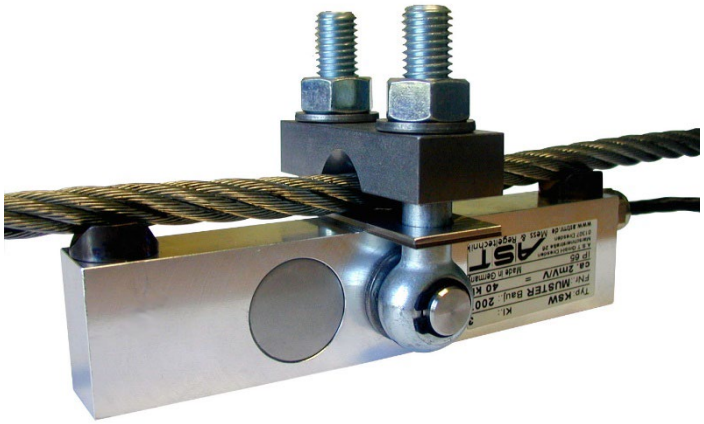
AST Gruppe
Angewandte System Technik

# Wire Rope Overload Guard
# KSW

## Installation Instruction



**Content**


**1. Description ..... 2**
**2. Scope of delivery ..... 2**
**3. Specifications ..... 2**
**4. Mounting ..... 3**
4.1. Overview ..... 3
4.2. Mounting instruction ..... 3
4.3. Wiring code ..... 4
**5. Norms ..... 4**
**6. Recommended Electronics ..... 4**


Further information on the KSW can be found on our website www.ast.de


A.S.T. - Angewandte System Technik GmbH, Mess- und Regeltechnik
Marschnerstraße 26 01307 Dresden
Telefon (03 51) 44 55 30 Telefax (03 51) 44 55 555
www.ast.de vertrieb.dd@ast.de

## 1. Description

The rope guard is intended for indirect measurement of the tensile force in ropes. For example at the fixed end of a rope.
The output signal is depend from the characteristic of rope and assembly. Deviations from the factory setting are possible!

## 2. Scope of delivery

| | |
|---|---|
| 1 | Wire Rope Overload Guard KSW |
| 1 | clamping yoke |
| 2 x | shims 0,5 mm dick |
| 1 x | shim 1,5 mm dick |
| 4 x | washer DIN125-6,4-A2 |
| 1 | Installation instruction |

## 3. Specifications

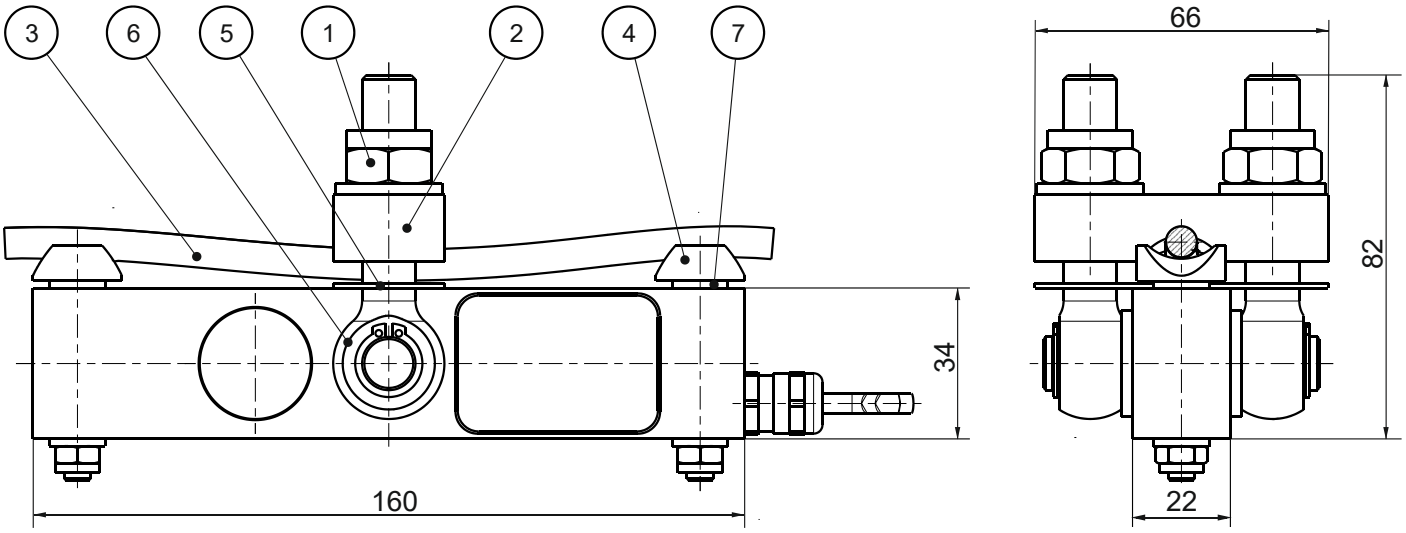
| **Accuracy class** | **% $F_{nom}$** | **3** | **with Integrated Amplifier** |
|---|---|---|---|
| Tested measuring force<br>- Conforms to rated load (wire rope)<br>Rope diameter | kN<br>kN<br>mm | 8<br>ca. 40<br>6 - 22 | 8<br>ca. 40<br>6 - 22 |
| Rated characteristic value ($C_{nom}$)<br>Zero signal tolerance<br>Reference excitation voltage (Uref)<br>Operating range of excitation voltage (BUG)<br>Input resistance ($R^e$)<br>Output resistance ($R^a$)<br>Insulation resistance ($R^{is}$ | mV/V<br>%<br>VDC<br>VDC<br>Ω<br>Ω<br>Ω | ca. 2 [1)]<br>≤ 3<br>5<br>0.5 ... 12<br>380 ± 30<br>352 ± 1.5<br>> 5 x $10^9$ | |
| Temperature effect on zero signal ($TK^0$)<br>Temperature effect on characteristic value ($TK^c$) | %/10K<br>%/10K | ≤ 0.3<br>≤ 0.5 | ≤ 0.3<br>≤ 0.5 |
| Reference temperature ($T^{ref}$)<br>Rated temperature range ($B^{T, nom}$)<br>Operating temperature range ($B^{T, G}$)<br>Storage temperature range ($B^{T, S}$)<br>Environmental protection (EN 60529) | °C<br>°C<br>°C<br>°C | +23<br>-20 ... +70<br>-30 ... +70<br>-40 ... +70<br>IP 65 | +23<br>-20 ... +70<br>-30 ... +70<br>-40 ... +70<br>IP 65 |
| Supply voltage<br>Input current<br>Output signal for compressive force (0...$F_N$)<br>Alternatively:<br>- Voltage output signal (max. Load: 5mA)<br>- Current output signal<br>- Maximum resistance | VDC<br>mA<br><br><br>V<br>mA<br>Ω | | 19 ... 28<br>35 (bei 24V)<br><br><br>0 ... 10<br>4 ... 20<br>300 |

All data according to VDI/VDE/DKD 2638

1) Tested with rope Ø 14mm without shims

## 4. Mounting

### 4.1. Overview




1 self looking nut, width across flat 17
2 clamping yoke
3 rope
4 rope support
5 shim (optional)
6 eye-bolt
7 washer (optional)

### 4.2. Mounting instruction

The rope guard KSW is mounted on a fixed end of the rope. The rope should be free of load.

Before the rope (3) is placed in the two rope supports (4), the shims (5) must be placed on the eye bolts (6), depending on the expected load in rope.
Non-binding guide values (measured with test rope 12mm):

| **Load in rope / kN** | **10** | **20** | **30** | **40*** | **50** | **60** | **70** |
|---|---|---|---|---|---|---|---|
| Thinkness of shim (mm) | - | - | - | - | 1 | 1,5 | 2 |
| Washer (number per support) | 3 | 2 | 1 | - | - | - | - |
| Signal mV/V | 0.89 | 1.40 | 1.68 | 1.81 | 1.75 | 2.00 | 1.79 |
| Signal 4 … 20 mA | 11.87 | 16.38 | 18.85 | 20.00 | 19.47 | 21.68 | 19.82 |
| Signal 0 … 10 V | 4.92 | 7.73 | 9.28 | 10.00 | 9.67 | 11.05 | 9.89 |

*Default setting

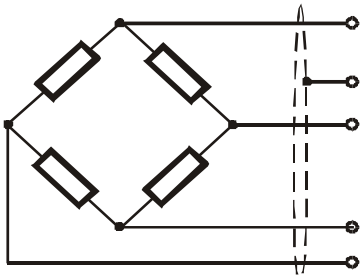
After the rope has been placed in the supports, the clamping yoke (2) is placed on the eyebolts so that it encloses the rope.

Finally, the nuts (1) are screwed on and tightened.
Care must be taken to ensure that the rope is only deformed to a reasonable extent and that it rests on the wire rope overload guard body respectively a shim.
The wire rope overload guard provides a signal of about 2mV/V at load in rope and shims according to the table, but it is essential to calibrate the measuring chain because of the method used. Before

calibrating the wire rope overload guard, the rope must be loaded approx. five times with the maximum permissible load. It must be checked by visual inspection that the rope under the clamp does not lift off from the transducer body or the shim. If necessary, tighten the nuts.
It is recommended to repeat the calibration every two years or after a rope change.
If the operating condition "slack rope" has occurred in the installation, check the correct position of the KSW on the rope and check the load value.

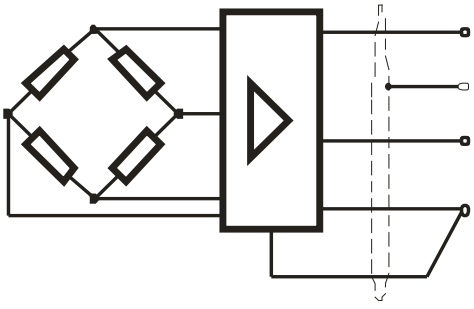
### 4.3. Wiring code

- KSW … 1mV/V



| | | | |
|---|---|---|---|
| excitation voltage + | (+EX) | brown | max. 12VDC |
| shield | (SHI) | black | |
| signal + | (+SI) | green | approx. 1mV/V |
| excitation voltage - | (-EX) | yellow | |
| signal - | (-SI) | white | |

- KSW-E/ … 4-20mA with integrated amplifier



| | | | |
|---|---|---|---|
| supply voltage + | (UB) | brown | UB: 12VDC … 30VDC |
| shield | (SHI) | black | |
| signal + | (OUT) | green | OUT: 4mA…20mA |
| ground / signal - | (0V) | yellow | 0V and PRG to be connected by the customer! |
| programming interface | (PRG) | white | |

### 5. Norms

-EMC Directive 89/336
-CE-Designation standard 93/068

### 6. Recommended Electronics

In principle, all evaluation devices that process systems with strain gauge signals can be connected downstream of the wire rope overload guard KSW.

The following devices are recommended by the manufacturer:

| Device | Supply voltage | Output signal | Special features |
|---|---|---|---|
| BA 662<br>Strain gauge measuring amplifier | Supply voltage 24V+/-20% | Normsignals :<br>-10(0) ... +10V or<br>0(4) ... 20 mA | The measuring amplifier is a separate module to be mounted on a DIN rail (DIN°EN 50022-35). The zero point of the output signal and the amplification are adjustable in a wide range. |
| BS 805<br>Stain gauge switching amplifier | Supply voltage 24V+/-20% | Normsignal 4 ... 20mA,<br>Relay outputs | In addition to the two freely adjustable limit values, the switching amplifier has signal outputs for signaling defective sensor lines. |