date of calibration



#### Applications

- suitable for mobile display AE 703
- Changing sensors without risk
- suitable also for non A.S.T.-sensors

#### Features

- calibration data stored in the sensor
- simple data storage with ASTAS
- complies to the standard IEE 1451.4

#### How it works

Sensor data, that usually are stored in a instrument or amplifier, are now stored in a chip that is part of the msensor plug.

This data is for example:

- Rated load
- Sensitivity
- Name of the sensor
- Manufacturer
- Day of calibration
- Data usually stored in „Range“ of the display AE 703

#### Benefits

The display AE 703 can be connected to any A.S.T.-TEDS-sensor without any setup. On the spot it displays correct values. Users now can operate sensor pools, meaning that a number of sensores can be connected to a number of displays regardless the setup of the displays. A sensorpool can be extended easily – without sending out the display for calibration.

#### Flexibility

Most of the TEDS data can be changed by the customer. The customers keeps complete control over calibrations, names of Transducers and displayed units.

#### Calibration

To calibrate the TEDS-Sensor a AE 703 and the Software AS-TAS is needed. The calibration features 2 points only. For a 100-per cent tracability to the national standard of force a regular mV/V-calibration of the AE 703 is suggested, the traditionell calibration of sensor and display is another option.

#### Connection

A.S.T.-TEDS can be combined with all strain gage sensors. For TEDS functionality pin 5 and pin 6 of the standard A.S.T.-plug are used. Using sense wires is in combination with TEDS is not possible.





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