Angewandte System Technik

3-Roller Rope Overload Guard
KSW-3R16
KSW-3R38

Installation Instructions

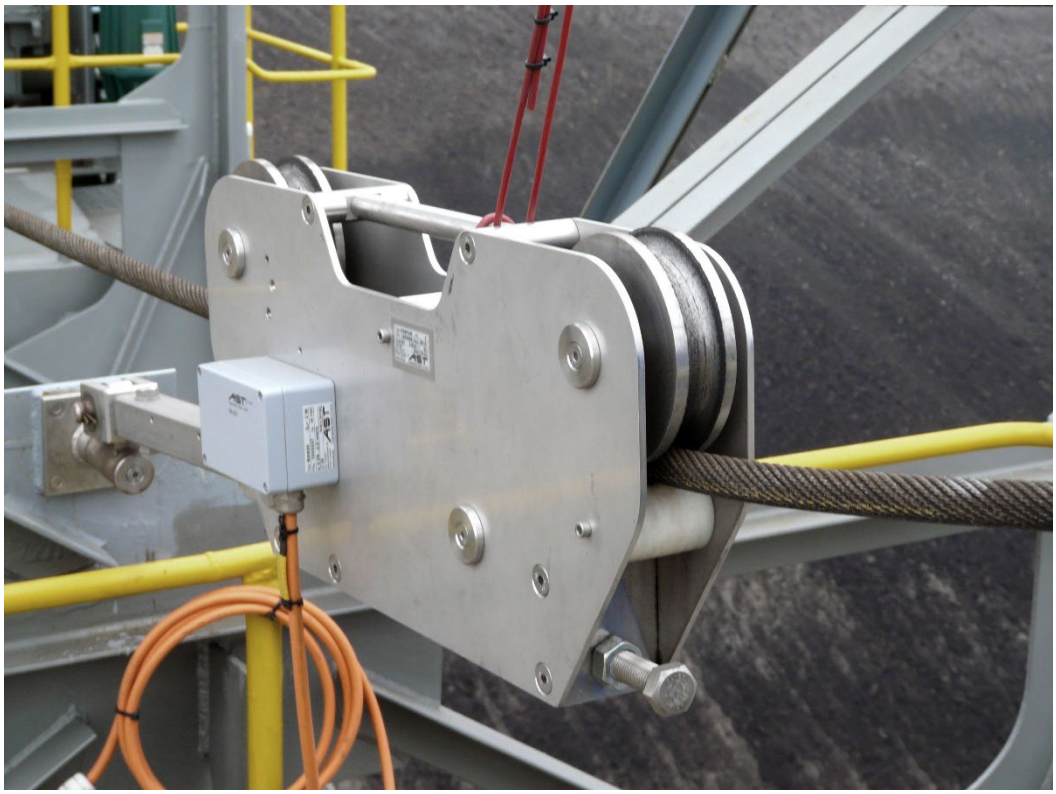

Photo: KSW-3R38 and XKM 078 mounting unit (rear left)

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1. General information

The KSW-3R16/.38 has to be capable of following the movements of the rope transverse to the direction of pull, essentially force-free. This must be noted in particular when installing the rope overload guard in front of a rope drum.

Suitable tethers must be used to prevent the KSW-3R16/.38 from being carried on the rope by the movement of the rope in either direction (forward or backward).
The ring eyelets, one on the KSW-3R38 and two on the KSW-3R16, are to be used for appropriate retaining devices. "XKM 078 mounting units for fixing the KSW-3R16/.38 in the rope axis" are available from AST as retaining devices (photo of the cover sheet, Figure 5 and Figure 6).

The intrinsic weight of the KSW-3R16/.38 should not impact too heavily upon the rope or be borne by suitable suspension devices.
Ensure in any situation that there is adequate space between the KSW-3R16/.38 and the rope rollers/ drums.

2. Delivery state

A KSW-3R16/..38 3-roller rope overload guard is delivered/adjusted in accordance with the customer's order, for example:
- Rope diameter → 24mm,
- Rope force → 0kN..120kN
- Rope type → Slinging rope

In this case, the output signal is adjusted to 0kN ... 120kN → 4mA ... 20mA.
The identifier for this example is: KSW-3R38/120kN/D24mm/4-20mA

With rope diameters ≤16mm, model KSW-3R16 is delivered as a general rule or following consultation with the customer;
model KSW-3R38 is delivered for rope diameters >16mm to 38mm.

3. Preparation for mounting

In order to insert the rope, the side plate (Figure 1 and Figure 2) must be dismantled from the KSW-3R16/.38.
The on-site connection of the 24VDC voltage supply and of the 4-20mA signal in the attached strain-gauge measuring amplifier BA 616 or BA 627, Figure 4shows a detail of this, are described in Capital 4.4.
The table below contains a list of the important tools. They are not included in the scope of supply.

Tool	KSW-3R16 side plate	KSW-3R38 side plate	Strain-gauge measuring amplifier BA627
17 mm open-end/ring spanner	5x hex head screws M10x12-A2 DIN933	-	-
4mm hex head wrench	4x cheese-head screw M5x20-A2 DIN912	-	-
4mm hex head wrench	4x countersunk screws M6x12-A2 DIN7991	-	-
6mm hex head wrench	-	6x countersunk screws M10x20-A2 DIN7991	-
5mm hex head wrench	-	4x countersunk screws M8x16-A2 DIN7991	-
5mm hex head wrench	-	6x cheese-head screw M6x20-A2 DIN912	-
19mm open-end spanner	-	-	M20 cable gland
Flat-head screwdriver 0.6x3.5	-	-	SMKDS 2.5 terminals

Table 1

4. Installation instructions

The rope must be **slack** when it is mounted and dismantled.
Only the slide plate which does **not** support the BA 616 or BA 627 amplifier is to be removed.
Once the rope has been mounted, the block from the middle roller must be pressed **exclusively onto the force sensor**.

4.1. Model KSW-3R16 … for rope diameters ≤ 16mm

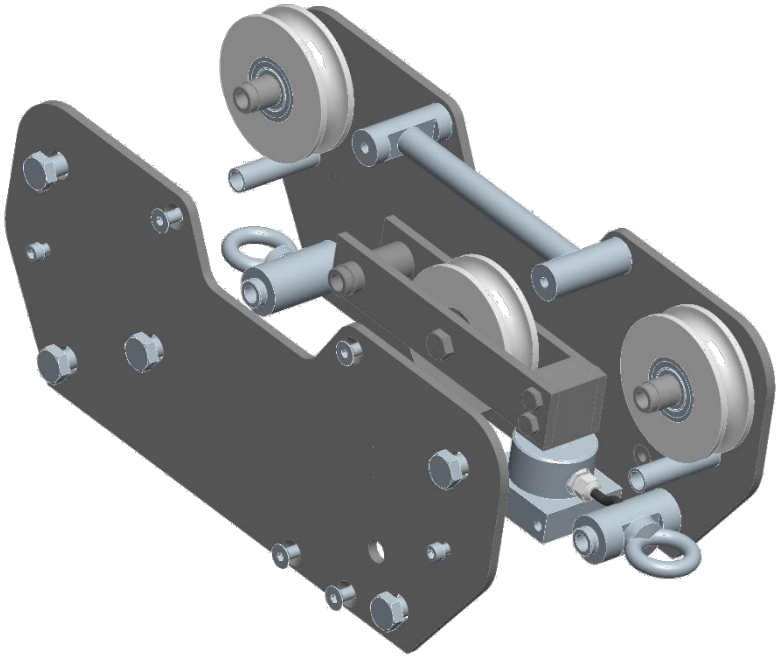

Figure 1: Dismantle the KSW-3R16 side plate

a) Dismantle the side plate by loosening the screws
   - Four M6x12 countersunk screws (handle and sensor block)
   - Two M5x20 cheese-head screws (guide rollers)
   - Five M10x12 hex head screws (rope rollers, among others)
   - Pull off side plate
   - Two M5x20 cheese-head screws (guide rollers on the amplifier side)

b) Insert the rope between the two upper rollers and their guide rollers; the rope sites on the middle roller

c) Mount the side plate
   - Place on the side plate, carefully sitting it into the guides
   - Tighten the M10x12 hex head screws
   - Tighten the M6x12 countersunk screws

Tighten the M5x20 cheese-head screws

4.2. Model KSW-3R38 … for rope diameters ≤ 38mm

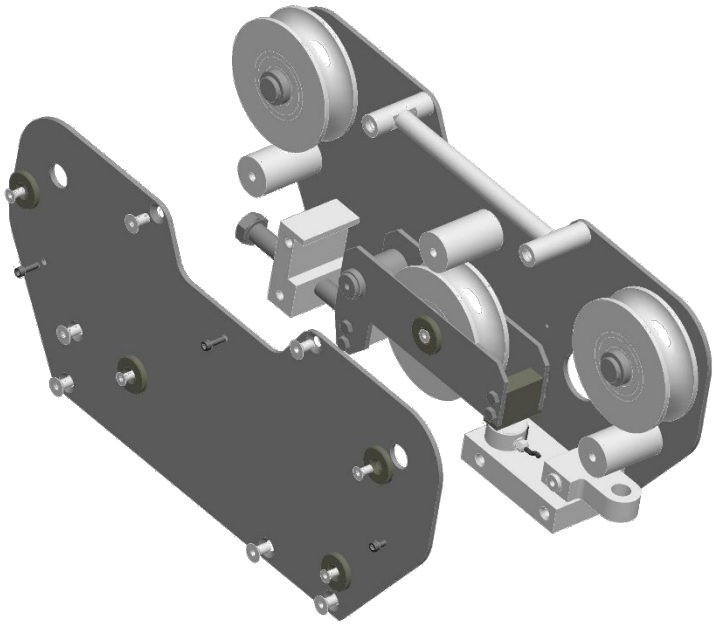

Figure 2: Dismantle the KSW-3R38 side plate

a) Dismantle the side plate by loosening the screws
   - Six M10x20 countersunk screws (handle, sensor block, spacer piece)
   - Three M6x20 cheese-head screws (guide rollers)
   - Four M8x16 countersunk screws (rope rollers, among others)
   - Pull off side plate
   - Three M6x20 cheese-head screws (guide rollers on the amplifier side)

b) Insert the rope between the rollers and their guide rollers; the rope sits on the middle roller. By loosening the sensor block carefully, undoing the M20x140 hex head screw and folding down the middle roller block, the rope can be inserted more easily. The middle roller block must then be pressed up with the M20x140 screw in order to secure the sensor block so that it is tension-free.

c) Mount the side plate
   - Place on the side plate, carefully sitting it into the guides
   - Tighten the M8x16 countersunk screws
   - Tighten the M10x20 countersunk screws
   - Tighten the M6x20 cheese-head screws

4.3. Check the position of the KSW-3R 16/ 38 on the rope

Once the KSW-3R16/.38 rope overload guard has been tethered in the direction of the rope by appropriate measures, but transverse movements of the rope can follow, perform trial runs to check that the KSW-3R16/.38 and the rope work properly in any situation. The KSW-3R16/..38 must also be free in extreme situations and may not cause any damage to itself or to other parts.

Please note: ropes are likely to become twisted during the initial load changes, particularly when they are new.

4.4. Cable connection and Operation to the strain-gauge measuring amplifier BA627*

** for KSW-3R with amplifier BA627*

4.4.1. Overview operating elements BA627

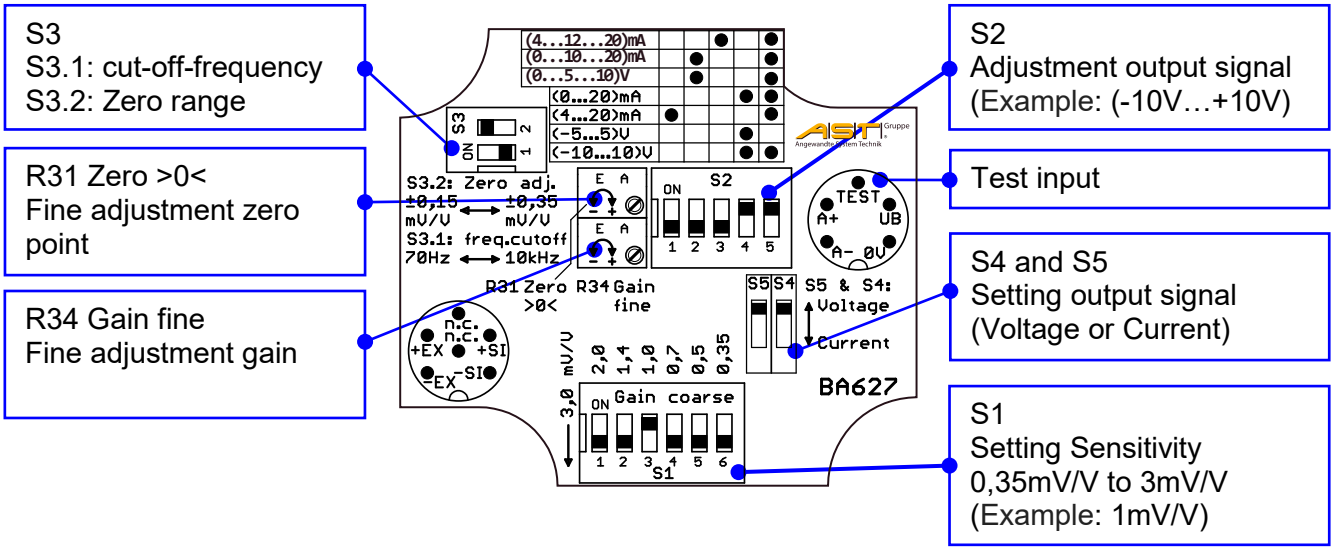

Figure 3: Overview operating elements BA627

4.4.2. Sensitivity (S1)

Set the DIP-switches according of Table 2 to **"ON"** to select the input sensitivity (mV/V).

DIP-Switch ON	none	1	2	3	4	5	6
Sensitivity (mV/V)	3,0	2,0	1,4	1,0	0,7	0,5	0,35

Table 2

4.4.3. Signal output (S2, S4, S5)

Set the DIP-switches according of Table 3 to **"ON"** to select the output signal.

Output	S2-1	S2-2	S2-3	S2-4	S2-5	S4	S5
4 ... 12 ... 20mA			ON		ON	Current	Current
0 ... 10 ... 20mA		ON			ON	Current	Current
0 ... 5 ... 10V		ON			ON	Voltage	Voltage
0 ... 20mA				ON	ON	Current	Current
4 ... 20mA	ON				ON	Current	Current
-5V ... +5V				ON		Voltage	Voltage
-10V ... +10V				ON	ON	Voltage	Voltage

Table 3

ATTENTION! Check the right positions of DIP-switches **S4** and **S5**!

4.4.4. Zero alignment (Zero >0<)

Use the **R31 Zero >0<** potentiometer of the measuring amplifier to align zero.
The zero point can be adjusted depending on the position of **S3-2** approx. 0.35 mV/V or approx. 0.15 mV/V (*see also 4.4.5*) independent of the sensor resistance and largely independent of gain.

4.4.5. Zero range (S3-2)

Select the range of the zero point **±0,35 mV/V** or **±0,15 mV/V** with the DIP-switch **S3-2**.*(see too 4.4.4)*.

NOTE With the zero range **±0,15 mV/V** its possible to adjust the zero point more exactly.

4.4.6. Amplification (Gain fine)

Use the **R34 Gain fine** potentiometer of the measuring amplifier to align output signal. The adjustment range is **±25 %**.
Depending on the setting the following range are possible S1 (*see too 4.4.2*.

Sensitivity (S1) (mV/V)	**0,35**	**0,5**	**0,7**	**1,0**	**1,4**	**2,0**	**3,0**
Min (mV/V)	0,28	0,4	0,56	0,8	1,12	1,6	2,4
Max (mV/V)	0,42	0,6	0,84	1,2	1,68	2,4	3,6

Table 4

NOTE Check the zero point after changing of amplification.

4.4.7. Cut-off-frequency (S3-1)

Select the cut-off-frequency **10 kHz** or **70 Hz** with the DIP-switch **S3-1**.

4.4.8. Test input

If you connect the test input **Test** with **+24V** then you create an offset of 0.5mV/V at a 350 Ohm strain gauge bridge.
The recorded value can be used for checking the measuring device.

4.4.9. Test under load

Once the KSW-3R16/.38 has been fully mounted on the rope and the higher-level analysis/control units have been connected, tests are to be conducted under load in order to confirm that the entire system is working properly.

4.5. Cable connection and Operation to the strain-gauge measuring amplifier BA616**

***for KSW-3R with amplifier BA616*

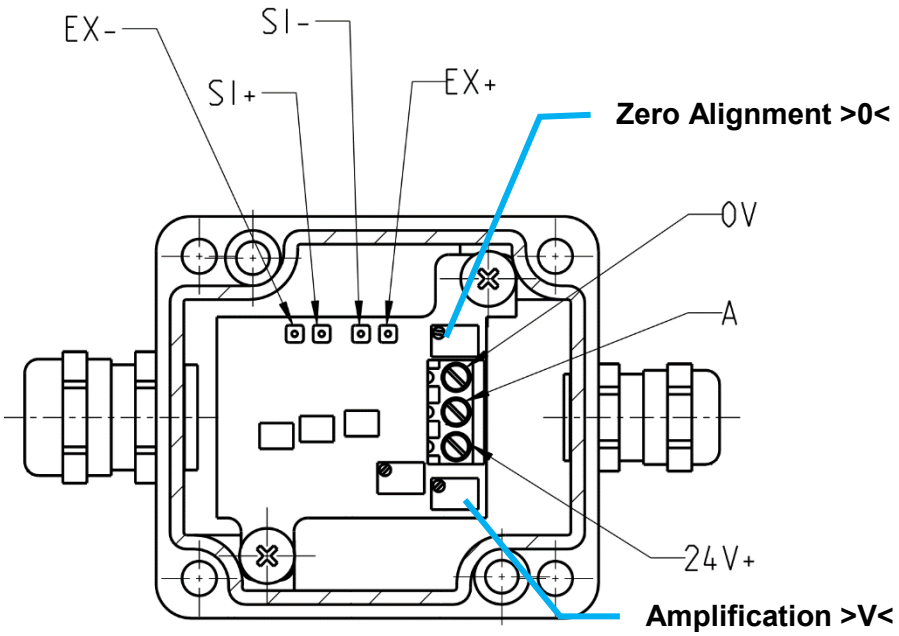

Figure 4: Cable connection and Operation to the strain-gauge measuring amplifier BA616

4.5.1. How to connect supply voltage

The supply voltage is connected to the terminal (24V) and to (0V). The bridge amplifier is protected against voltage reversal polarities.

4.5.2. Adjustment of Amplification (output)

Use the >V< potentiometer to set the amplifier output signal to its proper value.
The range of amplification is approximately ±20%.

4.5.3. Zero Alignment

Use the >0< potentiometer of the measuring amplifier to align zero. The range of alignment is approximately 20%.

NOTE!
In an amendment to the amplifier output via potentiometer > V < should also always a new zero balance

5. Mounting units XKM 078 (option)

5.1. XKM 078.01 for KSW-3R38

- The freedom of movement of the XKM 078.01 mounting unit for the KSW-3R38 is shown in Figure 5.

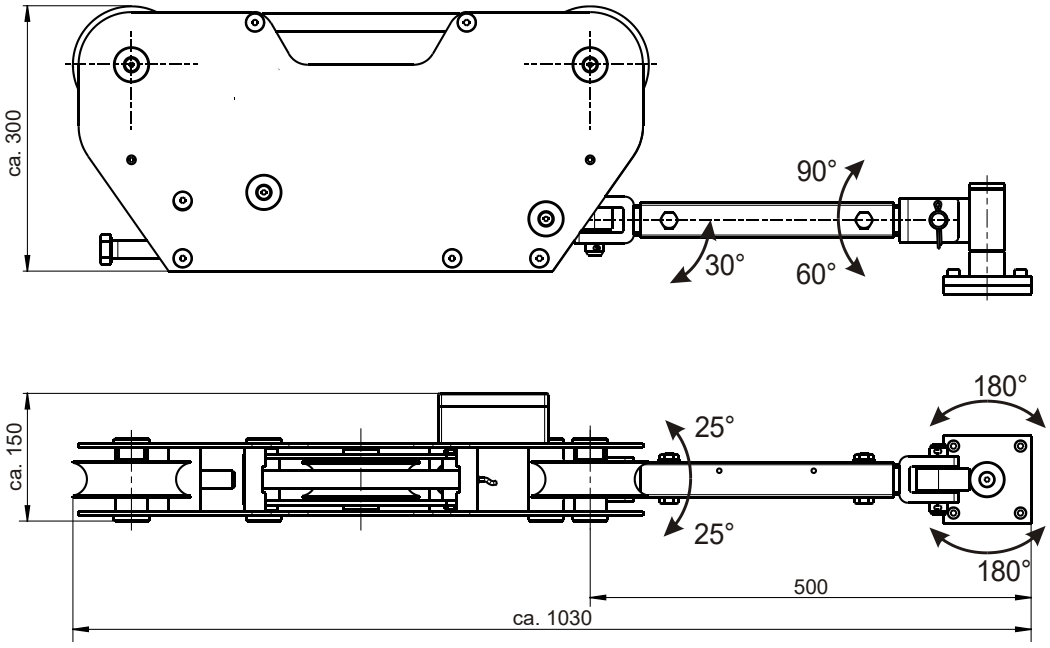

Figure 5: KSW-3R and the XKM 078.01 mounting unit

5.2. XKM 078.02 for KSW-3R16

The freedom of movement of the XKM 078.02 mounting unit for the KSW-3R16 is shown in Figure 6. The two coupling points for the mounting unit are a "pivot head/fork head" system. The tilting angles of 2° and 30° can be changed in relation to the KSW-3R16 by turning the mounting unit.

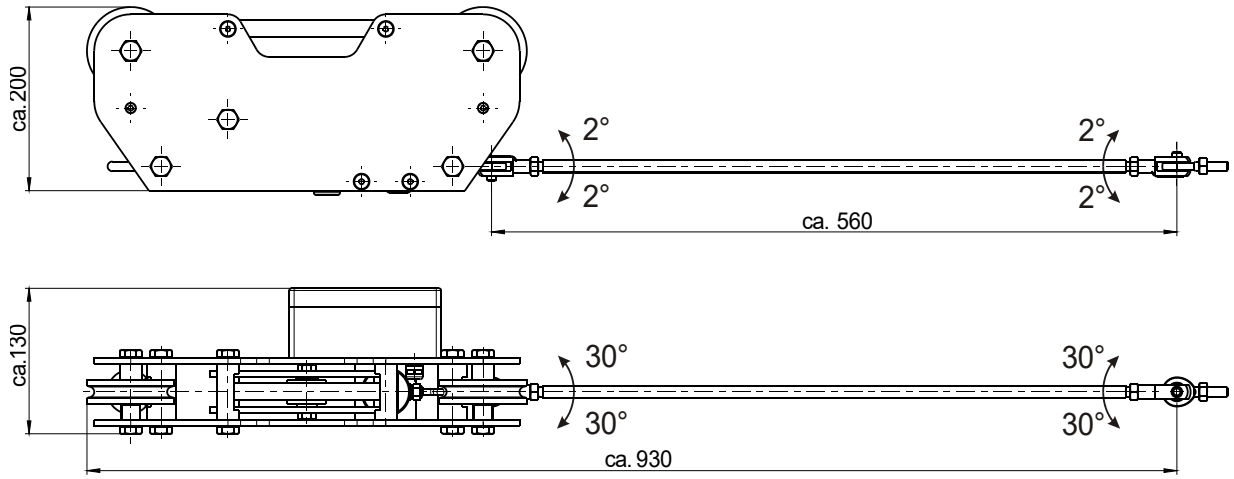

Figure 6: KSW-3R16 and the XKM 078.02 mounting unit