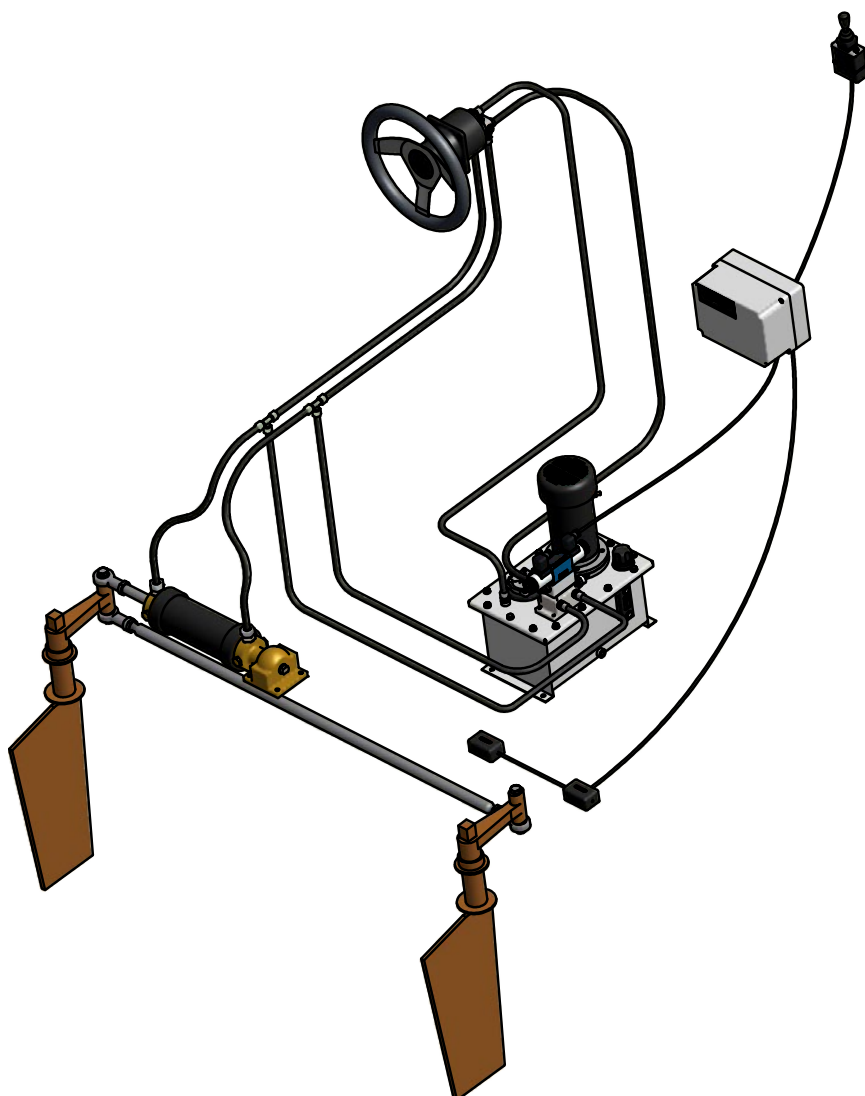




HYDRAULIC STEERING SYSTEMS

Power steering
PS600
v1.0.4

Installation and User manual



SLEIPNER MOTOR AS
P.O. Box 519
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Norway
www.side-power.com

Made in Norway

SIDE-POWER
Steering Systems



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All Side-Power steering products complies with the Directive 2013/53/EU



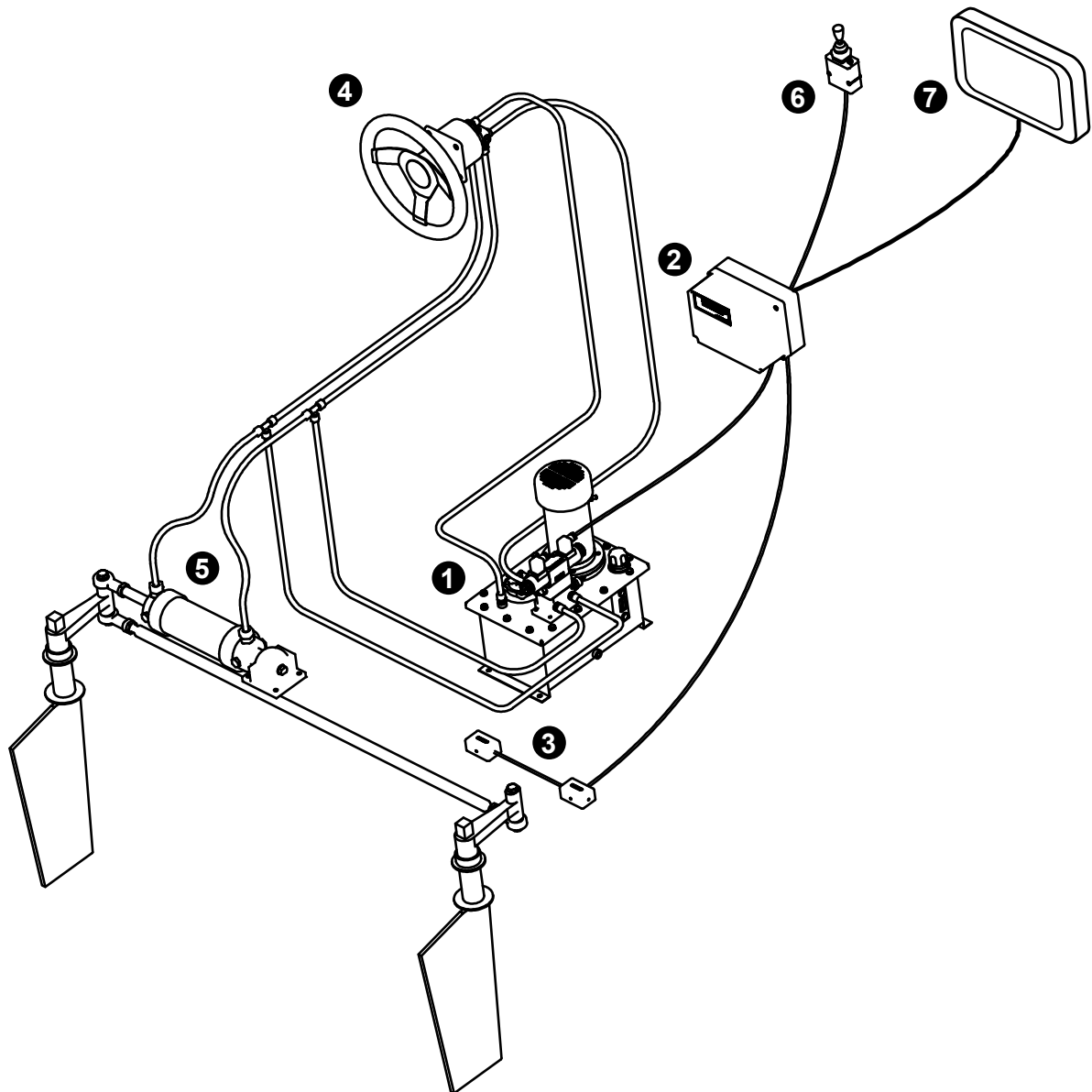
Alle Side-Powe styreprodukter er i henhold til Directive 2013/53/EU

Before you start installing your Side-Power hydraulic steering kit, please read this installation manual thoroughly.

Sleipner Motor AS will not take any responsibility for products that are not installed in accordance with the instructions given in this installation manual.

Les denne manualen nøye før du begynner å installere Side- Power / Sleipner Motor hydraulisk styre-system.

Sleipner Motor AS tar inget ansvar for produkter som ikke er installert i henhold til instruksjonene som er gitt i denne installasjonsmanualen.



EN System description

The power steering system includes the following main components:

- 1) Hydraulic power unit consists of electric motor, hydraulic pump, oil filter, valve system and oil reservoir.
- 2) Electronic control unit handling signals from joystick, autopilot and rudder stop switches. Output signals from the control box controls starboard and port directional valves and the motor starter relay.
- 3) Rudder end stop switches.
- 4) Helm pump
- 5) Rudder cylinder(s)
- 6) Joystick, one or two
- 7) Autopilot

The system will switch off the electro motor 30 sec after the last signal from joystick/autopilot

NO Systembeskrivelse

Servostyringssystemet består av følgende hovedkomponenter:

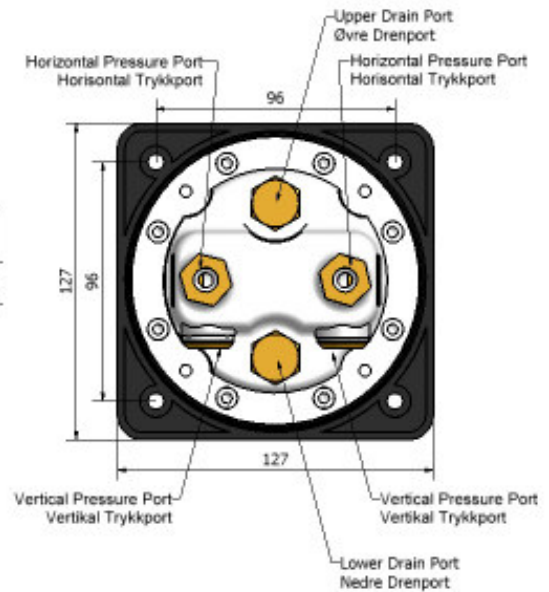
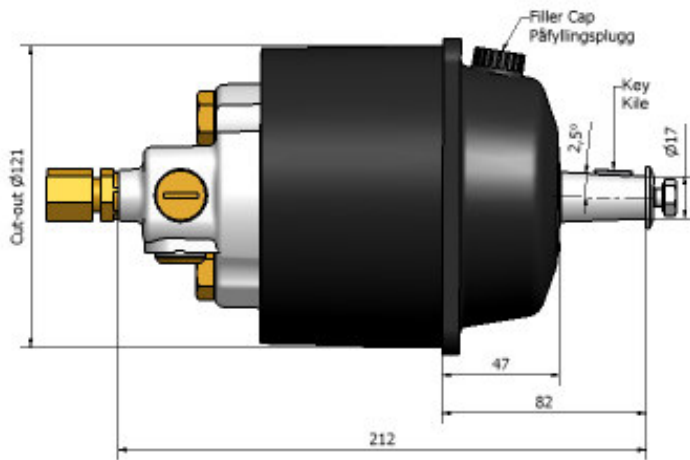
- 1) Servoaggregat med elektromotor, hydraulikk-pumpe, oljefilter, ventilblokk og oljetank.
- 2) Elektronisk kontrollenhet som behandler signaler fra joystick, autopilot og rorindikator. Signaler fra kontrollenheten styrer retningsventiler og elektromotorens starterrelé.
- 3) Endestoppbrytere
- 4) Rattpumpe
- 5) Styresylinder(e)
- 6) Joystick, en eller to
- 7) Autopilot

Systemet har en timerfunksjon som vil stoppe elektromotoren 30 sekunder etter siste styreimpuls fra stikke eller autopilot

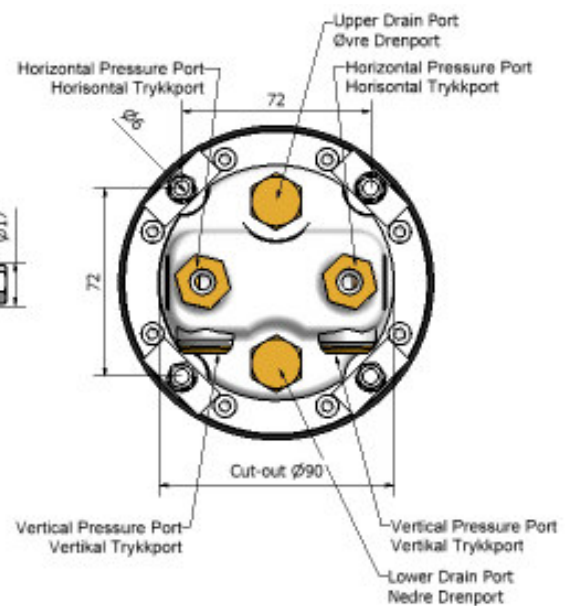
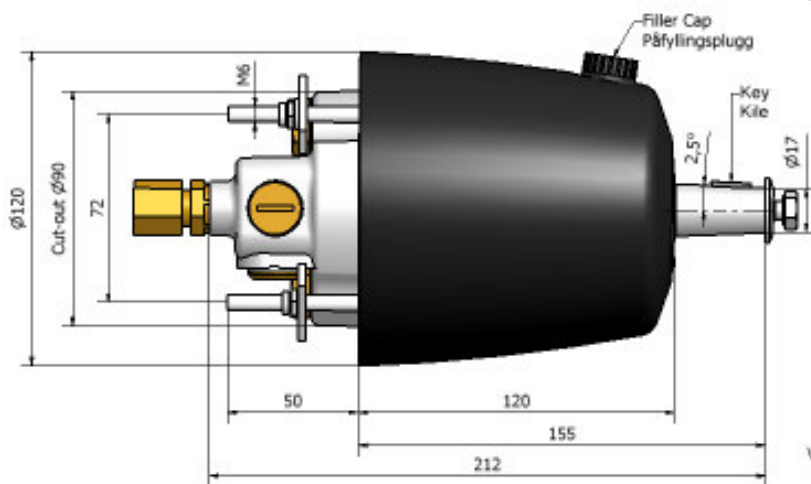
**EN Helm pump dimensions
26 / 35 / 43 / 70 ccm**

**NO Dimensjoner, Rattpumpe
26 / 35 / 43 / 70 ccm**

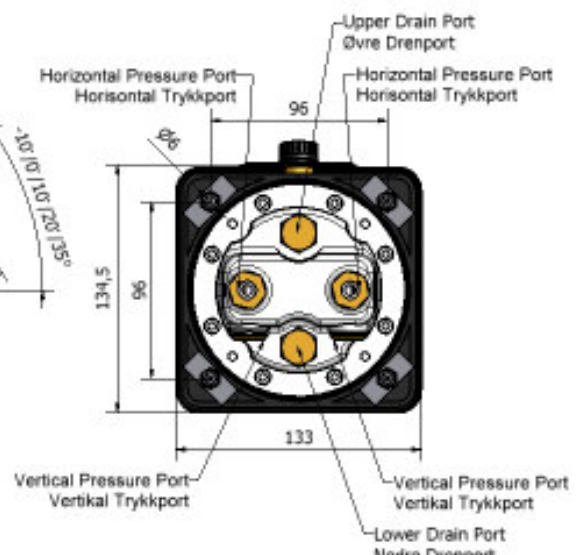
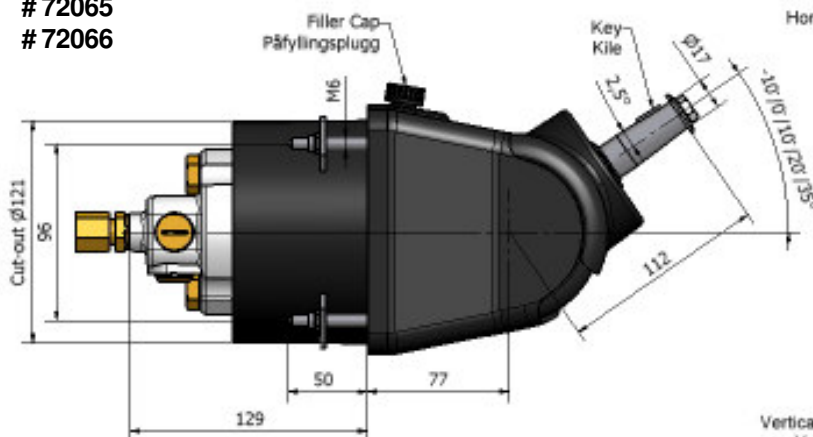
- # 72061: 26ccm
- # 72062: 35ccm
- # 72063: 43ccm



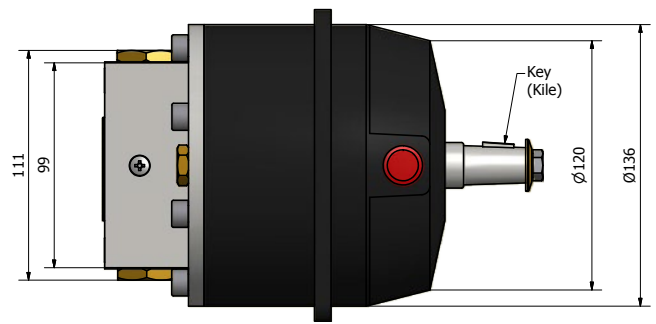
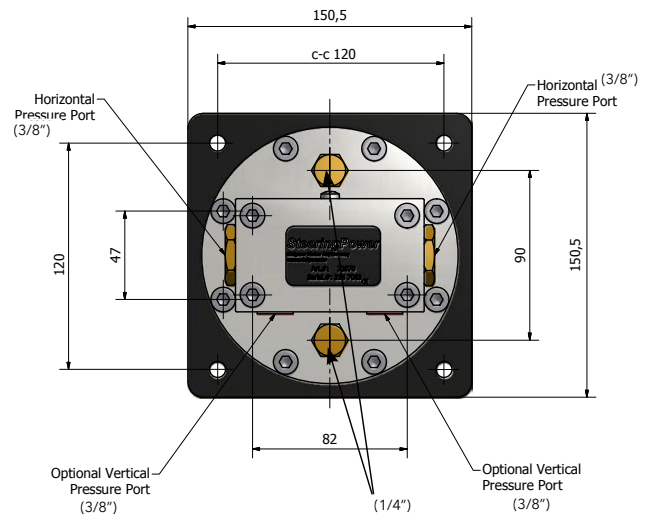
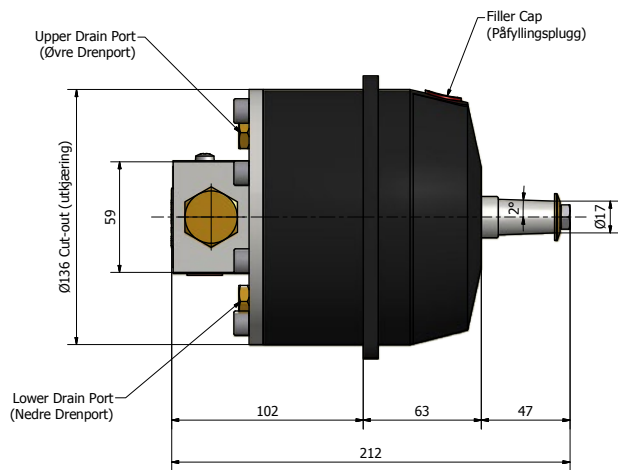
- # 72067: 26ccm
- # 72068: 35ccm
- # 72069: 43ccm

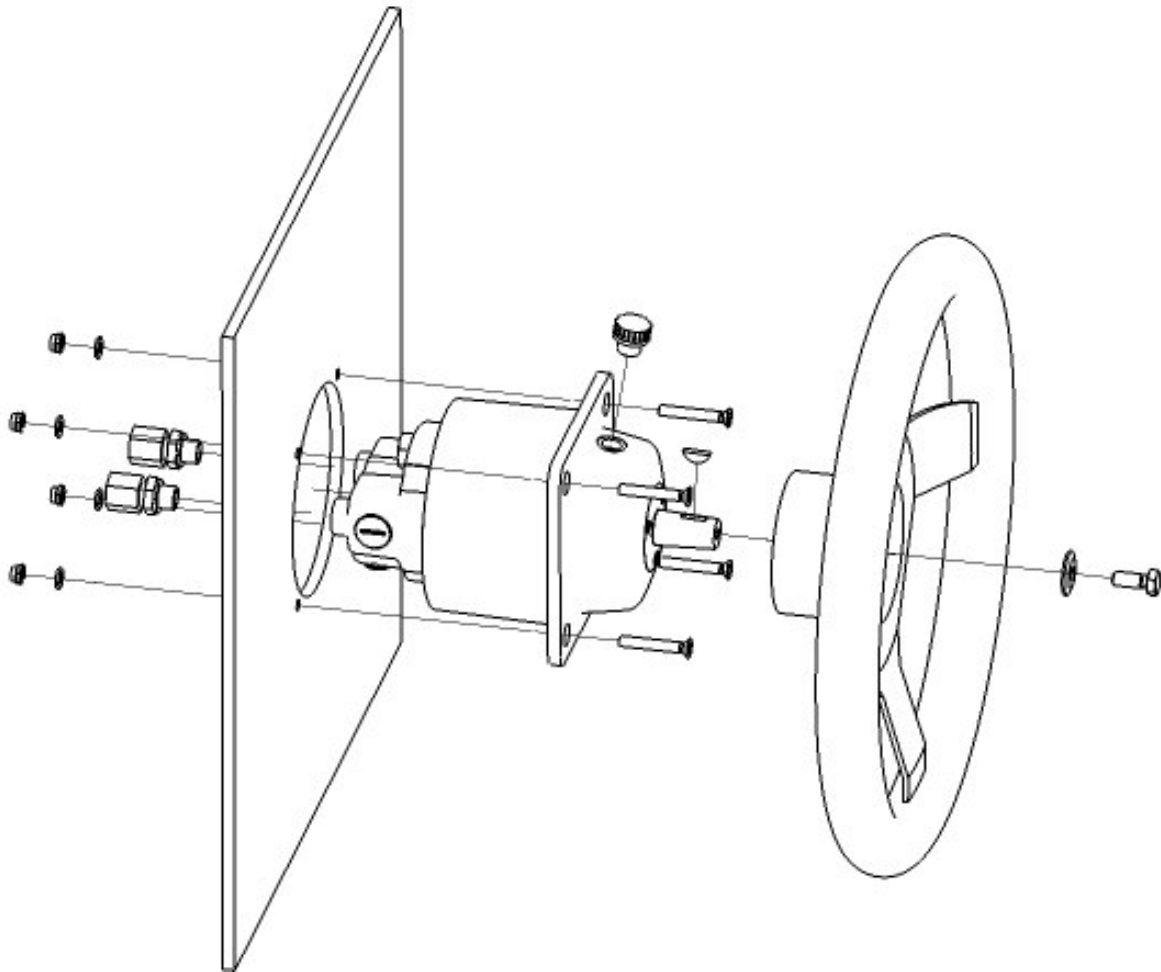


- # 72064
- # 72065
- # 72066



#72070



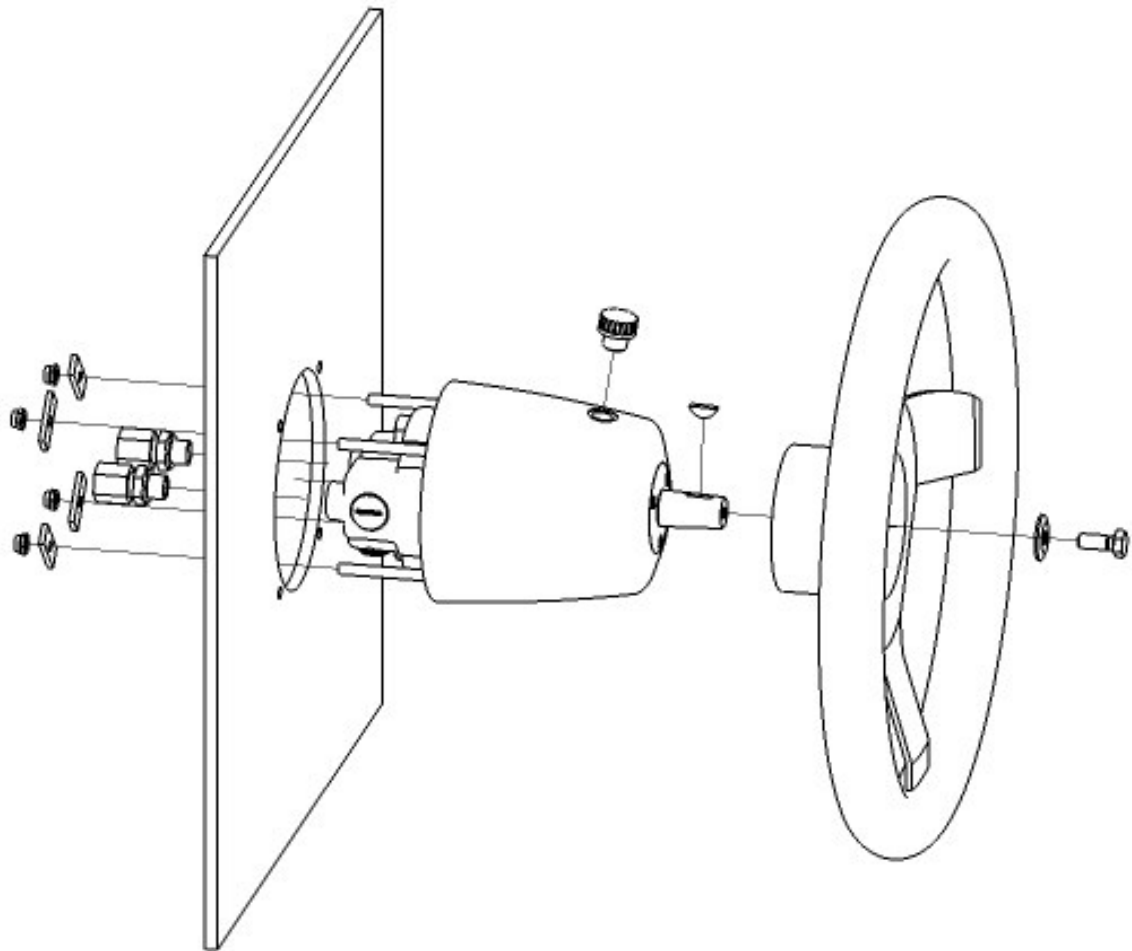


**EN Helm pump installation
- Semi recessed pump**

- Check that there is enough room so that the pump housing, steering wheel and hoses will not interfere with cables, wires or other components (See helm pump dimensions)
- Cut out the main hole, Ø121 mm (70ccm: Ø135 mm), and drill four 7 mm (5/16") screw holes in accordance with the dimension drawing on page 5 (26-43ccm: 96 x 96 mm, 70ccm: 120x 120 mm).
- Use 4 pcs 6 mm (1/4") countersink head bolts with big washers and lock nuts to fasten the helm pump.
- Apply a thin layer of grease on the helm pump shaft before you fit the steering wheel.

**NO Installasjon av rattpumpe
- Pumpe med flens**

- Pass på at det er nok plass, slik at pumpehus, rattet og slangene ikke kommer i konflikt med kabler, ledninger eller andre komponenter. (Se målskisse for rattpumpe)
- Skjær ut senterhullet på Ø121mm (70ccm: Ø135 mm) og bor de fire 7mm festehullene i følge målskissen på side 5 (26-43ccm: 96 x 96 mm, 70ccm: 120x 120 mm).
- Fest rattpumpen med 4 stk 6mm skruer med fosenket hode.
- Smør litt olje på rattpumpens styreaksel før rattet monteres.

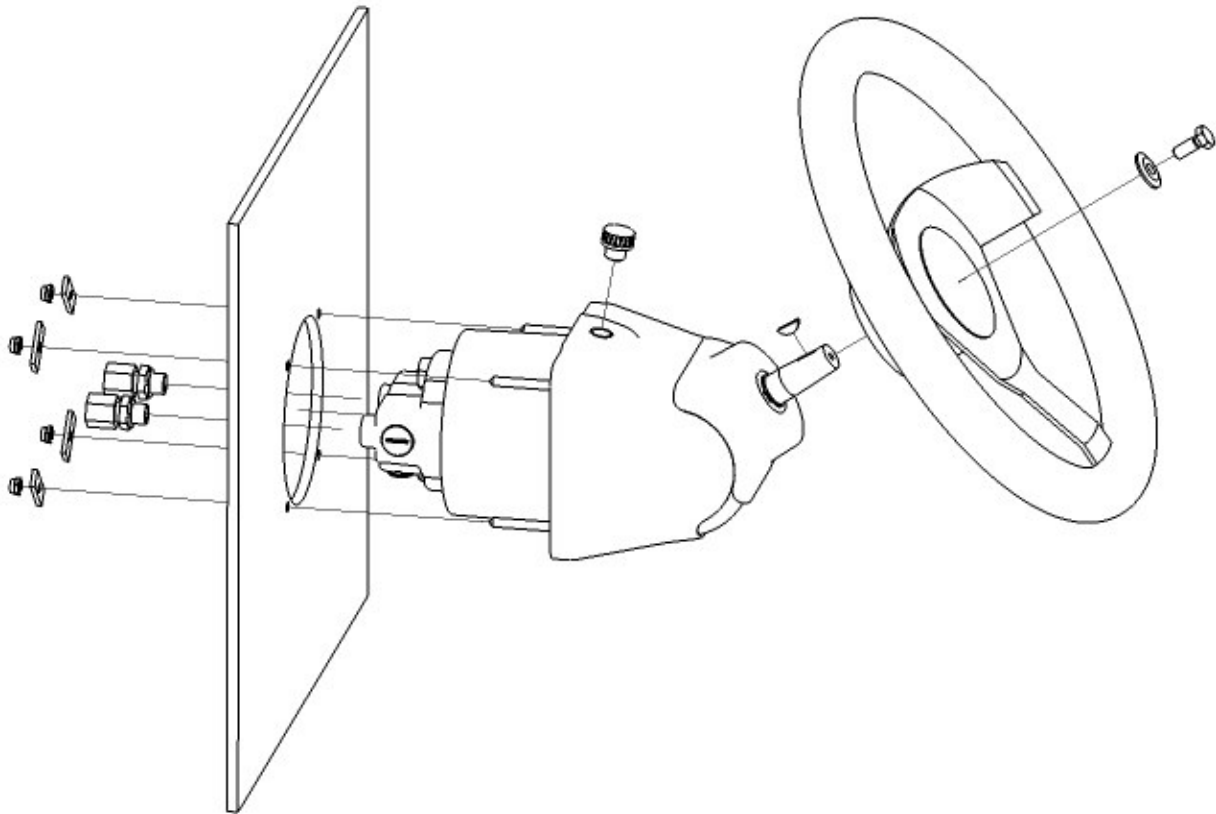


**EN Helm pump installation
- External fit pump**

- Check that there is enough room so that the pump housing, steering wheel and hoses will not interfere with cables, wires or other components (See helm pump dimensions)
- Cut out the main hole (Ø90 mm), and drill the four 7 mm (5/16") screw holes in accordance with the dimension drawing on page 5 (72 x 72 mm).
- Use the 4 pcs 6 mm bolts, washers and locknuts to fasten the helm pump.
- Apply a thin layer of grease on the helm pump shaft before you fit the steering wheel.

**NO Installasjon av rattpumpe
- Frontmontert pumpe**

- Pass på at det er nok plass, slik at pumpehus, rattet og slangene ikke kommer i konflikt med kabler, ledninger eller andre komponenter. (Se målskisse for rattpumpe)
- Skjær ut senterhullet på Ø90 mm og bor de fire 7 mm festehullene i følge målskissen på side 5 (72 x 72 mm).
- Fest rattpumpen med de 4 stk 6mm boltene på rattpumpen.
- Smør litt olje på rattpumpens styreaksel før rattet monteres.


EN

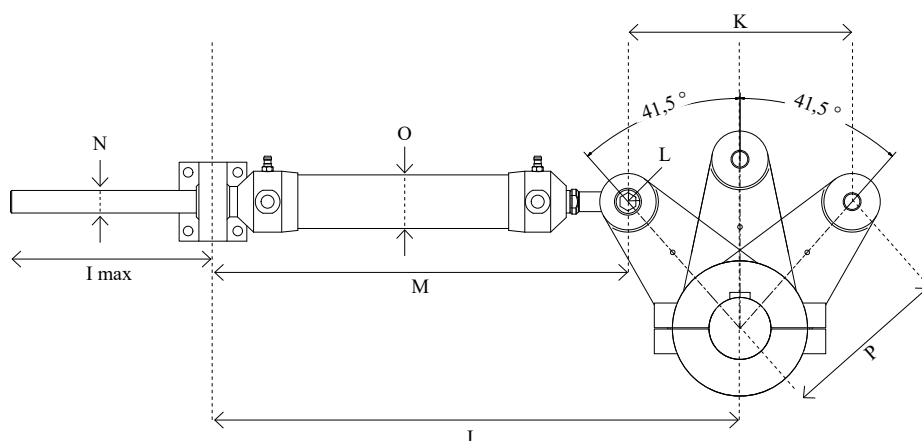
Helm pump installation - Tilt pump

- Check that there is enough room so that the pump housing, steering wheel and hoses will not interfere with cables, wires or other components (See helm pump dimensions)
- Cut out the main hole (Ø121 mm), and drill the four 7 mm (5/16") screw holes in accordance with the dimension drawing on page 5 (96 x 96 mm).
- Use the 4 pcs 6 mm bolts, washers and locknuts to fasten the helm pump.
- Apply a thin layer of grease on the helm pump shaft before you fit the steering wheel.

NO

Installasjon av rattpumpe - Tilt pumpe

- Pass på at det er nok plass, slik at pumpehus, rattet og slangene ikke kommer i konflikt med kabler, ledninger eller andre komponenter. (Se målskisse for rattpumpe)
- Skjær ut senterhullet på Ø121mm og bor de fire 7mm festehullene i følge målskissen på side 5 (96 x 96 mm).
- Fest rattpumpen med de 4 stk 6mm boltene på rattpumpen.
- Smør litt olje på rattpumpens styreaksel før rattet monteres.



Cylinder Art.nr	Recommended turns with helm size:			
	26cm3	35m3	43m3	70cm3
71140	-	-	8,0	4,9
71220	-	-	-	8,1
71500	-	-	-	16,7

Recommended

Art.nr	Cylinder	Volume cm ³	Max Rudder torque	Max pressure	Hose diameter	Port dimensions	I max	J	K Cylinder stroke	L	M	N	O	P
71140	SP155	345	130 Kgm	50 bar	1/2"	1/4"	165	492	200	14	392	20	57	150
71220	SP250	565	250 Kgm	50 bar	1/2"	3/8"	175	520	200	16	350	25	75	150
71500	SP500	1170	500 Kgm	50 bar	1/2"	M22x1,5	236	600	200	20	420	25	100	150

All measurements are in mm.

EN

Rudder Cylinder installation

- The cylinder must be mounted on a strong, rigid surface, either directly to the hull, or on a bracket.
- The cylinder should be angled parallel to the transom (or to the tie bar on dual rudder installations), when rudder is in one of the end positions (full turn over).
- The cylinder must be installed in a position where the stroke will be the same in both directions (see dimensions given above).
- Secure the cylinder mounting bracket with four bolts. Use thru bolts with locknuts if possible.
- It is important that the cylinder mounting bracket is installed 90 degrees to the tiller arm, when rudder is in centre position, to avoid the cylinder from bending on the bracket at full turn over.
- Connect the cylinder eye to the tiller arm. Use correct bolt dimensions.
- Tighten the bolts.
- For extra safety, install tiller arm stops to prevent the rudder from moving more than 41,5 degrees even if the steering fails.
- The piston rod must be covered if grinding, moulding or mechanical work is taking place nearby.

NO

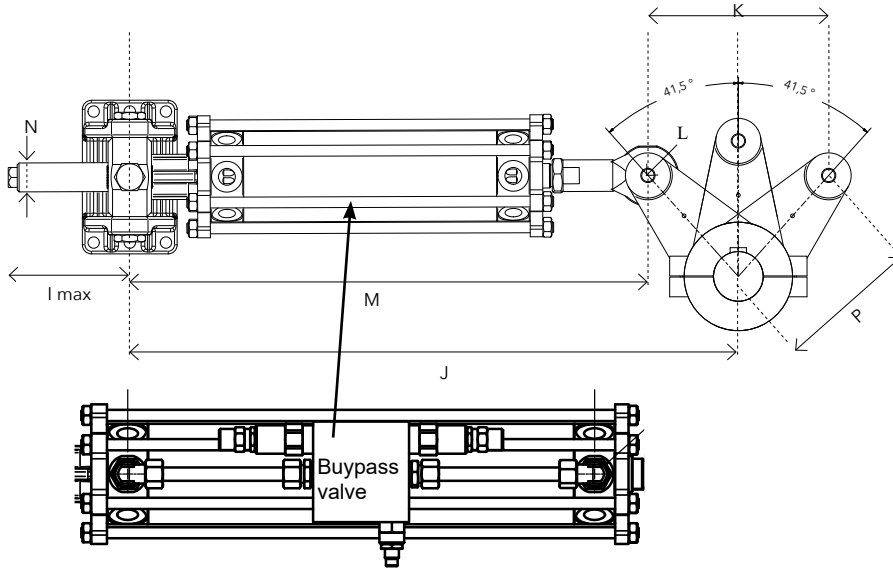
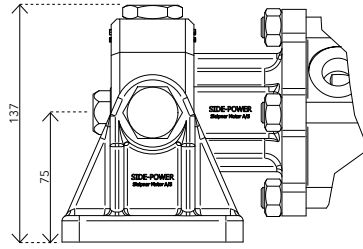
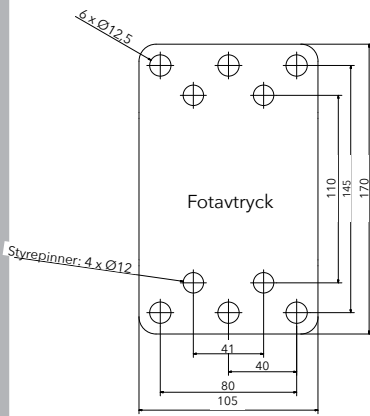
Installasjon av styresylinder

- Sylindere må monteres på en solid / stiv flate, enten direkte på et skott eller på en brakett.
- Sylindere skal vinkles parallelt med hekken på båten (eller parallellstaget mellom to ror), når roret er i endestopp posisjon (fullt rattutslag).
- Sylindere må monteres slik at den får samme utslag i begge retninger. Se målskissen ovenfor.
- Bolt fast sylindere festebakke med 4 gjennomgående bolter med låsemutter dersom det er mulig.
- Det er viktig at sylindere feste / fot er vinklet 90 grader i forhold til rorarmen når roret står i midtstilling, for å hindre at sylindere bryter på braketten ved fullt utslag.
- Øyet på sylindere stange boltes fast til rorarmen. Bruk riktig boltdimensjon.
- Trekk til alle bolter / muttere.
- Rorstopper bør monteres for ekstra sikkerhet.
- Stempelstange må tildekkes dersom det foregår plaststøping eller mekaniske arbeider i nærheten.

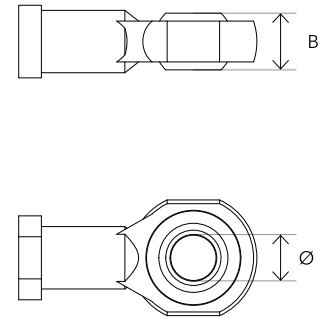


Cylinder Art.nr	Recommended turns on helm size:	
	43m ³	70cm ³
6525-200-xx	13,1	8,1
6530-200-xx	12,1	7,5
8032-200-xx	-	12,0
9032-200-xx	-	16,0

Anbefalt



Rod-end w/bearing



Series	Art.nr	Volume cm ³	Max Rudder torque	Max pressure	Hose diameter*	I max	J	K Cylinder stroke	L Rod-end		M	N	P
									Ø	B			
70	6525-200-7-10	565	290	70	1/2"	148	645	200	ø16	21	545	25	150
	6525-200-7-11	565	290	70	1/2"	148	657	200	ø20	25	557	25	150
	9032-200-7-10	1111	490	60	1/2"	135	656	200	ø20	25	556	32	150
90	6530-200-9-10	522	350	90	1/2"	148	656	200	ø20	25	556	30	150
	8032-200-9-10	844	560	90	1/2"	137	674	200	ø25	20	574	32	150
	9032-200-9-10	1111	740	90	1/2"	135	674	200	ø25	20	574	32	150

* Hoses / pipes must be sized depending on the installation and if the system will be operated by steering helm. Available in various stroke lengths and with relief valve or bypass valve. Contact us for more information. Port Dimension: 1/2 "BSP.

All measurements in mm.

Heavy Duty Rudder Cylinder installation

- The cylinder must be mounted on a strong, rigid surface, either directly to the hull, or on a bracket.
- The cylinder should be angled parallel to the transom (or to the tie bar on dual rudder installations), when rudder is in one of the end positions (full turn over).
- The cylinder must be installed in a position where the stroke will be the same in both directions (see dimensions given above).
- Secure the cylinder mounting bracket with four bolts and 4 guide pins. Use thru bolts with locknuts if possible.
- It is important that the cylinder mounting bracket is installed 90 degrees to the tiller arm, when rudder is in centre position, to avoid the cylinder from bending on the bracket at full turn over.
- Connect the cylinder eye to the tiller arm. Use correct bolt dimensions.
- Tighten the bolts.
- For extra safety, install tiller arm stops to prevent the rudder from moving more than 41,5 degrees even if the steering fails.

EN Important installation precautions

- All hydraulic components must be installed in a clean environment. All hose/pipe ends and connection points should be sealed during the installation.
- Mount the hydraulic power unit in the desired location using the four mounting holes in the base of the unit. Make sure that it is sufficient room for oil filling, hose connections and electrical connections. The DC motor are fan cooled, and a free room of 100mm above fan cover are advised for proper cooling and service access

Note! The DC power unit may be hot during operation. The unit have to be located in a vented area.

- Use hydraulic oil ISO-VG15 (DIN51524-3 HVLP specifications).
- Keep all hoses/pipes and looms clear from sharp edges and hot surfaces.
- Hoses/pipes and looms must be clamped/fastened properly to avoid vibrations, mechanical wear or chaffing.

EN Hose installation

- 1) Install the system according to schematics and dimension table on page 10.
- 2) Clean, and plug hoses pipes and fittings before the installation.
- 3) Make sure to avoid tight bends - follow requirements from the hose manufacturer.
- 4) Hoses and pipes must be clamped/fastened properly to avoid vibrations, mechanical wear or chaffing
- 5) The cylinder hoses have to be routed against the foot end of the cylinder. This is important in order to reduce hose movement during operation.

NO Viktig for installasjonen

- Alle hydrauliske komponenter må installeres i rene omgivelser. Alle slanger/rør og tilkobling-spunkter må tettes for å forhindre forurensning i systemet under installasjonen.

- Monter hydraulikk aggregatet på et egnet sted ved hjelp av de 4 festehullene aggregat labbene. Sjekk at det er nok plass rundt aggregatet for påfylling, slange tilkoblinger og elektriske koblinger. DC motoren er viftekjølt, og vi anbefaler fritt område på 100mm over motoren for tilstrekkelig kjøling.

NB! Hydraulikk aggregatet/DC motoren blir varm under drift, og må plasseres i et ventilert område.

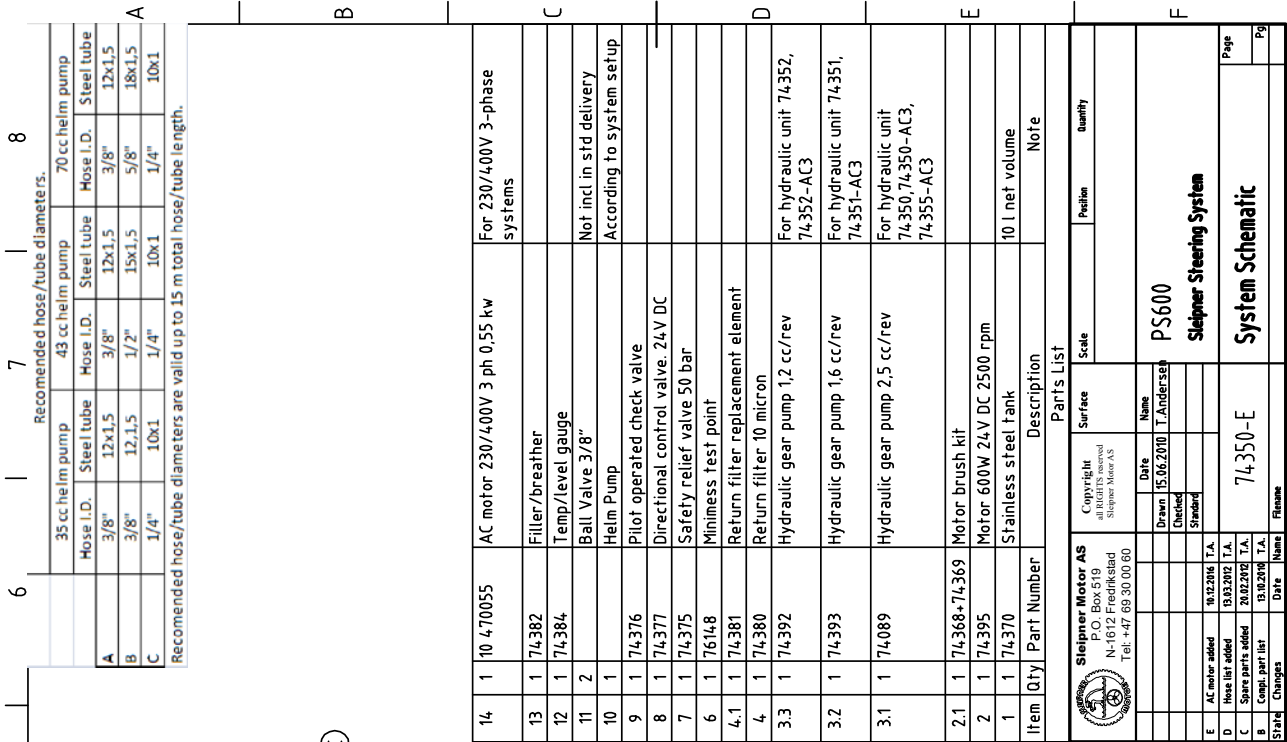
- Bruk hydraulikk olje ISO-VG15 (DIN51524-3 HVLP spesifikasjoner).

- Pass på at slanger/rør ikke hviler mot skarpe kanter eller varme overflater.

- Slanger/rør og kabler må klamres/stripes tilstrekkelig for å forhindre vibrasjoner og mekanisk slitasje.

NO Installasjon av slanger

- 1) Systemet kobles i henhold til skjema og dimensjonstabell side 10.
- 2) Rengjør og plugg alle slanger, rør og fittings før montering.
- 3) Unngå skarpe bend - følg slangeleverandørens anbefalinger. Unngå at slanger og rør ligger mot skarpe hjørner/kanter
- 4) Slanger og rør må klamres/stripes tilstrekkelig for å forhindre vibrasjoner og mekanisk slitasje.
- 5) Sylindere slangene skal ligge i retning mot fotlageret. Dette er viktig for å få minst mulig bevegelse på slangene

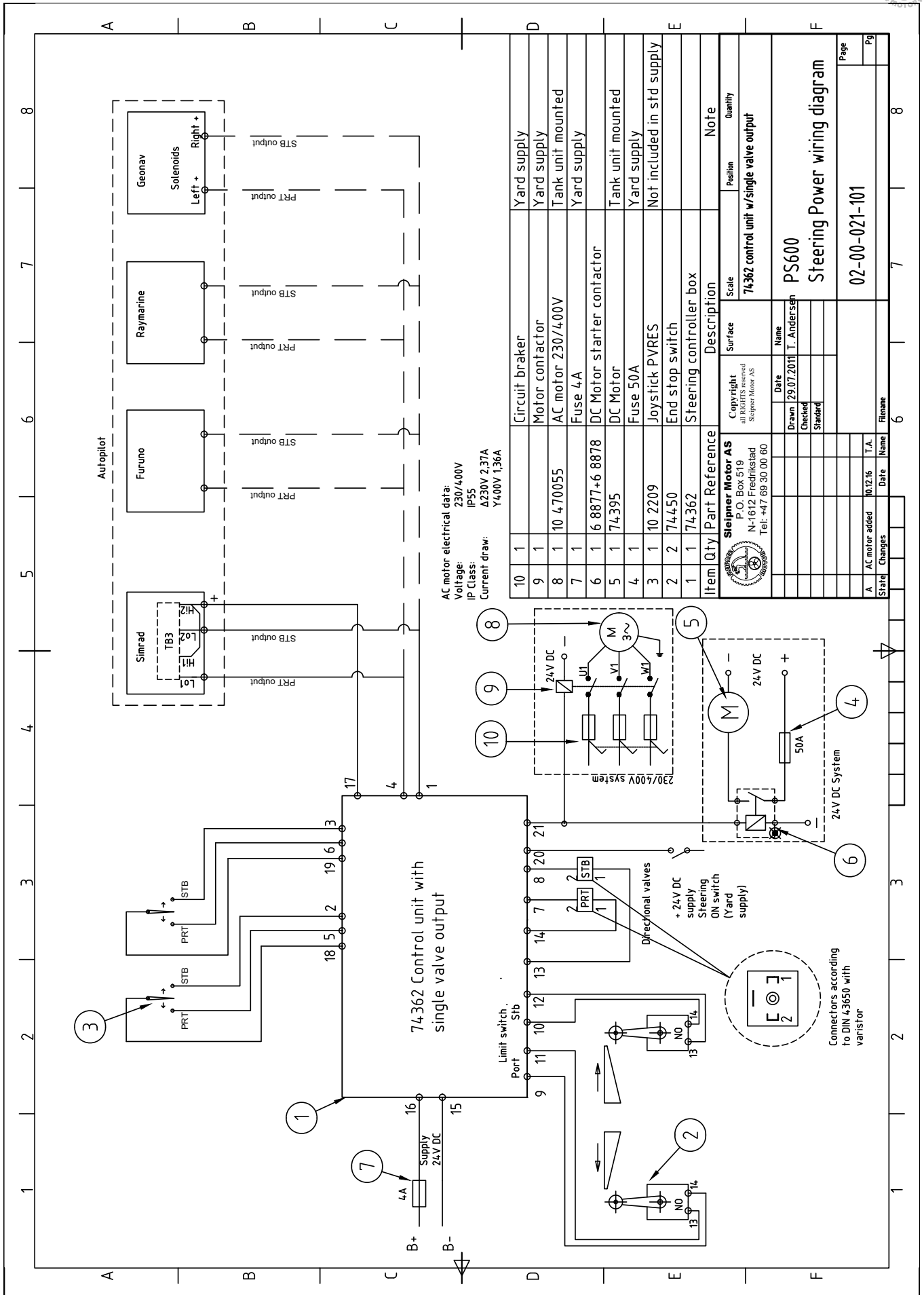


	35 cc helm pump	43 cc helm pump	70 cc helm pump
	Hose I.D.	Steel tube	Hose I.D.
A	3/8"	12x1.5	3/8"
B	3/8"	12x1.5	1/2"
C	1/4"	10x1	1/4"

Recommended hose/tube diameters are valid up to 15 m total hose/tube length.

Item	Qty	Part Number	Description	Note
14	1	10.470055	AC motor 230/400V 3 ph 0.55 kw	For 230/400V 3-phase systems
13	1	74382	Filler/breather	
12	1	74384	Temp./level gauge	
11	2		Ball Valve 3/8"	Not incl in std delivery
10	1		Helm Pump	According to system setup
9	1	74376	Pilot operated check valve	
8	1	74377	Directional control valve, 24V DC	
7	1	74375	Safety relief valve 50 bar	
6	1	76148	Minimiss test point	
4.1	1	74381	Return filter replacement element	
4	1	74380	Return filter 10 micron	
3.3	1	74392	Hydraulic gear pump 1,2 cc/rev	For hydraulic unit 74352, 74352-AC3
3.2	1	74393	Hydraulic gear pump 1,6 cc/rev	For hydraulic unit 74351, 74351-AC3
3.1	1	74089	Hydraulic gear pump 2,5 cc/rev	For hydraulic unit 74350, 74350-AC3, 74355-AC3
2.1	1	74368+74369	Motor brush kit	
2	1	74395	Motor 600W 24V DC 2500 rpm	
1	1	74370	Stainless steel tank	10 l net volume

Sleipner Motor AS		Parts List	
Copyright all rights reserved Sleipner Motor AS		Surface	Scale
Drawn	Date	Name	Quantity
15.06.2010	15.06.2010	T.Andersen	
Checked			
E	AC motor added	10.02.2016	T.A.
D	Hose list added	19.03.2012	T.A.
C	Spare parts added	20.02.2008	T.A.
B	Comp. part list	19.08.2008	T.A.
A	Created		
Status Changes		Date	Name
74350-E			
P5600			
Sleipner Steering System			
System Schematic			
Page	8		

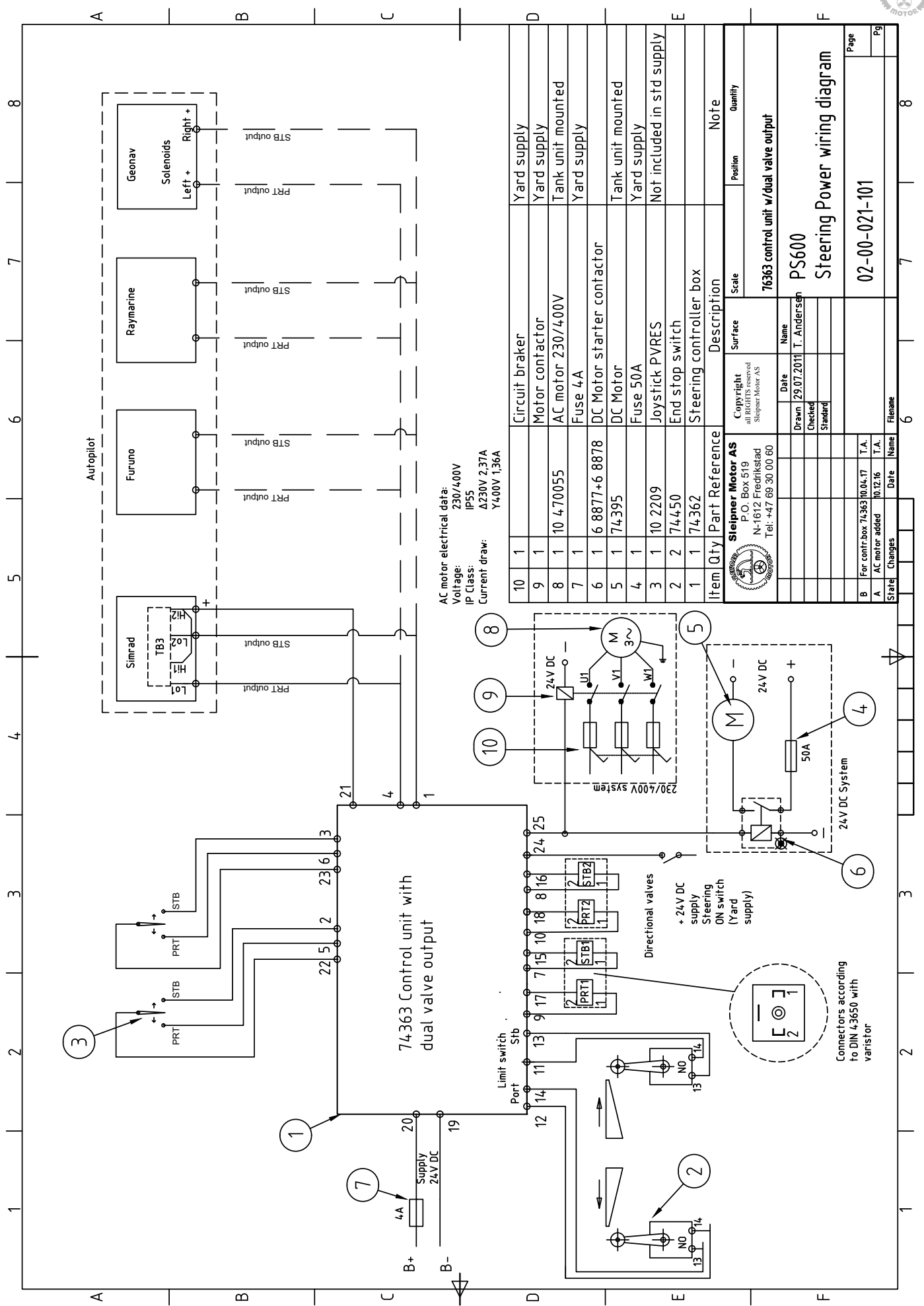


AC motor electrical data:
 Voltage: 230/400V
 IP Class: IP55
 Current draw: Δ230V 2,37A
 Y400V 1,36A

Item	Qty	Part Reference	Description	Scale	Position	Note
10	1		Circuit breaker		Yard supply	
9	1		Motor contactor		Yard supply	
8	1	10 4-70055	AC motor 230/400V		Tank unit mounted	
7	1		Fuse 4A		Yard supply	
6	1	6 8877+6 8878	DC Motor starter contactor		Tank unit mounted	
5	1	74-395	DC Motor		Yard supply	
4	1		Fuse 50A		Not included in std supply	
3	1	10 2209	Joystick PVRES			
2	2	74-450	End stop switch			
1	1	74-362	Steering controller box			

Copyright		Surface		Scale		Quantity	
Sleipner Motor AS		all RIGHTS reserved		74-362 control unit w/single valve output			
P.O. Box 519		N-1612 Fredrikstad		PS600		Steering Power wiring diagram	
Tel: +47 69 30 00 60				02-00-021-101		Page	
						Pg	
						8	

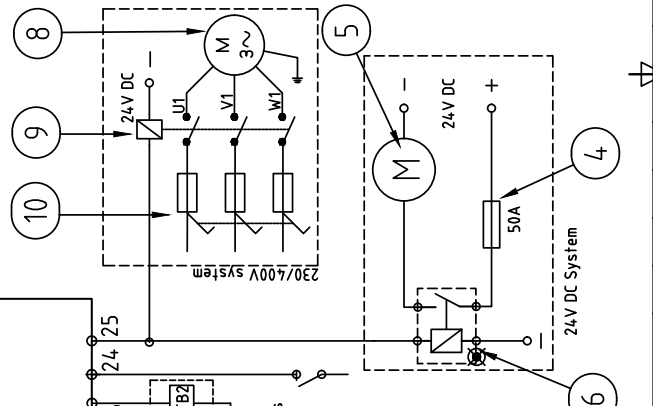
State	Changes	Date	Name	Filename
A	AC motor added	10.12.16	T.A.	



AC motor electrical data:
 Voltage: 230/400V
 IP Class: IP55
 Current draw: Δ230V 2,37A
 Y400V 1,36A

Item	Qty	Part Reference	Description	Note
10	1	Circuit breaker	Yard supply	Yard supply
9	1	Motor contactor	Yard supply	Yard supply
8	1	AC motor 230/400V	Tank unit mounted	Tank unit mounted
7	1	Fuse 4A	Yard supply	Yard supply
6	1	DC Motor starter contactor	Tank unit mounted	Tank unit mounted
5	1	DC Motor	Yard supply	Yard supply
4	1	Fuse 50A	Not included in std supply	Not included in std supply
3	1	Joystick PVRES		
2	2	End stop switch		
1	1	Steering controller box		

Copyright	Surface	Scale	Position	Quantity
Steiner Motor AS all RIGHTS reserved Steiner Motor AS				
Drawn	Date	Name		
	29.07.2011	T. Andersen		
Checked				
Standard				
Steiner Motor AS P.O. Box 519 N-1612 Fredrikstad Tel: +47 69 30 00 60			76363 control unit w/dual valve output	
			PS600	
			Steering Power wiring diagram	
			02-00-021-101	
			Page	
			Pg	



Connectors according to DIN 43650 with varistor

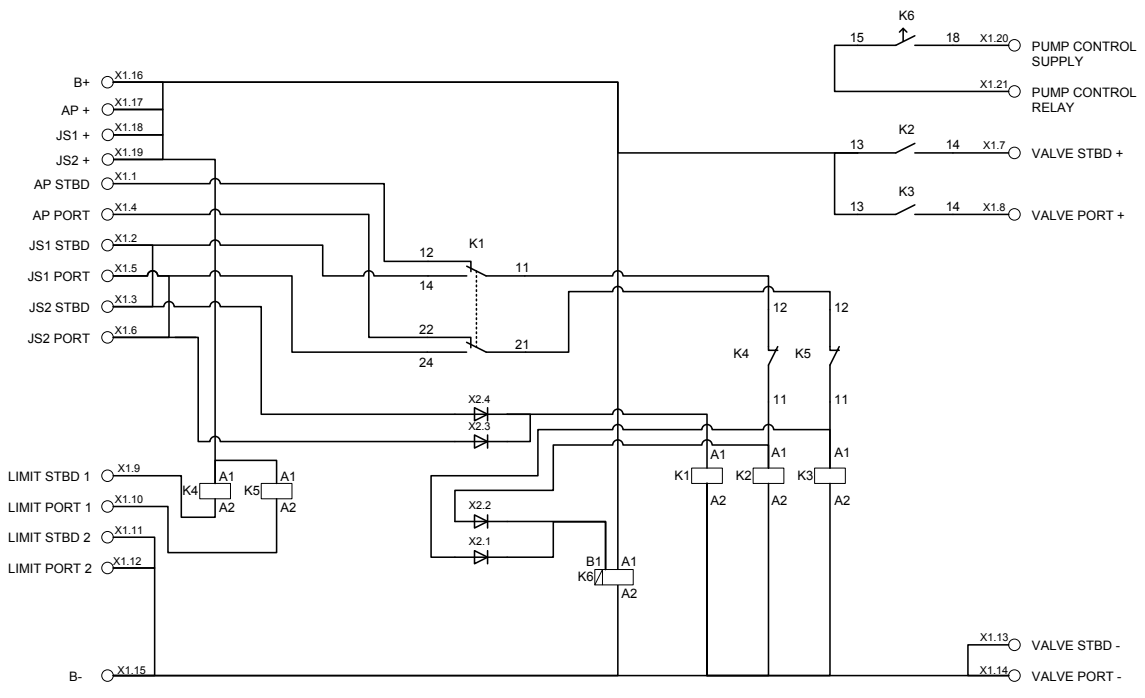


EN

Single Valve output control unit 74362

NO

Singel Ventil kontrollenhet 74362

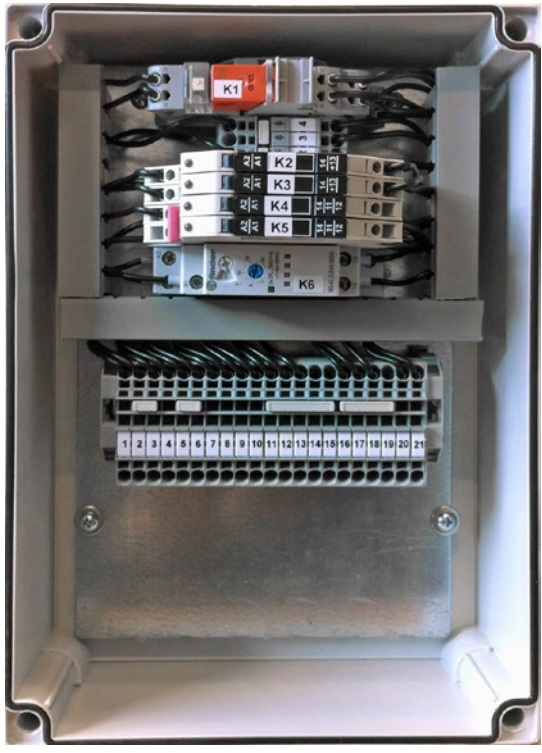


EN

Electrical control box

NO

Elektrisk kontrollboks



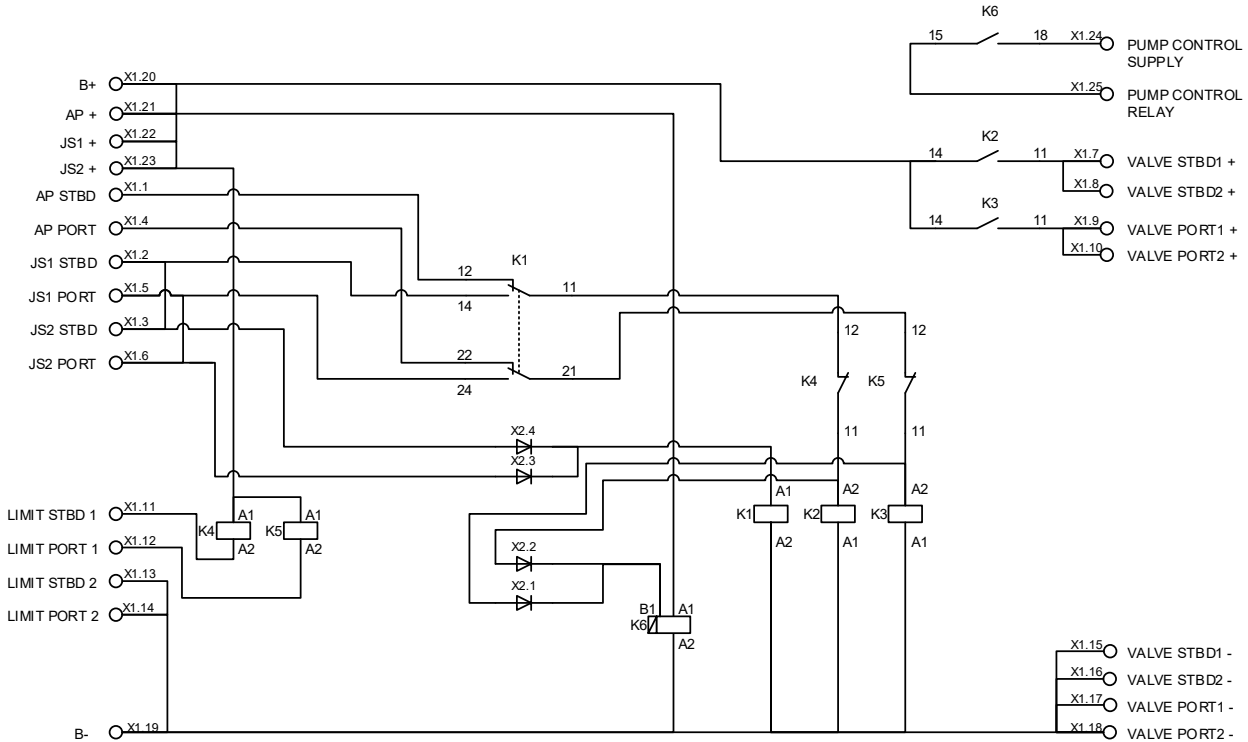
1	Autopilot, Starboard
2	Joystick 1, Starboard
3	Joystick 2, Starboard
4	Autopilot, Port
5	Joystick 1, Port
6	Joystick 2, Port
7	Valve, Starboard +
8	Valve, Port +
9	Limit Starboard 1
10	Limit Port 1
11	Limit Starboard 2
12	Limit Port 2
13	Valve, Starboard -
14	Valve, Port -
15	Battery -
16	Battery + 24V DC
17	Autopilot +
18	Joystick 1 +
19	Joystick 2 +
20	Pump Control Supply
21	Pump Control Relay

Power LED

K1	RED - signal input from joystick
K2	YELLOW - Starboard valve output
K3	YELLOW - Port valve output
K4	YELLOW - Limit switch starboard
K5	YELLOW - Limit switch port
K6	RED, Flashing - Power ON, Timer OFF RED, Stable - Power ON, Timer ON Timer preset to 30 Sec

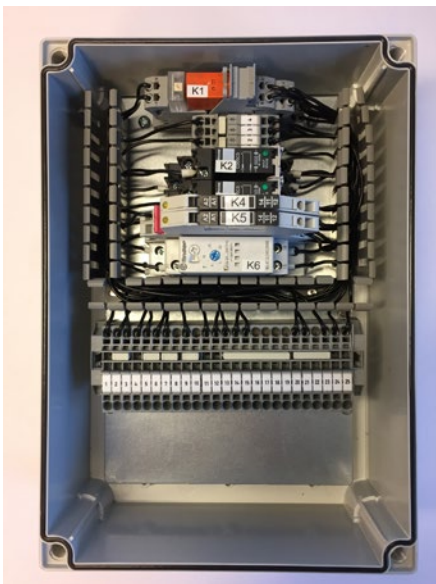
EN Dual Valve output control unit 74363

NO Dobbel Ventil kontrollenhet 74363



EN Electrical control box

NO Elektrisk kontrollboks



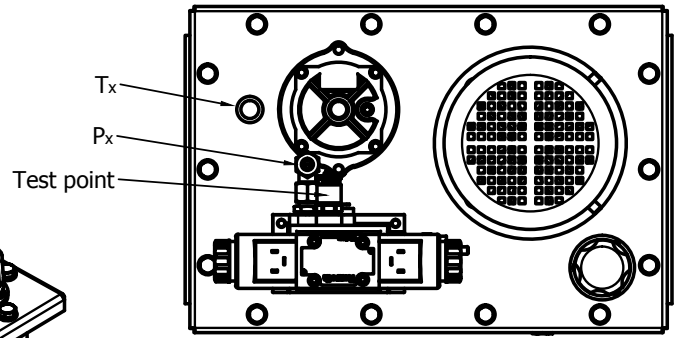
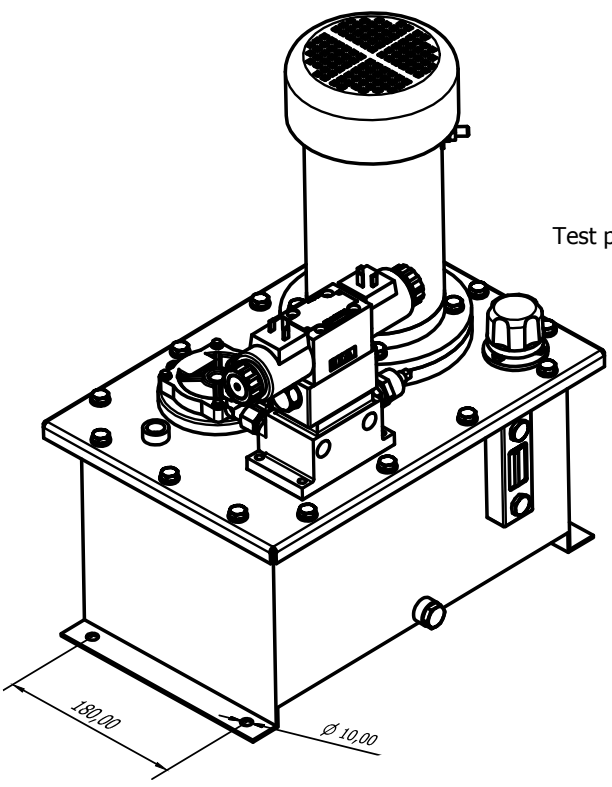
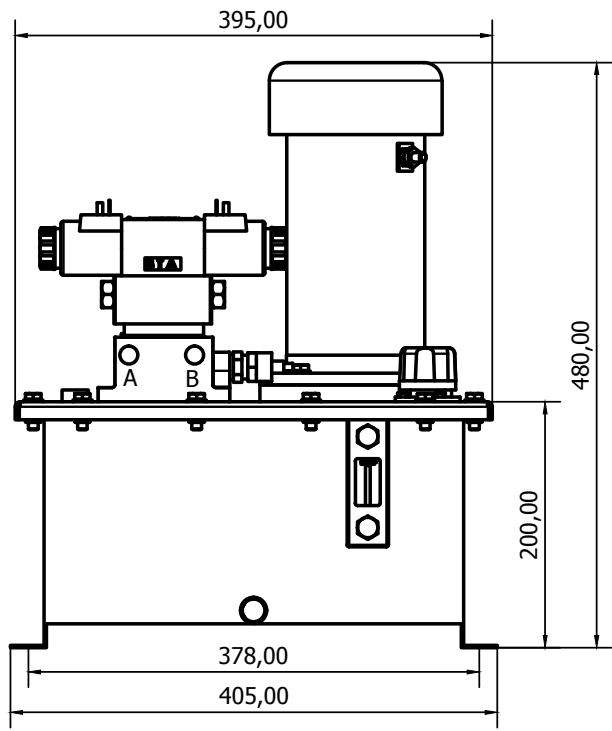
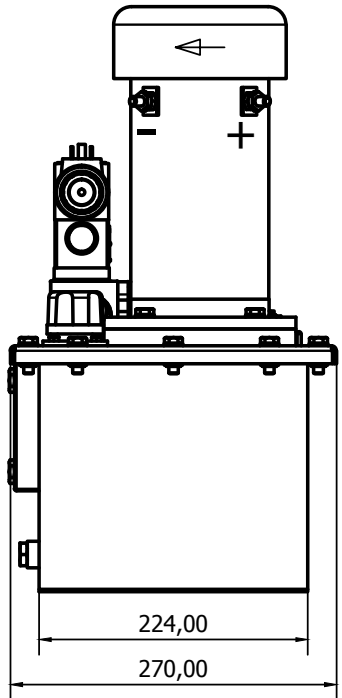
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17	Valve 1, Port +
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19	Battery -
20	Battery +
21	Autopilot +
22	Joystick 1 +
23	Joystick 2 +
24	Pump Control Supply
25	Pump Control Relay

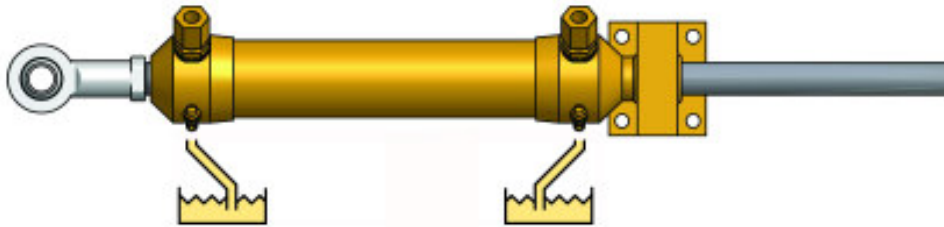
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EN **Measurements**


NO **Måltegninger**





EN Filling and air-bleeding

NB: Use filler plug without breathing on helm pump(s)!


- 1 Remove steering system main fuse
- 2 Check that all pipe and hose connections are properly fastened and tightened
- 3 Fill the tank with hydraulic oil ISO VG 15. Fill the tank to upper part of level indicator
- 4 Remove filler cap from help pump. Fill with oil
- 5 Turn the helm pump steering wheel in both directions a few times (approximately 1 1/2 turn in each direction), until the system is filled with oil. Check oil level. 
- 6 Turn the steering wheel all the way to starboard end stop. Open starboard air bleeder at the steering cylinder. Use a small hose on the nipple, so that the oil can be collected in a tray / can / bottle. Turn the steering wheel clockwise until the oil that is pushed out through the air bleeder nipple is free of air. Remember to tighten the air bleeder.
- 7 Repeat point 6 at port side of the cylinder. Check oil level.
8. Repeat bleed procedure if necessary.
- 9 Check oil level, and place sealed filler cap in the helm pump filler port.
- 10 Insert main fuse for steering system and run the cylinder back and forth 10-15 times with the lever. **NB!** Check oil level and replenish when necessary. When the system runs, a small amount of oil will circulate through the helm pump back to the tank. This will ensure that the helm pump is filled with oil, and contribute to the system bleeding (given that the system is connected to the helm pump with 4 hoses as shown in illustration).
- 11 Check for oil leaks. Check that all mechanical connections are tight and secured

If a manual closing valve is used between the cylinder ports, open the valve on the initial use of the system from a helm pump or joystick if no helm pump is used. On installations with two helm pumps, the bleeding must be done first from the help pump situated lowest in the system.

NB! It is not possible to bleed all air from the system. When the remaining air in the system evacuate through the tank, the oil level will drop. Check oil level after the first 5 hours of run time, and replenish if necessary.

NO Fylling og lufting

NB: Rattpumpene må ha tett påfyllingsplugg!

- 1 Fjern hovedsikringen for styreaggregatet.
- 2 Sjekk at alle rør og slangekoblinger er skikkelig festet og tiltrukket.
- 3 Fyll tanken med hydraulikkolje ISO VG 15. Fyll tanken til øvre del av nivåglasset.
- 4 Ta ut påfyllingspluggen i rattpumpa, fyll opp med olje. 
- 5 Drei rattet frem og tilbake noen ganger (ca 1 1/2 omdreining til hver side) til systemet er fylt med olje. Sjekk oljenivå.
- 6 Drei rattet helt mot styrbord endestopp. Åpne styrbord luftenippel på styresylinderen. Bruk en slange på luftenippelen, slik at oljen som luftes ut kan samles i et kar e.l. (se skisse ovenfor) Drei rattet mot høyre helt til det ikke kommer luft fra luftenippelen (kun ren olje) Steng luftenippelen.
- 7 Repeter pkt. 6 på babord side. Husk å sjekke oljenivået i rattpumpen.
- 8 Gjenta lufteprosedyre om nødvendig.
- 9 Kontroller oljenivået, og sett tilbake tett plugg i rattpumpens påfyllingsport.
- 10 Sett tilbake hovedsikringen for styreaggregatet, og kjør styresylinderen frem og tilbake 10-15 ganger med styrespaken. **NB!** Sjekk oljenivået og etterfyll når nødvendig. Når aggregatet kjøres vil det sirkulere en liten oljemengde via rattpumpa og tilbake til tank. Dette sikrer at rattpumpa er full av olje, og vil bidra til å lufte systemet (forutsatt at systemet er koblet opp med 4 slanger til rattpumpen i henhold til skjema).
- 11 Sjekk for lekkasjer, ettertrekk om nødvendig. Sjekk at alle mekaniske forbindelser er fast tiltrukket

Dersom det er montert manuell stengeventil mellom sylinderportene, skal denne åpnes ved første betjening av systemet fra rattpumpe eller styrespak dersom det ikke er montert rattpumpe. Ved installasjoner med 2 rattpumper skal luftingen først utføres fra den laveste rattpumpen.

NB! Man vil ikke alltid klare å fjerne all luften i systemet. Etter hvert som den lufta kommer ut via tanken, vil oljenivået falle. Sjekk oljenivå etter de første 5 driftstimene, og etterfyll systemet om nødvendig.

EN
Maintenance

Every 6th month:

- Check hoses / connections for leakages.
- Check hoses for damage (caused by sharp edges, hot surfaces etc).
- Check that all bolts are tightened and secure.
- Ensure that bearings and joints are greased and free to rotate / move properly.
- SP60, SP90 and JR1.100 cylinders have a nipple to grease the mounting bracket. Fill up with new marine grease.

Every 500 hours:

- Check DC motor brushes for wear.
Replace brushes when shorter than 8mm measured from the groove in the brush.

After 1st year / Every 2000 hours or 3rd year:

- The hydraulic oil and filter should be replaced after the first year, and then every third year.

For service parts and further support, please contact your Side-Power Steering System dealer.

NO
Vedlikehold

Hver 6.måned:

- Sjekk slanger og koblinger for lekkasje.
- Sjekk slanger for skader fra varme, skarpe kanter osv.
- Sjekk at alle bolter er tiltrukket og sikret.
- Sjekk at alle opplagringer, ledd og foringer er smurt og kan beveges fritt uten å knipe eller sette seg.
- SP60, SP90 og JR1.100 sylindere har smøre- nipler på festefoten. Press inn vannfast fett.

Hver 500. time:

- Sjekk DC motorens børster for slitasje.
Bytt børstene dersom lengden på børstene er under 8mm målt fra sporet i børsten.

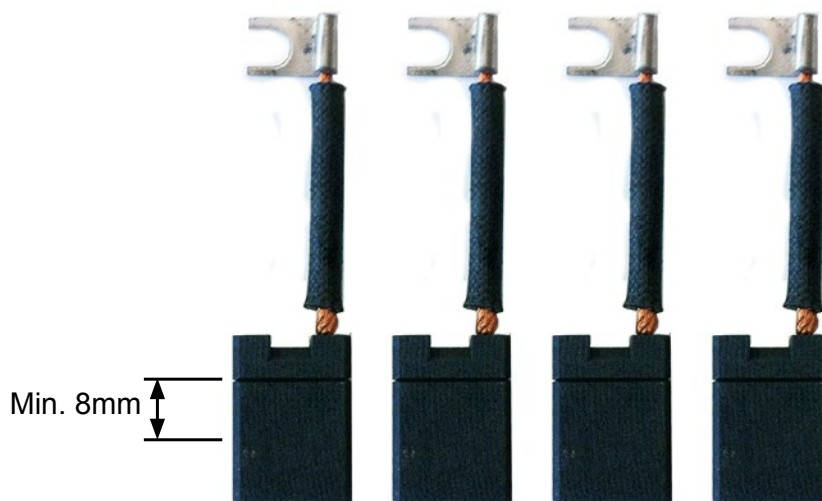
Etter 1. år / Hver 2000. time eller hvert 3. år:

- Olje og filter bør byttes etter første års bruk.
Etter dette bør man bytte olje og filter hvert tredje år.

For servicedeler og veiledning, vennligst kontakt din Side-Power Steering System forhandler.



Brush spring kit, part no. 74368



Brush kit, part no. 74369



Warranty Statement

1. The equipment manufactured by Sleipner Motor AS (The "Warrantor") is warranted to be free from defects in workmanship and materials under normal use and service.
2. This Warranty is in effect for of two years (Leisure Use) or one year (Commercial use) from the date of purchase by the user. Proof of purchase must be included, to establish that it is inside the warranty period.
3. This Warranty is transferable and covers the product for the specified time period.
4. In case any part of the equipment proves to be defective, other than those parts excluded in paragraph 5 below, the owner should do the following:
 - (a) Prepare a detailed written statement of the nature and circumstances of the defect, to the best of the Owner's knowledge, including the date of purchase, the place of purchase, the name and address of the installer, and the Purchaser's name, address and telephone number;
 - (b) The Owner should return the defective part or unit along with the statement referenced in the preceding paragraph to the warrantor, Sleipner Motor AS or an authorized Service Centre, postage/shipping prepaid and at the expense of the Purchaser;
 - (c) If upon the Warrantor's or Authorized Service Centre's examination, the defect is determined to result from defective material or workmanship, the equipment will be repaired or replaced at the Warrantor's option without charge, and returned to the Purchaser at the Warrantor's expense;
 - (d) no refund of the purchase price will be granted to the Purchaser, unless the Warrantor is unable to remedy the defect after having a reasonable number of opportunities to do so. Prior to refund of the purchase price, Purchaser must submit a statement in writing from a professional boating equipment supplier that the installation instructions of the Installation and Operation Manual have been complied with and that the defect remains;
 - (e) warranty service shall be performed only by the Warrantor, or an authorized Service Centre, and any attempt to remedy the defect by anyone else shall render this warranty void.
5. There shall be no warranty for defects or damages caused by faulty installation or hook-up, abuse or misuse of the equipment including exposure to excessive heat, salt or fresh water spray, or water immersion except for equipment specifically designed as waterproof.
6. No other express warranty is hereby given and there are no warranties which extend beyond those described in section 4 above. This Warranty is expressly in lieu of any other expressed or implied warranties, including any implied warranty of merchantability, fitness for the ordinary purposes for which such goods are used, or fitness for a particular purpose, and any other obligations on the part of the Warrantor or its employees and representatives.
7. There shall be no responsibility or liability whatsoever on the part of the Warrantor or its employees and representatives for injury to any person or persons, or damage to property, loss of income or profit, or any other consequential or resulting damage or cost which may be claimed to have been incurred through the use or sale of the equipment, including any possible failure or malfunction of the equipment, or part thereof.
8. The Warrantor assumes no liability for incidental or consequential damages of any kind including damages arising from collision with other vessels or objects.
9. This warranty gives you specific legal rights, and you may also have other rights which vary from country to country.









Worldwide sales and service



www.side-power.com



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