

LKVE OVERLOAD GUARD



The PIAB LKVE is an electronic transmitter which is attached direct to a stationary line part. It has high repeatability, is made for use in aggressive industrial environments and fully conforms to IP 67.

PIAB

RANGE OF APPLICATION

The PIAB LKVE is intended for use as an overload guard and/or a slack line switch in lifting equipment and is made in a range for forces up to

16000 kp in single line part and for max. 44 mm line diameter.

FUNCTION

The PIAB electronic overload guard system consists of a force transducer with amplifier and an electronic signal processing unit.

The force transducer LKVE is attached to a stationary line part.

The rope is deflected through a slight angle between the two wheels and the clamping jaw. When loaded, the rope tends to straighten and applies a force which is transmitted to the load cell.

The foil gauge of the load cell is fed with a constant tension from the transducer amplifier. A signal is received in return, which is proportional to the force on the load cell. The signal is amplified and is converted to a current signal of 4 - 20 mA.

The strong signal makes it possible for the distance between the force transducer and the electronic unit to be up to 500 m.



PROTECTION AGAINST CORROSION

The PIAB LKVE is zinc coated and yellow chromated. The bearings of the hardened wheels are sealed with O-rings and lubricated with MoS₂. The load cell and the amplifier are

hermetically sealed and meet the requirements for international protection specification class IP 67 according to IEC 144.

SAFETY

The PIAB LKVE is not directly included in the rope system and does not affect the construction of the lifting equipment.

Owing to the design of the clamping jaw, the measurement test result is not affected by the changes in the rope diameter that occur after some use.

Together with the PIAB electronics

the PIAB LKVE is protected against faulty operation and adopts overload mode in all combinations of cable breakdowns and/or short circuits that can arise due to cable damage.

The load cell can be overloaded mechanically by 100% nominal load without affecting the accuracy of measurement.

MEASURING SIGNAL

The PIAB LKVE gives a defined output of 4-20 mA, which is hard to disturb.

The strong signal manages serial resistances of up to 250 ohm and the cable can therefore be lengthened without special demands on joints or

cable lengths. The unshielded cable, 4x 1.5 mm² transfers supply voltage to the transmitter amplifier and load cell as well as measuring signal to the electronic unit. The cable can be placed close to other live cables without affecting the measuring signal.

TECHNICAL DATA

CONNECTION

The supply voltage to the transducer is 15-30 VDC. Power consumption 60 mA.

WORKING TEMPERATURES

-20°C -+70°C. The load cell is temperature compensated with regard to both span and zero-offset.

ACCURACY

The repeatability and linearity of the load cell are better than 0.1%.

Mounted on the rope the LKVE has a repeatability of 0.1-1.5% and a linear deviation of 0.4%.

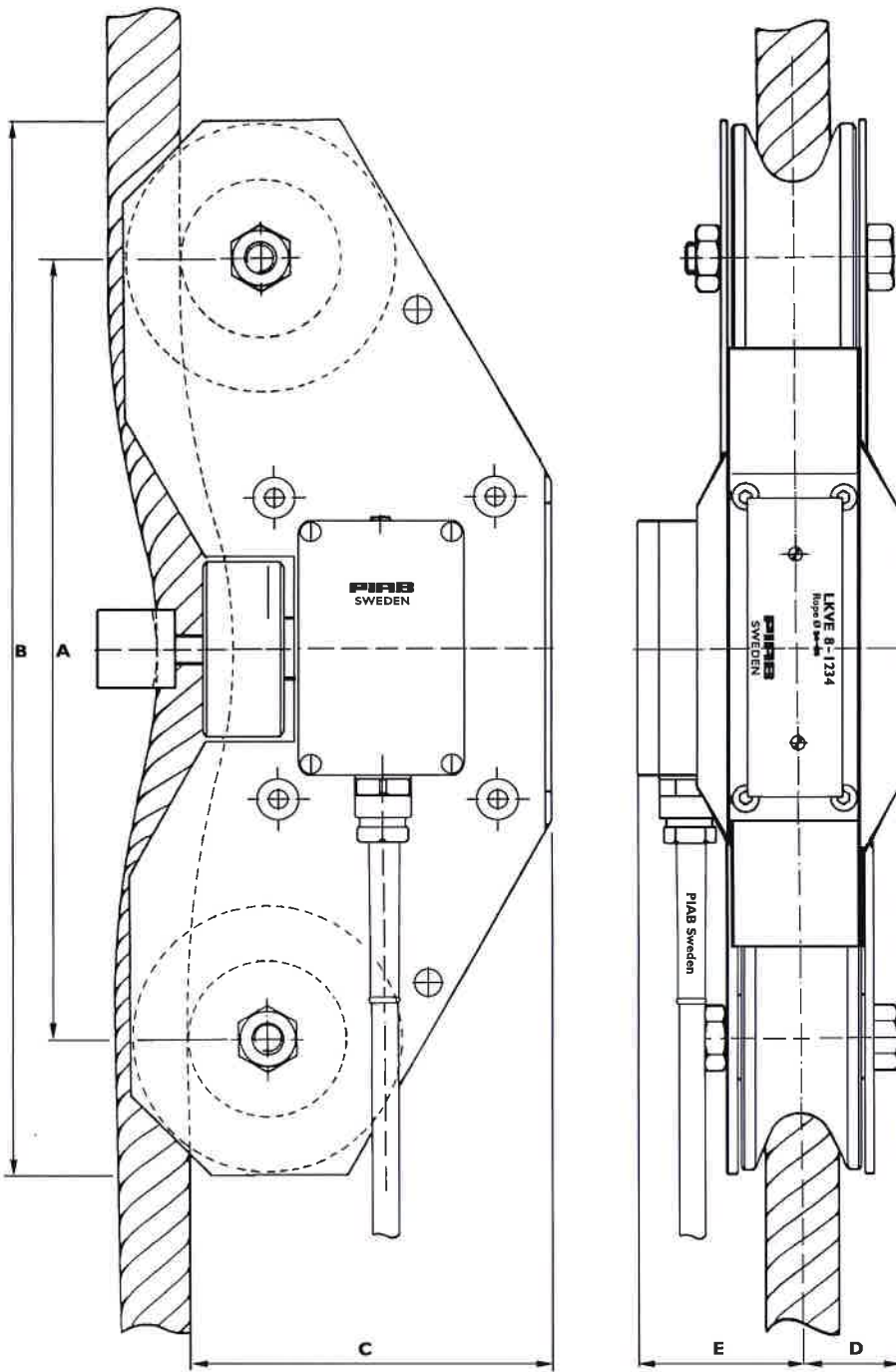
The variations arise from differing rope characteristics.

INTERNATIONAL PROTECTION SPECIFICATION CLASS

IP 67, according to IEC 144.

LKVE WITHOUT TRANSDUCER AMPLIFIER

PIAB LKVE is also available without transducer amplifier and is then called LKVEI. The impedance of the transducer bridge is 350Ω and the sensitivity 1.6 mV/V nominally. Recommended supply voltage 10 VDC.



The drawing is for an LKVE 1-4. The other types are of a slightly different design.

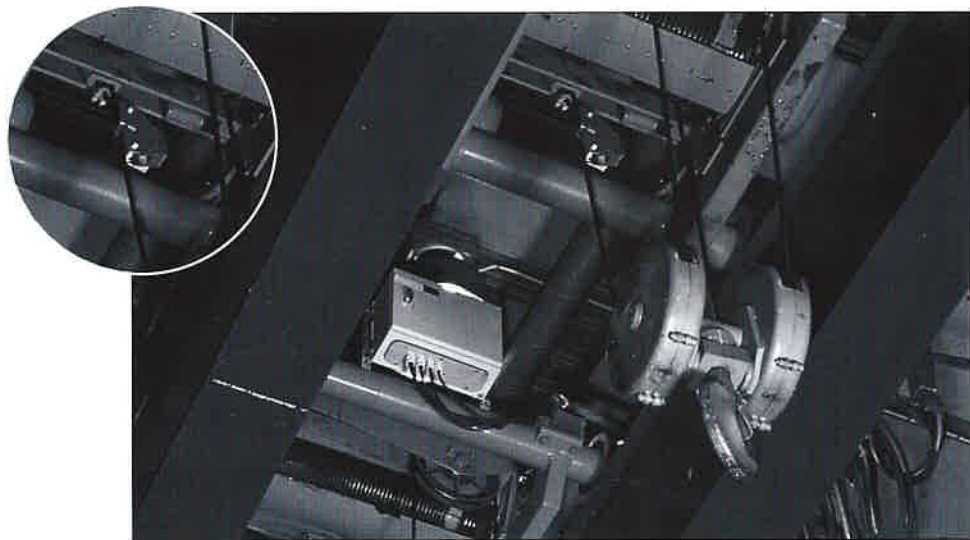
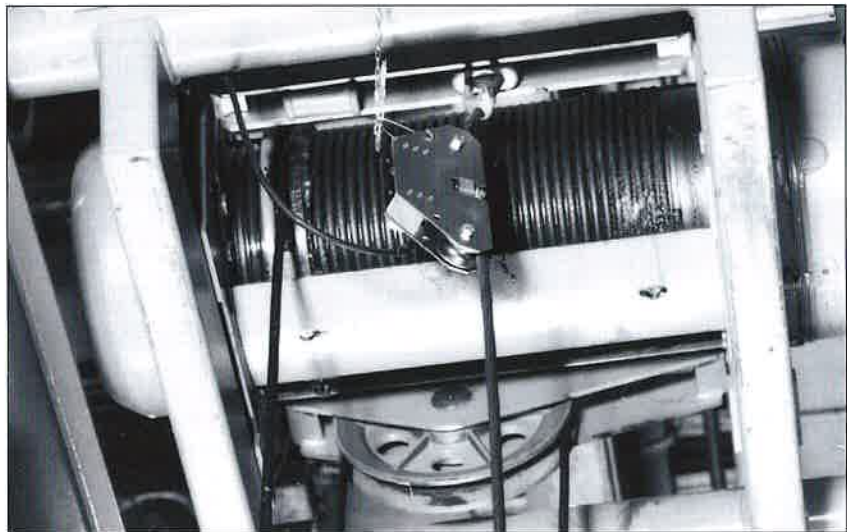
TYPE	MAX. SWITCH VALUE IN KG	FOR WIRE DIMENSION Ø IN MM	DIMENSIONS IN MM					DEAD WEIGHT IN KG
			A	B	C	D	E	
LKVE 1	1000	5-8	200	272	122	28	55	5
LKVE 2	2000	8-12						
LKVE 4	4000	12-16 16-20						
LKVE 8	8000	16-20	300	406	140	39	63	12
LKVE 12	12000	20-24						
		24-28 28-32 32-36						
LKVE 16	16000	32-36 36-40 40-44	480	600	145	70	70	21

APPLICATIONS FOR THE PIAB LKVE

In order to avoid damage caused by overloading in multi-point lifting, the LKVE protects each lift and the various combinations simultaneously.



Here, the force transducer LKVE is attached to a stationary line part.



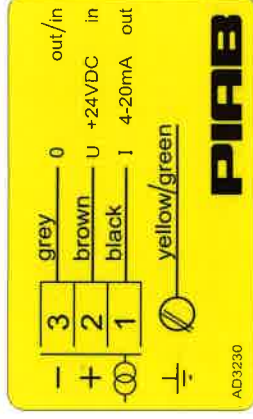
GIGASENSE

Force Measurement

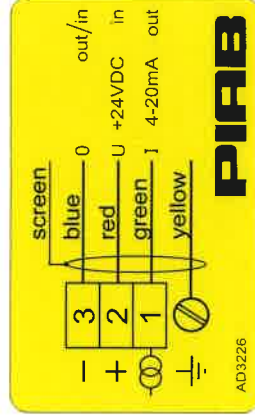
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PIAB LKVE LKVEi

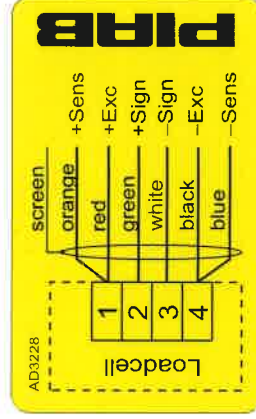
BA 7142 - 080212



Type: LKVE standard



Type: LKVE for CSM



Type: LKVEi
+Exc - -Exc 10 - 15VDC

Instrucciones de montaje para el LKVE de PIAB

- 1 Desenrosque los dos tornillos de cabeza hexagonal y quite la abrazadera exterior del cable.
- 2 Coloque el LKVE contra el cable, cerca del punto de anclaje o a algo de distancia de la polea de compensación con la salida del cable eléctrico hacia abajo.
- 3 Vuelva a colocar la abrazadera exterior que sujeta el cable y apriete los tornillos de cabeza hexagonal con la llave de fuerza proporcionada.
- 4 Asegúrese de situar el LKVE de forma que no haya riesgo de que el gancho o las poleas del cable causen daños, y ajuste la posición del interruptor de fin de carrera de rebase, en caso necesario.
- 5 Fije la cadena de seguridad del cable para que, si el LKVE es separado del cable de la grúa para el mantenimiento de esta, esto sea soportado por la cadena y no por el cable eléctrico. Esta cadena debería estar floja en el funcionamiento normal.
- 6 Compruebe que cable eléctrico no sea dañado por las poleas del cable de la grúa o por alguna parte del engranaje de la grúa.
- 7 Conecte el cable eléctrico a la unidad electrónica y compruebe el funcionamiento.

Instruções de montagem do LKVE PIAB

- 1 Soltar os dois parafusos e retirar a braçadeira exterior.
- 2 Posicionar o LKVE com fio elétrico voltado para baixo no cabo fixo ou perto da roldana de equilibragem.
- 3 Montar a braçadeira e apertar os dois parafusos com a chave Allen que acompanha o aparelho.
- 4 Verificar a posição do LKVE sobre o cabo afim de eliminar riscos de danos pelo moitão, roldanas, etc. Se necessário ajustar o interruptor do ponto mais alto da ponte.
- 5 Fixar a corrente de segurança de tal modo que, em caso de troca do cabo da ponte, o LKVE seja suspenso pela corrente de segurança e não pelo fio elétrico. Observe que a corrente de segurança deve estar frouxa.
- 6 Verificar o fio eléctrico para que não possa ser danificado pela roldana ou alguma parte da engrenagem da ponte.
- 7 Conectar o cabo com a unidade eletrónica e controlar o funcionamento.

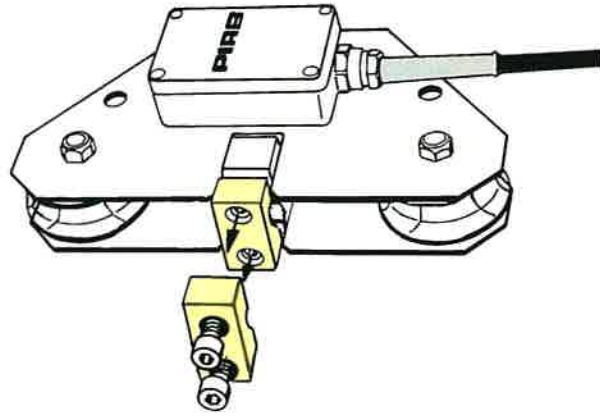


Monteringsanvisning
Assembly Instructions
Montageanleitung
Instruccions de montaje
Instrucciones de montaje
Instruções de montagem

GIGASENSE
Force Measurement

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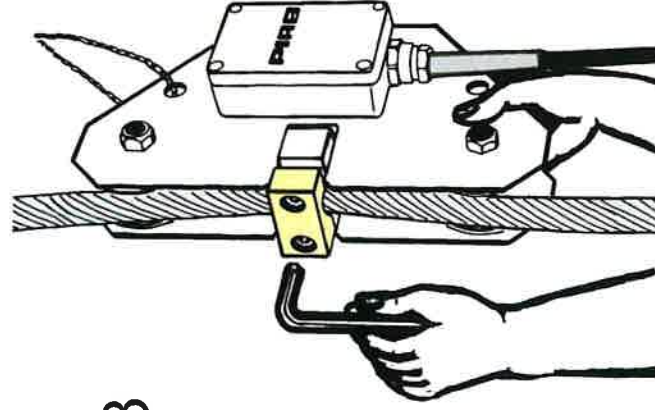
Monteringsanvisning PIAB LKVE

- 1 Lossa de två insexskruvarna och tag bort den yttre spännbacken.
- 2 Placera LKVE på plats mot linan, invid den fasta parten eller en bit in från utjämningshjulet med kabelutgången nedåt.
- 3 Montera den yttre spännbacken och drag fast de båda insexskruvarna med nyckeln.
- 4 Kontrollera att LKVE sitter så att den inte riskerar att skadas av krokblock eller linhjul, och justera om nödvändigt toppgränsbrytaren.
- 5 Fäst säkerhetskedjan så att kabeln inte kommer att belastas vid t ex linbyten. Observera att kedjan skall vara obelastad då LKVE är monterad.
- 6 Kontrollera att kabeln inte riskerar att skadas av linhjul etc.
- 7 Anslut kabeln till elektronikenheten enligt gällande förbindningsschema.

Montageanleitung PIAB LKVE

- 1 Die beiden Inbusschrauben lösen und die äussere Seilklemmbacke entfernen.
- 2 Den LKVE mit dem Kabelausgang nach unten gegen das Seil halten und zwar am feststehenden Seilstrang nahe dem Seilfestpunkt oder in einiger Entfernung von der Ausgleichsrolle.
- 3 Die äussere Seilklemmbacke montieren und die beiden Inbusschrauben mit dem Schlüssel festziehen.
- 4 Die Position des LKVE am Seil prüfen, damit er weder vom Haken noch von den Seilrollen beschädigt wird, falls notwendig den oberen Endschalter justieren.
- 5 Die Sicherheitskette befestigen damit das Kabel beim Auswechseln der Seile nicht belastet wird. Bitte beachten, dass die Kette bei einem montierten LKVE nicht belastet ist.
- 6 Prüfen, dass die Kabel nicht durch Seilrollen usw. beschädigt wird.
- 7 Kabel und das elektronische Steuergerät anschliessen. Letztlich, überprüfe die Funktion.

2-3



Assembly instructions for PIAB LKVE

- 1 Loosen the two hexagon-headed screws and remove the outer rope clamp.
- 2 Place the LKVE against the rope, close to the anchor point or at some distance from the compensating pulley, with the cable outlet downwards.
- 3 Replace the outer rope clamp and tighten the two hexagon-headed screws evenly with the wrench provided.
- 4 Ensure that the LKVE is placed so that there is no risk of damage by the hook block or rope pulleys, and adjust the position of the upper limit switch, if necessary.
- 5 Arrange the safety chain so that if the LKVE is detached from the rope for crane maintenance, it is supported by the chain and not by the cable. This chain should be slack in normal operation.
- 6 Check that the cable will not be damaged by the rope wheels or any part of the crane gear.
- 7 Connect the LKVE cable to the electronic unit according to valid connection diagram and test the function.

Instructions de montage du LKVE PIAB

- 1 Démonter la mâchoire extérieure du câble.
- 2 Placer l'appareil (le cordon électrique vers le bas) contre le brin fixe ou près d'un moufle d'équilibrage.
- 3 Rémonter la mâchoire extérieure e revisser les deux vis.
- 4 Vérifier la position de l'appareil afin d'éliminer tous les risques de dommage par le crochet, par un rouleau etc. Si nécessaire, déplacer l'interrupteur du point haut du point.
- 5 Fixer la chaîne de sécurité afin qu'en cas de changement du câble de levage, le LKVE soit soutenu par la chaîne et pas par son cordon électrique. La chaîne de sécurité ne doit pas être tendue.
- 6 Vérifier que rien risque de endommager le cordon électrique.
- 7 Brancher le cordon à la unité électronique et vérifier le fonctionnement.

PIAB LKVE

Force Transmitter 4 - 20 mA

Prevents accidents and costly equipment breakdowns for a negligible daily cost.

Is installed directly on to wire rope in minutes
(with 2 bolts+1 cable in the dead end of rope or at equalizing sheaves).

PIAB LKVE is not directly included in the rope system and doesn't affect the construction of the lifting or pulling equipment.

Preset from factory. Associated and additional equipment can be set from factory.

Does not need to be adjusted when wire rope is exchanged.

Can temporarily be overloaded by 100% without affecting the accuracy.

Tempered jaws and rollers minimise wear and maintain accuracy

LKVE has a repeatability of 0,1 - 1,5% and a linear deviation of 0 - 4,5% due characteristics of wire rope.

Pressure tight, conforms to IP67 according to IEC529.

