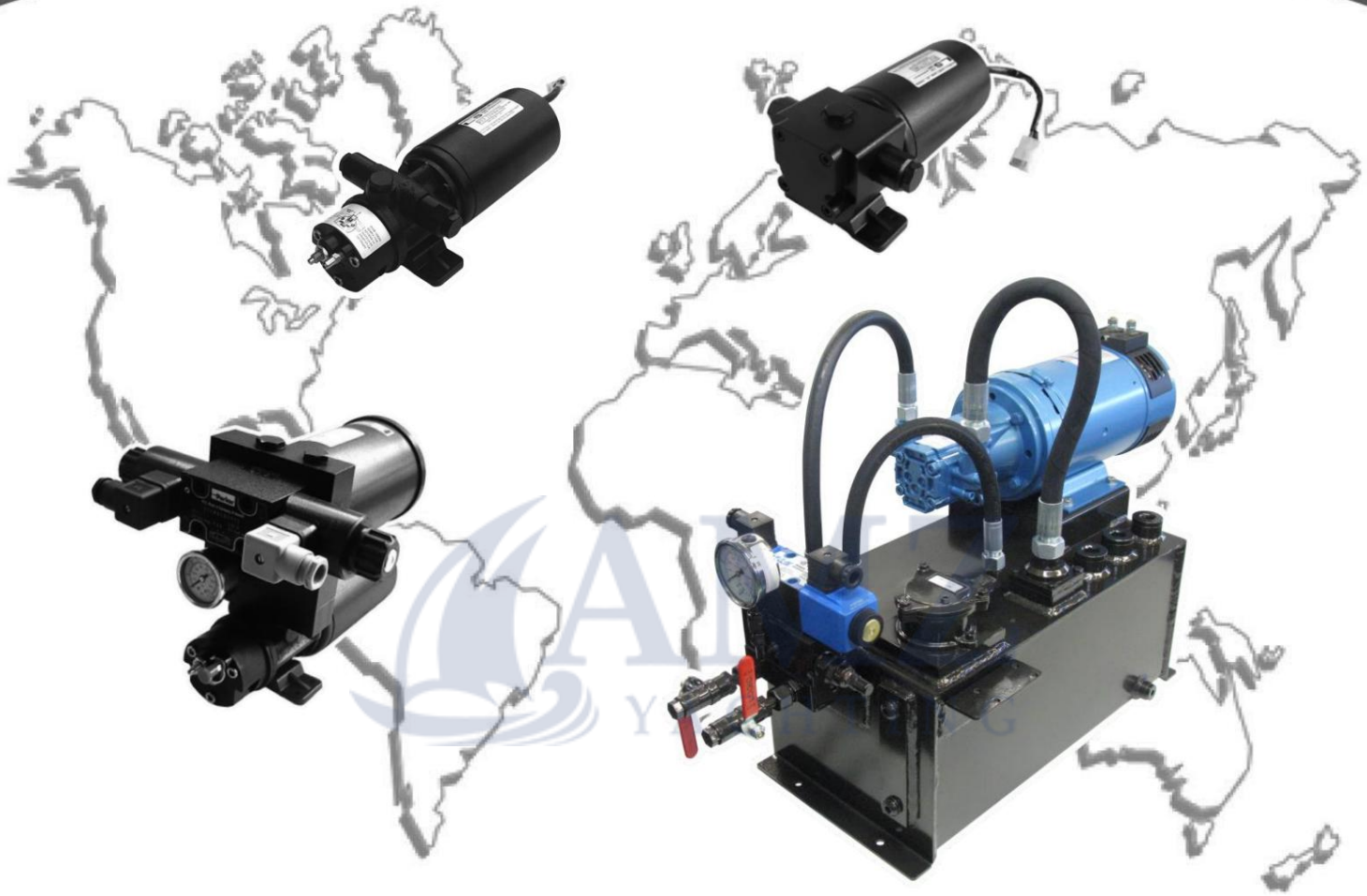
MONTAGE ET PURGE DES GROUPES DE PILOTAGE LS

INSTALLING AND BLEEDING LS POWER PACKS FOR AUTOPILOTS

ISO 9001
BUREAU VERITAS
Certification



Tools required for installation

- 1 set of open-end wrenches: 7 to 32
- 1 adjustable wrench
- 1 set of flat screwdrivers -
1 set of hexagon keys - 1 cutter

- 1 drill + 1 set of drill bits - 1 pair
of pliers - 1 torque
wrench

Tools required for the installation

- 1 set of spanners: 7 to 32
- 1 adjustable spanner
- 1 set of straight screwdrivers
- 1 set of hexagon keys
- 1 cutter
- 1 drilling machine + 1 set of drill bits -
1 pair of pliers -
1 torque wrench

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Date: 08-29-2022	

ASSEMBLY AND BLEEDING OF LS CONTROL GROUPS
INSTALLING AND BLEEDING LS POWER PACKS FOR AUTOPILOTS

SUMMARY **Page**

HAPPY **Page**

IMPORTANT RECOMMENDATIONS

- The entire steering group must:
  - be installed by a person with all the required skills.
  - be installed in a well-ventilated environment, allowing access to the control and use devices (pressure gauge, pressure limiter, flow adjustment, traps, etc.).
  - be placed at a level lower than that of the lowest steering pump.

- Check that the supply voltage corresponds to that of the components of the control group assembly (motor, solenoid valve, etc.) and that the wiring section is sized according to your installation.

- Throughout the installation period, protect the control group assembly, and more particularly the cylinder rod, against any risk of impact, scratches or any other type of damage.

- No impurities must penetrate inside the control group assembly. Hoses, piping and fittings must be cleaned before any connection.

- No foreign element must hinder the proper functioning of the cylinder (electrical wiring, pipes, earth braids, rigid objects, etc.).

  Ensure that the cylinder remains free in all its movements and that, whatever the mounting (floor, ceiling, partition), the traps are accessible.

- The bearing surface of the bearings or group and cylinder fixing lugs must be perfectly flat, without foreign bodies.

- The electro-pump unit must be placed as close as possible to the boat's leading line and protected from all water splashes.

- It is imperative to respect the tightening torques indicated **(..Nm).**

! All dimensions indicated are expressed in millimeters.

IMPORTANT RECOMMENDATIONS

- *Power pack assemblies should be:*
  - *installed by a qualified person.*
  - *located in a well ventilated environment, allowing easy access to control and ancillary equipment (manometer, pressure relief valve, flow adjustment screw, bleeder cocks, etc.)*
  - *positioned at a lower level than the lowest helm pump on the boat.*

- *Check that the serviceable voltage on the boat matches the one on the power pack assembly (motor, electro-valve, etc.) and that the wiring section is correctly sized in function of your installation.*

- *The power pack assembly and more particularly the cylinder rod should be protected against risks of impacts, scratches or other damages during the installation.*

- *No impurities are to enter the components of the power pack assembly. Hydraulic hoses, hydraulic piping and fittings should be cleaned prior to connection.*

- *No foreign body should hinder the cylinder operation (electrical cables, tubing, earth connection braiding, rigid objects, etc.). Make sure that the cylinder can move freely and that the bleeder cocks are accessible, whatever way the cylinder has been installed (ceiling, floor or bulkhead mounted).*

- *The mounting areas for the cylinder support plate and the power pack mounting brackets must be perfectly even and free of foreign bodies.*

- *The electro-pump must be positioned as close as possible to the boat lubber line, away from possible water projections.*

- *Strictly follow the torque indications **(…Nm).***

! All dimensions are quoted in mm.

REVERSIBLE CONTROL GROUPS – FIXED FLOW
REVERSIBLE POWER PACKS – FIXED FLOW RATE

RV07 GROUP
RV07 POWER PACK

Assembly instructions 1.

Position and secure the RV07 group in the chosen location according to our **“Important Recommendations” paragraph.**

2. Unscrew the 3 ¼ BSPP plugs (L, M and M') and make the hydraulic connection according to our **"Hydraulic wiring diagram" paragraph.**

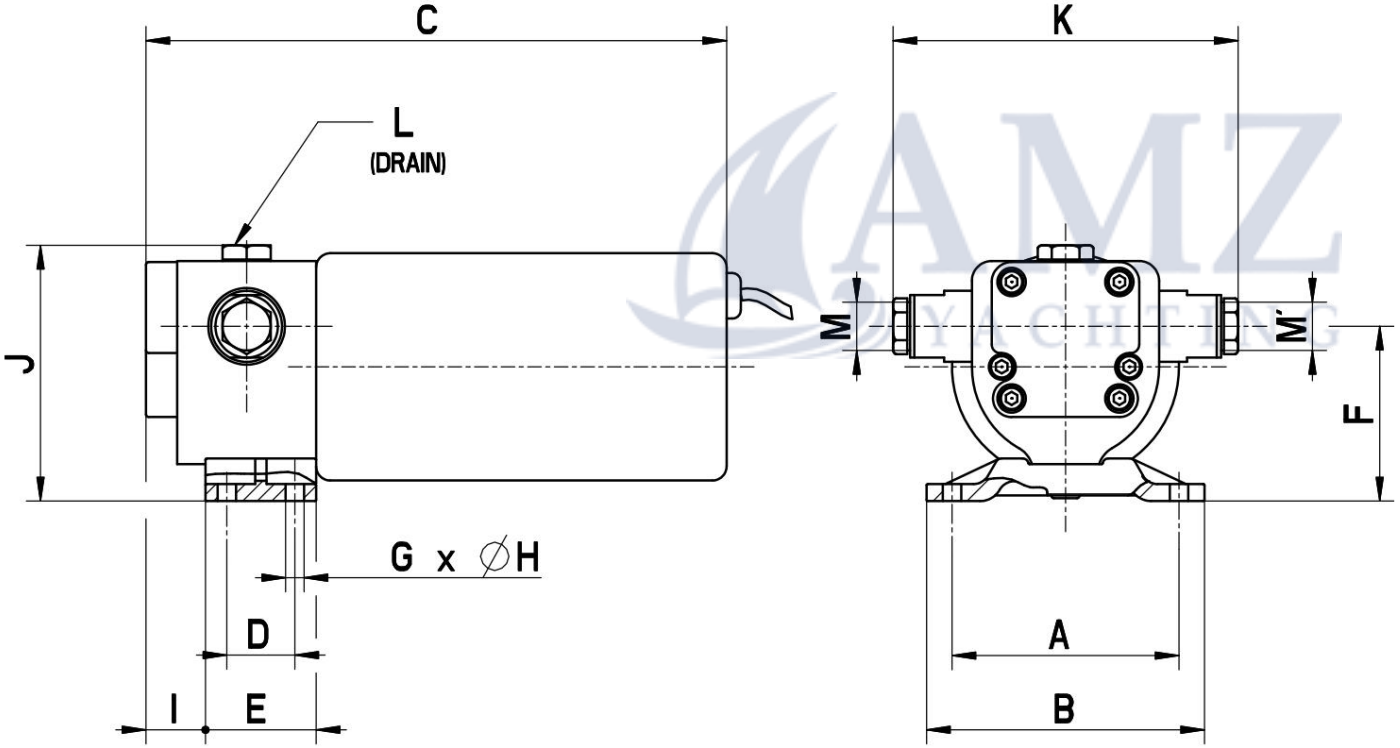
3. Carry out the electrical connection according to our **“Electrical wiring diagram” paragraph.**

Mounting instructions

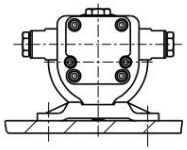
1. *Position and secure the RV07 power pack at the selected location by following the instructions in paragraph* ***“Important Recommendations”.***

2. *Undo the 3 ¼ BSPP plugs (L, M and M') and proceed with the hydraulic connections by following the instructions in paragraph* ***“Hydraulic Connection Drawing”.***

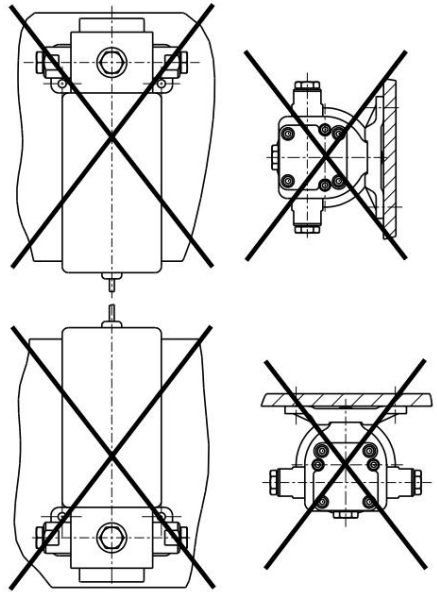
3. *Connect the electric wiring by following the instructions in paragraph* ***“Electric Connection Drawing”.***



MONTAGE CONFORME
CORRECT MOUNTING



MONTAGE NON CONFORME
WRONG MOUNTING



	AB		vs	D	E	F	G Ø H		I	J	K	LM – M’	
RV07	80		98	210	24	39	65	4	6.5	21	90	122	1/4 BSPP	1/4 BSPP

REVERSIBLE CONTROL GROUPS – ADJUSTABLE FLOW
REVERSIBLE POWER PACKS – ADJUSTABLE FLOW RATE

GROUPS RV1 – RV2 – RV3
RV1 – RV2 – RV3 POWER PACKS

Assembly instructions 1.

Position and fix the RV1, RV2 or RV3 group in the location chosen according to our **"Important recommendations" paragraph.**

2. Unscrew the 3 ¼ BSPP plugs (L, M and M') and make the hydraulic connection according to our **"Hydraulic wiring diagram" paragraph.**

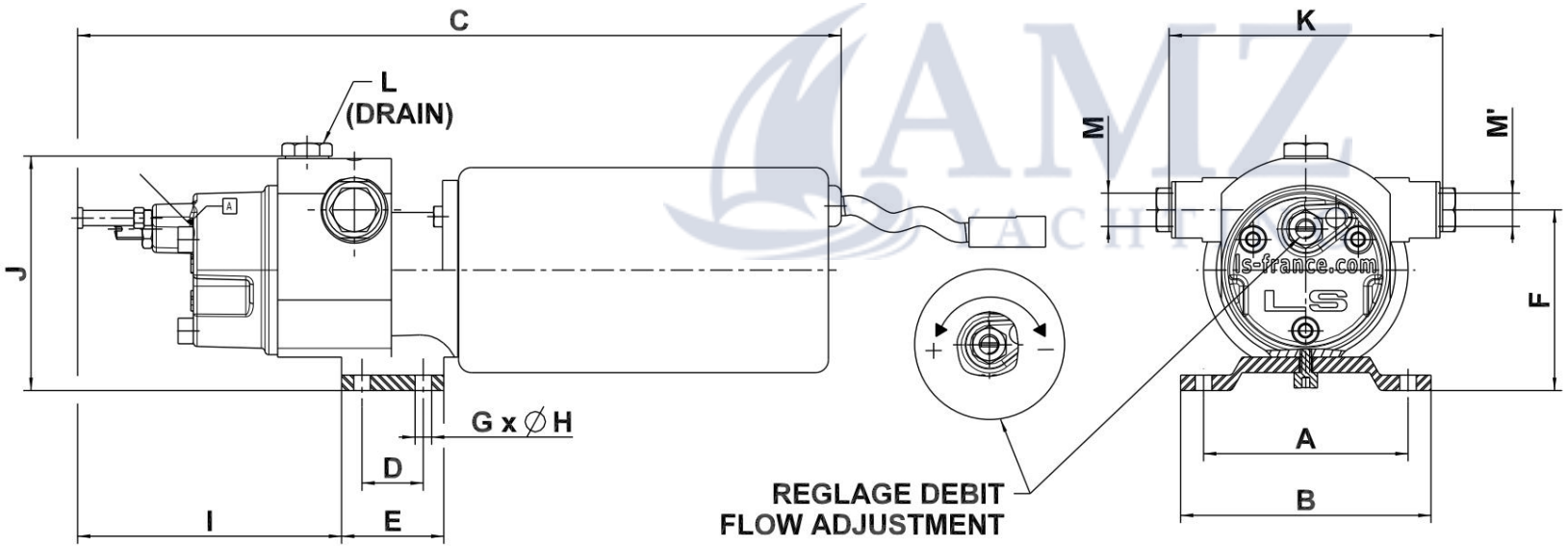
3. Carry out the electrical connection according to our paragraph **"Electrical wiring diagram".**

Mounting instructions

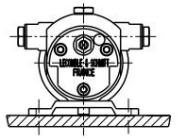
1. *Position and secure the RV1, RV2 or RV3 power pack at the selected location by following the instructions in paragraph* ***"Important Recommendations".***

2. *Undo the 3 ¼ BSPP plugs (L, M and M') and proceed with the hydraulic connections by following the instructions in paragraph* ***"Hydraulic Connection Drawing".***

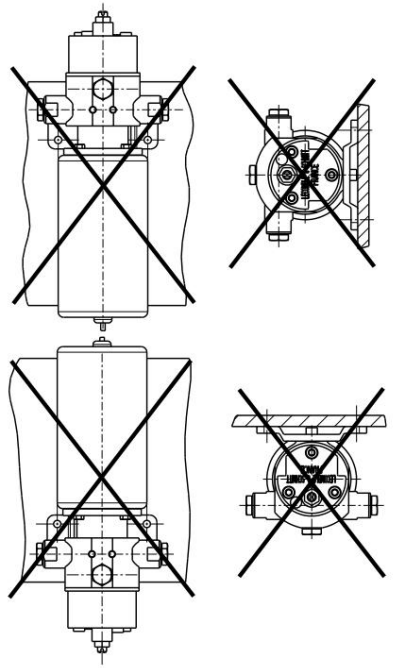
3. *Connect the electric wiring by following the instructions in paragraph* ***"Electric Connection Drawing".***



MONTAGE CONFORME
CORRECT MOUNTING



MONTAGE NON CONFORME
WRONG MOUNTING



	ABCD				E	FG ØH		I	J	KLM – M'	
RV1 / RV2 / RV3	80	98 300 24 39				70	4	6.5 104 97 117		1/4 BSPP	1/4 BSPP

CONTROL GROUPS WITH SOLENOID VALVES – ADJUSTABLE FLOW
POWER PACKS WITH ELECTROVALVES – ADJUSTABLE FLOW RATE

GROUPS EV2 - EV3 - HVR
EV2 – EV3 – HVR POWER PACKS

Assembly instructions 1.

Position and secure the EV2, EV3 or HVR group in the location chosen according to our **"Important recommendations" paragraph.**

2. Unscrew the 3 ¼ BSPP plugs **(L** and **2 x** M) and make the hydraulic connection according to our **"Hydraulic wiring diagram" paragraph.**

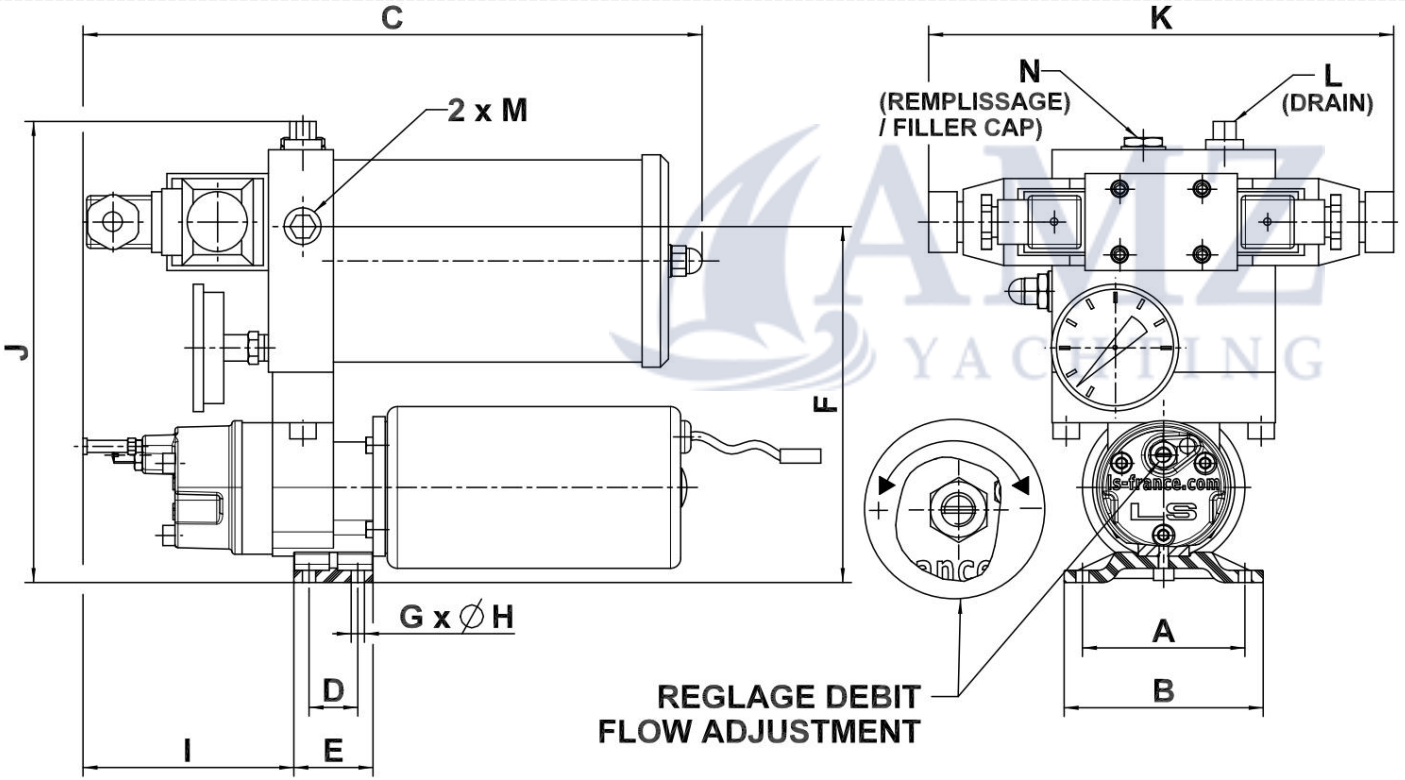
3. Carry out the electrical connection according to our paragraph **"Electrical wiring diagram".**

Mounting instructions

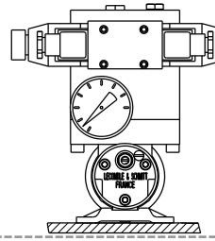
1. *Position and secure the EV2, EV3 or HVR power pack at the selected location by following the instructions in paragraph* ***"Important Recommendations".***

2. *Undo the 3 ¼ BSPP plugs* ***(L*** *and* ***2 x*** *M) and proceed with the hydraulic connections by following the instructions in paragraph* ***"Hydraulic Connection Drawing".***

3. *Connect the electrical wiring by following the instructions in paragraph* ***"Electric Connection Drawing".***



MONTAGE CONFORME
CORRECT MOUNTING



MONTAGE NON CONFORME
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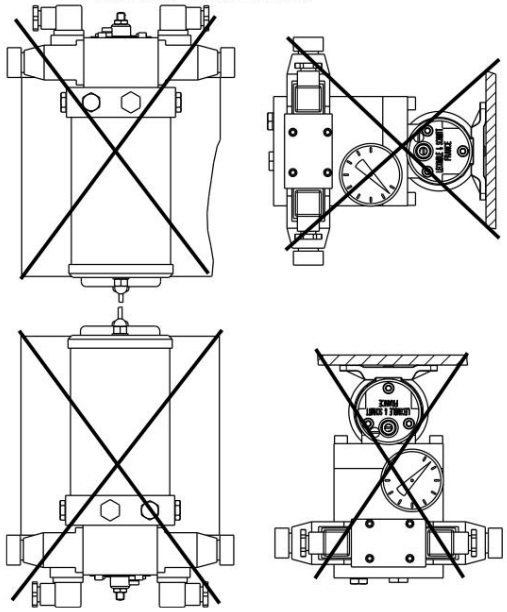


	ABC			OF		FG Ø HI			J.K.		L	M	NOT
EV2 / EV3	80	98	305	24	39	182	4		6.5	104	220	230	1/4 BSPP	1/4 BSPP	3/8 BSPP
HVR	100	115	440	80	100	179	4		7,267	239	230		1/4 BSPP	1/4 BSPP	3/8 BSPP

HF HYDRAULIC POWER PLANT
HYDRAULIC HF UNIT

Assembly instructions 1.

Position and secure the HF hydraulic unit to the location chosen according to our **"Important recommendations" paragraph.**

2. Unscrew the 3 caps **(1 x G and 2x** F) and carry out the hydraulic connection according to our paragraph **"Hydraulic wiring diagram".**

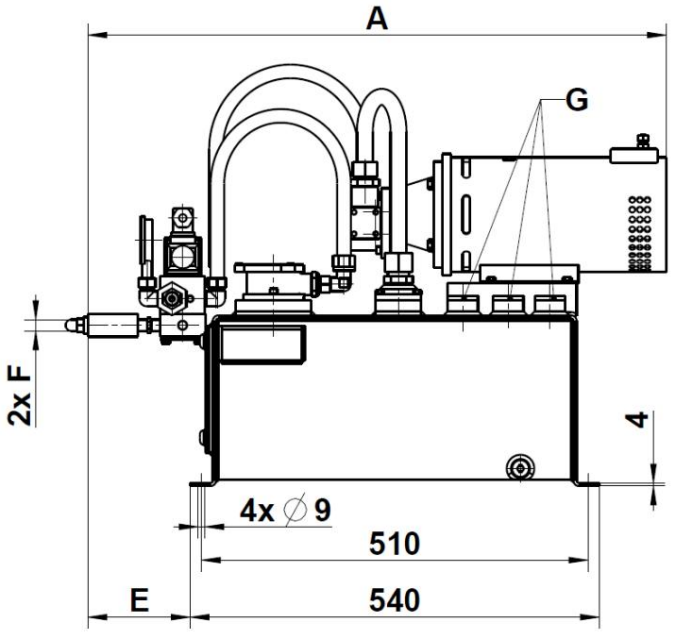
3. Carry out the electrical connection according to our paragraph **"Electrical wiring diagram".**

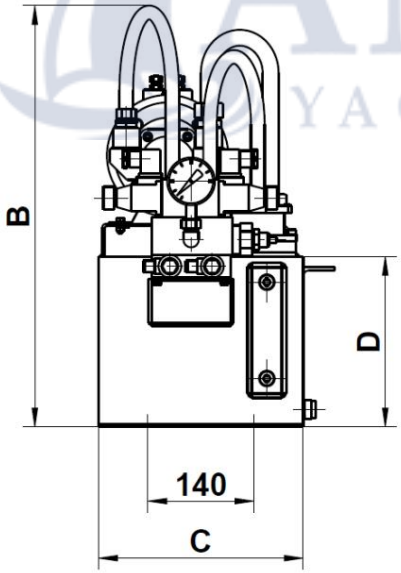
Mounting instructions

1. *Position and secure the HF electro-hydraulic unit at the selected location by following the instructions in paragraph* ***"Important Recommendations".***

2. *Undo the 3 plugs* ***(1 x G*** *and* ***2 x*** *F) and proceed with the hydraulic connections by following the instructions in paragraph* ***"Hydraulic Connection Drawing".***

3. *Proceed with the electrical connections by following the instructions in paragraph* ***"Electric Connection Drawing".***





	MASS / *MASS*	A	B	C	D	E			FG	
HF 1 - 2.5 **HF 1 - 3** **HF 1 - 4**	35 kg	750	460	220	125	140			3/8 BSPP	1 BSPP
HF 1 - 6	45 kg	750	560	270	225	140			3/8 BSPP	1 BSPP
HF 1.5 - 9	57 kg	750	560	270	225	140			3/8 BSPP	1 BSPP
HF 1.5 - 11	57 kg	770	560	270	225	140			3/8 BSPP	1 BSPP
HF 1.5 - 15 **HF 1.5 - 18**	62 kg	810	785	270	450	160			1/2 BSPP	1 BSPP

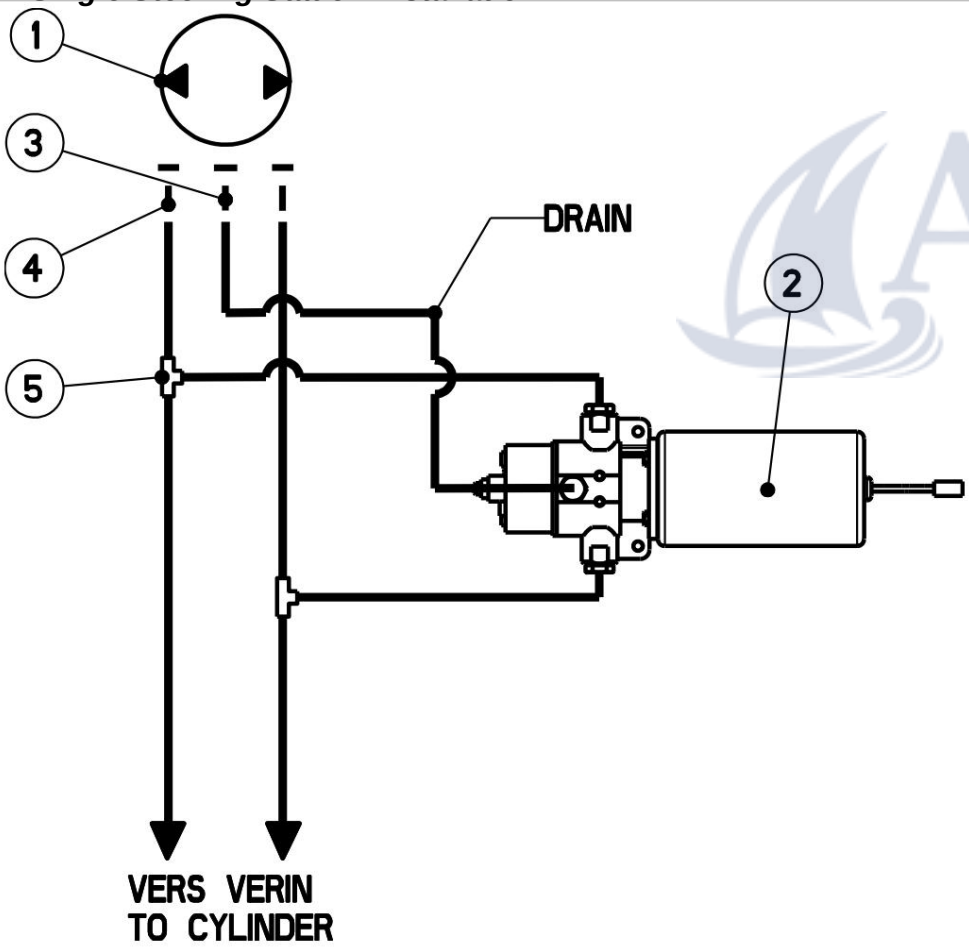
HYDRAULIC WIRING DIAGRAMS FOR GROUPS RV07 – RV1 – RV2 – RV3

HYDRAULIC CONNECTION DRAWINGS FOR RV07 – RV1 – RV2 – RV3 POWER PACKS

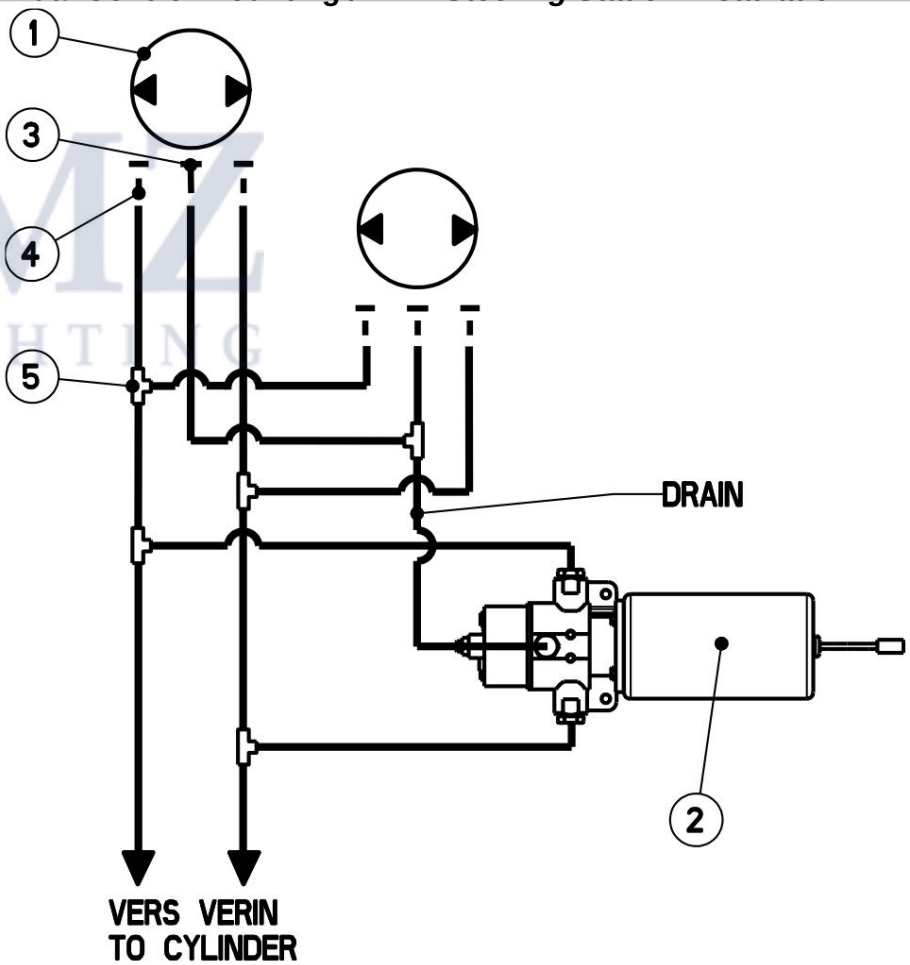
		1 Manual pump *Manual helm pump*	2 Band *Power pack*	3 Drain fittings *Drain fittings*	4 User connections *Outlet fittings*	5 Equal tees *Equal tee fittings*
Simple order *Single Steering Station*	Quantity *Quantity*	1	1	2	4	2
Dual order *Twin Steering Station*	Quantity *Quantity*	2	1	3	6	5

Tightening torque fittings *Tightening Torque for Fittings*	1/8BSPP	1/4 BSPP	3/8 BSPP	1/2 BSPP
(Nm)	3	7.57	35	62

Single Steering Station Installation



Dual Control Mounting / *Twin Steering Station Installation*



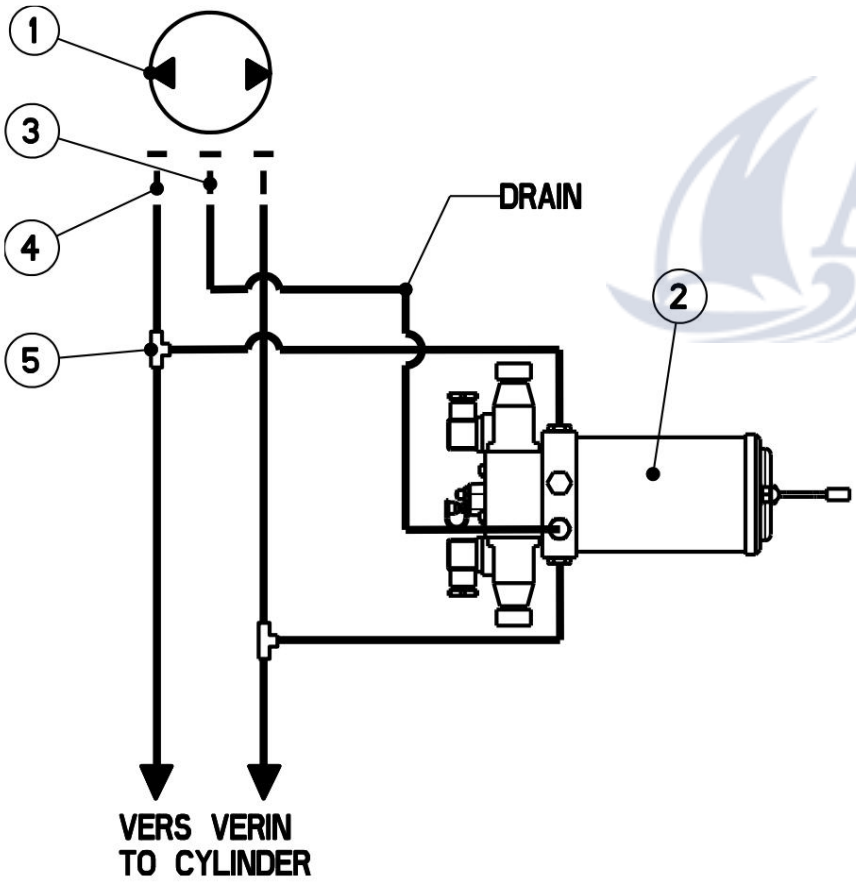
HYDRAULIC WIRING DIAGRAMS FOR EV2 – EV3 – HVR 1/3 GROUPS

HYDRAULIC CONNECTION DRAWINGS FOR EV2 – EV3 – HVR 1/3 POWER PACKS

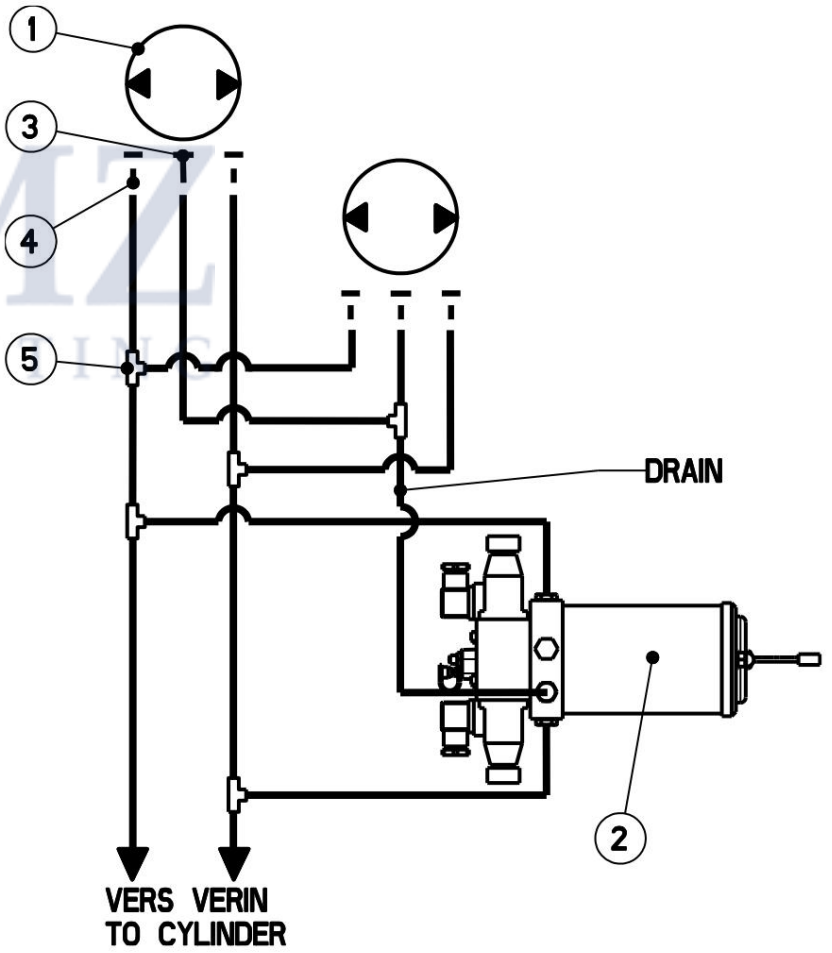
		1 Manual pump *Manual helm pump*	2 Band *Power pack*	3 Drain fittings *Drain fittings*	4 User connections *Outlet fittings*	5 Equal tees *Equal tee fittings*
Simple order *Single Steering Station*	Quantity *Quantity*	1	1	2	4	2
Dual order *Twin Steering Station*	Quantity *Quantity*	2	1	3	6	5

Tightening torque fittings *Tightening Torque for Fittings*	1/8BSPP	1/4 BSPP	3/8 BSPP	1/2 BSPP
(Nm)	3	7.57	35	62

Single Steering Station Installation



Dual Control Mounting / *Twin Steering Station Installation*



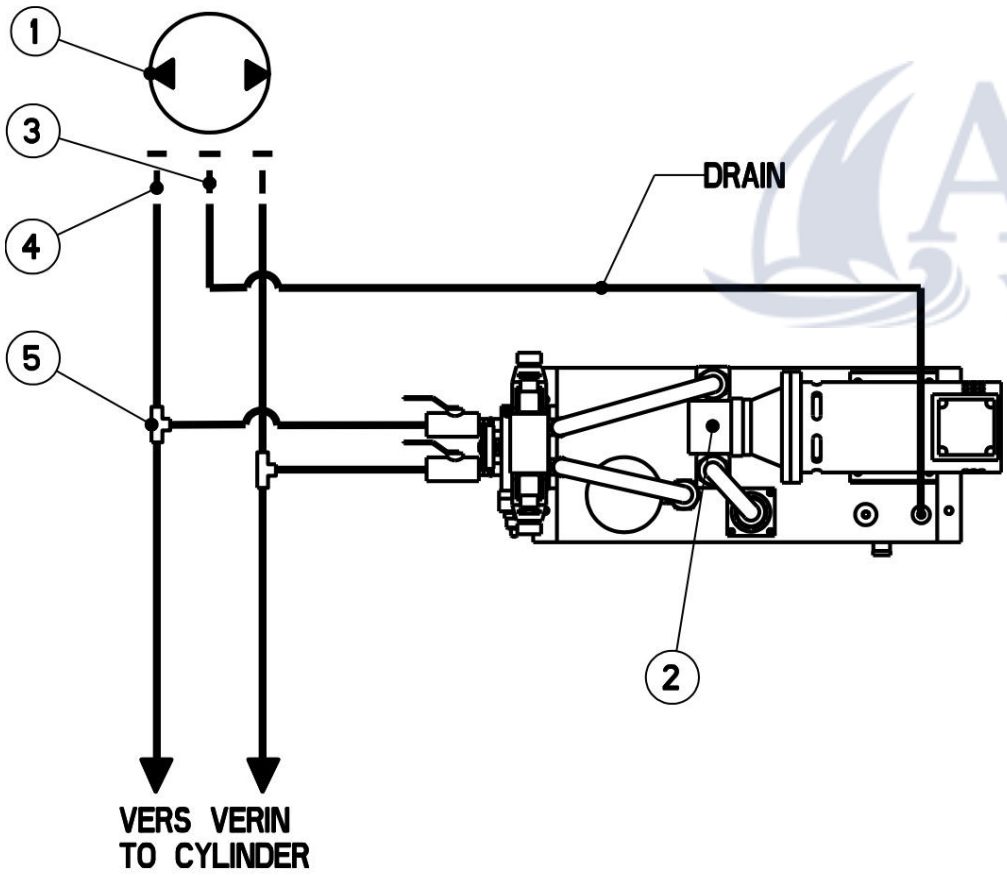
HYDRAULIC WIRING DIAGRAMS FOR HF GROUPS

HYDRAULIC CONNECTION DRAWINGS FOR HF UNITS

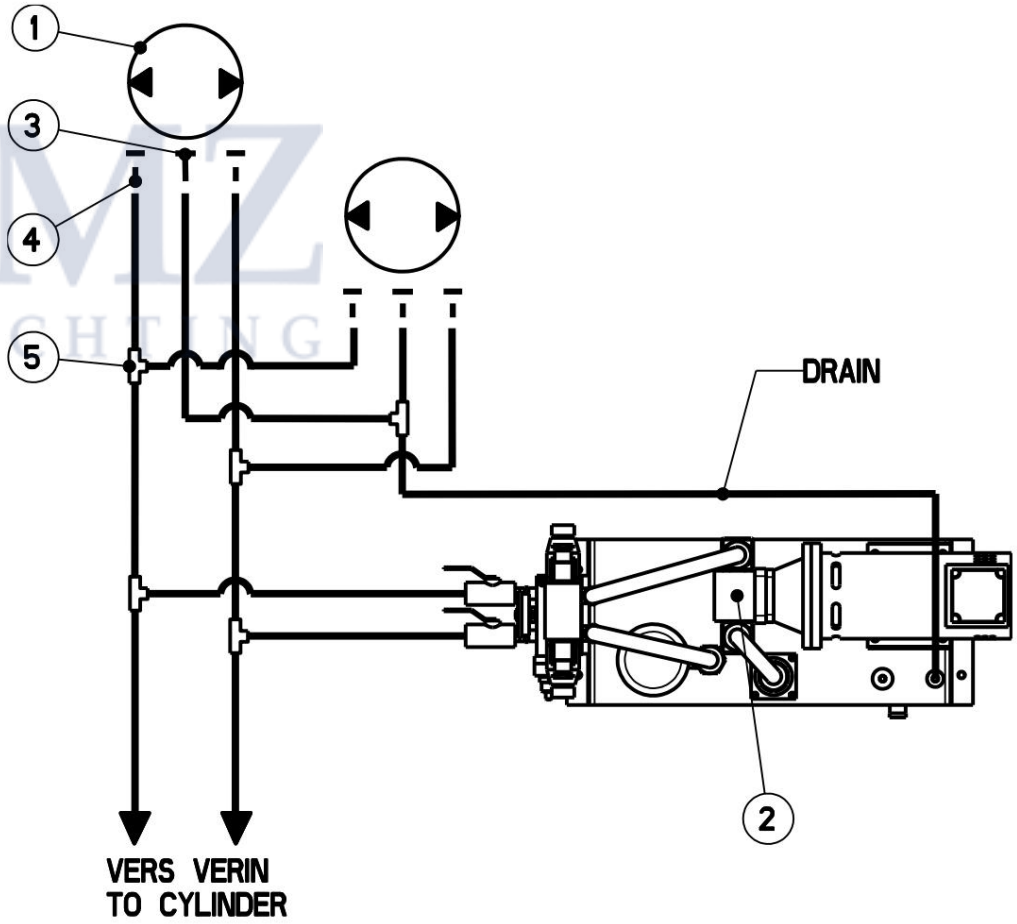
		1 Manual pump *Manual helm pump*	2 Band *Power pack*	3 Drain fittings *Drain fittings*	4 User connections *Outlet fittings*	5 Equal tees *Equal tee fittings*
Simple order *Single Steering Station*	Quantity *Quantity*	1	1	2	4	2
Dual order *Twin Steering Station*	Quantity *Quantity*	2	1	3	6	5

Tightening torque fittings *Tightening Torque for Fittings*	1/8BSPP	1/4 BSPP	3/8 BSPP	1/2 BSPP
(Nm)	3	7.57	35	62

Single Steering Station Installation



Dual Control Mounting / *Twin Steering Station Installation*



CONNECTION TYPES

- By clamp
- By screw connection
- By crimp connection
- By pre-crimped fitting and flexible

TYPES OF CONNECTION

- *Clamp fitting*
- *Screwed connection*
- *Crimp connection*
- *Swaged Fittings and Flexible Tubes with Swaged Fittings*

Fittings

Do not use conical fittings.

Crimping hoses

The cut of the hoses must be straight and perpendicular.
Do not cut the hoses too short: take into account the movement of the cylinder and the minimum bending radii (R 90 mm).

No impurities must enter the hoses.

Fittings

Do not use conic fittings.

Crimping of Flexible Tubes

Make a clean and perpendicular cut on the flexible tubes.
Do not cut them too short to allow for the cylinder motion and the minimum bending radius of the pipes (R 90 mm).
No impurities are to enter the pipes.

By clamp

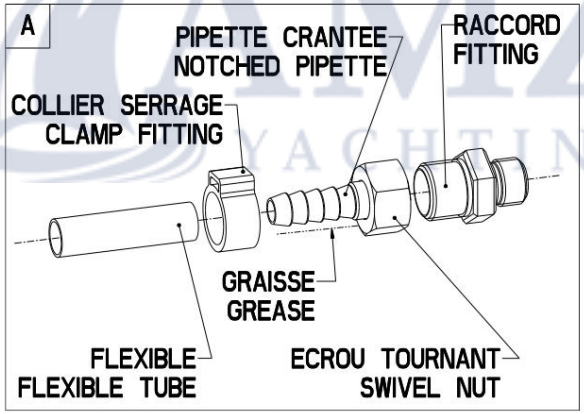
Figure A:

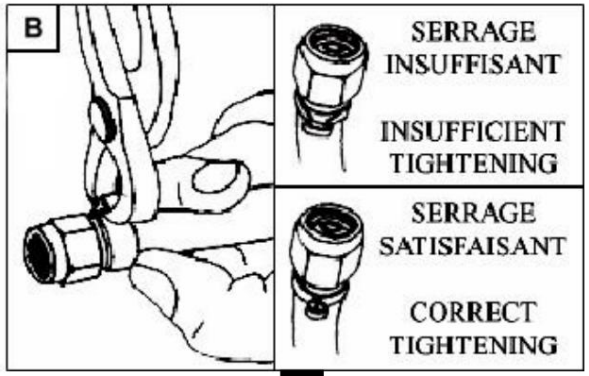
ÿ Separate the rotating nut and the notched pipette from the group connection.
ÿ Screw the connection part onto the group uses, respecting the tightening torques indicated.

ÿ Grease the notched pipette.
ÿ Pass the hose through the collar.
ÿ Fit the flexible onto the notched pipette up to 1 mm from the rotating nut.

Figure B:

ÿ Place the collar approximately 3 to 5 mm from the face of the rotating nut and crimp it.
ÿ Refit the rotating nut on the group connection (tightening torque 6 Nm) while holding the connection with a spanner.





Clamp fitting

Drawing A:

ÿ *Loosen the swivel nut and the pipette from the fitting for the power pack.*
ÿ *Screw the fitting (union piece) in the power pack outlets as per the indicated torque.*
ÿ *Grease the notched pipette.*
ÿ *Insert the tube through the clamp.*
ÿ *Push the tube on the notched pipette up to 1 mm from the swivel nut.*

Drawing B:

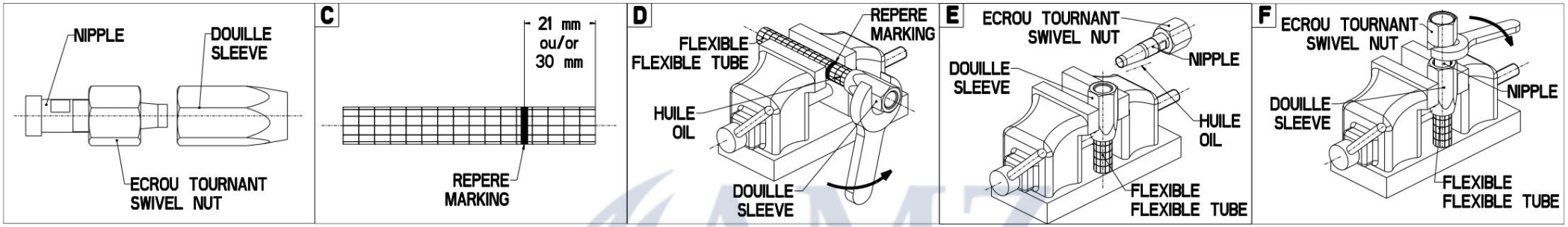
ÿ *Move the clamp to approx. 3 to 5 mm from the swivel nut and crimp it.*
ÿ *Tighten the swivel nut on the fitting, while holding the fitting with a spanner (torque = 6 Nm).*

By screw connection

ÿ Separate the rotating nut, the socket and the nipple from the group connection.
ÿ Screw the connection part onto the uses of the group, respecting the tightening torques indicated (see wiring diagram).
ÿ Draw a mark at 21 mm for ÿ int. 8 mm or 30 mm for ÿ int. 10mm **(Fig.** C).
ÿ Oil the end of the hose and lock it in rotation without crushing it **(Fig.** D).
ÿ Screw the socket up to the mark, direction of rotation counter-clockwise **(Fig.** D).
ÿ Place the socket in the vice **(Fig.** E) and oil the nipple.
ÿ Screw the nipple to the limit of the thread, clockwise direction of rotation **(Fig.** F).

Screwed connection

ÿ *Separate the swivel nut, the sleeve and the nipple from the fitting for the power pack.*
ÿ *Screw the fitting (union piece) in the power pack outlets as per the indicated torque (see hydraulic connection drawing).*
ÿ *Mark a point of reference at 21 mm for 8 mm inner Ø tube or 30 mm for 10 mm inner Ø tube **(Dwg** C).*
ÿ *Lubricate the end of the tube and immobilize it without squeezing it **(Dwg** D).*
ÿ *Screw the sleeve up to the marking in anticlockwise direction **(Dwg** D).*
ÿ *Immobilize the sleeve in a vice **(Dwg** E) and lubricate the nipple.*
ÿ *Screw the nipple to the thread end in clockwise direction **(Dwg** F).*



By crimp connection

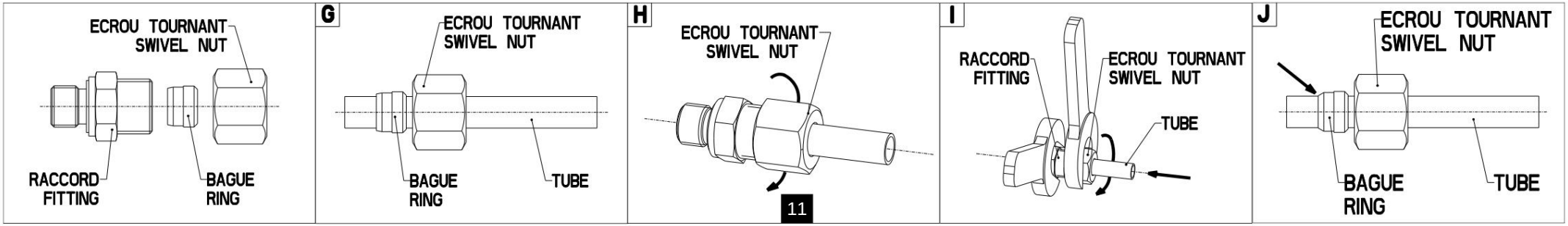
ÿ Separate the rotating nut and the ring from the group connections.
ÿ Screw the connection part onto the uses of the group, respecting the tightening torques indicated (see wiring diagram).
ÿ Slide the rotating nut and the ring onto the tube **(Fig.** G).
ÿ Screw the rotating nut to the start of the stop **(Fig.** H).
ÿ Firmly push the tube into the body of the fitting until it stops.
Then using a wrench, tighten the rotating nut approximately 1 ½ turns **(Fig.** I).
ÿ Check: remove the rotating nut. A visible collar must fill the space in front of the front face of the edge. The ring can rotate, but no axial movement is allowed **(Fig.** J).

Reassembly : *screw the rotating nut onto the fitting until it reaches the start of the stop then tighten by approximately 1/8 turn using a wrench.*

Crimp connection

ÿ *Separate the swivel nut and the ring from the fittings for the power pack.*
ÿ *Screw the fittings (union pieces) in the power pack outlets as per the indicated torque. (See hydraulic connection drawing).*
ÿ *Slip the swivel nut and the ring on the tube **(Dwg** G).*
ÿ *Screw on the swivel nut until it makes contact. Do not tighten. **(Dwg** H).*
ÿ *Firmly insert the tube inside the fitting until it comes to a stop. Tighten the swivel nut with a spanner by approximately 1 ½ turn **(Dwg** I).*
ÿ *Checking: loosen the swivel nut. A visible flange must occupy the space in front of the edge front face. The ring can turn but no axial movement is allowed **(Dwg** J).*

Reassembly: *screw on the swivel nut until it makes contact, then tighten it by about 1/8 turn with a spanner.*



By pre-crimped connection and flexible hose

ÿ Remove the protective caps delivered on the group and the connections.

ÿ Screw the fitting clockwise, joint of the fitting towards the group then the to squeeze.

	1/8' BSPP	1/4' BSPP	3/8' BSPP	1/2' BSPP
“ Nm	9	35	45	65

ÿ Remove the protective cap from the hose.

ÿ Screw the flexible hose clockwise onto the fitting then tighten it.

Fitting series	10L	12L	15L	17L
“ Nm	35	45	55	65
Fitting series	18L	21L	JIC 7/8	JIC 9/16
“ Nm	65	90	85	28

Flexible Ø series	DN8	DN10	DN13	DN16	DN19
Minimum curvature radius (mm)	90	110	150	175	215

ÿ Repeat the same operation with the other hose.

Swaged Fittings and Flexible Tubes with Swaged Fittings

ÿ *Remove the protective caps supplied with the power pack and fittings.*

ÿ *Screw the fitting clockwise into the pump with the fitting seal on the power pack side then tighten it.*

	1/8' BSPP	1/4' BSPP	3/8' BSPP	1/2' BSPP
“ Nm	9	35	45	65

ÿ *Remove the protective cap from the flexible tube.*

ÿ *Screw the flexible tube clockwise on the fitting and tighten it.*

Fittings Range	10L	12L	15L	17L
“ Nm	35	45	55	65
Fittings Range	18L	21L	JIC 7/8	JIC 9/16
“ Nm	65	90	85	28

Flexible tubes Range Ø DN8		DN10	DN13	DN16	DN19
Minimum Bending Radius (mm)	90	110	150	175	215

ÿ*Repeat the same operation with the other flexible tube.*

ELECTRICAL WIRING DIAGRAM FOR GROUPS RV07 – RV1 – RV2 – RV3

ELECTRIC CONNECTION DRAWING FOR RV07 – RV1 – RV2 – RV3 POWER PACKS

		RV07	RV1	RV2	RV3
Recommended protection *Recommended protection*	**12V**	16A	16A	25A	30A
	24V	6A	6A	16A	16A
Wire section (*) *Wire Cross Section (*)*	**12V**	4 mm2 / sq.mm	6 mm2 / sq.mm	6 mm2 / sq.mm	10 mm2 / sq.mm
	24V	2.5 mm2 / sq.mm	4 mm2 / sq.mm	4 mm2 / sq.mm	4 mm2 / sq.mm

(*) maximum length: 5 meters / *maximum length: 5 meters*

! All connection operations described below must be carried out taking care to cut off the power supply.

Never run groups without oil.

1. Make sure that the supply voltage (12 or 24 V) corresponds to the voltage indicated on the motor.

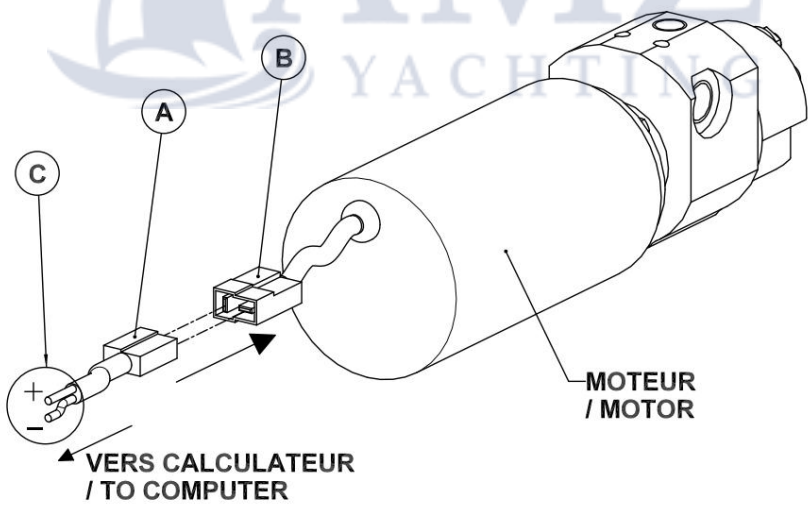
2. Connect the ½ socket **A** supplied with the group to the power supply wires C.

3. Fit the ½ sockets **A** and **B** without taking into account the **+** and **–** polarities

4. Switch on the electrical circuit.

5. Start up the driver according to the manufacturer's instructions.

6. If the unit motor turns in the wrong direction (actuator movement contrary to that requested), reverse the **+** and **–** polarities in ½ socket A.



! *All the electrical connections below must be carried out once the electrical supply has been cut off.*
Never run the power packs without oil.

1. *Check that the serviceable voltage on the boat (12 or 24 V) is the same as the one specified on the motor.*

2. *Connect the "half plug"* **A** *supplied with the power pack to the electric wires C.*

3. *Fit together both "half-plugs"* **A** *and* **B** *without taking into account the* **+** *and* **–** *polarities.*

4. *Turn the power on.*

5. *Put the autopilot electronics into service as per the manufacturer's instructions.*

6. *If the power pack motor turns the wrong way round (motion of the cylinder in the wrong direction), simply reverse* **+** *and* **–** *polarities in the "half-plug" A.*

ELECTRICAL WIRING DIAGRAM OF GROUPS EV2 – EV3 – HVR 1/3 – HF

ELECTRIC CONNECTION DRAWING FOR EV2 – EV3 – HVR 1/3 – HF POWER PACKS

			EV2	EV3	HVR 1/3	HF 1	HF 1.5
Recommended protection ***Recommended protection***	**Engine** ***Motor***	**12V**	25A	30A	32A		
		24V	16A	16A	20A	50A	100A
	Electro-distributor ***Electro-distributor***	**12V**	2A	2A	2A		
		24V	1A	1A	1A	1A	1A
Wire section (*) ***Wire Cross Section (*)***	**Engine** ***Motor***	**12V**	6 mm2 / sq.mm 10 mm2 / sq.mm 10 mm2 / sq.mm				
		24V	4 mm2 / sq.mm 4 mm2 / sq.mm 4 mm2 / sq.mm **12 V** 0.75 mm2 / sq.mm			16 mm2 / sq.mm	25 mm2 / sq.mm
	Electro-distributor ***Electro-distributor***	0.75 mm2 / sq.mm 0.75 mm2 / sq.mm					
		24 V 0.75 mm2 / sq.mm 0.75 mm2 / sq.mm 0.75 mm2 / sq.mm 0.75 mm2 / sq.mm					0.75 mm2 / sq.mm

(*) maximum length: 5 meters / *maximum length: 5 meters*

CONNECTION OF THE ELECTRO - DISTRIBUTOR / *CONNECTION OF THE ELECTRO-DISTRIBUTOR*

! All connection operations described below must be carried out taking care to cut off the power supply.

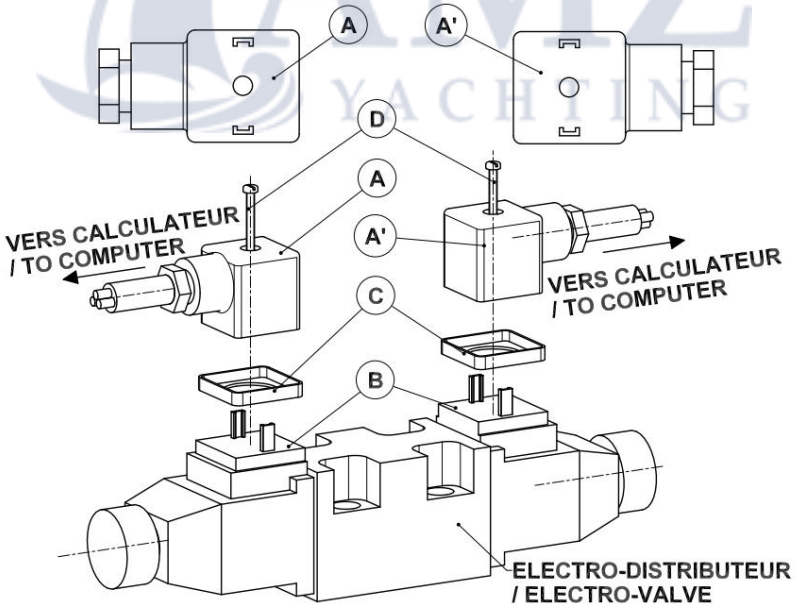
Never run groups without oil.

1. Make sure that the supply voltage (12 or 24 V) corresponds to the voltage indicated on the solenoid distributor.

2. Connect the ends of the cables recommended by the computer manufacturer to the female sockets **A** and **a** (Power supply: U-shaped terminals, no polarity to be respected). Connect the other ends of the cables to the computer.

3. Fit the female sockets **A** and **a** onto the male sockets **B ,** taking care to correctly position the seals C. Secure the assembly using the screws D.

! When starting the pilot, if the cylinder moves in the wrong direction, reverse the female sockets A and a.



! All the electrical connections below must be carried out once the electrical supply has been cut off.
Never run the power packs without oil.

1. *Check that the serviceable voltage (12 or 24 V) is identical to the one indicated on the electro-distributor.*

2. *Connect the electrical wires as specified by the autopilot manufacturer to the female connectors* **A** *and* **a** *(Power supply:* U-shaped *terminals, irrespective of polarity). Connect the other wire ends to the autopilot computer.*

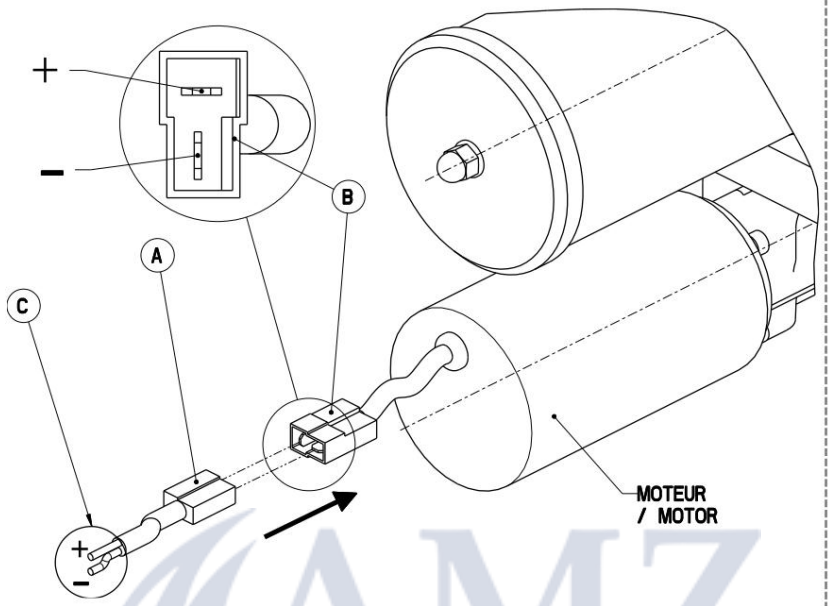
3. *Fit together female plugs* **A** *and* **a** *on male plugs* **B.** *Make sure that seals* **C** *are correctly positioned. Secure the assembly with screws D.*

! When starting the autopilot, invert female plugs* A *and* a *if the cylinder moves in the wrong direction.

CONNECTION OF THE PART : MOTOR OF GROUPS EV2, EV3, HVR 1/3 / *CONNECTION OF THE POWER PACK MOTOR ON EV2, EV3, HVR 1/3*

! All connection operations described below must be carried out taking care to cut off the power supply.
Never run groups without oil.

1. Make sure that the supply voltage (12 or 24 V) corresponds to the voltage indicated on the motor.
2. Connect the ½ socket **A** supplied with the group to the power supply wires **C ,** taking into account the **+** and **–** polarities of the ½ socket B.
3. Fit the ½ sockets **A** and B.
4. Switch on the electrical circuit.
5. Start up the driver according to the manufacturer's instructions.



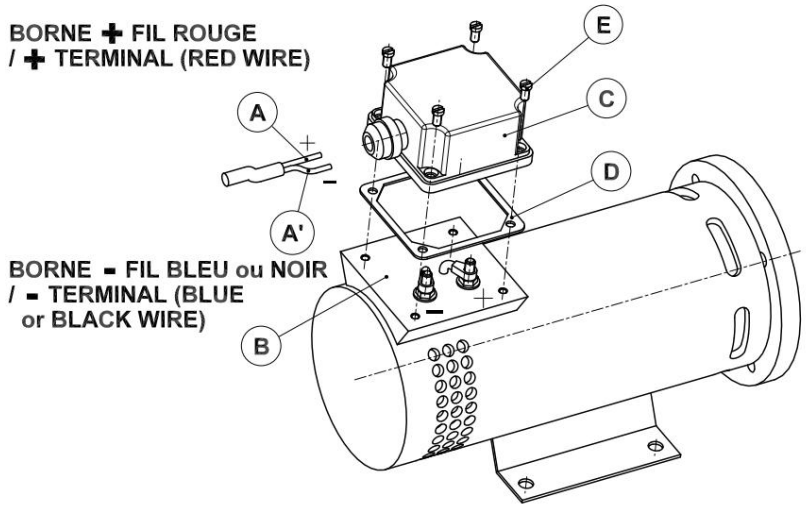
! All the electrical connections below must be carried out once the electrical supply has been cut off.
Never run the power packs without oil.

1. *Check that the serviceable voltage on the boat (12 or 24 V) is the same as the one specified on the motor.*
2. *Connect the "half plug"* **A** *supplied with the power pack to the electric wires C in compliance with the + and – polarities in "half plug" B.*
3. *Fit together both "half-plugs"* **A** *and B.*
4. *Turn the power on.*
5. *Put the autopilot electronics into service as per the manufacturer's instructions.*

CONNECTION OF THE PART : MOTOR DESGROUPES *HF/ CONNECTION OF THE HFUNITMOTOR*

! All connection operations described below must be carried out taking care to cut off the power supply.
Never run groups without oil.

1. Ensure that the supply voltage corresponds to the voltage indicated on the motor.
2. Connect the electrical wires **A** and **a** to the terminals of box **B** respecting the polarities **+** (terminal with red wire) and **–** (terminal with blue or black wire).
3. Close the box **B** with its cover **C ,** taking care to correctly position the seal D. Secure the assembly using the 4 screws E.
4. Switch on the electrical circuit.
5. Start up the driver according to the manufacturer's instructions.



! All the electrical connections below must be carried out once the electrical supply has been cut off.
Never run the power packs without oil.

1. *Check that the serviceable voltage on the boat is the same as the one specified on the motor.*
2. *Connect the electric wires* **A** *and* **A'** *to the terminals on block* **B** *by observing the polarities* **+** *(red wire) and* **–** *(blue or black wire).*
3. *Close the block* **B** *with its cover C. Make sure that seal* **D** *is correctly positioned. Secure the assembly with 4 screws E.*
4. *Turn the power on.*
5. *Put the autopilot electronics into service as per the manufacturer's instructions.*

FILLING AND BLEEDING YOUR SYSTEM

- ÿ **Simple cockpit + group**
- ÿ **Double cockpit + group**
- ÿ **Single and dual cockpit final operations**

Use only **DEXRON II (ATF DII)** oil .

In all cases, make sure that your pipes and your oil remain perfectly clean, as any impurities could cause damage to the hydraulic steering components.

FILLING UP AND BLEEDING THE SYSTEM

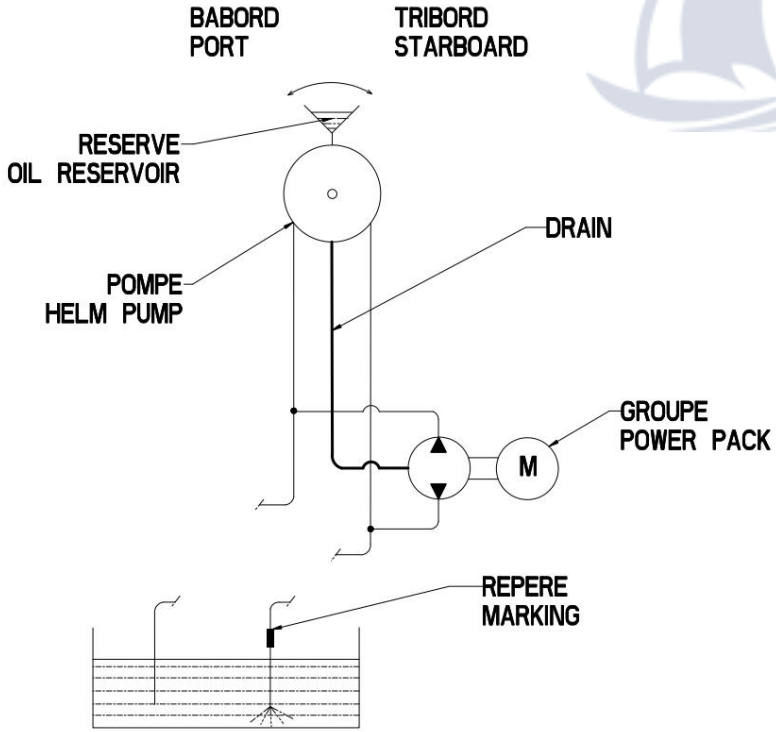
- ÿ ***Single steering Station System + Power Pack***
- ÿ ***Twin Steering Station System + Power Pack***
- ÿ ***Final Operations for Single and Double Steering Station Systems***

*Only use oil **DEXRON II (ATF DII).***

Make sure that the hydraulic piping is perfectly clean and keep the oil free from impurities which may cause the deterioration of the components of the hydraulic steering system.

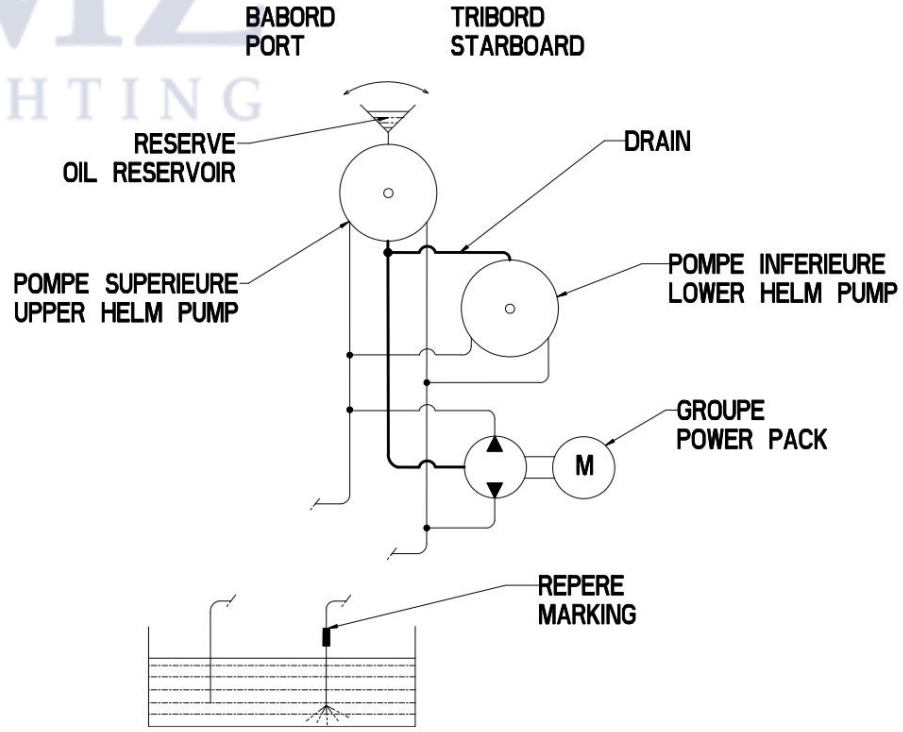
Single cockpit + group RV07, RV1, RV2, RV3

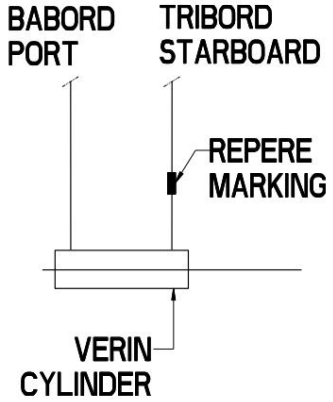
Single Steering Station System + Power Pack RV07, RV1, RV2, RV3



Double cockpit + group RV07, RV1, RV2, RV3

Twin Steering Station System + Power Pack RV07, RV1, RV2, RV3





ÿ Simple cockpit

+ group RV07, RV1, RV2, RV3

ÿ Connect the operating hoses to the manual pump and the group and immerse the other end of the hoses in a container of oil.

ÿ Connect the drain between the manual pump and the group.

ÿ **Install a reserve on the manual pump and keep it constantly filled with oil while purging the circuit.**

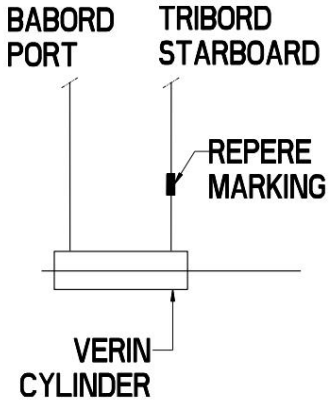
ÿ **RV07 group :** disconnect the drain hose on the group side. When the oil flows without air, reconnect the hose.

ÿ **Groups RV1, RV2, RV3 :** open the group bleeder (1 turn). When the oil flows without air, close the bleeder (3.5 Nm).

ÿ Turn the manual pump slowly on the starboard side (around 15 turns depending on the length of your circuit), then turn the group (same direction of rotation as the manual pump) for 10 to 15 seconds. Locate the discharge hose when it no longer emits air (see diagram).

ÿ Rotate the group on the port side (by reversing the direction of rotation) for 10 to 15 seconds, then the manual pump on the port side (approximately 15 turns), until there is no more air coming out of the unmarked hose.

ÿ Position the cylinder with the rod fully extended on the starboard side of your boat.



ÿ *Single Steering Station System*

+ Power Pack RV07, RV1, RV2, RV3

ÿ *Connect the utilization pipes to the manual helm pump and the power pack. Plunge the other pipe ends into an oil container.*

ÿ *Connect a drain between the manual pump and the power pack.*

ÿ ***Put an oil container on the oil filler neck of the manual helm pump and keep it full of oil during the bleeding process.***

ÿ ***Power pack RV07:*** *disconnect the drain on the power pack. When the oil that comes out is free of air bubbles, connect the drain again.*

ÿ ***Power packs RV1, RV2, RV3:*** *open the bleeder cock on the power pack (1 turn). When the oil that comes out is free of air bubbles, tighten the bleeder cock (3.5 Nm).*

ÿ *Turn the manual pump slowly to starboard (around 15 wheel turns in function of the hydraulic circuit length), then run the power pack (in the same direction as the manual pump) for 10 to 15 seconds. Mark the delivery pipe once there is no air coming out anymore (see drawing).*

ÿ *Run the power pack to port (by reversing the rotation direction) for 10 to 15 seconds, then turn the manual pump to port (around 15 turns) until there is no air coming out of the unmarked pipe.*

ÿ *Position the cylinder with its rod out on the boat starboard side.*

ÿ Connect the hose marked to the cylinder, on the output rod side.
! Do not open the starboard side cylinder bleeder.

ÿ Connect the unmarked hose to the cylinder, on the retracted rod side, and open the cylinder bleeder on the port side.

ÿ Rotate the manual pump slowly on the port side, then the unit (same direction of rotation as the pump). When no more air comes out of the port side cylinder bleeder, close the bleeder (3.5 Nm).

ÿ Open the cylinder bleeder on the starboard side (output rod side).

ÿ Turn the unit on the starboard side, then the manual pump slowly,
also starboard side. When the rod has moved through its entire travel and no more air is coming out of the starboard side cylinder bleeder, close the bleeder (3.5 Nm).

ÿ For final single and double cockpit operations, refer to section **3** at the end of the instructions.

ÿ Double cockpit
+ group RV07, RV1, RV2, RV3

ÿ Connect the operating hoses to the manual pumps and the unit and immerse the other end of the hoses in a container of oil.

ÿ Connect the drains between the manual pumps and the group.

ÿ **Install a reserve on the upper manual pump and the**
keep it constantly filled with oil while bleeding the circuit.

ÿ Open the lower pump filler cap and when the pump is filled with oil, replace the cap.

ÿ **RV07 group :** disconnect the drain hose on the group side. When the oil flows without air, reconnect the hose.

ÿ **Groups RV1, RV2, RV3 :** open the group bleeder (1 turn). When the oil flows without air, close the bleeder (3.5 Nm).

ÿ *Connect the marked pipe to the cylinder on the side where the rod is out.*
! *Do not open the cylinder bleeder cock on starboard.*

ÿ *Connect the unmarked pipe to the cylinder on the side where the rod is in. Open the bleeder cock on port.*

ÿ *Turn the manual pump slowly to port and then run the power pack (in the same direction as the pump). When the oil coming out from the cylinder port bleeder cock is free of air bubbles, close the bleeder cock (3.5 Nm).*

ÿ *Open the cylinder bleeder cock on starboard (side where the cylinder rod is out.)*

ÿ *Run the power pack to port and then turn the manual helm pump slowly to port also. Once the cylinder rod has traveled its complete stroke and the air coming out of the cylinder starboard bleeder cock is free of air bubbles, close the bleeder cock (3.5 Nm).*

ÿ *Please refer to paragraph* **3** *at the end of the manual for the final check list for single or twin steering stations.*

ÿ *Twin Steering Station System*
+ Power Pack RV07, RV1, RV2, RV3

ÿ *Connect the utilization pipes to the manual helm pumps and the power pack. Plunge the other pipe ends into an oil container.*

ÿ *Connect the drains between the manual pumps and the power pack.*

ÿ ***Put an oil container on the oil filler neck of the upper manual helm pump and keep it full of oil during the bleeding process.***

ÿ *Open the filler cap on the lower manual helm pump. Once the pump is full of oil, put the filler cap back on.*

ÿ ***Power pack RV07:*** *disconnect the drain on the power pack. When the oil that comes out is free of air bubbles, connect the drain again.*

ÿ ***Power packs RV1, RV2, RV3:*** *open the bleeder cock on the power pack (1 turn). When the oil that comes out is free of air bubbles, tighten the bleeder cock (3.5 Nm).*

ÿ Turn the upper manual pump slowly on the starboard side (approximately 15 turns depending on the length of your circuit), then the lower manual pump slowly on the starboard side (approximately 15 turns depending on the length of your circuit). Rotate the group (same direction of rotation as manual pumps) for 10 to 15 seconds.

Locate the discharge hose when it no longer emits air (see diagram).

ÿ Rotate the group on the port side by reversing the direction of rotation for 10 to 15 seconds. Turn the lower port side hand pump (approximately 15 turns depending on the length of your circuit), then the upper port side hand pump (approximately 15 turns depending on the length of your circuit), until it there is no more air coming out of the unmarked hose.

ÿ Position the cylinder with the rod fully extended on the starboard side of your boat.

ÿ Connect the hose marked to the cylinder, on the output rod side.
! Do not open the starboard side cylinder bleeder.

ÿ Connect the unmarked hose to the cylinder, on the retracted rod side, and open the cylinder bleeder on the port side.

ÿ Rotate the upper hand pump slowly on the port side, then the lower hand pump and then the unit (same direction of rotation as the pumps). When no more air comes out of the port side cylinder bleeder, close the bleeder (3.5 Nm).

ÿ Open the cylinder bleeder on the starboard side (output rod side).

ÿ Rotate the unit on the starboard side, then the lower manual pump slowly on the starboard side and then the upper manual pump on the starboard side. When the cylinder rod has moved through its entire travel and no more air is coming out of the starboard side cylinder bleeder, close the cylinder bleeder (3.5 Nm).

ÿ For final single and double cockpit operations, refer to section **3** at the end of the instructions.

ÿ *Turn the upper manual pump slowly to starboard (around 15 wheel turns in function of the hydraulic circuit length), then turn the lower manual pump slowly to starboard (around 15 wheel turns in function of the hydraulic circuit length). Run the power pack (in the same direction as the manual pumps) for 10 to 15 seconds. Mark the delivery pipe once there is no air coming out anymore (see drawing).*

ÿ *Run the power pack to port by reversing the rotation direction during 10 to 15 seconds, then turn the lower manual helm pump to port (around 15 turns in function of the hydraulic circuit length). Then turn the upper manual helm pump to port (around 15 turns in function of the hydraulic circuit length) until there is no air coming out of the unmarked pipe.*

ÿ *Position the cylinder with its rod out on the boat starboard side.*

ÿ *Connect the marked pipe to the cylinder on the side where the rod is out.*
***!** Do not open the cylinder bleeder cock on starboard.*

ÿ *Connect the unmarked pipe to the cylinder on the side where the rod is in.*
Open the bleeder cock on port.

ÿ *Turn the upper manual pump slowly to port, then the lower manual pump and then run the power pack (in the same direction as the pumps). When the oil coming out from the cylinder port bleeder cock is free of air bubbles, close the bleeder cock (3.5 Nm).*

ÿ *Open the cylinder bleeder cock on starboard (side where the cylinder rod is out).*

ÿ *Run the power pack to starboard, then turn the lower manual helm pump slowly to starboard also, then turn the upper manual pump in the same direction. Once the cylinder rod has traveled its complete stroke and the air coming out of the cylinder starboard bleeder cock is free of air bubbles, close the bleeder cock (3.5Nm).*

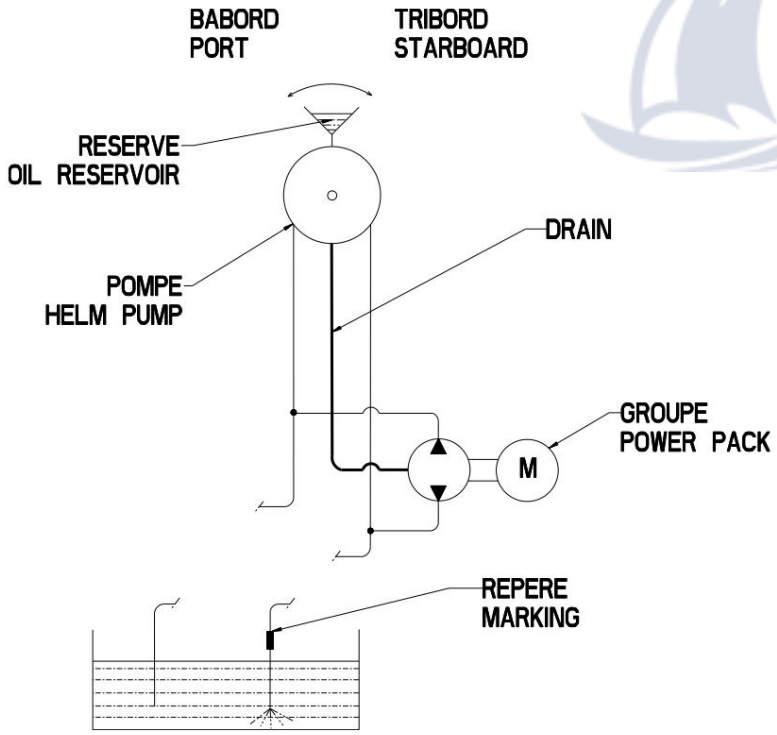
ÿ *Please refer to paragraph 3 at the end of the manual for the final check list for single or twin steering stations.*

Tank capacity of groups EV2 – EV3 – HVR 1/3 – HF
Reservoir Contents on Power packs EV2 – EV3 – HVR 1/3 – HF

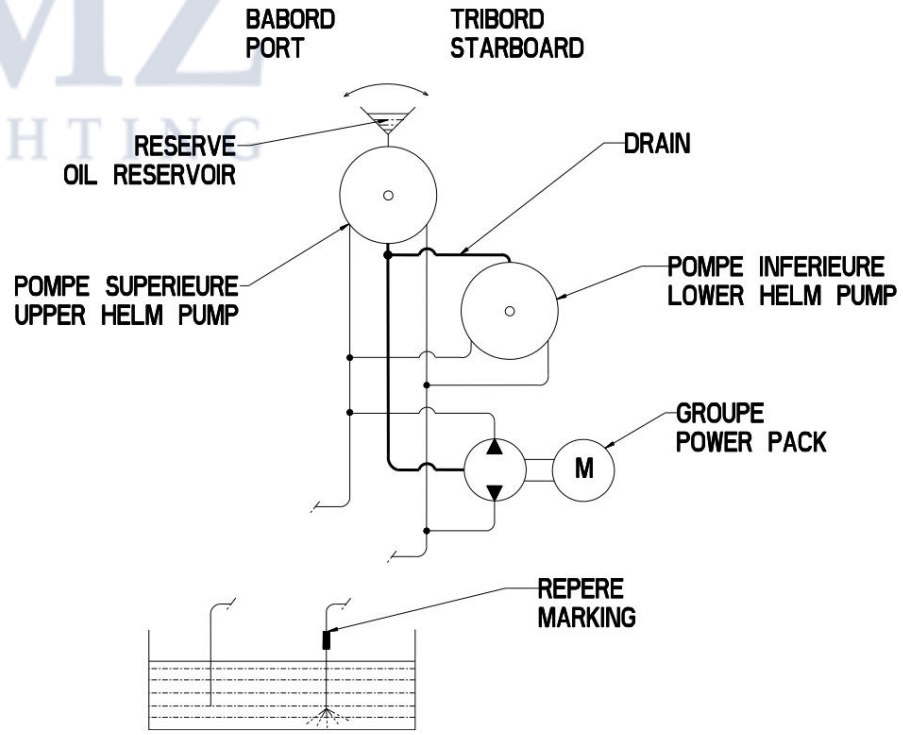
	EV2	EV3	HVR 1/3	HF 1-2.5	HF 1-3	HF 1-4	HF 1-6	HF 1.5-9	HF 1.5-11	HF 1.5-15	HF 1.5-18
1 liter / *1 liter*	X	X	X								
10 liters / *10 liters*				X	X	X					
25 liters / *25 liters*							X	X	X		
50 liters / *50 liters*										X	X

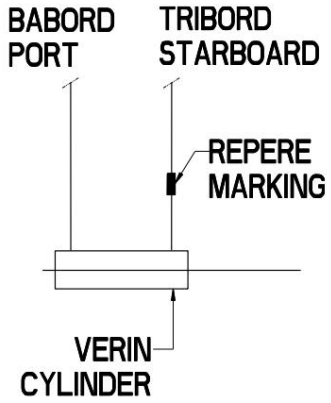
! Pre-set pressure limiter; do not modify its setting / *The pressure limiter has been factory adjusted. Please do not mo*

Single cockpit + group EV2, EV3, HVR 1/3, HF
Single Steering Station System + Power Pack EV2, EV3, HVR 1/3, HF



Double cockpit + group EV2, EV3, HVR 1/3, HF
Twin Steering Station System + Power Pack EV2, EV3, HVR 1/3, HF





ÿ Simple cockpit

+ group EV2, EV3, HVR 1/3, HF

ÿ Connect the operating hoses to the manual pump and the group and immerse the other end of the hoses in a container of oil.

ÿ Connect the drain between the manual pump and the group.

ÿ Fill the group tank (see capacity table) and leave the filling port open.

! For HF groups: leave a buffer of air at the top of the tank of approximately 30 mm to facilitate drain purging.

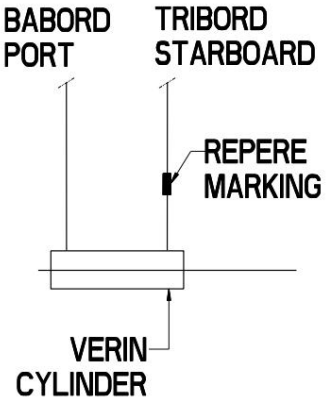
ÿ **Install a reserve on the manual pump and keep it constantly filled with oil while purging the circuit.**

ÿ Purge the drain circuit by filling this reserve and close the drain orifice filling the group tank when it is completely filled.

! For groups EV2 and EV3 : leave the group trap open while purging the drain circuit. Close it (3.5 Nm) when the drain circuit has been purged and the oil flows without air from the bleeder.

ÿ Turn the manual pump slowly on the starboard side (around 15 turns depending on the length of your circuit), then turn the group by powering the coil of the electro-distributor(*) corresponding to the starboard circuit for 10 to 15 seconds . Locate the discharge hose when it no longer emits air (see diagram).

(*) See section "Electrical wiring diagram for groups EV2, EV3, HVR 1/3, HF"



ÿ *Single Steering Station System*

+ Power Pack EV2, EV3, HVR 1/3, HF

ÿ *Connect the utilization pipes to the manual helm pump and the power pack. Plunge the other pipe ends into an oil container.*

ÿ *Connect a drain between the manual pump and the power pack.*

ÿ *Fill up the power pack reservoir with oil (see table of contents). Leave the filler neck open.*

***! HF units:** leave 30 mm air gap on top of the reservoir to facilitate purging the drain.*

ÿ ***Put an oil container on the oil filler neck of the manual helm pump and keep it full of oil during the bleeding process.***

ÿ *Bleed the drain circuit by filling the oil container with oil and close the reservoir oil filler cap on the power pack when full.*

ÿ ! ***Power packs EV2 and EV3:** leave the bleeder cock open on the power pack during the bleeding of the drain circuit. When the drain circuit is bled and the oil coming out of the bleeder cock is free of air bubbles, tighten the bleeder cock (3.5 Nm).*

ÿ *Turn the manual pump slowly to starboard (around 15 wheel turns in function of the hydraulic circuit length), then run the power pack for10 to 15 seconds by applying current to the electro-distributor solenoid (*) corresponding to the starboard circuit. Mark the delivery pipe once there is no air coming out anymore (see drawing).*

(*) Refer to paragraph "Electric Connection Drawing for EV2, EV3, HVR 1/3, HF"

ÿ Run the unit by energizing the coil of the electro-distributor corresponding to the port side circuit for 10 to 15 seconds, then turn the manual pump slowly on the port side (around 15 turns), until it stops. there is more air coming out of the undetected hose.

ÿ Position the cylinder with the rod fully extended on the starboard side of your boat.

ÿ Connect the hose marked to the cylinder, on the output rod side.

! Do not open the starboard side cylinder bleeder.

ÿ Connect the unmarked hose to the cylinder, on the retracted rod side, and open the cylinder bleeder on the port side.

ÿ Turn the manual pump slowly on the port side, then turn the group by powering the coil of the electro-distributor corresponding to the port side circuit. When no more air comes out of the port side cylinder bleeder, close the bleeder (3.5 Nm).

ÿ Open the cylinder bleeder on the starboard side (output rod side).

ÿ Turn the unit on the starboard side by powering the coil of the electro-distributor corresponding to the starboard circuit, then the manual pump slowly, also on the starboard side. When the cylinder rod has moved through its entire travel and no more air is coming out of the starboard side cylinder bleeder, close the bleeder (3.5 Nm).

ÿ For final single and double cockpit operations, refer to section **3** at the end of the instructions.

ÿ Double cockpit
+ group EV2, EV3, HVR 1/3, HF

ÿ Connect the operating hoses to the manual pumps and the unit and immerse the other end of the hoses in a container of oil.

ÿ Connect the drains between the manual pumps and the group.

ÿ Fill the group tank (see “Capacity table” section)
and leave the fill port open.

! For HF groups: leave a buffer of air at the top of the tank of approximately 30 mm to facilitate drain purging.

ÿ **Install a reserve on the upper manual pump and the**
keep it constantly filled with oil while bleeding the circuit.

ÿ Purge the drain circuit by filling this reserve and close the drain orifice
filling the group tank when it is completely filled.

ÿ *Run the power pack for 10 to 15 seconds to port by applying current to the electro-distributor solenoid corresponding to the port circuit, then turn the manual helm pump slowly to port (by around 15 turns) until there is no air coming out of the unmarked pipe.*

ÿ *Position the cylinder with its rod out on the boat starboard side.*

ÿ *Connect the marked pipe to the cylinder on the side where the rod is out.*

! *Do not open the cylinder bleeder cock on starboard.*

ÿ *Connect the unmarked pipe to the cylinder on the side where the rod is in.*
Open the bleeder cock on port.

ÿ *Turn the manual pump slowly to port and then run the power pack by*
applying current to the electro-distributor solenoid corresponding to the port circuit. When the oil coming out from the cylinder port bleeder cock is free of air bubbles, close the bleeder cock (3.5 Nm).

ÿ *Open the cylinder bleeder cock on starboard (side where the cylinder rod is out).*

ÿ *Run the power pack to starboard by applying current to the electro-distributor solenoid corresponding to the starboard circuit and then turn the manual helm pump slowly to starboard also. Once the cylinder rod has traveled its complete*
stroke and the air coming out of the cylinder starboard bleeder cock is free of air bubbles, close the bleeder cock (3.5 Nm).

ÿ *Please refer to paragraph 3 at the end of the manual for the final check list for single or twin steering stations.*

ÿ *Dual steering station systems*
+ power pack EV2, EV3, HVR 1/3, HF

ÿ *Connect the utilization pipes to the manual helm pumps and the power pack. Plunge the other pipe ends into an oil container.*

ÿ *Connect a drain between the manual helm pumps and the power pack.*

ÿ *Fill up the power pack reservoir with oil (see table of contents). Leave the filler neck open.*

! ***HF units:*** *leave 30 mm air gap on top of the reservoir to facilitate purging the drain.*

ÿ ***Put an oil container on the oil filler neck of the upper manual helm pump and keep it full of oil during the bleeding process.***

ÿ *Bleed the drain circuit by filling the oil container with oil and close the reservoir oil filler cap on the power pack when full.*

! For groups EV2 and EV3 : leave the group trap open while purging the drain circuits. Close it (3.5 Nm) when the drain circuit bleeding is complete and the oil flows without air from the drain valve.

ÿ Turn the upper manual pump slowly on the starboard side (approximately 15 turns depending on the length of your circuit), then the lower manual pump slowly on the starboard side (approximately 15 turns depending on the length of your circuit). Run the unit by energizing the coil of the electro-distributor(*) corresponding to the starboard circuit for 10 to 15 seconds. Locate the discharge hose when it no longer emits air (see diagram).

ÿ Rotate the group by powering the coil of the electro-distributor corresponding to the port circuit for 10 to 15 seconds. Turn the lower hand pump slowly on the port side (approximately 15 turns depending on the length of your circuit), then the upper hand pump slowly on the port side (approximately 15 turns depending on the length of your circuit), until There is no longer any air coming out of the unmarked hose.

ÿ Position the cylinder with the rod fully extended on the starboard side of your boat.

ÿ Connect the hose marked to the cylinder, on the output rod side.
! Do not open the starboard side cylinder bleeder.

ÿ Connect the unmarked hose to the cylinder, on the retracted rod side, and open the cylinder bleeder on the port side.

ÿ Turn the upper manual pump slowly on the port side, then the lower manual pump and then the unit by supplying the coil of the electro-distributor corresponding to the port side circuit. When no more air comes out of the port side cylinder bleeder, close the bleeder (3.5 Nm).

ÿ Open the cylinder bleeder on the starboard side (output rod side).

ÿ Turn the unit on the starboard side by powering the coil of the electro-distributor corresponding to the starboard circuit, then the lower manual pump slowly on the starboard side and then the upper manual pump on the starboard side. When the cylinder rod has moved through its entire travel and no more air is coming out of the starboard side cylinder bleeder, close the cylinder bleeder (3.5 Nm).

ÿ For final single and double cockpit operations, refer to section **3** at the end of the instructions.

(*) See section "Electrical wiring diagram for groups EV2, EV3, HVR 1/3, HF"

! Power packs EV2 and EV3: *leave the bleeder cock open on the power pack during the bleeding of the drain circuits. When the drain circuits are bled and the oil coming out of the bleeder cock is free of air bubbles, tighten the bleeder cock (3.5 Nm).*

ÿ *Turn the upper manual helm pump slowly to starboard (around 15 wheel turns in function of the hydraulic circuit length), then turn the lower manual helm pump slowly to starboard (around 15 wheel turns in function of the hydraulic circuit length). Run the power pack for 10 to 15 seconds by applying current to the electro-distributor solenoid* ***(*)*** *corresponding to the starboard circuit. Mark the delivery pipe once there is no air coming out anymore (see drawing).*

ÿ *Run the power pack for 10 to 15 seconds to port by applying current to the electro-distributor solenoid corresponding to the port circuit. Turn the lower manual helm pump slowly to port (by around 15 turns in function of the hydraulic circuit length), then turn the upper manual helm pump slowly (by around 15 turns in function of the hydraulic circuit length) until there is no air coming out of the unmarked pipe.*

ÿ *Position the cylinder with its rod out on the boat starboard side.*

ÿ *Connect the marked pipe to the cylinder on the side where the rod is out.*
! *Do not open the cylinder bleeder cock on starboard.*

ÿ *Connect the unmarked pipe to the cylinder on the side where the rod is in. Open the bleeder cock on port.*

ÿ *Turn the upper manual pump slowly to port and then the lower manual pump in the same direction. Run the power pack by applying current to the electro-distributor solenoid corresponding to the port circuit. When the oil coming out from the cylinder port bleeder cock is free of air bubbles, close the bleeder cock (3.5 Nm).*

ÿ *Open the cylinder bleeder cock on starboard (side where the cylinder rod is out).*

ÿ *Run the power pack to starboard by applying current to the electro-distributor solenoid corresponding to the starboard circuit. Turn the lower manual pump slowly to starboard and then the upper manual pump in the same direction. Once the cylinder rod has traveled its complete stroke and the air coming out of the cylinder starboard bleeder cock is free of air bubbles, close the bleeder cock (3.5 Nm).*

ÿ *Please refer to paragraph 3 at the end of the manual for the final check list for single or twin steering stations.*

(*) Refer to paragraph "Electric Connection Drawing for EV2, EV3, HVR 1/3, HF"

ÿ Final Operations Single and Twin Steering Stations

ÿ Remove the oil reserve previously installed on the pump. ÿ Top up the oil level, leaving approximately 25 mm of air in the pump. ÿ Screw the filling cap delivered into the fixing pouch. ÿ Recommended impeller diameter = Consult the instructions supplied with the pump.

Checking correct operation

ÿ That a rotation of the steering wheel to the right (SH) or starboard, moves the boat towards starboard. ÿ That the circuit is well purged.

ÿ That there are no leaks at the connections, pumps, cylinder, groups and to the hoses.

ÿ That the pump is correctly filled with oil (only the upper pump for double shifts).

ÿ That the nuts and screws are tightened to the indicated torques.

ÿ That the hoses describe normal curves and are not flattened.

ÿ All these checks are necessary after each wintering.

ÿ Final Check List for Single and Twin Steering Statio

ÿ *Remove the oil reservoir previously installed on the pump.*

ÿ *Fill up the oil in the pump by leaving a 25 mm air gap on top.*

ÿ *Screw on the filler cap provided in the mounting kit.*

ÿ *Recommended wheel diameter: refer to the manual supplied with the pump.*

Test Check Operation

ÿ *Check that the boat turns to starboard when the wheel is turned clockwise.*

ÿ *Check that the circuit has been correctly corrected.*

ÿ *Check that the connections, the pumps, the cylinder, the power packs and the flexible tubes do not leak.*

ÿ *Check that the oil level in the pump is correct* ***(for twin steering stations, only check the upper pump).***

ÿ *Check that the nuts and screws are tightened at the indicated torque.*

ÿ *Check that the tubes follow a normal path without loops and are not squeezed.*

ÿ *These verifications should be carried out after every wintering period.*

NOTES

NOTES

GUARANTEE

1) The manufacturer guarantees the equipment sold and supplied by him against any defect or defect in manufacturing and operation, whether due to a defect in the design, raw materials, manufacturing or execution and this under the conditions and within the following limits:

2) The guarantee is only applicable if the customer has fulfilled the general obligations of this contract and in particular the payment conditions.

3) The warranty is strictly limited to supplies sold by the manufacturer. It does not extend to the equipment in which the supplies are incorporated and, in particular, to the performance of this equipment.

4) When the manufacturer's supplies are incorporated by the customer, or a third party, into any material, they are solely responsible for the adaptation, choice and adequacy of the manufacturer's supplies, the diagrams, studies and The manufacturer's projects are only given for information purposes, unless specifically stipulated in the acceptance of the order. The manufacturer does not guarantee in particular either the elements and materials not sold by it, nor against defects in assembly, adaptation, design,
relationship and functioning of the whole or parts of the whole thus created. The manufacturer's supplies, as well as the assembly created by the customer or a third party, are presumed to be operated and used under the direction and exclusive control of the customer or third party.

5) The warranty period is eighteen months from the date of first use by the original consumer or twenty-four months from the date of delivery of the products to the carrier, distributor or wholesaler. The manufacturer is entitled to require from the customer proof of the commissioning date indicated on the warranty request. This period is neither extended nor interrupted by the customer's amicable or legal complaint. At the end of this period, the guarantee ceases automatically.

6) The manufacturer's warranty obligation can only apply if the customer establishes that the defect appeared under the conditions of use normally provided for the type of supply, or indicated by the manufacturer in writing, and during normal use. It does not apply in the event of user fault, negligence, carelessness, lack of supervision or maintenance, failure to comply with recommendations or use instructions, use of insufficient quality oil. The manufacturer is not responsible for any damage caused by oil loss or leaks. Any warranty is also excluded for incidents resulting from fortuitous events or force majeure, as well as for damage, replacements or repairs resulting from normal wear and tear of the equipment.

7) The guarantee is limited to the obligation to restore in the manufacturer's workshops, at its expense and as quickly as possible, the materials and parts supplied by it, recognized as defective by its technical services, and which have been addressed free of charge, without any compensation being claimed for any damage suffered, such as accidents to persons, damage to property other than that forming the subject of this contract, loss of use, loss of business, commercial damage or loss of earnings. During the warranty period, the costs of labor, dismantling and reassembly of the equipment outside the manufacturer's workshops, the costs of transferring defective or replaced or repaired equipment, the travel and living expenses of the technicians are to be paid. the customer's responsibility.
When guarantees are given as to the industrial results of a given material, the definition of these results and the
The consequences of this commitment will be the subject of a special agreement between the parties.

8) To be able to claim the benefit of the guarantee, the customer must notify the manufacturer without delay and in writing of the defects which he attributes to his equipment and provide all justification as to the reality of these. He must give the manufacturer every facility to identify defects and remedy them. The warranty does not apply if the equipment is not returned to the manufacturer in the condition in which it broke down, or if it has previously been unleaded, dismantled, repaired, modified, either by a third party or by the user or customer. After having been regularly notified of the defect in its equipment, the manufacturer will remedy this defect as soon as possible, reserving, if necessary, the right to modify all or part of the equipment, so as to satisfy its obligations.

9) The customer agrees that the manufacturer will not be liable for damages caused by the customer's failure to fulfill any of the obligations as defined above.

GUARANTEE

1) The manufacturer guarantees the equipment sold and supplied against any faulty manufacturing or defects whether they are the result of the design, the raw material, the manufacturing or construction under the terms and restrictions indicated below:

2) The guarantee is applicable only if the client has satisfied the general obligations of this contract, in particular, the terms of payment.

3) The guarantee only includes equipment sold by the manufacturer. It does not extend to equipment in which the manufacturer's supply has been installed and, in particular, to the performances of this equipment.

4) When the manufacturer's supplies are installed by the client or a third party into any other equipment, they remain solely responsible for this installation, the selection and suitability of the manufacturer's supplies as the manufacturer's diagrams, designs and proposals are given as an indication only , unless otherwise specified in the order. In particular, the manufacturer does not guarantee components or equipment not sold by him, nor the assembly adaptation, design or operation of the assembly or parts of the assembly thus created. The manufacturer's supply, as well as the assembly created by the client or a third party, are assumed to be operated under the exclusive control of the client or the third party.

5) The period of the guarantee is eighteen months starting from the date of first use by the original consumer or twenty four months from the date of delivery of the products to the transporter, distributor or wholesaler. The manufacturer has the right to require from the client proof of the commissioning date specified on the guarantee request. This delay is neither extended nor interrupted through legal or amicable claims on the part of the client. At the end of this period, the guarantee is terminated without further consideration.

6) The obligation of the guarantee only applies if the client establishes that the defect appeared under normal operating conditions stipulated for this type of supply, or indicated by the manufacturer in writing and during normal operation. It does not apply in case of negligence, faulty maintenance or supervision, operator's responsibility, imprudence, non observance of recommended or operating instructions, or the use of oil of insufficient quality for the equipment. The manufacturer is released from responsibility for any damage caused by loss of oil or leaks. The guarantee also does not apply for any incidents resulting from Acts of God, as well as any damage, replacement or repairs exceeding the normal material wear.

7) The guarantee is limited to the repair in the manufacturer's shop at his own cost within the shortest possible time, of the equipment and parts supplied by him, identified as defective by the technical department. These parts must be sent pre-paid. No claim may be made for compensation for any damage such as personal injury, damage to goods other than those concerned in this contract, deprivation of possession, operating losses, commercial damage or loss of earnings. During the guarantee period, the cost of labor, dismantling and reassembly of the equipment outside the manufacturer's plant, the shipping costs for repaired, replaced or faulty equipment, traveling and accommodation expenses for technicians are the responsibility of the client.
When guarantees are given on the industrial results a specific equipment is to achieve, these results and consequences of this undertaking will be recorded in a special agreement between the parties.

8) In order to take advantage of this guarantee, the client must notify the manufacturer in writing as soon as possible of the defects attributed to the equipment and provide any proof concerning these defects. He must do his best for the manufacturer to be able to ascertain these defects and to carry out corrective actions. The guarantee does not apply if the equipment is not returned to the manufacturer in the state in which it broke down or if it has previously been disassembled, repaired, modified either by a third party, the user or the client.

After receiving proper notification of the failure, the manufacturer shall correct this fault as soon as possible, reserving the right, if applicable, to modify all or part of equipment in order to fulfill the obligations.

9) The client agrees that the manufacturer will not be responsible for damage due to the fact that the client has not satisfied anyone of the obligations defined above.