

40367

Operating Instructions

F-1008 Load Cell



Translation of the original instruction manual

Edition: 2012-01

JUD AG LIECHTENSTEIN

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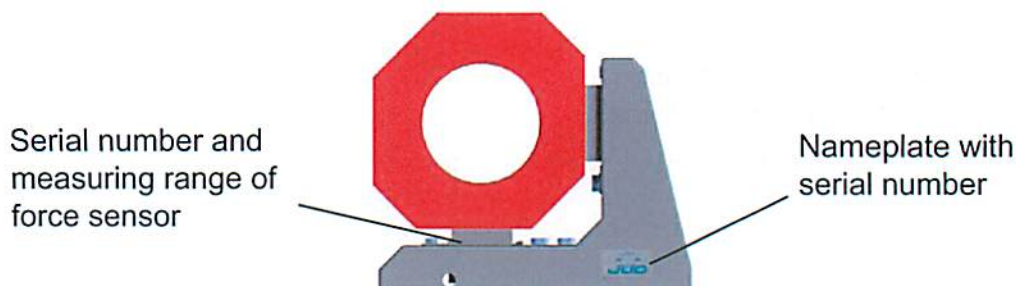
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1. General

1.1 Marking of the Load Cell



1.2 Document identification

Designation: Operating instructions, Load Cell F-1008, issue 2012-01

Design: The above operating instructions are not subject of the EC Machinery Directive 2006/42/EC for partly completed machinery, Appendix VII. B. However, they have been drawn up considering the above mentioned guidelines.

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1.3 Manufacturer's address

JUG AG
Papiermaschinen
Industriering 15
FL-9491 Ruggell

Principality of Liechtenstein

1.4 Proof of origin

The Load Cell F-1008 was designed and manufactured in Switzerland.

1.5 State of the art

In the interest of our customers, we reserve the right to alter the device without notice as a result of new technological developments.

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1.6 Declaration of Conformity

We

JUD AG
Papiermaschinen
Industriering 15
FL-9491 Ruggell



declare on our sole responsibility that the Load Cell of type F-1008 was designed and manufactured in accordance with the following EC Directives:

2004/108/EG **Electromagnetic compatibility**

Applied standards for assessment of the Load Cell:

EN ISO 12100-1 &

EN ISO 12100-2

EN 50 082-2

EN 60 529

EN 61010-1

Safety of machinery

Electromagnetic compatibility, resistance to jamming, industry sector

Types of protection by housing (IP code)

**Safety requirements of electrical measuring, control, regulation and laboratory equipment
Part 1: General requirements**

VDI/VDE/DKD 2638

Characteristics of force transducers

Complete technical documentation is available.

Ruggell,

Place, Date

Stefan Wegan-Hauenschild, General Manager

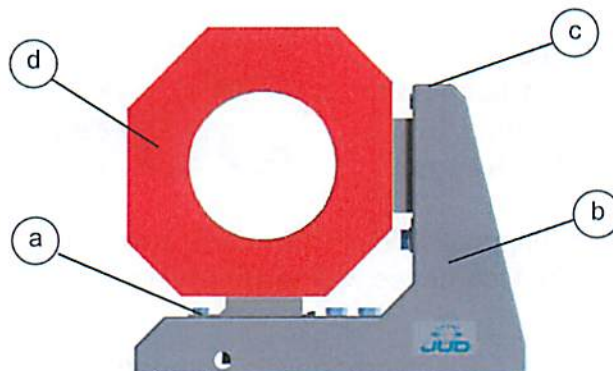
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2. Design and Function



a force sensor
b support

c linear guidance
d bearing yoke

The Load Cell

- measures forces resulting from the fabric tension.
- is mounted on a roll with a constant wrap angle.

The yoke for holding the bearing housing is guided on the support with a linear guidance and attached to the force sensor.

The force sensor contains specially arranged wire strain gauges, which change the electrical resistance in response to mechanical load.

The change in resistance is

- converted into electrical signals,
- transmitted by the measuring cable and
- evaluated by a Tension Controller or Amplifier Card.

Available types:

F-1008 - -XXXXX

- | | |
|---|--|
| S | Support and bearing yoke made of cast iron or mild steel |
| X | Support and bearing yoke in stainless steel |
| A | max. bearing yoke diameter 220 mm |
| B | max. bearing yoke diameter 330 mm |
| C | max. bearing yoke diameter 410 mm |



The exact type of the Load Cell can be found on the name plate or in the shipping papers.

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3. Safety Precautions

3.1 Intended use

The Load Cell F-1008 is used exclusively to measure the fabric tension on a roll with a constant wrap angle.

The forces

- must not exceed the specified nominal load of the installed force sensor (chapter 6 „Technical specifications“),
- must act in a specific direction depending on the installation position of the force sensor.

The Load Cell F-1008 must only be connected to the following JUD AG Papiermaschinen devices:

Tension Display Unit TDU-2-8

Tension Controller TC-211/ 721/ 731/ 741/ 301, TC-113

Amplifier Card F-1015 , F-1016M, F-1017M

Any other use requires written approval by JUD AG Papiermaschinen.

Without such approval, the customer shall be solely liable for any damage caused if the equipment is used improperly.

Improper use also includes assembly and startup of the Load Cell

- by unqualified personnel,
- without studying and understanding the operating instructions of the Load Cell and the Amplifier Card, Tension Display Unit or Tension Controller.

If used improperly, there is a risk of

- personal injury up to life-threatening injuries,
- damage to the Load Cell and overall system,
- damages to the product to be processed,
- error messages.

3.2 At the employee level

Preferably, commission the staff of JUD AG Papiermaschinen

- with the assembly and startup of the Load Cell or
- the creation of an installation proposal.

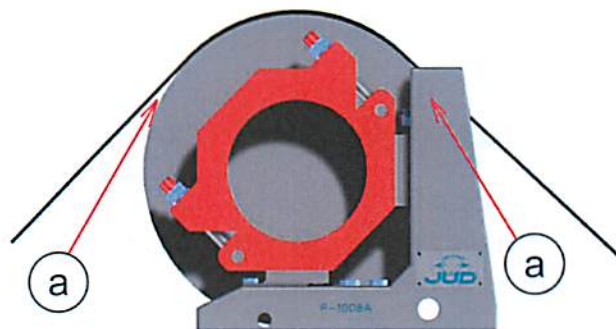
The person in charge of safety of the overall system may only entrust qualified skilled personnel with assembly, start-up and maintenance of the Load Cell.

The skilled personnel can identify and avoid any risks thanks to

- training, experience and instruction,
- knowledge of relevant standards, regulations, accident prevention instructions and on-site conditions.

Responsibilities for assembly and maintenance must be clearly defined and observed.

3.3 Danger areas



Danger area	Risk of injury due to
a) rotating roll with running felt/wire	drawing in with bruises of limbs

3.4 Specific dangers

In case of operating the Load Cell as part of a complete installation additional dangers can occur.

The company putting the overall system into circulation or operation within the European Community must

- perform a risk assessment and issue a conformity declaration
- affix the CE mark to the overall system
- inform the operating personnel about additional risks and any necessary preventive measures.

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3.5 Safety Instructions

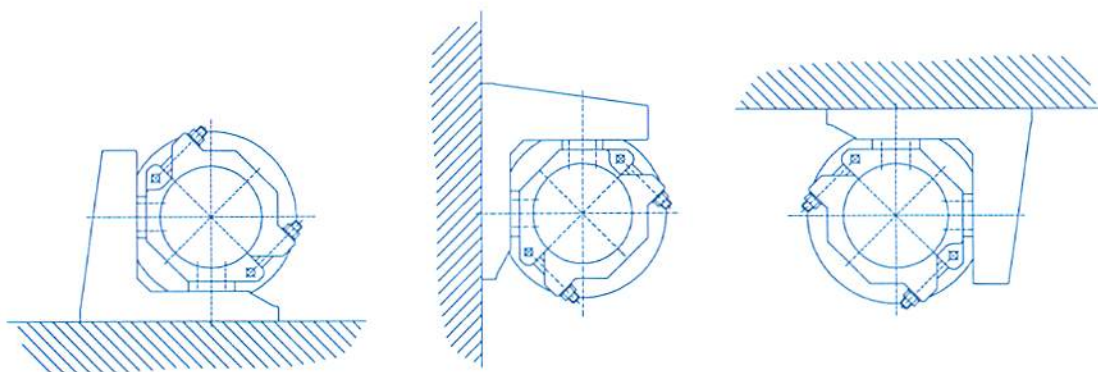
All operations for maintenance, checking and troubleshooting of the Load Cell can be performed only with the entire system switched off. If problems cannot be eliminated by simple means, service personnel of company JUD AG Papiermaschinen must be consulted.

Unauthorized changes in the Load Cell (e.g. additional bores in the support) can only be made with the written permission of JUD AG Papiermaschinen.

4. Installation and Setting into Operation

4.1 Installation instructions

- Have the technical personnel of JUD AG Papiermaschinen to make an installation proposal for the Load Cell.
- The Load Cell doesn't have a display and operating elements and therefore doesn't need to have a workstation of its own.
- When connecting cables, make sure there is good accessibility and satisfactory room for a kink-free laying of the measuring cable.
- The Load Cell can be installed in all positions, e.g. horizontally, vertically or overhead. It does not need to be installed in the resulting direction of force of the felt/wire wrap.



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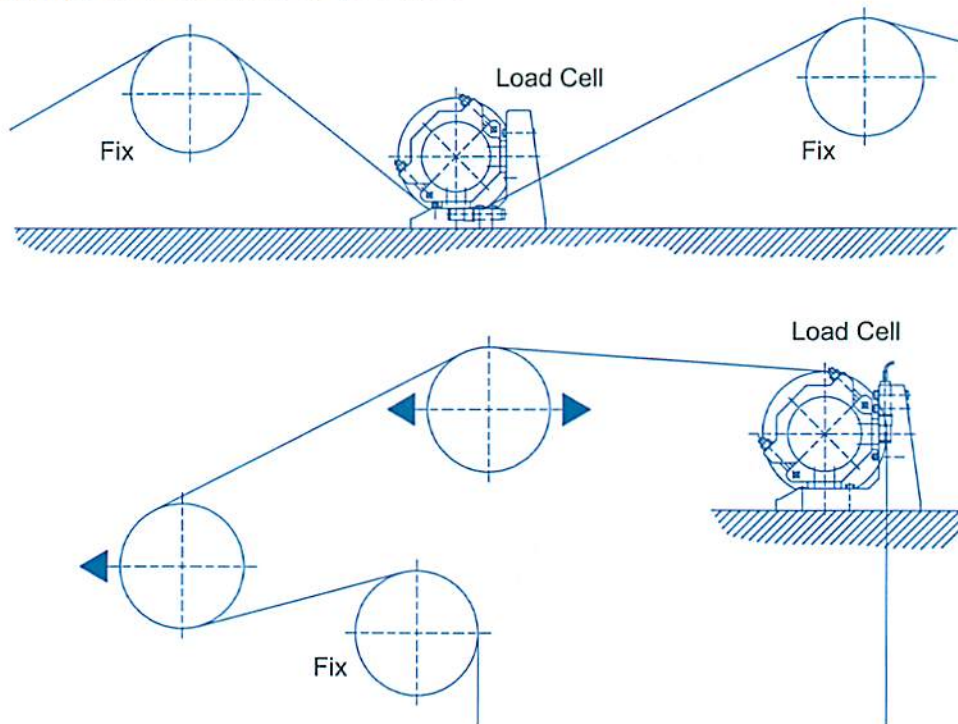
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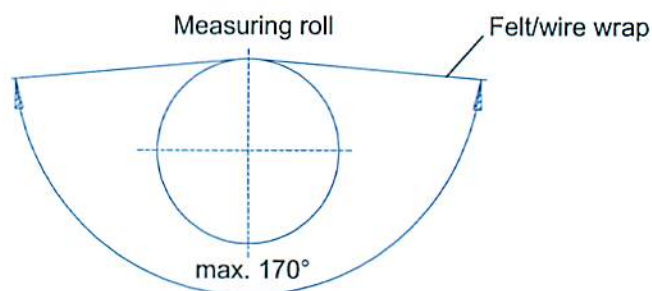
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4.2 Installation site requirements

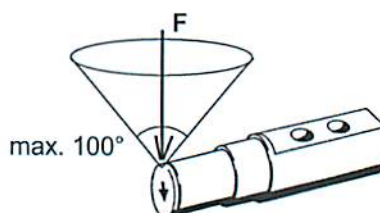
- The Load Cell must be mounted between two fixed rollers if possible, in order to hold the wrap angle constant. In case this is impossible, one must ensure that it is possible to select an installation site in which the change in the angle of the fabric is as small as possible.



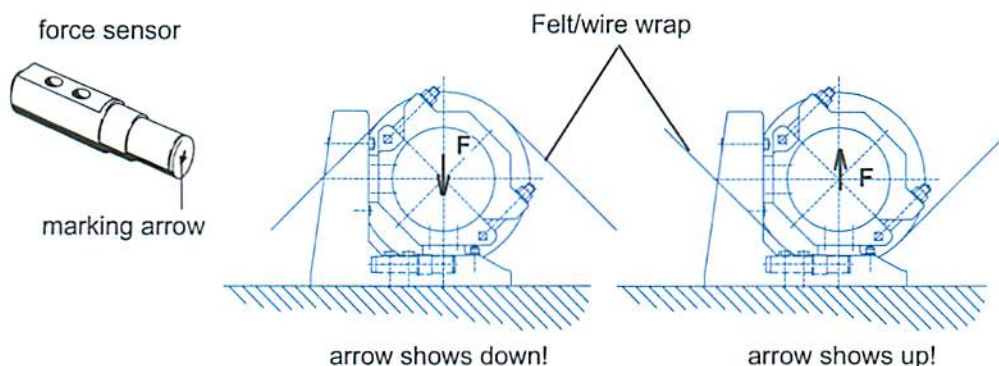
- The total wrap angle must not exceed 170 degrees.



- The resulting force of the felt/wire wrap can deviate a maximum of $\pm 50^\circ$ from the measuring direction of the force sensor.

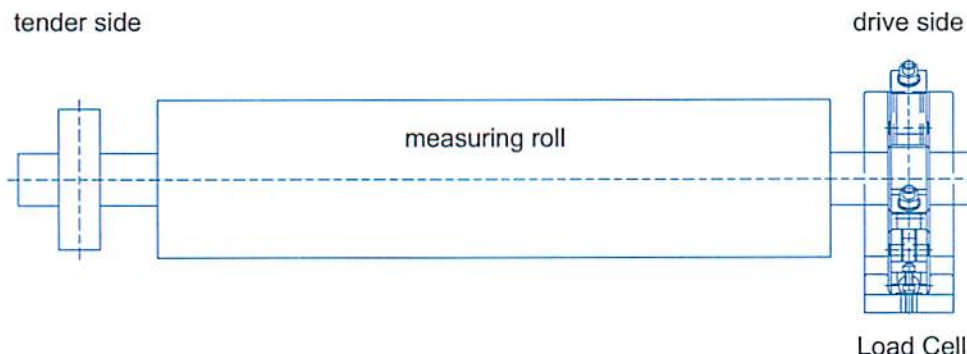


- The direction of the resulting force should correspond to the direction of the marking arrow on the housing of the force sensor.



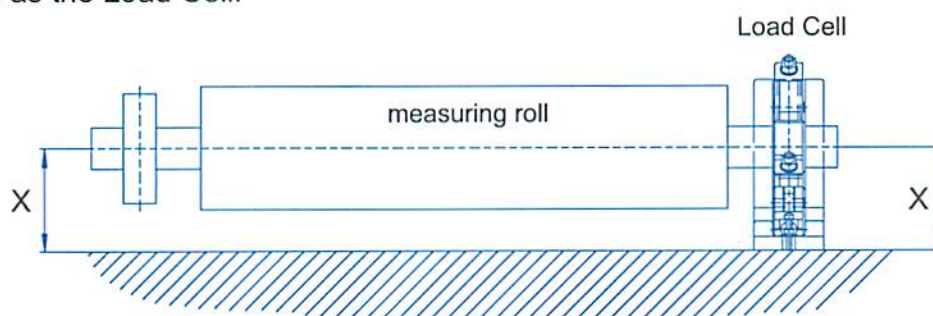
If the requirements of the measuring accuracy are low, the force can also run counter to the marking arrow. The force sensor can measure in both directions loaded and unloaded.

- The Load Cell is mounted on only one side of the measuring roll. If possible the drive side should be used in order to be able not to depend on the cable connection of the Load Cell when changing felt/wire.



4.3 Installation

- 1.) Make sure that the other side of the measuring roll has the same center height (X) as the Load Cell.



- 2.) Align the Load Cell parallel to the machine frame and use two pieces of hexagonal head screws to fasten it.

Bolts required:M20 resp. M30 x ____
 Bolt locking:Washer DIN 125A
 Lubrication:None
 Bolt fastening torque:
 A2-70max. 370 Nm for M20
 A2-50max. 571 Nm for M30
 8.8max. 390 Nm for M20
 8.8max. 1350 Nm for M30



Mentioned fastening torques are approximate values at medium friction factor - fastening factor needs to be considered separately.

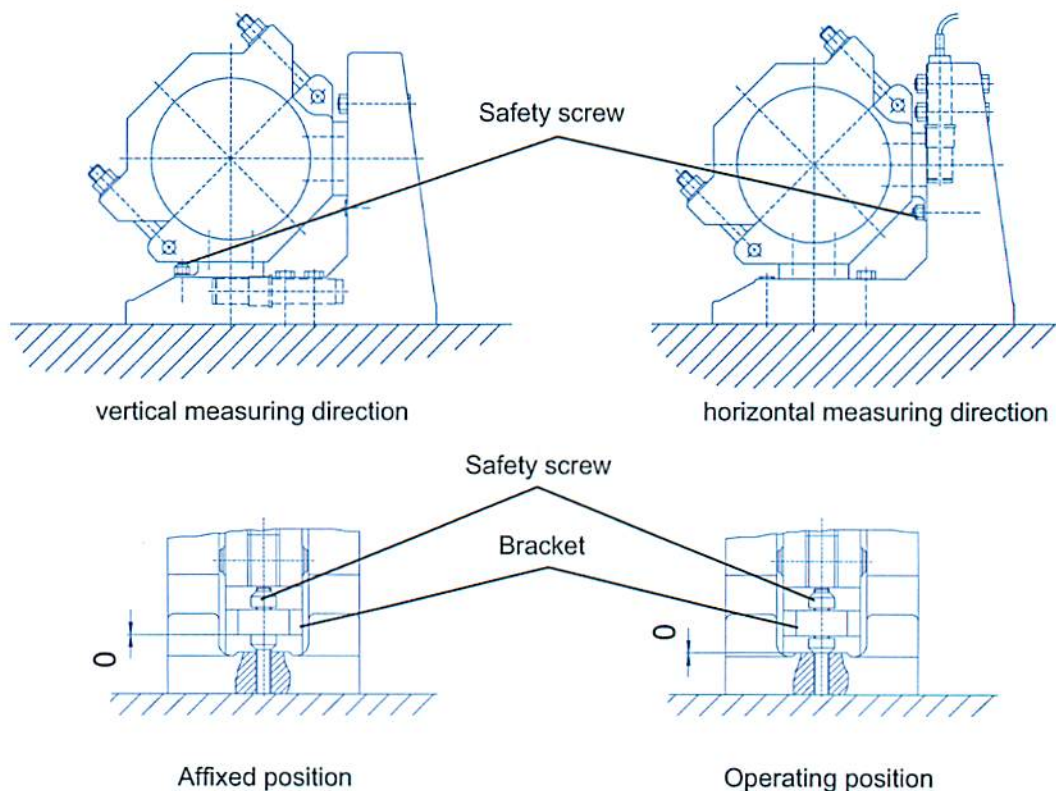
- 3.) Check to make sure the force sensor is secured: The bearing yoke must be affixed using the safety screw.



IMPORTANT

The safety screw protects the force sensor from damage and overloading during installation and removal of the measuring roll.

For proper function of the Load Cell the safety screw has to be in operating position.



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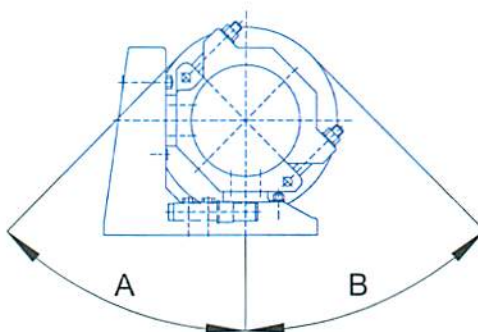
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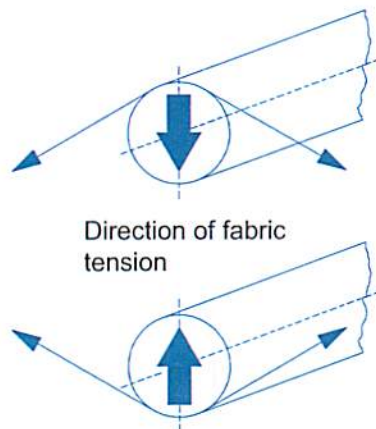
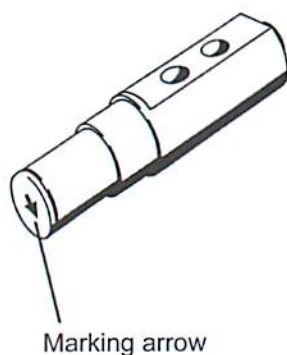
- 4.) **Carefully** insert and fasten the measuring roll on the Load Cell.
After that turn the safety screw clockwise until it stops and fasten it (operating position). There must be a gap between bracket and head of the screw.

4.4 Check wrap angle and measuring direction

After installing the machine clothing the actual wrap angles have to be checked with the angles A & B on the installation proposal respectively dimensional drawing. The actual angles have to be used for parameterizing of the Tension Controller respectively Amplifier Card.



The marking arrow is located on the front side of the force sensor. The direction of the resulting force of the felt/wire tension should correspond to the direction of the arrow.



4.5 Laying measuring cable

The force sensor is equipped with 10 meter cable directly connected as a standard. As an option it can be arranged with a lemo plug.

- Lay cable without kinks (minimum bending radius approx. 50 mm) and protect from mechanical stresses (step protection).
- Do not lay the measuring cable along with high voltage cables.

- If the measuring cable is extended or replaced by a customer-specific version, only an equivalent cable can be used (see item 6 „Technical specifications“).
- Connection boxes to connect 2 measuring cables have to be placed outside the wet area. Protection class should be at least IP66.
- To ensure a reliable measurement the length of the cable between force sensor and amplifier card must not exceed 150m.

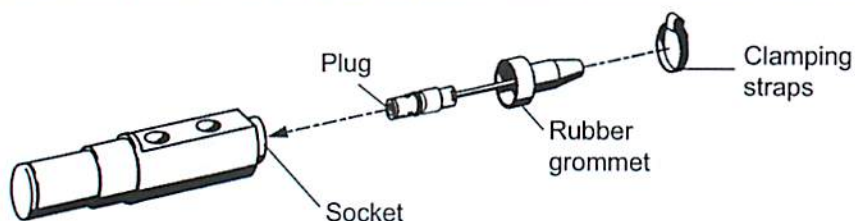
4.6 Connecting measuring cable

- Before connecting the measuring cable: Switch off Tension Display Unit or Tension Controller and observe installation instructions in the operating manual.
- Pay attention to the low-resistance connection between the shield of the measuring cable and the cabinet.



The pin assignment of the measuring cable can be found in chapter 6.1.

Assembly instructions for plug connection on the force sensor (option):



- 1.) Align the plug on the socket and insert until the plug housing latches.
- 2.) Slide rubber grommet over plug and socket until the grommet lies against the housing of the force sensor.
- 3.) Affix the rubber grommet with clamping straps.

5. Maintenance and repair



CAUTION

Before doing any maintenance or repair work switch off the entire system and secure it against switching on the machine accidentally (block main switch, apply warning sign, etc.).



IMPORTANT

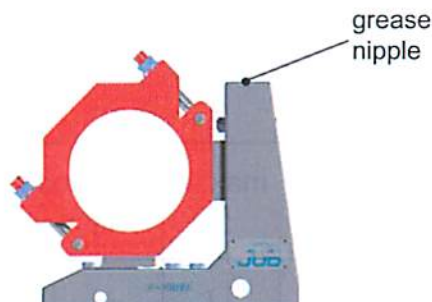
Before each removal and installation of the measuring roll, affix the force sensor using the safety screw (chapter 4.3).

During maintenance operations on the entire system, the following points must be checked periodically:

- all fixation screws on the Load Cell.
- the measuring cable has to be checked on mechanical damage.

5.1 Lubrication

The linear guidance is to be filled with ball bearing grease **every six months** (~5g).
Manufacturer's recommendation: Ball bearing grease DIN 51502 K3N-30 (Shell Alvania Grease 2, Esso Beacon 2, Mobil Oil Mobilux Grease 2, FAG Arcanol L71)



5.2 Replacing force sensor

Procedure:

- 1.) Loosen fabric until there is no load on the measuring roll anymore.
Switch off the entire system and prevent against accidentally switching on the machine.
- 2.) Turn safety screw counterclockwise until the force sensor is completely unloaded from the weight of the measuring roll.
- 3.) Remove force sensor
Loosen both screws and remove shear force sensor.

- 4.) Before installing the force sensor
 - check nominal load that is printed on it,
 - check direction of the marking arrow.
- 5.) Mount force sensor with attachment screws.
Put the safety screws into operating position, chapter 4.3.
- 6.) Connect measuring cable according to the pin assignment mentioned in chapter 6.1.
- 7.) In order to tare the measuring signal, proceed according to the associated operating instructions for:
 - Tension Controllers TC-211/ 721/ 731/ 741/ 301, TC-113
 - Tension Display Unit TDU-2-8
 - Amplifier Card F-1015, F-1016M, F-1017M

6. Technical specifications



The exact dimensions of your Load Cell can be found on the dimensional drawing in the appendix. The weight depends on the design size (AN, BN, CN).

Force sensor:

For the various design sizes of the Load Cell there are force sensors with the following measuring range available:

design size	max. nominal load in kN						
	10	20	30	40	50	60	100
A	○	○	○	—	—	—	—
B	—	—	○	○	○	○	—
C	—	—	○	○	○	○	○



The nominal load is printed on the housing of the force sensor.



CAUTION

The max. nominal load must not be exceeded, since an overload can lead to measuring errors or damage to the force sensor or Load Cell!

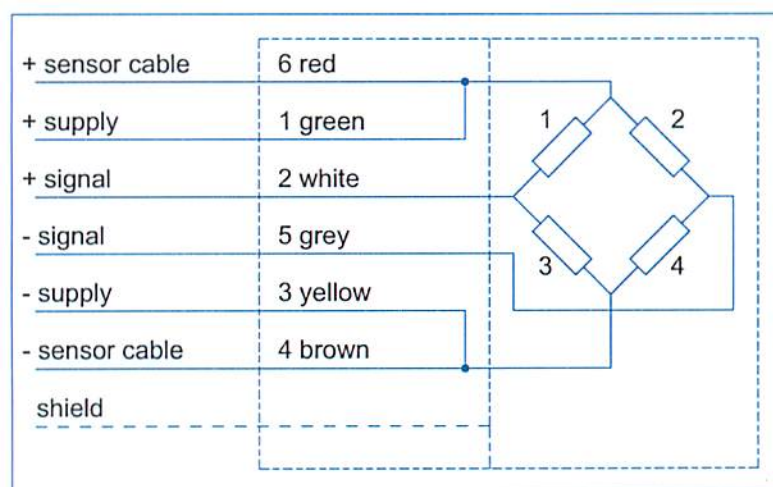
Supply voltage	..... max. 10 VDC
Input resistance	..... 4 x 600 Ohm
Accuracy	..... +/- 0.5%
Sensitivity	..... 1.95 mV/V ±5%
Temperature range	..... -10 °C to +140 °C
Type of protection	..... IP 69K
Corrosion protection	..... force sensor in stainless steel
Emissions	..... no noise and vibration, no electromagnetic interference

Measuring cable:

Outer diameter	.....7mm
Conductor	.....6 x 0.25mm ²
Insulation	..... Radox 155
Shielding	..... Copper braiding, tin-plated
Temperature range	..... -55 °C to +155 °C
Minimum bending radius	.....50mm

Plug connection (option) Lemo, 6 pins

6.1 Pin assignment



7. Disposal

The Load cell contains no hazardous materials and can be disposed of without special precautions.

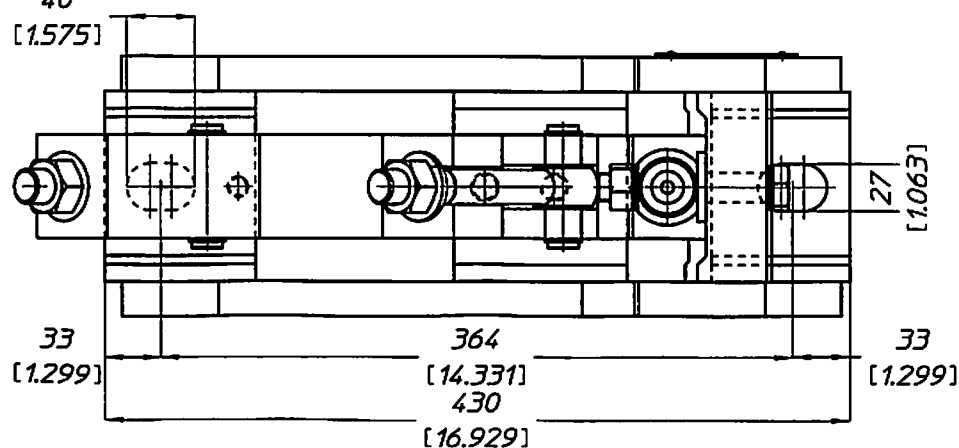
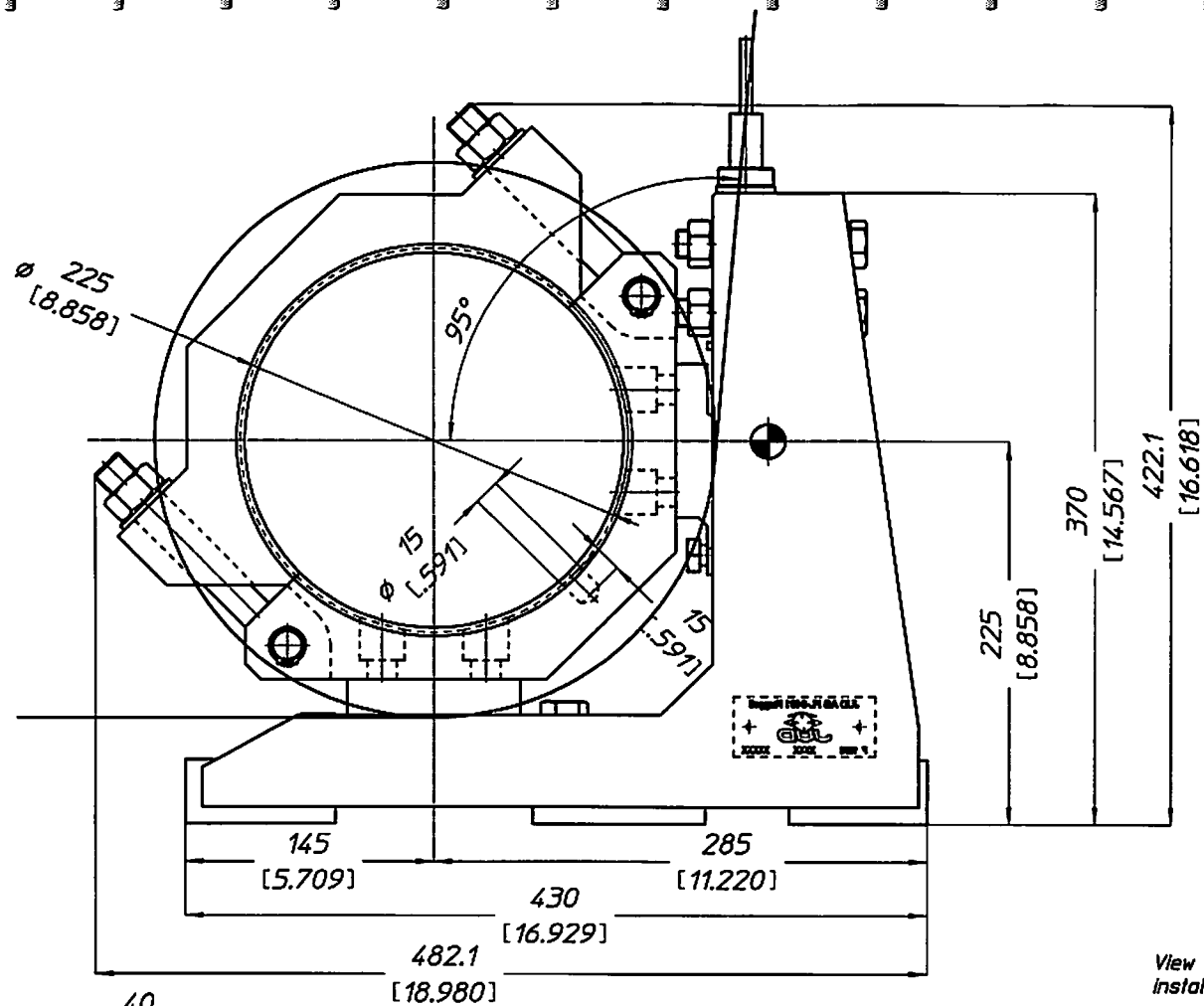


Observe national legislation and regulations on waste disposal, and commission a disposal company with appropriate disposal and recycling.

8. Appendix

☐ Dimensional drawing and position drawing

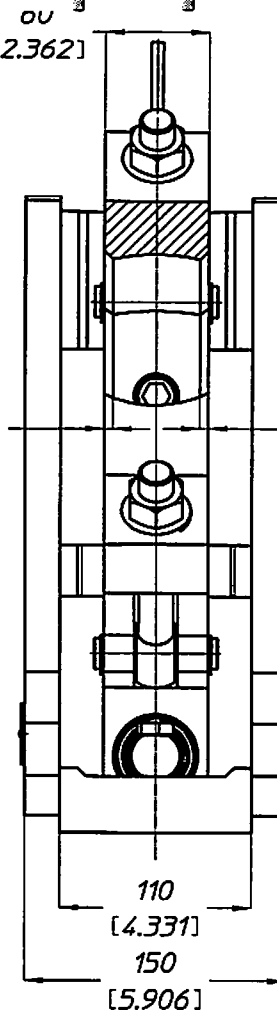
☐ Part list



View tenderside
installation driveside

5x45°
[.197x45°]

5x45°
[.197x45°]



F-1008 01196-01198

CC: 5150mm
Felt-/wire width: 4850mm
Tension: 4.4N/mm
Roll weight: kg
Machine speed: m/min
Nominal load SFS: 20kN

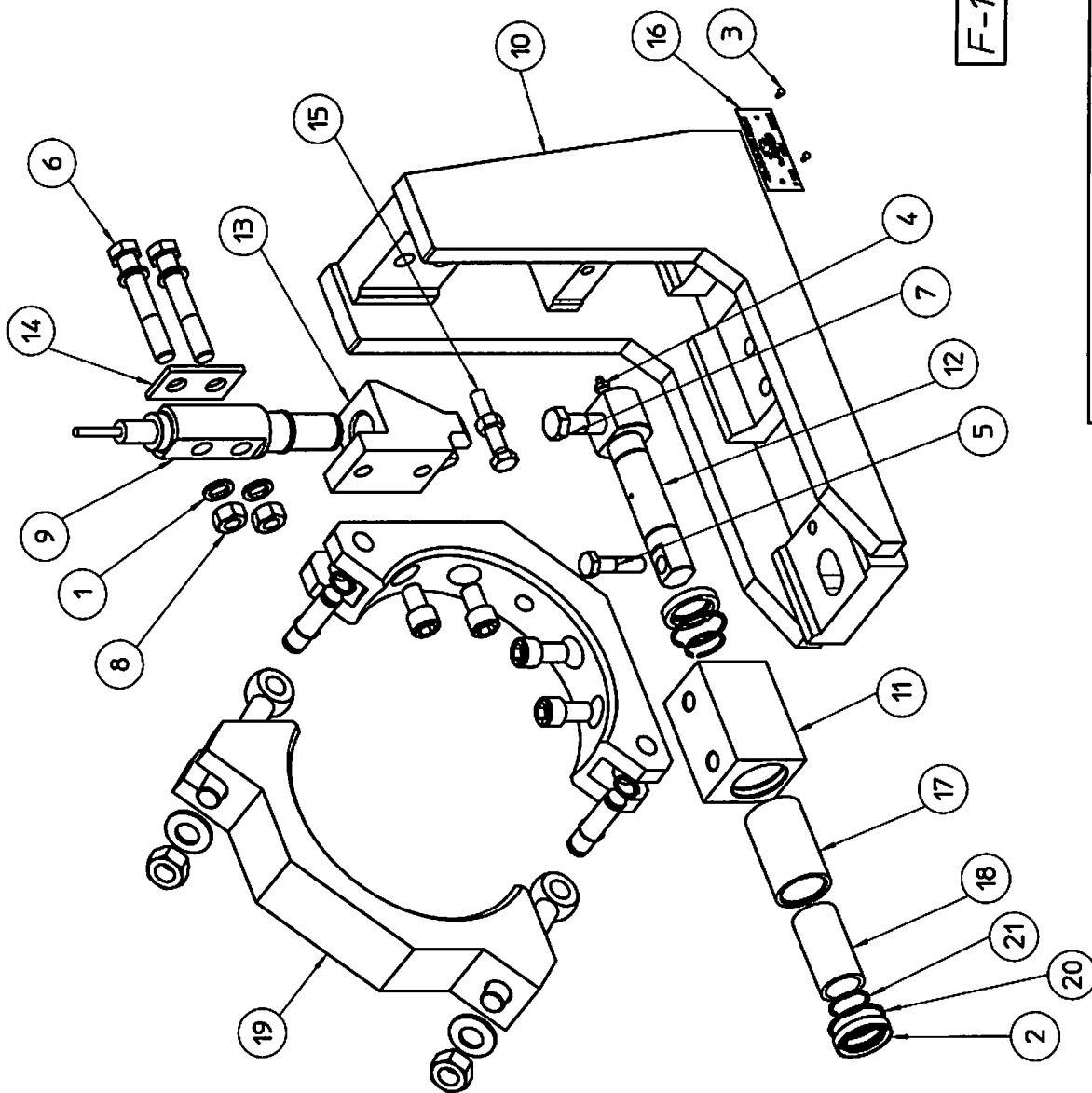
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A	ELS-SKA-20-10 neu	28.11.13	bjü	Customer ID: 102147	A3
Order no.: 205788		JUD Corporation			
Georgia Pacific Canada LP		Scale 1:3	Date 29.10.13	Name gbi	
PM/KM: -		Checked	FMT DIN 7168	mittl	
Press section		Drawing number	Rev.		
F-1008A-X-00H00-0001		A			





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Rev.	Description	Date	Name	Model:	-	F-1008
A	ELS-SKA-20-10	28.11.13	bju	Serial no.:	-	01196-01198
 a member of 		Order no.:	205788	Custom. ID:	102147	Page 1 / 1
		Georgia Pacific Canada LP		JUD Corporation		
		PM/KM: -		-		
		Press section		Created	29.10.13	gbi
JUD AG Papiermaschinen Industrierung 15 FL-9491 Ruggell Liechtenstein Europe Tel.: +423 375 82 82 Fax: +423 375 82 99 E-Mail: info@jud.li Web: www.ibs-ppg.com		Checked		29.10.13	bju	
		Part list number		Rev.		
		F-1008A-X-OOHOO-0001		A		
Pos.	Qty.	Part number	Description	Norm	Dimension	Material
1	4	25201M16A4	Lock washer	DIN25201	ø17	Stainless
2	2	3760A30x48x8VI	Shaft seal	DIN3760A	ø30xø48x8	FPM
3	2	689U2.89x6.35A2	Hammer head bolt	BN689U	ø2.89x6.35	Stainless
4	1	71412AG1-8A2	Grease nipple	DIN71412A	G1/8	Stainless
5	1	931M12x50A2	Hexagon head screw	DIN931	M12x50	Stainless
6	2	931M16x100A2	Hexagon head screw	DIN931	M16x100	Stainless
7	1	931M16x60A2	Hexagon head screw	DIN931	M16x60	Stainless
8	2	934M16A2	Hexagon nut	DIN934	M16	Stainless
9	1	ELS-SKA-20-10	Shearforce transducer		ø44x210	Stainless
10	1	F-1008A-010-X	Support		430x150x370	Stainless
11	1	F-1008A-011-X	Bearing housing		100x60x69.5	Stainless
12	1	F-1008A-012-X	Guide bolt		ø50x175	Stainless
13	1	F-1008A-013-X	Link plate		70x60x123	Stainless
14	1	F-1008A-015-X	Plate		40x5x76	Stainless
15	1	F-1008A-S-BG01	Transportation lock		ø22x72.5	Stainless
16	1	JUD-1008-X	Type plate		35x82x1	Stainless
17	1	LAG-LAU38x48x77	Sleeve		ø38xø48x77	Mild steel
18	1	LAG-ROL30x38x72	Roller cage		ø30xø38x72	PA
19	1	LG1008SA225KX001	Bearing yoke		340x275x60	Stainless
20	2	SPR-BR48-F	Snap ring		ø48xø43.5x1.5	Mild steel
21	2	SPR-WR30-F	Snap ring		ø30xø34.5x1.5	Mild steel




F-1008 01196-01198

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		Order no.: 205788		28.11.13	blu	JUD Corporation		A3
 a member of 		Georgia Pacific Canada LP		Scale	Name	Date	Drawn by	Checked
PM/KM: -		Press section		1:4	abi	29.10.13		FMT DIN 7168
								Drawing number
								Rev.
								F-1008A-X-00H00-0001
								A

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 E-Mail: info@jud.li Web: www.jud-ag.com

Bei Ersatzteilanfrage bitte Seriennummer der Messstelle bekanntgeben!
For spare part inquiry please state serial number of load cell

		8 October 91 IBS PAPER GROUP	
Rev.	Description	A ELS-SKA-20-10 neu	
Order no.: 205788		Georgia Pacific Canada LP PM/KM:- Press section	
Date	Name	Scale	Date
28.11.93	blu	1:4	29.10.93
Material: Stainless		Drawn by	qbi
Customer ID: 102147		Checked	
JUD Corporation		FMT DIN 7168	mittel
		Drawing number	Rev.
		F-1008A-X-00HQ-00001 A	