RECKMANN

operation manual

SF
hydraulic furling system

RT

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Stand: 27 January 2011

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Reckmann Yacht Equipment GmbH
Siemensstr. 37-39
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1 Introduction

1.1.1 Packing list SF

Date _____

Customer _____

Dealer _____

Order number _____

Type: SF _____

1	CZxts-	_____	t
	With motor / brake	_____	
1	Topswivel T-	_____	t
	2:1 sheave for Topswivel	(optional)	
1	Pin for topswivel		
1	Manual		

	Stainless steel deckjoint consistent of:
1	Cadanic ring with four plain bearing bushes
2	Inner pins
2	Outer pins
2	Locking plates
1	Padeye
1	Upper padeye
1	Spacer

1	Inner rubber collar ring
1	Inner padeye
1	Deckblind
1	Rubbercollar
13	DIN 7991 M5x12
8	DIN 7991 M5x45
6	DIN 7991 M8x45
8	DIN 912 M8x16

Aluminium deckjoint consistent of:

1	Milled aluminium counter plate
1	Cadanic ring with four plain bearing brushes
2	Inner pins
2	Outer pins
2	Locking plate
1	Outer padeye
1	Outer clamp ring
1	Inner clamp ring
1	Rubber collar
	DIN 7991 M...
8	DIN912 M8x25

__ **Stay joint consists of:**

1 Upper pin

1 Splint for upper pin

1 Insert

1 Quick Release Pin

1 Tack part

1 Insert

Additional equipment: _____

_____

Packed by _____

_____

Dear Reckmann customer,

With the SF reefing system you have purchased the latest reefing system which you can rely on. This unit is manufactured using the latest technical innovations and uses the best materials. It is a successful combination of design, performance and safety. We are confident that the SF reefing system will provide you with enjoyment for many years.

1.1.2 How to use this manual

Read this manual carefully before assembly and operation of your Reckmann gear.
Points that need additional attention will be marked in the following way:

Note!
This sign marks points which need special attention.

Warning!
This sign marks the risk of injuries or other significant danger.

Tip
this triangle marks useful tips.

1.1.3 Important remarks

After your furling system was installed accordingly to this manual, we recommend to read the following notes carefully before you set your furling system into operation.

Note!

Improper use according to this manual of the furler may cause loss of warranty.
Consult a Reckmann service partner in any case of problems.

Warning!

Any modification or damage may influence the safe operation of the furler.

Please make sure that the furling system is in a well condition according to this manual.

Warning!

Adjusting with load on the sheet may damage the profile.
Adjust only when sheet is unloaded.

1.2 Maintenance of the furler

To keep the furler in a good optical and technical condition, a regular service is required. Maintenance of the furler consists of two basic points:

- Regular maintenance by the customer
- Regular Service performed by one of our service partners

Tip

Proper operation can only be ensured by regular service. Make sure that the maintenance plan of your furler is carried out carefully.

1.2.1 Maintenance to be carried out by the customer

Clean your furling gear regularly. Wash carefully all salt from the furler.
Stainless steel parts can be treated with special care product.
Additional for all electric and hydraulic furling units, the function of the manual backup drive and the condition of all hydraulic hoses / electric wires should be checked regular.

1.2.2 Maintenance to be carried out by a Reckmann service partner

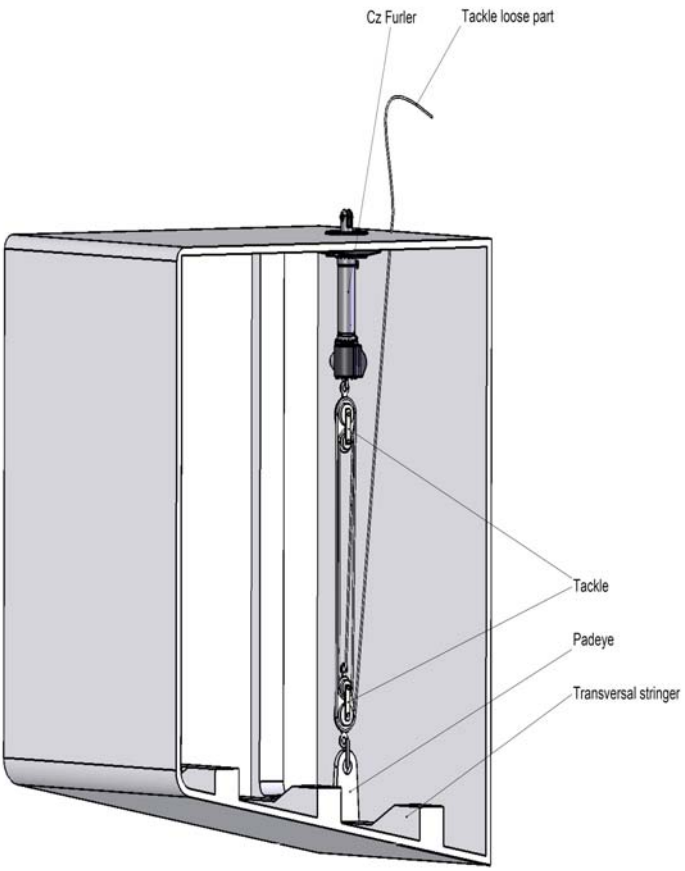
To ensure the safe and proper operation of the furler, it has to be serviced every five years by an authorized Reckmann service partner. A table of all authorized Reckmann service partners can be found at the end of this manual or at www.reckmann.com

1.3 Securing the furler against swinging in rough sea conditions

To secure the furler against swinging in rough sea conditions we recommend a tackle. The tackle is connected to an eyebolt furlerwise. The other part needs to be connected to a sturdy, rigid structure in the ship in alignment with the stay axis.

The loose end of the tackle can be redirected to operate it from above deck. A through deck fitting may need to be installed.

If the furler should be used or is used the load may be taken from the tackle by easing off the tackle.

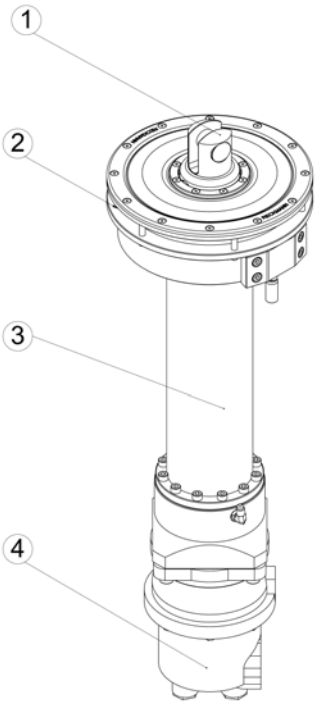


2 Product description

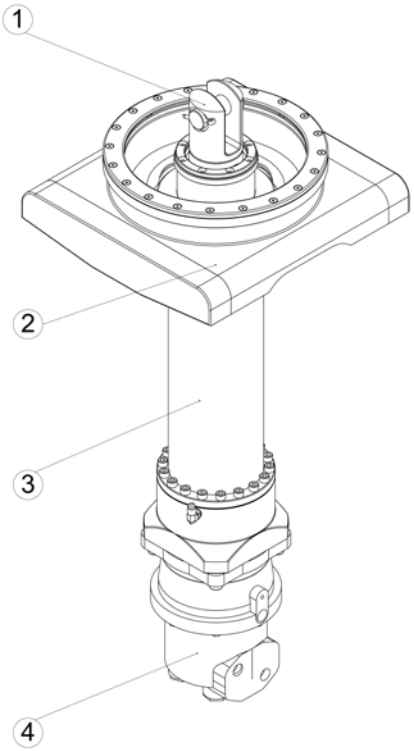
2.1 Product description

Reckmann staysail furling systems are available with two different deck joints.

Stainless steel deck flange:



Aluminium deck flange:



1 staysail fork fitting

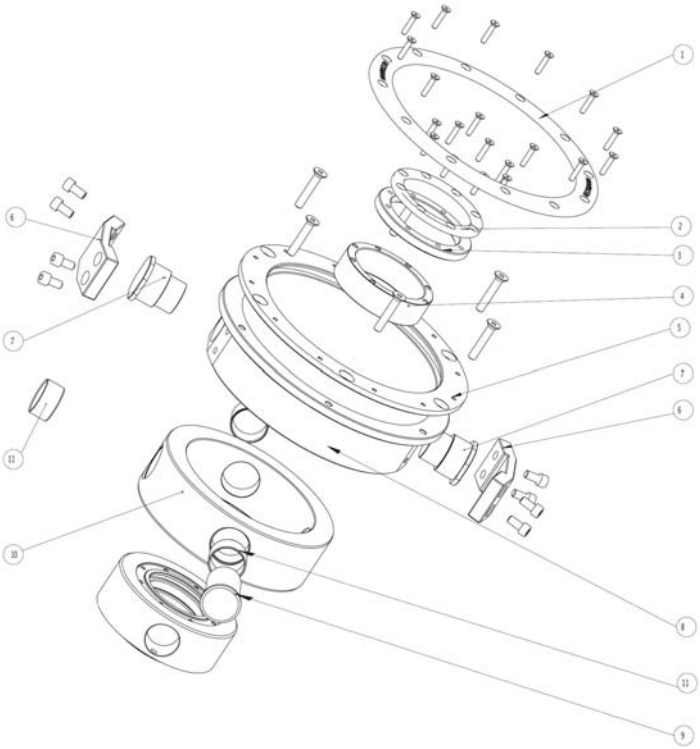
2 deck joint

3 adjuster unit

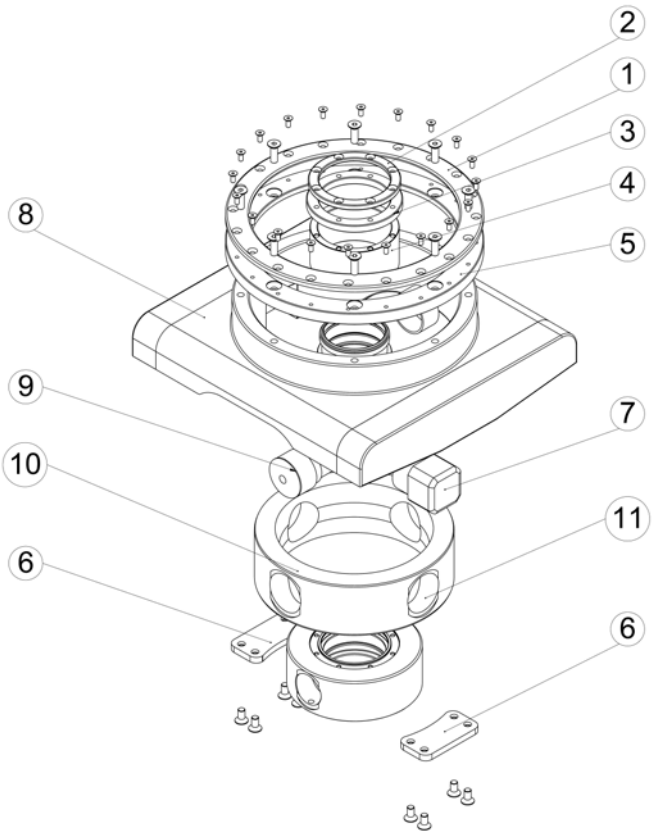
4 hydraulic motor with brake SF

2.2 Elements of the deck joint

Deck flange made of stainless steel:



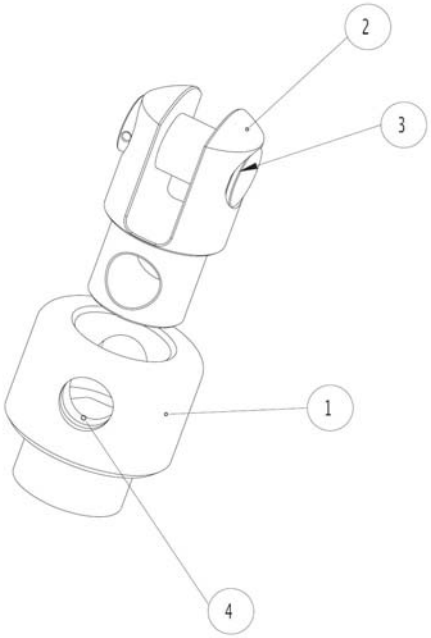
Deck flange made of aluminium:



1	Outer deck ring	2	Inner deck ring
3	Inner clamp ring	4	Spacer ring
5	Outer clamp ring	6	Securing plate
7	Outer pin	8	Deck flange
9	Inner pin	10	Cardan ring
11	Friction bearing		

2.3 Elements of the stay joint (as an option)

The stay joint consists of the following components:



1 furler clutch
2 stay fork fitting
3 pin
4 hole for Quick Release Pin

3 Assembling the furling unit

The Reckmann furling unit is installed directly to the deck. The deck has to tolerate the entire stay load.

Warning!

Make sure that the deck is strong enough to carry the entire stay load.

Note !

Corrosion may occur between the furler and the deck. Tighten the furler and the deck with Sikaflex or a similar sealing product.
Between CFK decks and the furler has to be an insulation layer made of GRP

Note!

The deck flange of the furler is not watertight. To avoid flooding of the boat, the furler has to installed in a drained compartment.

Reckmann CZ furlers are available with different deck flanges. Please follow the chapter for your product.

Warning!

Without a tensioned stay the furler will move freely in the deck hinge. There is a risk of being harmed exposed to swell especially.
Thoroughly secure and support the furler when not in use.

Note!

An erring fore/aft alignment can cause damages of the furler.
Keep alignment corresponding to description above.

Note!

If the furler swings forward it may damage the upper hydraulic connection.
Secure the furler manually against swinging forward.

Note!

To avoid the securing screw from failing, it needs to be secured with a screw securing adhesive (Loctite)

3.1 Installation of the stainless steel deck flange

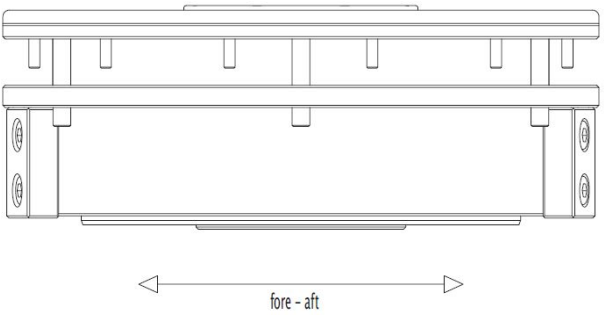


Bild 1

The furler is mounted cardanicly in the deck. All tensile loads and shearing forces have to be tolerated by the deck. Please make sure that the deck is able to withstand the loads and forces.

Make a circular cut-out in the deck. Drill the mounting holes around the cut-out.

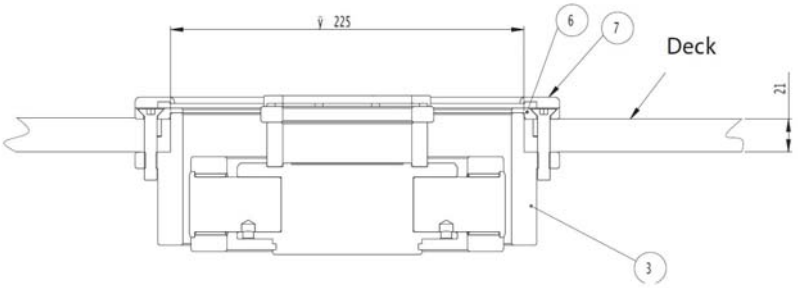


Bild 2

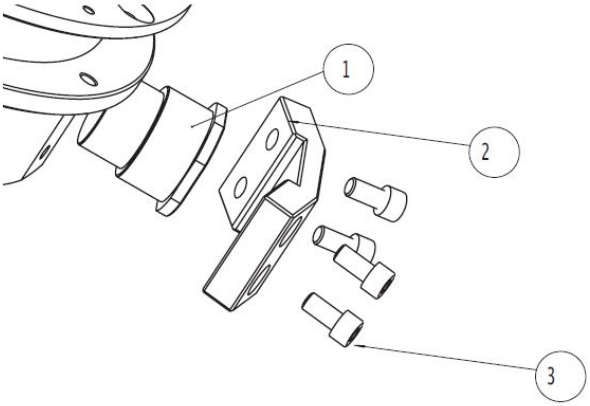
You can use the deck ring on the deck to mark the drilling holes. Adjust the deck ring with the pin drilling amidships exactly

(Bild 1)

After drilling the holes in the deck (1) move the deck ring (3) through the cut-out from underneath. Bolt it together with the outer clamp ring from top side (Bild 2).

Both the flange- and deck ring surface should now seat solidly on the deck.

3.2 Linking the furler with the deck ring



The furler is linked from above with the cardanic hinge.

Slide the furler with the premounted cardanic ring into the deck ring.

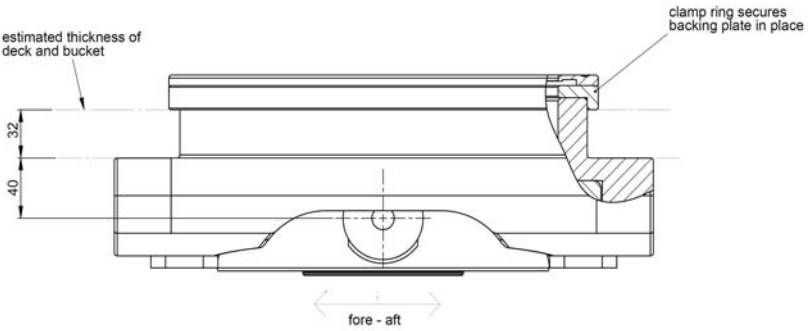
While doing this step use a halyard as aid or support it from underneath.

Put the outer pins (1) through the deck ring in the cardanic ring. Save the bolts with the locking plate (2) and the according screws (3).

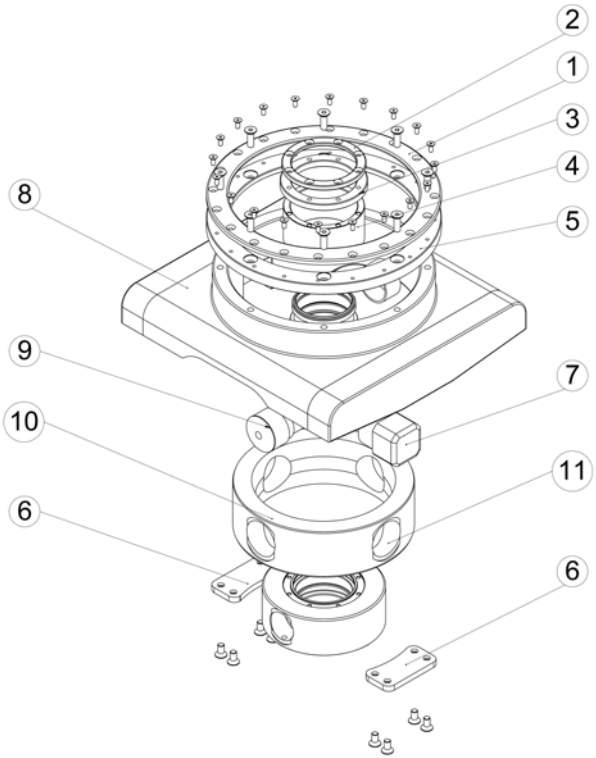
The furler has to be secured against motion, due to rough sea conditions when not in use. Furthermore the furler has to be secured agains swinging forwards otherwise the hydraulic connection of the adjuster may be damaged.

3.3 Installation of the aluminium deck flange

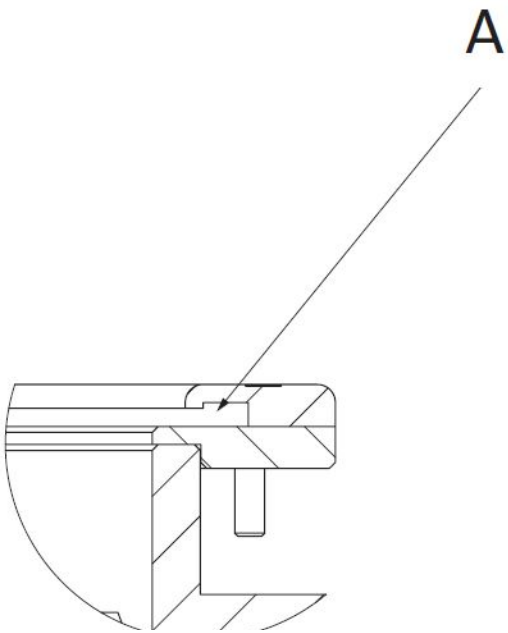
Clamp the aluminium backing plate with the deck (4, 5) and glue and or bolt it. Install it from the decks downside. Here it is of importance to keep the right alignment (Forward/ Aft see illustration below)



When the aluminium backing plate (8) is properly bonded with the deck, the furler can be lowered through the deck cut-out from above. Now assemble the ring (10) with the two inner bolts (11). Secure these bolts with the flange screws in the furler. Put the outer bolts (7) in the ring, too. Just now guide the furler while lifting into the backing plate (8). Once the furler is fixed with both locking plates (6) it's ready to use. Use Loctite or other derivative with every screw to secure it above all


2
1
3
4
8
5
9
7
10
11
6
6

3.4 Installation of the rubber collar



After the furler is linked to the deck ring and all joints are secured, the rubber gasket can be installed. The rubber gasket has to be clamped on the outside between the deck ring and the outer clamp ring and on the inside between inner deck ring and inner clamp ring. Put the inner deck ring aligned with the drillings on top of the rubber and put the screws provided in the holes. Now move the inner clamp ring and the black collar bush over the screws from underneath. Center the package on the ramrodguide. Tighten all screws. Lay the clamp ring onto the rubber collar and bolt it together with the deck ring. Make sure that the outer edge of the rubber gasket (A) fits into the recess in the clamp ring. Tighten these screws firmly criss-crossly, as well.

Please notice that the rubber collar won't be entirely watertight. Furthermore a failure of the collar may result in large quantities of water getting inboards. Install the furler in a self draining compartment of the boat.

Note!

The deck flange of the furler is not watertight. To avoid flooding of the boat, the furler has to installed in a drained compartment.

4 Hydraulic connection of the motor

4.1 Hydraulic connection of motors with brake

The hydraulic motor of the Reckmann furler is equipped with an integrated multiple disc brake. To release the

brake a hydraulic pressure of 30 - 280 bar has to be at the ventilation port of the brake.

Note: Higher pressure can cause damages of the brake

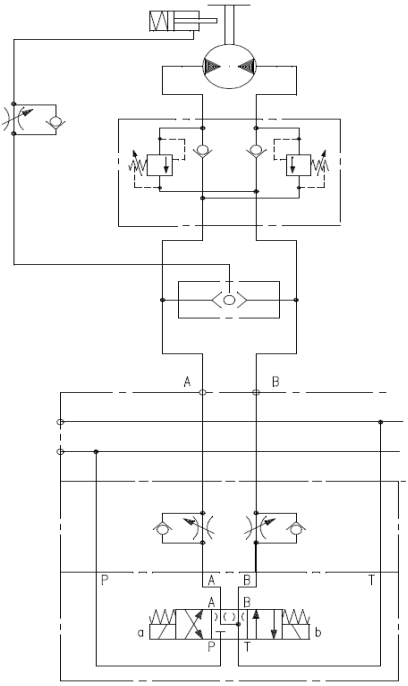
For a safe handling of the unit you should meet the following instructions:

The motor has to be controlled by a 4/3 way direction valve. Both directions are possible. To limit the revolution speed a

flow control valve has to installed in the return line of the direction valve.

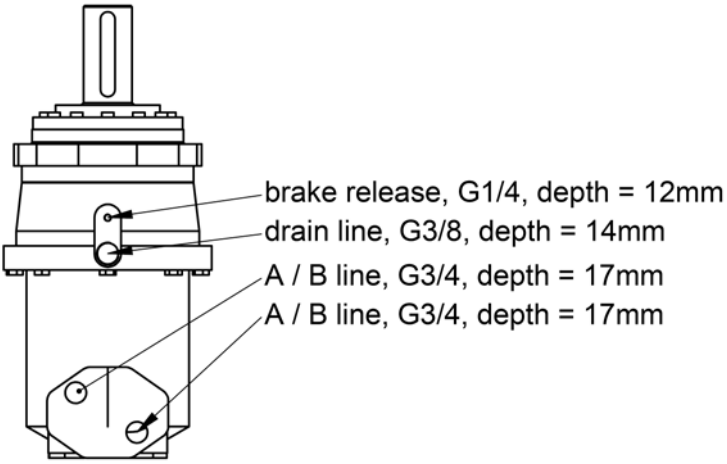
To avoid overloading of the motor in braking operation, two pressure relief valves have to be installed between the direction valve and the motor.

The leakage line of the motor has to be connected to the system. The direction valve of the brake should be operated parallel to the direction valve of the motor.



Please see the table in the annex for hydraulic details of the used elements.

Hydraulic ports of the motor:

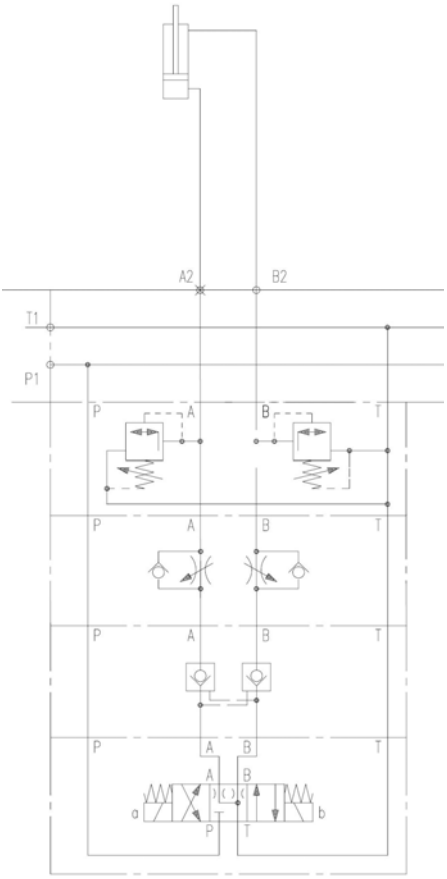


Note!

Operating beyond specifications my cause a sustainable damage of the furling system.
Ensure that the furler is not operated beyond its. specifications

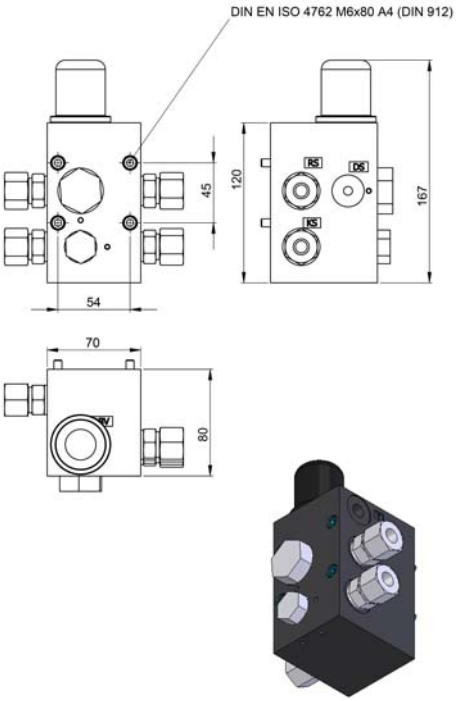
4.2 Installation of the adjuster

The adjuster works with hydraulic pressure. Maximal stroke and tensile loads can be extracted from the specifications in the annex. The cylinder is controlled by a directional valve (see drawing beside). To avoid overloading of the system while operating it needs to be fitted with a pressure relief valve between directional valve and cylinder. **The pressure needed to extend the adjuster has to be limited to 20 bar.** Flow control valves in circuits A and B avoid jolty motions of the cylinder. The hose connector is a G1/8“ internal thread adjusterwise.

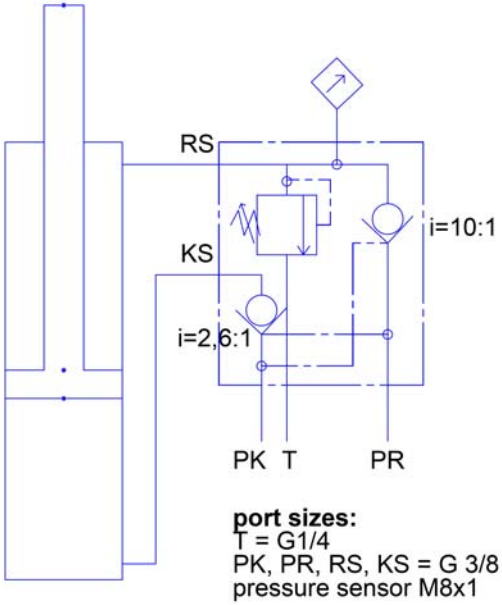


4.3 Load control block (optional)

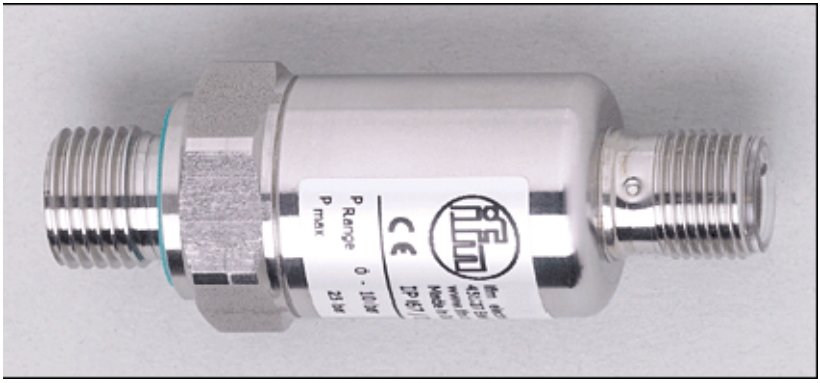
If your furler is equipped with a load control block, you should take care of this chapter.
The block can either be flanged to the furler or it is separated from the furler. In the second case it has to be connected to the adjuster with hoses. Please take care that the block is wired as shown in the diagram below. Make sure that the hoses are capable for the pressures that will occur due to the specified stay load.
The T port of the block needs to be connected to the pressure-free tank line. If the block is used together with a single acting ram, the KS port needs to be closed with a cap screw.



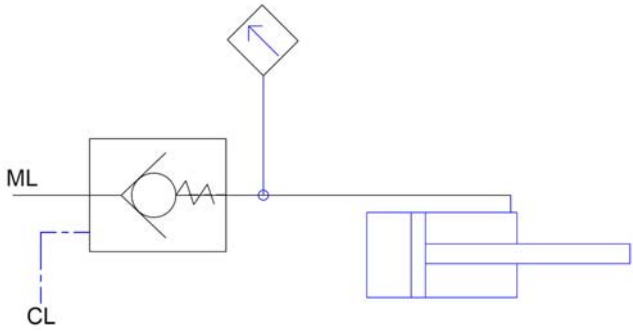
Function of the block:
The integrated po check valve makes your PR hose pressure free when the furler is in service with a tensioned stay. To avoid overloading of the furler, the integrated pressure relief opens at a factory set value. The ram can be extended by pumping oil into port PK.
The pressure which is needed to open the po-check valve can be determined by the following equation:
Pkt=(PRS/10)+2,5



4.4 Pressure sensor (as an option)



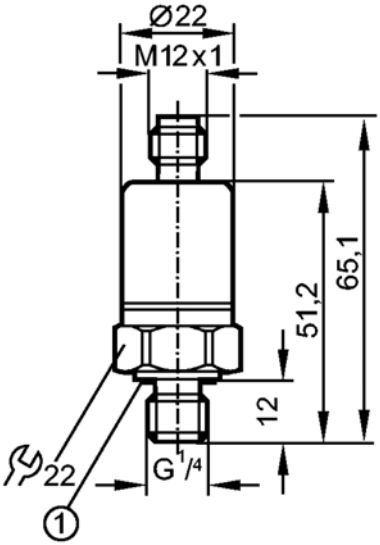
As an option we provide a pressure sensing unit to monitor the pressure in the adjuster. This value is corresponding with the load on the stay. The pressure can be measured as long as the adjuster is not in top position. There are two versions of the pressure sensor: one with 0...10V output and one with 4...20mA output. Please find the specs referring to your sensor on the following pages.
Hydraulic connection of the sensor:



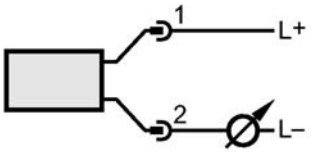
Note!

The sensor cannot measure the pressure inside the adjuster when it is fully extended.
Do not fully extend the adjuster to ensure a proper function of the sensor.
.

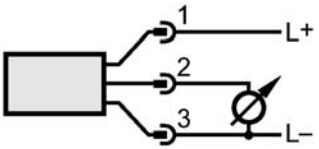
dimesions of the sensor:



Wiring:
PT3540 (mA output)



PT9540 (Voltage output)



Specifications:

	PT3540	PT9540
Operating Voltage	8,5 … 36V	16V … 36V
Reverse polarity protection	yes	yes
Analogue output	4…20mA	0…10V
Pressure rating	600 bar	600 bar
Bursting pressure	1600 bar	1600 bar
Connection	M12	M12
Materials	316L / 1.4404	316L / 1.4404

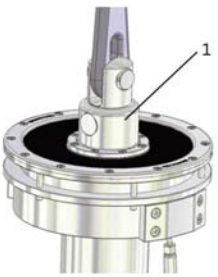
5 Operation of the furler

5.1 Joint of stay and sail

The sail is attached with a textile forestay to the furler. Despite the tensile forces of the furler the forestay has to transmit the torque as well.
The stay consists of a torsional cable where the thimbles are directly connected to the furler and the swivel. The sail gets lashed with webbings between the ends of the textile forestay.

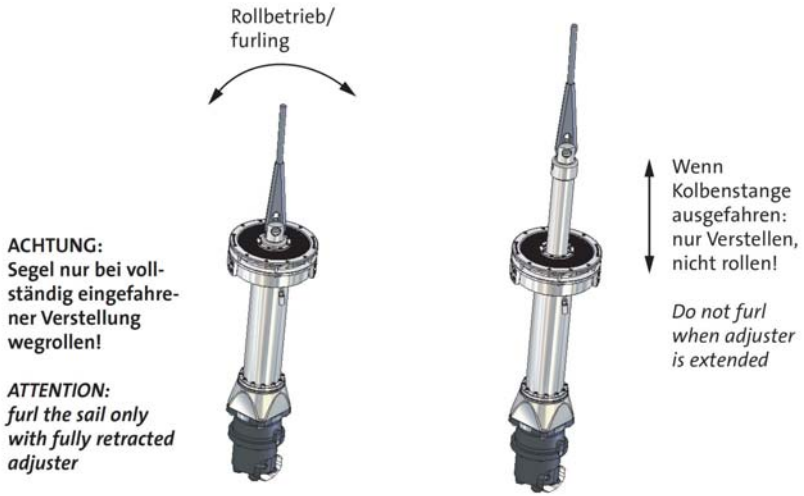
Bild 2

If your system is equipped with the Reckmann Quickreleasepin you can release the pin by pushing the bronze brad and extract it. The special Reckmann fork fitting remains at the bottom stay end. You disconnect it by using the Quickreleasepin.

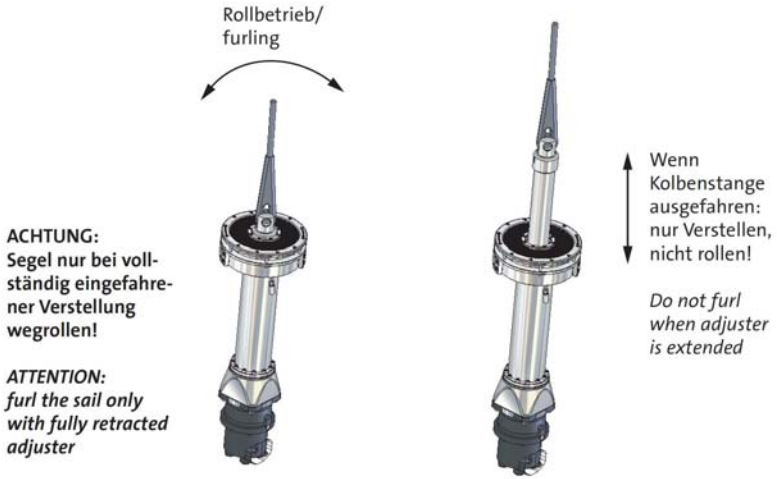


Sail attachment / tensioning
To attach the sail the, adjuster needs to be extended to full length. Attach the textile forestay to the furler. Now attach the swivel to the upper end of the textile forestay. Try to hoist it as high as possible in the mast. Begin to put tension on the stay until the adjuster is retracted fully. Pay attention that the furler aligns with the forestay. If it doesn't align, suspend the tensioning and check the hinge. While operating, the adjuster needs to be fully retracted during the furling process. Otherwise the furler may get damaged. If the adjuster can't be fully retracted due to workingloads, consult your sailmaker concerning the length of the forestay.

Furling / unfurling the sail
You can furl or unfurl to both sides either clockwise or counter clockwise. Make sure that the system is properly assembled and connected and the brake is venting during furling. Please note that this furler is a device to roll the sail away. Partially reefed sailing is not allowed.



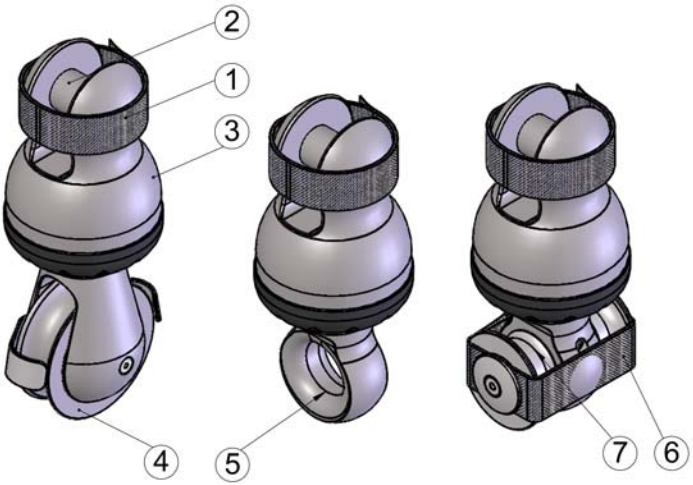
5.2 Furling the sail



You can furl or unfurl in both directions - either clockwise or counter clockwise. Make sure that the system is properly assembled and connected. Ensure that the brake is vented while furling. Please note that this furler is a device to roll the sail away. Partially reefed sailing is not allowed.

5.3 Topswivel

The Reckmann Titanium Topswivel range is available in three different types: To suit a 2:1 halyard setup, to be lashed with a rounded eye and to be lashed with a bone style connector.



2:1 halyard purchase eye connector bone connector

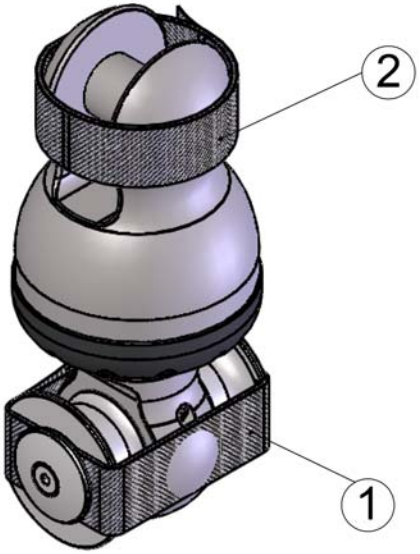
1	Velcro for stay pin securing	2	Stay pin
3	Swivel body	4	2:1 halyard sheave
5	Halyard connection eye	6	Velcro for lashing securing
7	Bone connector		

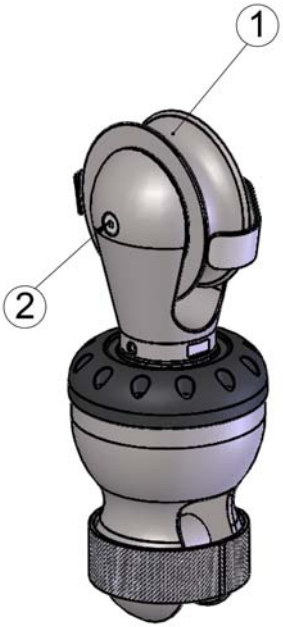
Tip

Ensure that the halyard can transmit the torque which occurs due to friction in the swivel bearing while rotating under load.

Warning!
Please replace the webbing and the velcro strops regular.

Please make sure that stay, halyard and 2:1 sheave are secured properly:
(please see (1) and (2) in the following illustrations)





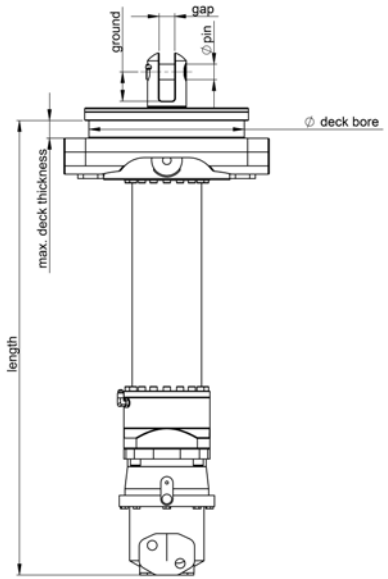
The bone-style connector should be used with a lashing in the following style:

Make sure that all parts of the lashing are lying properly on the sheaves and that the load distributed evenly on all parts of the lashing.

Note!

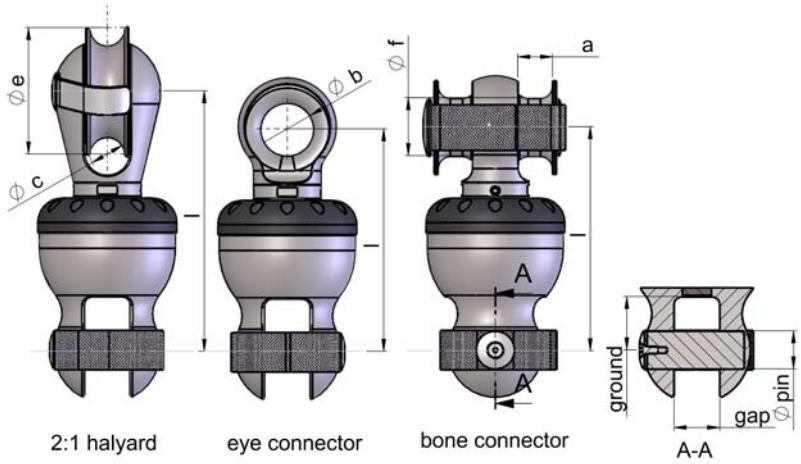
Seizing of threads. To avoid seizing of threads, all threaded parts need to be coated with anti seizing gel before they are joined.

5.4 Technical specifications CZxts furler



		SF-12	SF-16	SF-32
SWL	[kg]	12000	16000	32000
motor	[-]	OMT160 FH/FL	OMT160 FH/FL	OMT400FL/FH
weight	[kg]	83,8	97,5	128
max. furling moment	[Nm]	450	450	1100
at pmax	[bar]	200	200	180
furling speed	[rpm]	100	100	100
at oil flow	[l/min]	20	20	40
max. static braking moment	[Nm]	1200	1200	1200
Pin	[mm]	27	28	38
Gap	[mm]	22	28	38
Ground	[mm]	36	53	45
Length	[mm]	798	821	1063
max. deck thickness	[mm]	22	32	39
req. deck bore	[mm]	225	280	290
adjuster stroke	[mm]	300	300	500
max. oil flow adjuster	[l/min]	2	2	2
max. adjuster load	[kg]	13000	17000	28021
at pressure	[bar]	350	300	350
max. return pressure	[bar]	20	20	20

5.5 Specification topswivel



	TS-12			TS-20			TS-40		TS-64	TS-80
	2:1	eye	bone	2:1	eye	bone	eye	bone	bone	bone
swl t	12			20			40		64	80
pin mm	19			25			38		45	55
gab mm	25			30			38		45	55
ground mm	29			35			49		58	73
weight kg	1,5	1,2	1,5	3,2	2,5	3,1	5,5	6,8	15,0	26,0
l mm	98	111	111	129	146	146	190	190	237	280
a mm	-	-	17,5	-	-	22,5	-	27	38	42
b mm	-	26	-	-	35	-	45	-	-	-
c mm	16	-	-	23	-	-	-	-	-	-
e mm	65	-	-	83	-	-	-	-	-	-
f mm	-	-	28	-	-	38	-	49	66	80

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