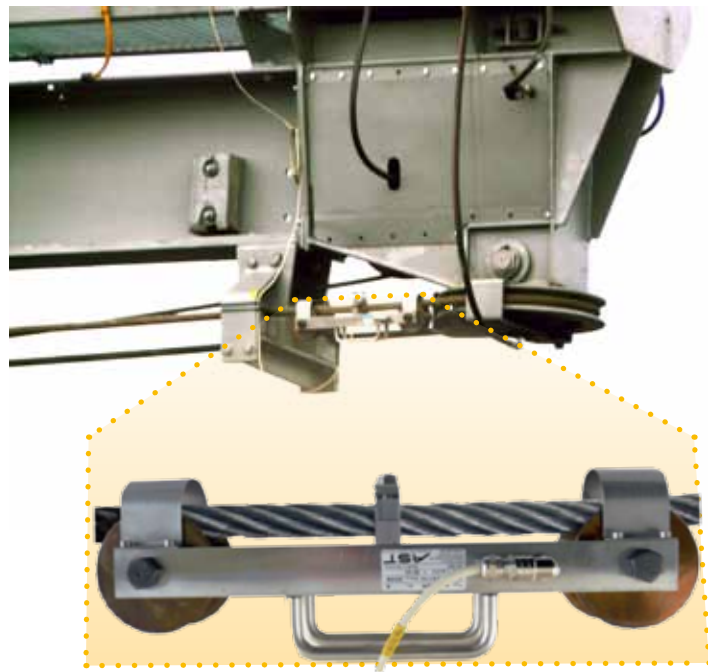


Application Note

Rope Tension Sensors for Overload Protection

Overload protection with redundant application of different rope sensors

In such environments with cranes and hoisting devices there are several ways for mounting rope sensors without changing the construction of the hoisting device. In this case a rope tension sensor is mounted close to the pulley of the extension arm. The rope at that point is only moving a little bit during the work allowing the rope sensor with two wheels KSW-2R to be mounted directly to the rope. The force in the rope's direction is putting force towards the sensor in proportion to the ropes tension.



One or more rope drums sometime don't allow the use of sensors at the rope's end without dismantling of the whole construction. An excellent solution which saves a lot of time and money is the KSW-3R. A rope tension sensor that is mounted directly to the running rope. Through its three running rolls the rope is slightly getting diverted and as a result, the force or tension of the rope is measured. The attached amplifier converts the sensor signal into a standard output of 4 to 20 mA and additionally allows the programming of two switching points for overload protection. Together with the system above the complete installation allows redundant overload protection with two sensors working independently.





Rope tension sensor for fixed rope KSW-2R

Directly mountable without changing the construction of the hoisting device. For example close to the rope fixing point or one of the compensating sheaves. The typical application includes overload or sleeping rope sensor with an accuracy of 2%.



Rope tension sensor for running rope KSW-3R16/KSW-3R36

The rope tension sensor KSW-3R can be used at the running rope. The maximum diameter of the rope is 16 mm (KSW-3R16) or 36 mm (KSW-3R36). The sensor is also directly mountable without changing the hoisting device. The photo is showing the installation at a ship crane.



Rope tension sensor for fixed rope KSW with DMS switching amplifier

The „smaller“ rope tension sensor KSW is also mountable at the fixed rope without changing the construction. The main application in use with the switching amplifier include sleeping rope sensors.

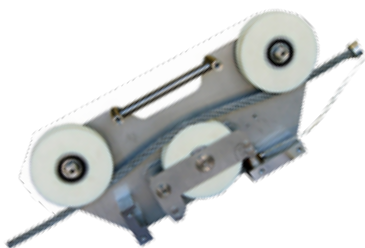
Rope tension sensor KSW
Rope \varnothing : ... 22mm
Rope load: ... 70kN
Output: 2 mV/V, opt.: 4 ... 20mA signal with BS805



2 wheel rope tension sensor KSW-2R
Rope \varnothing : ... 36mm
Rope load: ... 160kN
Output: 4 ... 20mA signal with integrated amplifier

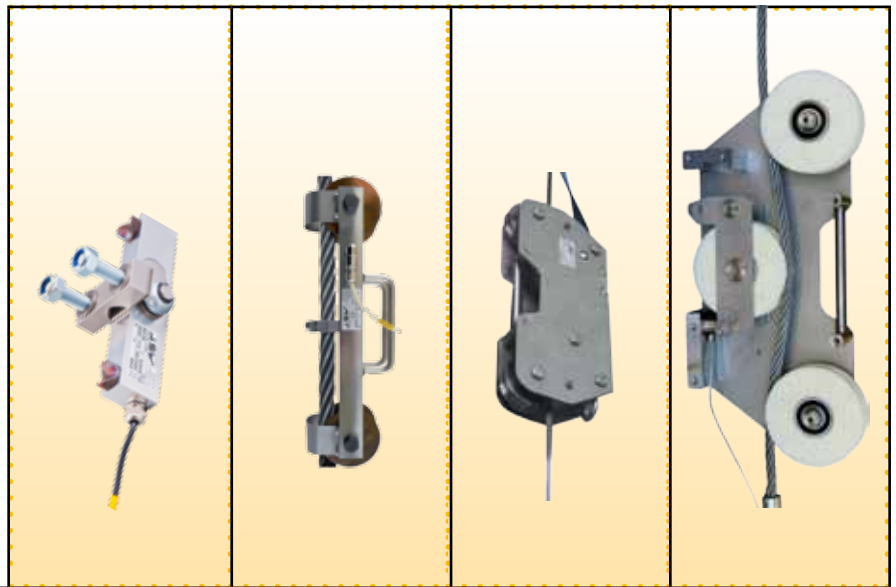


3 wheel rope tension sensor KSW-3R38 / KSW-3R16
Rope \varnothing : 38mm (KSW-3R38) /16mm (KSW-3R16)
Rope load: ... 320kN
Output: 4 ... 20mA / -10 ... 0 ... +10 V signal



Switching amplifier BS805
Input: DMS signal or 4 ... 20mA signal
Output: Two switch points, 4 ... 20mA signal
Class: IP65





		KSW	KSW-2R	KSW-3R16	KSW-3R38
Rated (nominal) force (F_{nom})	kN	40	120	160	320
Breaking force (F_B)	%	%	300	300	300
Weight (app.)	kg	0.5	7.0	7	25
Size (app.)	mm	160x70x90	380x85x140	100x75x182	700x95x325
Rope		fixed	fixed	running	running
Rope diameter	mm	≤ 22	≤ 36	≤ 16	≤ 38
Sensor Accuracy	%	3	1	1	1
Repeatability	%	3	1	1	1
Repeatability after sensor change	%	10	3	3	3
Repeatability after rope change	%	10	2	2	2
Application		Overload protection (switch mode)	Overload protection and sensing	Overload protection and sensing	Overload protection and sensing
Amplifier		Opt. BS805	Integrated	Type BA625	Type BA625
Rated characteristic value (C_{nom})	mV/V	2	-	-	-
Voltage output signal	V	-	-	-10 0 +10	-10 0 +10
Current output signal	mA	4 20	4 20	4 20	4 20
Switch points		2	-	-	-
Mounting kit (optional)		-	-	XKM 078.02	XKM 078.01