



HYDRAULIC STEERING SYSTEMS

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CONTENTS

	Pages
• Introduction – Description	1
• Working Principle	2
• Selection of a Hydraulic Steering System	3
• Assembly Diagrams of Hydraulic Steering Systems	4
• Hydraulic Steering Systems for Outboard Motors	5 to 12
• Power Assist Hydraulic Steering Systems for Outboard Motors	13 to 14
• Hydraulic Steering Systems for Racing	15
• Accessories for Outboard Steering Systems	16
• Hydraulic Steering Systems for Stern-Drives	17
• Hydraulic Steering Systems for Inboard Motor Boats	18 to 27
• Double Cylinder Systems from 105 to 2,495 kpm	28
• Hydraulic Electro-Pump Units for Autopilots	29 to 34
• Power assist Hydraulic Steering Systems for Inboard Motors	35 to 36
• Tiller arms	37
• Other Pump and Cylinder Models	38
• Steering Wheels	39 - 40
• Flexible Tubes	41
• Fittings	42
• Optional Additions to our Steering Systems	43
• Guarantee	

HYDRAULIC STEERING SYSTEMS

INTRODUCTION

L.S Hydraulic Steering Systems

Our hydraulic steering systems **are perfectly adapted** to outboard and inboard motor boats and pleasure, sporting, fishing and commercial applications and to monohull and multihull sailing-boats.

They **are easy to install**, state of the art machine finished and **made to resist a marine environment**.

You can easily select **the best suited system for your boat** within a range of more than **20 pumps, 40 cylinders** and **18 power packs for autopilots** which will provide **efficiency, reliability and smoothness**.

Our systems carry a **2 year warranty** and our range of cylinders for fishing and work boats **is approved** by Classification Societies such as **BV, ABS, LRS, GL** and others.

All our cylinders and pumps are **CE** approved.

DESCRIPTION OF L.S HYDRAULIC STEERING SYSTEMS

As a general rule, the basic set up of a steering system includes:

- 1 cylinder,
- 1 manual pump,
- tubing to connect the cylinder to the manual pump.

Other elements will be added to this basic set up in function of the number of steering stations, outboard motors or rudders to be operated, and of the installation of a power unit for automatic or non automatic pilot.

Cylinder

The cylinder is the dictating element towards the selection of a system as it gives the power to the steering system. To select a cylinder, follow the instructions on page 3.

Manual pump

The manual pump is an axial piston pump which makes it possible to suck and force back the oil contained in the circuit when the wheel is turned. Its cubic capacity determines the number of turns required for a lock to lock manoeuvre. The pump is fitted with a lock valve which prevents rudder or motor movement when the helm is not operated. Some models are fitted with pressure relief valves which protect the circuit against abnormal pressure increase.

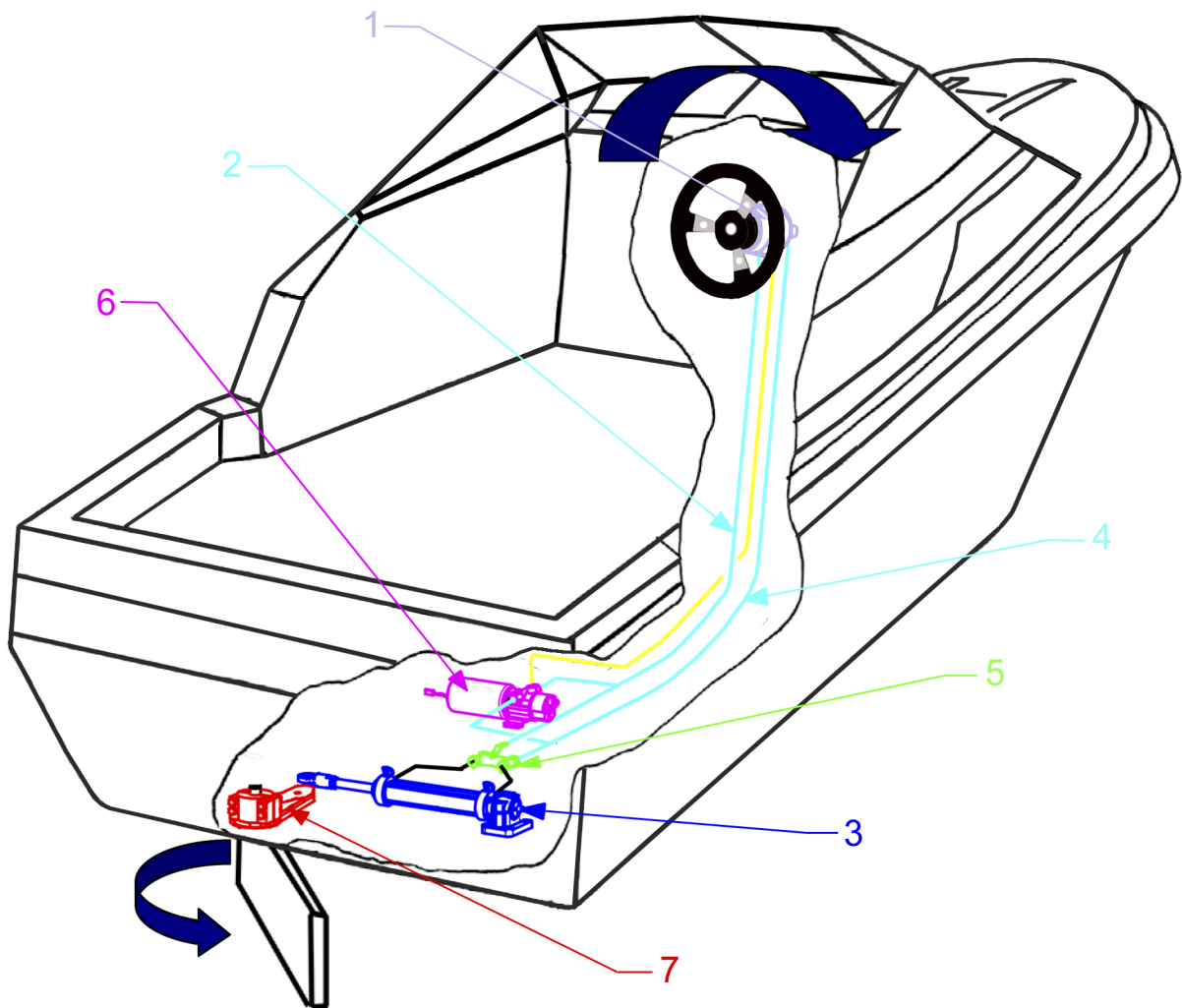
Tubing

Only tubing designed for hydraulic transfer is to be used. The tube diameter is calculated in function of the pump cubic capacity (see charts pages 19, 20 and 24). Maximum efficiency is achieved with inflexible tubing, however flexible tubing may be used for torque levels not exceeding 100 kpm.

HYDRAULIC STEERING SYSTEMS

WORKING PRINCIPLE

- (1) Manual pump
- (2) (4) Tubing
- (3) Cylinder
- (5) By-pass valve
- (6) Power pack
- (7) Tiller arm



When the helm is turned to starboard, the pump (1) sucks the oil from the port circuit (2) and pushes it back into the starboard circuit (4), thus driving the cylinder rod (3) which in turn displaces the rudder or motor. The cylinder body (3) is fixed to the boat.

HYDRAULIC STEERING SYSTEMS

SELECTION OF A HYDRAULIC STEERING SYSTEM

- **For boats fitted with outboard motors**, it is necessary to determine the maximum horse power developed by the motor.

For two motors working in the same rotational direction, add the power of both motors.

For two motors working in counter-rotation, take into account the power of one motor only.

Examples:

For the installation of 1 x 240 H.P.	1 LS 232 C or 1 LS 300 PRO
For the installation of 2 x 115 H.P. (same rotational direction)	1 LS 232 C or 1 LS 300 PRO
For the installation of 2 x 115 H.P. (in counter rotation)	1 LS 2428

If your motor is equipped with a four blade propeller, please contact us.

See our outboard steering systems on pages 5 to 15.

- **For boats fitted with a rudder** with speed not exceeding 25 knots, the torque of the rudder or rudders is calculated according to following formula and corrections.

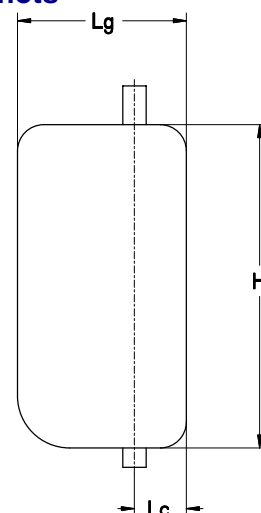
It must be known that the torque necessary to manoeuvre a boat depends on:

- the speed of the water flowing on the surface of the rudder at a certain angle,
- the rudder size,
- the total sweep of the rudder (and part of the boat), if the rudder shaft is not perpendicular,
- the compensating surface of the rudder.

Torque Calculation Formula for Speed below 25 Knots

$$C = S \times [(0.4 Lg) - Lc] \times V^2 \times K$$

- C = Torque in kpm
 S = Total surface of rudder (H x Lg) in sq. m
 H = Height of rudder in m
 Lg = Width of rudder in m
 Lc = Compensation width in m
 V = Maximum speed of the boat in knots
 K = Coefficient according to total angle of rudder
- Port to starboard 70° **K = 15.89**
 - Port to starboard 80° **K = 17.80**
 - Port to starboard 90° **K = 19.52**



Corrections in function of the type of boat:

- For sailing-boats **C x 0.5**
- For a boat with a steering nozzle **C x 2.0**
- For twin engine power boats with 1 rudder **C x 0.5**
- For boats fitted with several rudders (catamarans, trimarans, monohulls), multiply the calculated torque result by the number of rudders fitted on the boat.

Once the torque is known, the appropriate cylinder is selected (pages 18 or 23) and one or two manual pumps will be added accordingly (pages 18 or 23).

Warning: *If you select a pump with a higher flow rate in order to reduce the number of wheel turns, you will have to fit a wheel with a bigger diameter (see page 39).*

- **For pleasure boats with planing or semi-planing hulls** and speed exceeding 25 knots, the cylinder may be selected by using the chart below:

Length of Hull	Cylinder Type – 1 Rudder	Cylinder Type – 2 Rudders
8 metres	VHM 40 DTP – code 2200075 page 22	VHM 32 DTP – code 2200059 page 21
10 metres	VHM 40-254 – code 2200496 page 22	VHM 40 DTP – code 2200075 page 22
12 metres	VHM 40-254 – code 2200496 page 22	VHM 40 DTP – code 2200075 page 22
14 metres	VHM 50 DTP – code 2200497 page 22	VHM 40-254 – code 2200496 page 22

This chart is given as an indication only

HYDRAULIC STEERING SYSTEMS

ASSEMBLING DIAGRAMS OF HYDRAULIC STEERING SYSTEMS

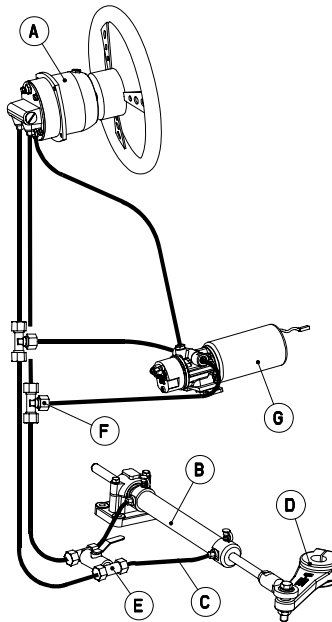
Single station + lock valve



A - 1 pump + LV + fittings
B - 1 cylinder
C - 2 hoses + fittings

Option D - tiller arm
E - by-pass valve

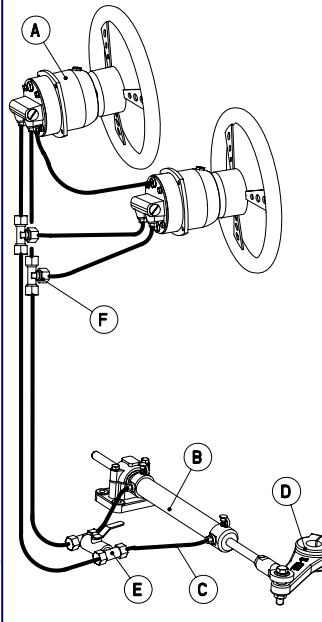
Single station + lock valve + power pack



A - 1 pump + LV + fittings
B - 1 cylinder
C - 2 hoses + fittings
F - tees + connection fittings
G - 1 power pack

Option D - tiller arm
E - by-pass valve

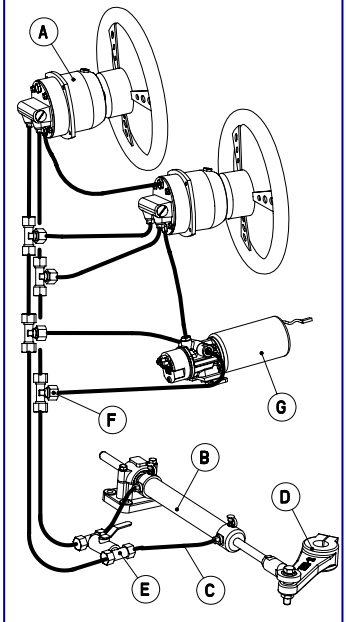
Double station + lock valve



A - 2 pumps + LV + fittings
B - 1 cylinder
C - 2 hoses + fittings
F - tees + connection fittings

Option D - tiller arm
E - by-pass valve

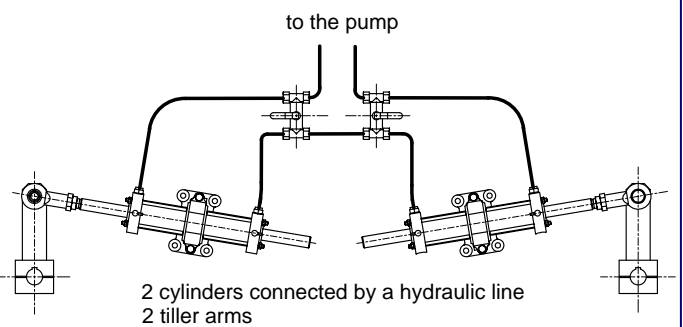
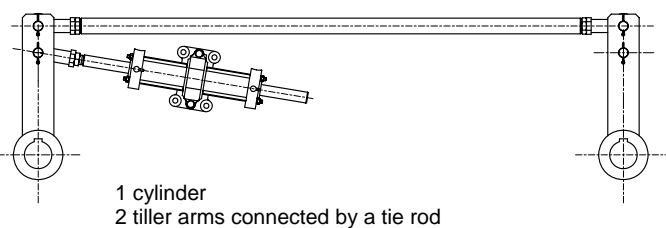
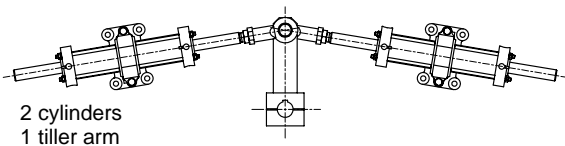
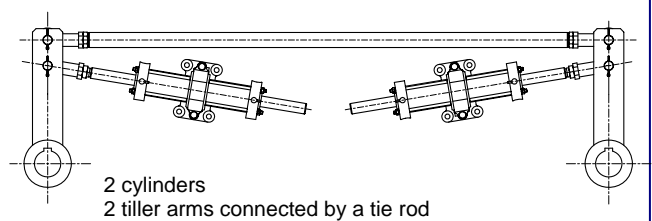
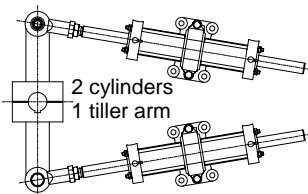
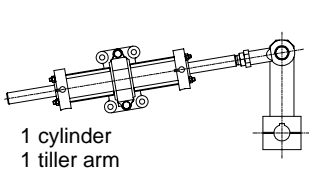
Double station + lock valve + power pack



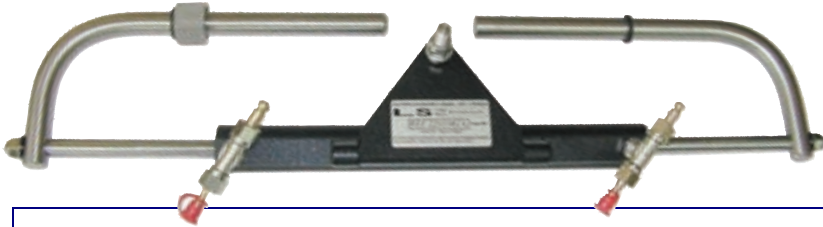
A - 2 pumps + LV + fittings
B - 1 cylinder
C - 2 hoses + fittings
F - tees + connection fittings
G - 1 power pack

Option D - tiller arm
E - by-pass valve

POSSIBLE ASSEMBLIES



HYDRAULIC STEERING SYSTEMS FOR OUTBOARD MOTORS

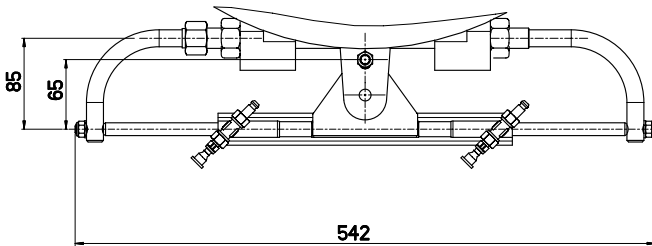


FOR OUTBOARD MOTORS UP TO 75 H.P.
(contact us for boat speed exceeding 40 knots)

LS 2024 2201982 Pump 201 HB with lock valve + fittings + cylinder VHM 224 + fittings + 10 m of flexible tube

PORT TO STARBOARD 3.6 turns

Code of elements that can make up a complete kit

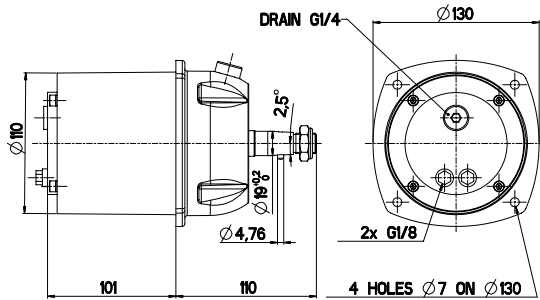
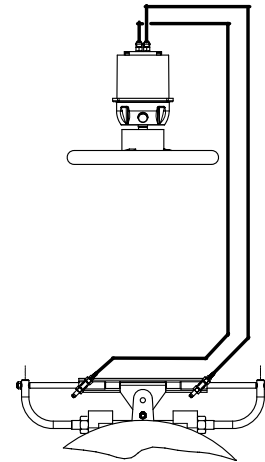


2201980	Pump 201 HB with lock valve
2201981	Cylinder VHM 224 + fittings
2201989	Set of fittings for pump 201 HB
2200810	Ø 6 mm flexible tube (per metre)
2200017	Oil (2 litre can)

- 1 motor
- 1 cylinder
- 1 pump

2201981 VHM 224

Weight: 2 kg

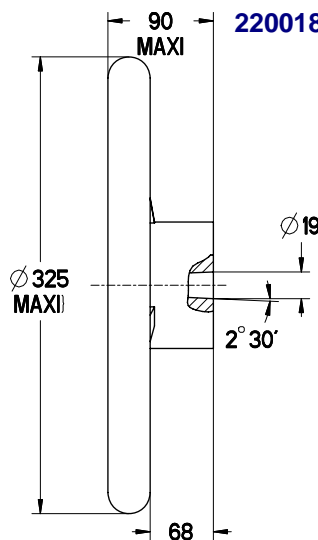


2201980 201 HB with lock valve

Weight: 2.7 kg

2200181 Plastic wheel

2200182 Imitation leather/anodised aluminium wheel



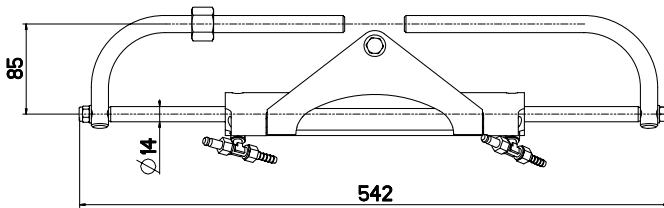
HYDRAULIC STEERING SYSTEMS FOR OUTBOARD MOTORS



**FOR OUTBOARD MOTORS UP TO 150 H.P.
(230 H.P. for two motors working in counter-rotation)
Contact us for boat speed exceeding 40 knots**

LS 2428 **2202274** Pump 201 HB with lock valve + fittings + cylinder VHM EX 281 + fittings + 10 m flexible tube
PORT TO STARBOARD 4.8 turns

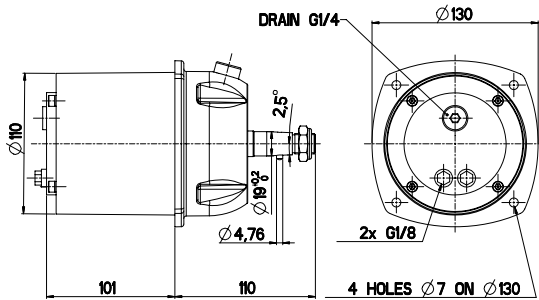
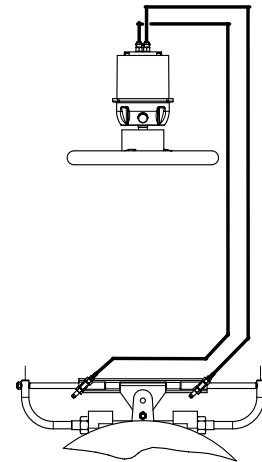
Code of elements that can make up a complete kit



- 2201980** Pump 201 HB with lock valve
- 2202275** Cylinder VHM EX 281 + fittings
- 2201989** Set of fittings for pump 201 HB
- 2200810** Ø 6 mm flexible tube (per metre)
- 2200017** Oil (2 litre can)

- 1 motor
- 1 cylinder
- 1 pump

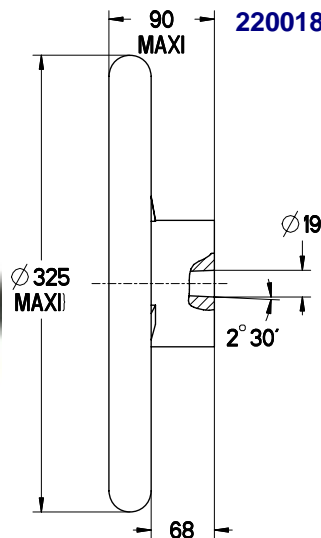
2202275 VHM EX 281 **Weight: 2.8 kg**



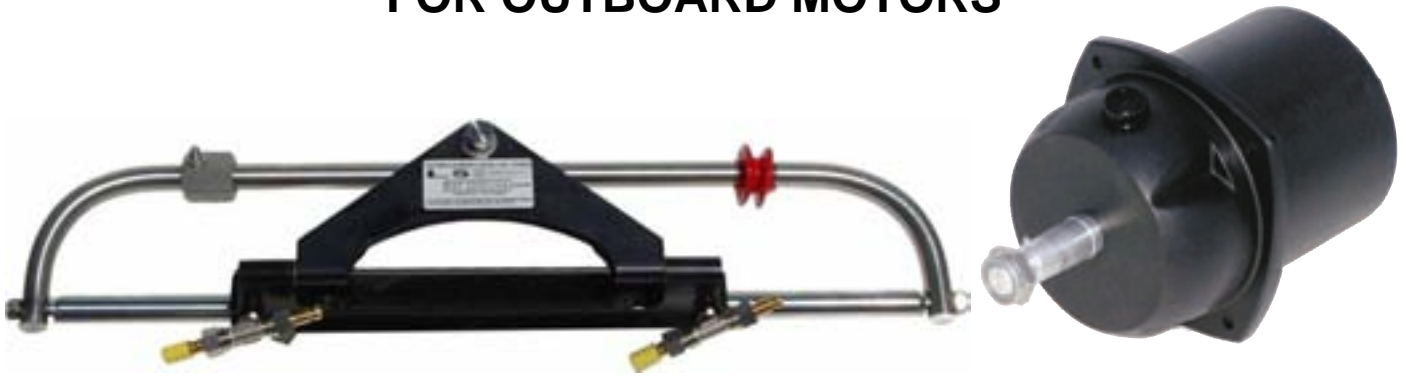
2201980 201 HB with lock valve **Weight: 2.7 kg**

2200181 Plastic wheel

2200182 Imitation leather/anodised aluminium wheel



HYDRAULIC STEERING SYSTEMS FOR OUTBOARD MOTORS



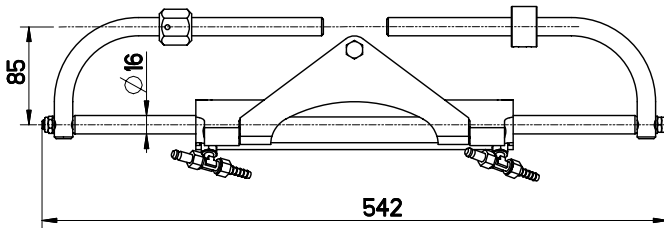
FOR OUTBOARD MOTORS UP TO 200 H.P. (350 H.P. for two motors working in counter-rotation)

LS 2832 2202112 Pump 281 HB with lock valve + fittings + cylinder VHM EX 321 + fittings + 10 m of flexible tube

PORT TO STARBOARD 4.5 turns

Code of elements that can make up a complete kit

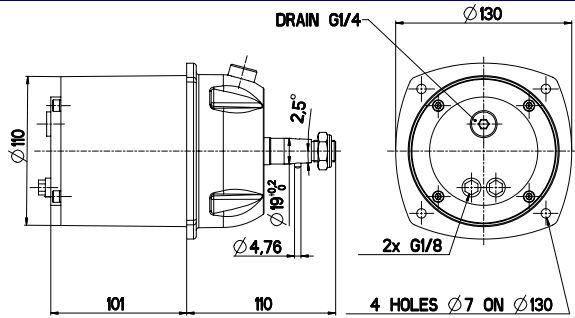
2202113	Pump 281 HB with lock valve
2202114	Cylinder VHM EX 321 + fittings
2202115	Set of fittings for pump 281 HB
2200024	Ø 8 mm flexible tube (per metre)
2200017	Oil (2 litre can)



- 1 motor
- 1 cylinder
- 1 pump

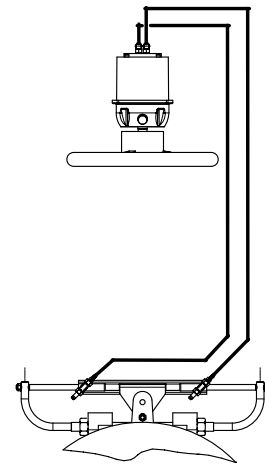
2202114 VHM EX 321

Weight: 2.8 kg

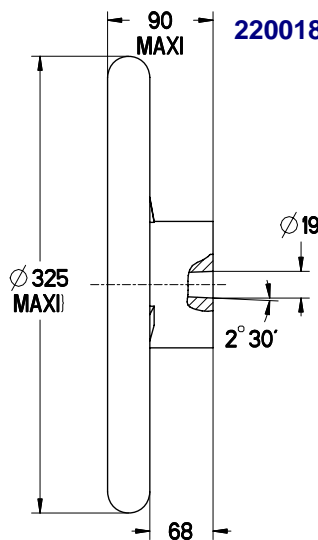


2202113 281 HB with lock valve

Weight: 2.7 kg



2200181 Plastic wheel



2200182 Imitation leather/anodised aluminium wheel



HYDRAULIC STEERING SYSTEMS FOR OUTBOARD MOTORS



FOR OUTBOARD MOTORS UP TO 300 H.P. (500 H.P. for two motors working in counter-rotation)			
LS 300 PRO/26 2202645 Pump 26 HB with lock valve + fittings + cylinder VHM 300 PRO + s/steel fittings + 10 m of flexible tube PORT TO STARBOARD 5.3 turns	Code of elements that can make up a complete kit	Type of pump	Nb of turns lock to lock
	2202644 Pump 20 HB with lock valve G ¼	Page 19 2202644 20 HB with lock valve G ¼	7
	2200948 Pump 26 HB with lock valve		
	2200950 Pump 30 HB with lock valve		
	2202305 Cylinder VHM 300 PRO RI	Page 19 2200948 26 HB with lock valve	5.3
	2200021 Set of pump fittings		
	2201733 Set of s/steel cylinder fittings.		
	2200038 Set of s/steel pump fittings		
2200047 Set of tees for Ø8 mm flex tube	Page 19 2200950 30 HB with lock valve	4.5	
2200024 Ø8 mm flexible tube (per metre)			
2200017 Oil (2 litre can)	2202103 300 PRO tie rod length 580 – 810 mm		
2202103 300 PRO tie rod length 580 – 810 mm			
	We recommend oil type DEXRON II or oil viscosity ISO 22		
2202305 VHM 300 PRO - RI Weight: 5.9 kg			
2200948 26 HB with lock valve Weight: 2.3 kg			
1 motor 1 cylinder 1 pump 	2 motors 1 cylinder 1 pump 1 tie rod 	2 motors 2 cylinders 1 pump 1 tie rod 	Double station CAUTION Non vented plug

HYDRAULIC STEERING SYSTEMS FOR OUTBOARD MOTORS

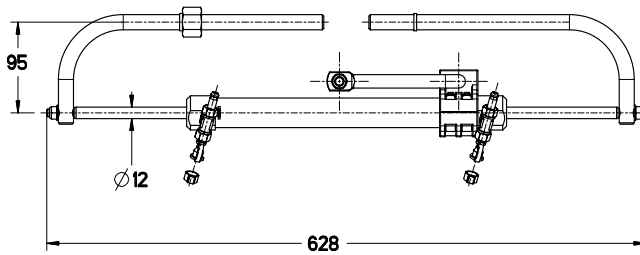


FOR OUTBOARD MOTORS UP TO 115 H.P. (180 H.P. for two motors working in counter-rotation)

LS 226 **2201757** Pump 20 HB with lock valve + fittings + cylinder VHM 226 + non-oxidizing fittings + 10 m of flexible tube

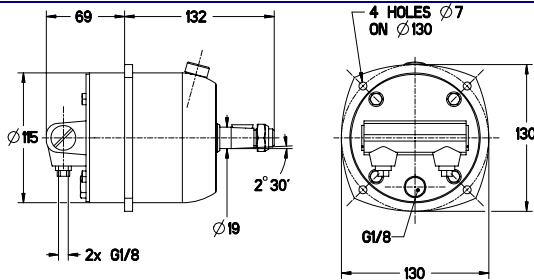
PORT TO STARBOARD 4.5 turns

Code of elements that can make up a complete kit



- 2200804** Pump 20 HB with lock valve
- 2200830** VHM 226 + fittings
- 2200807** Set of pump fittings
- 2200809** Set of tees for Ø6 mm flex tube
- 2200810** Ø6 mm flexible tube (per metre)
- 2200017** Oil (2 litre can)
- 2202041** Tie rod length 470 – 710 mm

2200830 VHM 226 + fittings **Weight: 3 kg**

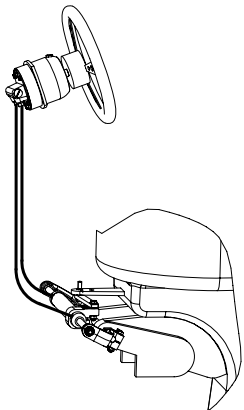


We recommend oil type **DEXRON II** or oil viscosity **ISO 22**

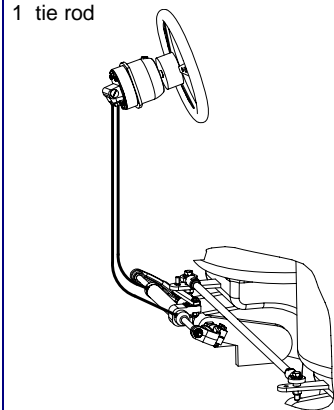


2200804 20 HB with lock valve **Weight: 2.3 kg**

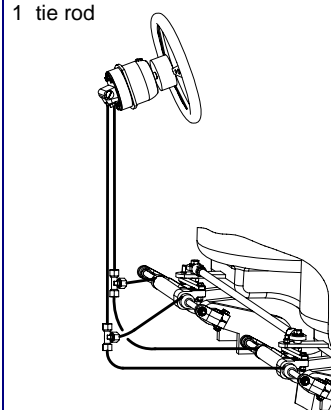
1 motor
1 cylinder
1 pump



2 motors
1 cylinder
1 pump
1 tie rod

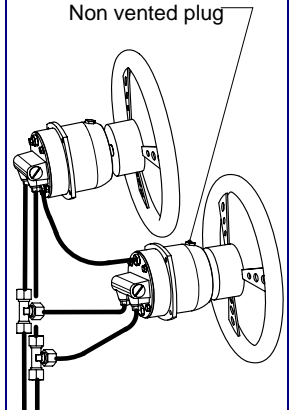


2 motors
2 cylinders
1 pump
1 tie rod



Double station

CAUTION
Non vented plug



HYDRAULIC STEERING SYSTEMS FOR OUTBOARD MOTORS



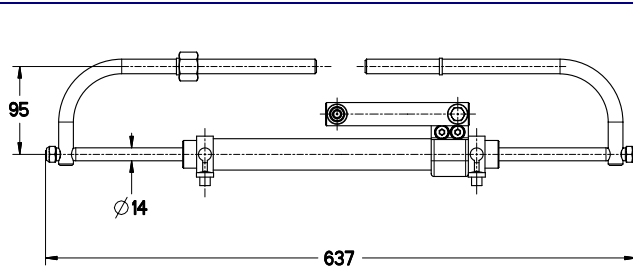
FOR OUTBOARD MOTORS UP TO 175 H.P. (300 H.P. for two motors working in counter-rotation)

LS 228 C 2202198 Pump 26 HB with lock valve + fittings + cylinder VHM 228 + s/steel fittings + 10 m of flexible tube
PORT TO STARBOARD 4.1 turns

Code of elements that can make up a complete kit

Type of pump

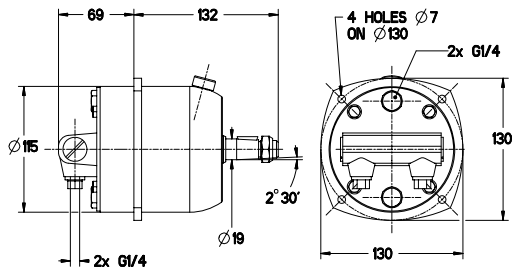
Nb of turns lock to lock



2200020 VHM 228

Weight: 4.1 kg

2202644	Pump 20 HB with lock valve G ¼	Page 19	5.1
2200948	Pump 26 HB with lock valve	2202644	
2200950	Pump 30 HB with lock valve	20 HB with lock valve G ¼	
2200020	Cylinder VHM 228	Page 19	4.1
2200322	Cylinder VHM 228 RI	2200948	
2200021	Set of pump fittings	26 HB with lock valve	
2200038	Set of s/steel pump fittings	Page 19	3.5
2200023	Set of s/steel cylinder fittings	2200950	
2200047	Set of tees for Ø8 mm flex tube	30 HB with lock valve	
2200024	Ø8 mm flexible tube (per metre)		
2200017	Oil (2 litre can)		
2202041	Tie rod length 470 – 710 mm		



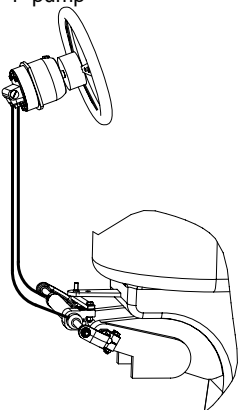
2200948 26 HB with lock valve

Weight: 2.3 kg

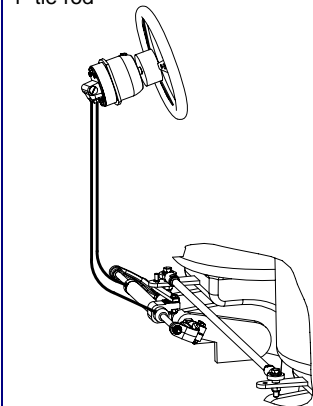
We recommend oil type **DEXRON II**
or
oil viscosity **ISO 22**



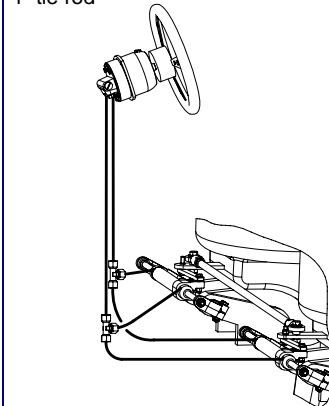
1 motor
1 cylinder
1 pump



2 motors
1 cylinder
1 pump
1 tie rod

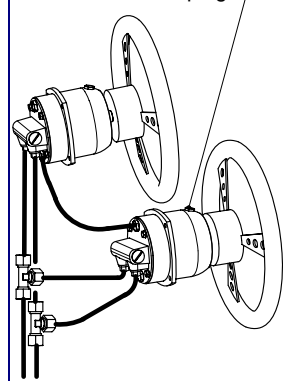


2 motors
2 cylinders
1 pump
1 tie rod

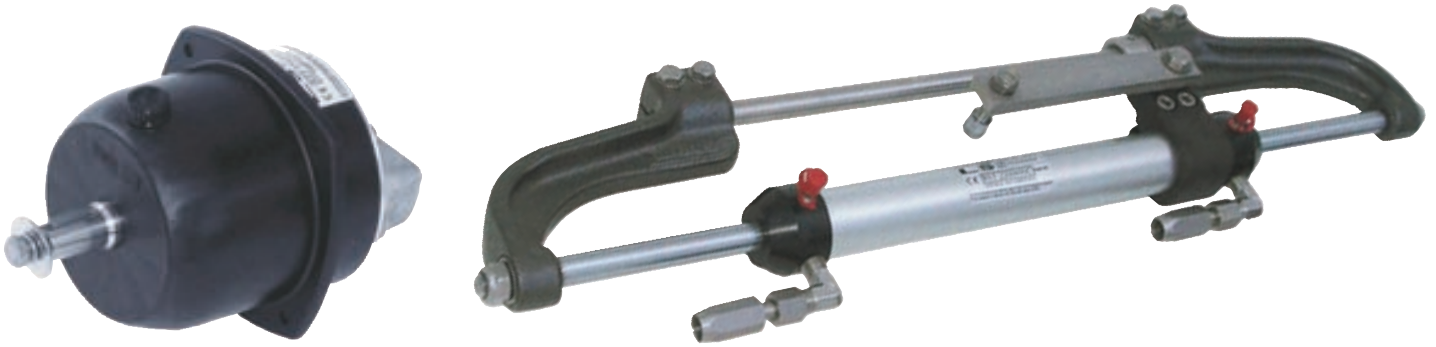


Double station

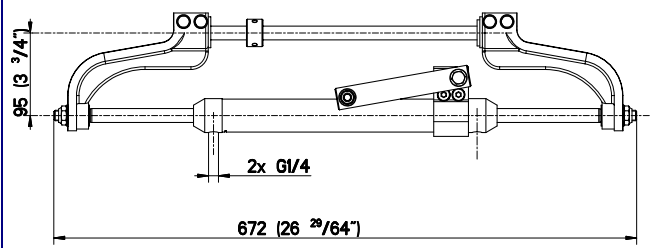
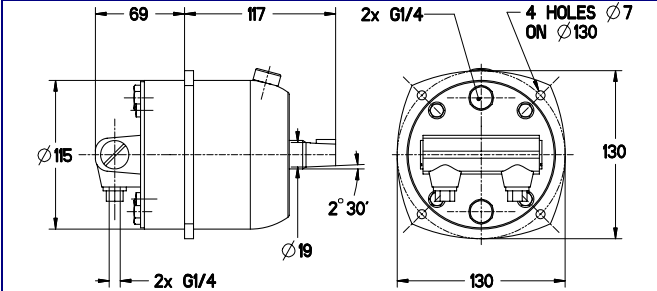

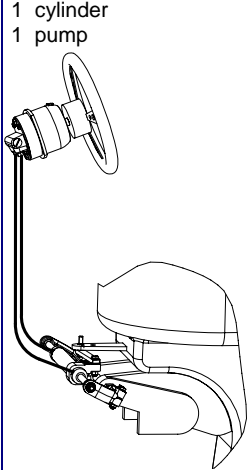
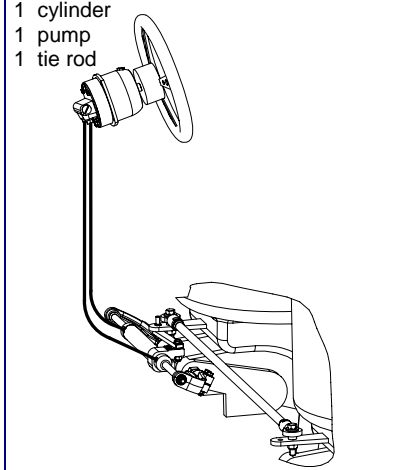
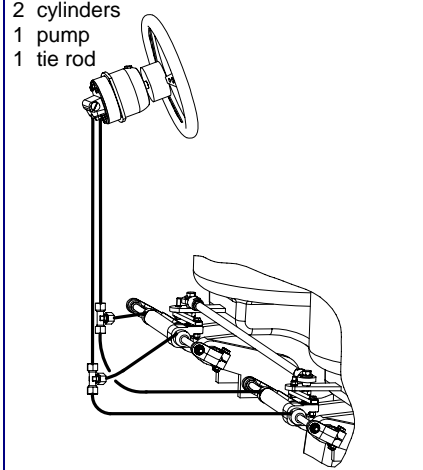
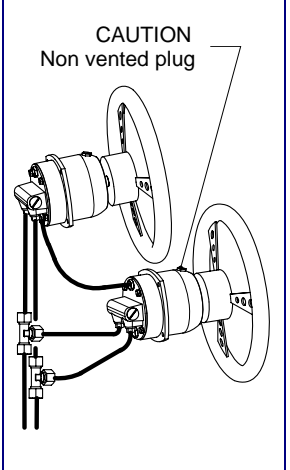
CAUTION
Non vented plug



HYDRAULIC STEERING SYSTEMS FOR OUTBOARD MOTORS



FOR OUTBOARD MOTORS UP TO 300 H.P. (500 H.P. for two motors working in counter-rotation)

LS 232 C 2202224 Pump 30 HB with lock valve + fittings + cylinder VHM 232 H + s/steel fittings + 10 m flexible tube PORT TO STARBOARD 4.7 turns	Code of elements that can make up a complete kit	Type of pump	Nb of turns lock to lock																																						
 <p>2200596 VHM 232 H Weight: 4.1 kg</p>	<table border="1"> <tr> <td>2202644</td> <td>Pump 20 HB with lock valve G ¼</td> <td rowspan="2">Page 19</td> <td rowspan="2">7</td> </tr> <tr> <td>2200948</td> <td>Pump 26 HB with lock valve</td> </tr> <tr> <td>2200950</td> <td>Pump 30 HB with lock valve</td> <td rowspan="2">Page 19</td> <td rowspan="2">5.5</td> </tr> <tr> <td>2200596</td> <td>Cylinder VHM 232 H</td> </tr> <tr> <td>2200696</td> <td>Cylinder VHM 232 H + RI</td> <td rowspan="2">Page 19</td> <td rowspan="2">4.7</td> </tr> <tr> <td>2200021</td> <td>Set of pump fittings</td> </tr> <tr> <td>2200038</td> <td>Set of s/steel pump fittings</td> <td rowspan="2">Page 19</td> <td rowspan="2">4.7</td> </tr> <tr> <td>2200023</td> <td>Set of s/steel cylinder fittings</td> </tr> <tr> <td>2200047</td> <td>Set of tees for Ø8 mm flex tube</td> <td rowspan="2">Page 19</td> <td rowspan="2">4.7</td> </tr> <tr> <td>2200024</td> <td>Ø8 flexible tube (per metre)</td> </tr> <tr> <td>2200017</td> <td>Oil (2 litre can)</td> <td></td> <td></td> </tr> <tr> <td>2202041</td> <td>Tie rod 470 – 710 mm</td> <td></td> <td></td> </tr> </table>	2202644	Pump 20 HB with lock valve G ¼	Page 19	7	2200948	Pump 26 HB with lock valve	2200950	Pump 30 HB with lock valve	Page 19	5.5	2200596	Cylinder VHM 232 H	2200696	Cylinder VHM 232 H + RI	Page 19	4.7	2200021	Set of pump fittings	2200038	Set of s/steel pump fittings	Page 19	4.7	2200023	Set of s/steel cylinder fittings	2200047	Set of tees for Ø8 mm flex tube	Page 19	4.7	2200024	Ø8 flexible tube (per metre)	2200017	Oil (2 litre can)			2202041	Tie rod 470 – 710 mm				
2202644	Pump 20 HB with lock valve G ¼	Page 19	7																																						
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2200950	Pump 30 HB with lock valve	Page 19	5.5																																						
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2200696	Cylinder VHM 232 H + RI	Page 19	4.7																																						
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2200038	Set of s/steel pump fittings	Page 19	4.7																																						
2200023	Set of s/steel cylinder fittings																																								
2200047	Set of tees for Ø8 mm flex tube	Page 19	4.7																																						
2200024	Ø8 flexible tube (per metre)																																								
2200017	Oil (2 litre can)																																								
2202041	Tie rod 470 – 710 mm																																								
 <p>2200950 30 HB with lock valve Weight: 3.4 kg</p>	We recommend oil type DEXRON II or oil viscosity ISO 22																																								
<p>1 motor 1 cylinder 1 pump</p> 	<p>2 motors 1 cylinder 1 pump 1 tie rod</p> 	<p>2 motors 2 cylinders 1 pump 1 tie rod</p> 	<p>Double station</p> <p>CAUTION Non vented plug</p> 																																						

HYDRAULIC STEERING SYSTEMS FOR OUTBOARD MOTORS



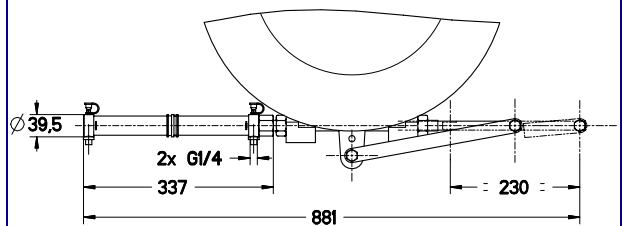
SIDE MOUNTED STEERING

Maxi motor power **115 H.P.** **2201134** **LS 26 HB**
(Pump 20 HB with lock valve + fitt. + VHM 26 ST HB + fitt + 8m of flex tube)

Maxi motor power **175 H.P.** **2200951** **LS 26 A**
(Pump 26 HB with lock valve + fitt. + VHM 28 ST HB + fitt + 8m of flex tube)

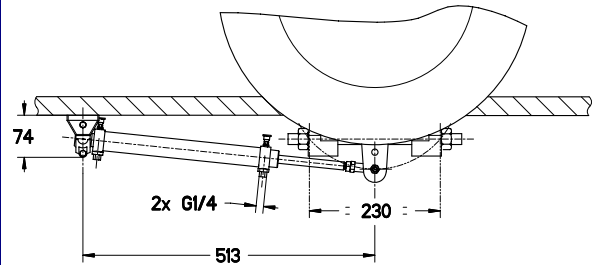
Maxi motor power **175 H.P.** **2200952** **LS 26 B**
(Pump 26 HB with lock valve + fitt. + VHM 28 ST HBR + fitt + 8m of flex tube)

Maxi motor power **300 H.P.** **2201327** **LS 32 HB**
(Pump 30 HB with lock valve + fitt. + VHM 32 ST HB + fitt + 8m of flex tube)



2201113 VHM 26 ST HB **Weight: 1.2 kg**
2200033 VHM 28 ST HB **Weight: 1.5 kg**
2200608 VHM 32 ST HB **Weight: 1.5 kg**

Code of elements that can make up a complete kit		Type of pump
2200804	Pump 20 HB with lock valve	Page 19
2200948	Pump 26 HB with lock valve	2200804
2200950	Pump 30 HB with lock valve	20 HB with lock valve
2201113	Cylinder VHM 26 ST HB	
2200033	Cylinder VHM 28 ST HB	Page 19
2200196	Cylinder VHM 28 ST HBR	2200948
2200608	Cylinder VHM 32 ST HB	26 HB with lock valve
2200807	Set of fittings for 20 HB	
2200021	Set of pump fittings	Page 19
2200022	Set of cylinder fittings	2200950
2200038	Set of pump s/steel fittings	30 HB with lock valve
2200023	Set of cylinder s/steel fittings	
2200809	Set of tees for Ø6 mm flex. tube	
2200047	Set of tees for Ø8 mm flex. tube	1 motor
2200810	Ø6 flexible tube (per metre)	1 cylinder
2200024	Ø8 flexible tube (per metre)	1 pump
2202041	Tie rod 470 – 710 mm	
2200017	Oil (2 litre can)	

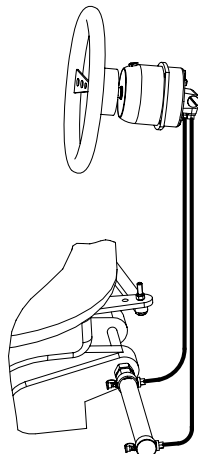


2200196 VHM 28 ST HBR **Weight: 1.1 kg**

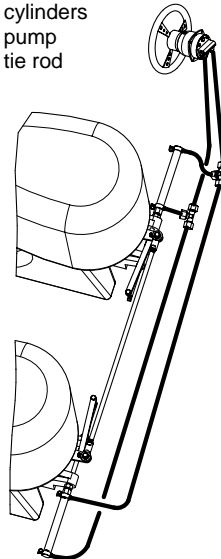
We recommend oil type
Dexron II
or oil viscosity **ISO 22**



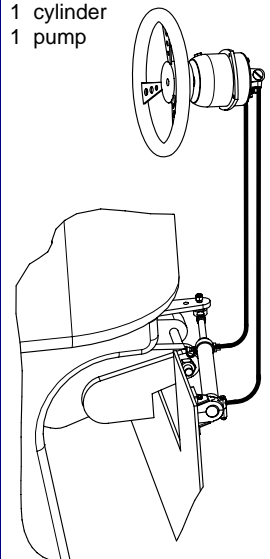
1 motor
1 cylinder
1 pump



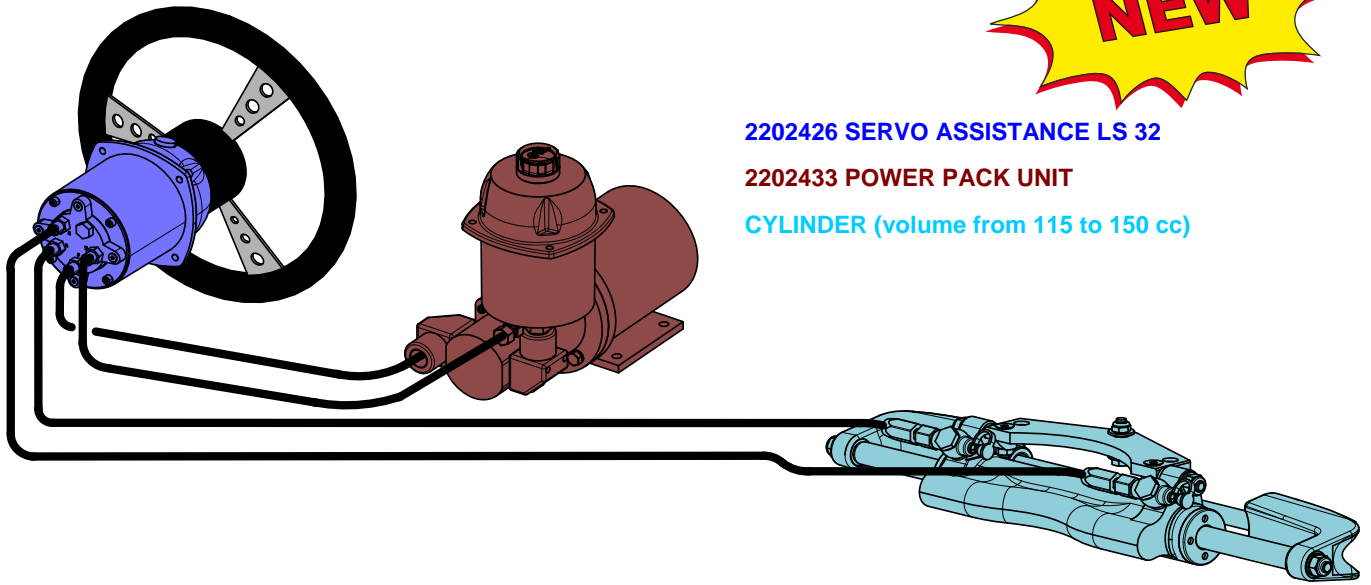
2 motors
2 cylinders
1 pump
1 tie rod



1 motor
1 cylinder
1 pump



POWER ASSIST STEERING FOR OUTBOARDS



2202426 SERVO ASSISTANCE LS 32

2202433 POWER PACK UNIT

CYLINDER (volume from 115 to 150 cc)

Designed for new installations or retrofits, for single or double steering stations, LS power assisted steering systems and kits for power assistance ensure absolute steering comfort. Steering is accurate, smooth and reactive (4.5 turns lock to lock with 115 to 150 cc cylinders).

Our power assist steering systems are easy to install and compatible with hydraulic autopilots. They are supplied in 12 V (24 V available upon request).

<p>2202430 Kit for power assist single steering station without cylinder (12 V) composed of:</p> <ul style="list-style-type: none"> - 1 servo assistance LS 32 2202426 - 1 power pack unit 2202433 - 1 connection kit 2202427 	<p>2202431 Kit for power assist double steering station without cylinder (12 V) composed of:</p> <ul style="list-style-type: none"> - 1 servo assistance LS 32 2202426 - 1 servo assistance LS 32 dble steering station 2202649 - 1 power pack unit 2202433 - 1 connection kit for dble steering station 2202650
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<p>2202426 SERVO ASSISTANCE LS 32 2202649 SERVO ASSISTANCE LS 32 dble steering station</p>	<p>2202433 POWER PACK UNIT in 12 V *</p>

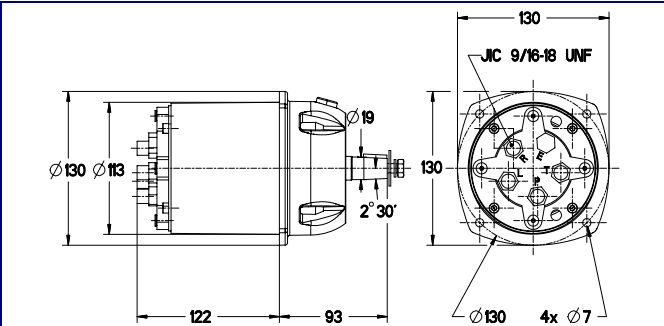
ACCESSORIES			
DEXRON II oil, 2 litre can	2200017	Ø 8 mm flexible tube (per metre)	2200024
Tilt system for power assistance	2202432	Pump bezel	2201058
Bulkhead strain relief	2201753	Steering wheels, see page 40	

* Available in 24 Volt upon request

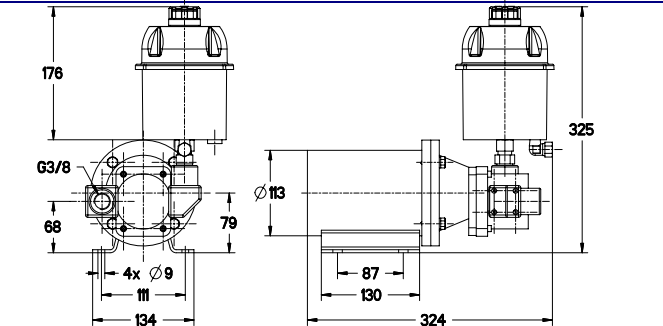
POWER ASSIST STEERING FOR OUTBOARDS



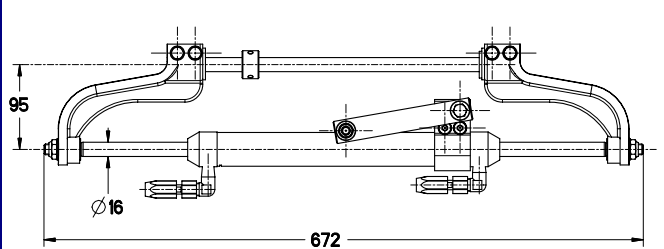
<p>2202428 LS 232 C POWER ASSISTED 12 V composed of:</p> <ul style="list-style-type: none"> - 1 servo assistance LS 32 2202426 - 1 power pack unit 2202433 - 1 connection kit 2202427 - 1 cylinder VHM 232H + s/steel fittings 2200696 	<p>2202429 LS 300 PRO POWER ASSISTED 12 V composed of:</p> <ul style="list-style-type: none"> - 1 servo assistance LS 32 2202426 - 1 power pack unit 2202433 - 1 connection kit 2202427 - 1 cylinder VHM 300 PRO + s/steel fittings 2202305
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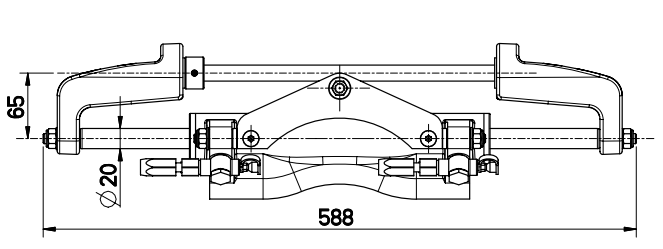
2202426 SERVO ASSISTANCE LS 32



2202433 POWER PACK UNIT in 12 V *



2200696 CYLINDER VHM 232 H + S/STEEL FITTINGS



2202305 CYLINDER VHM 300 PRO + S/STEEL FITTINGS

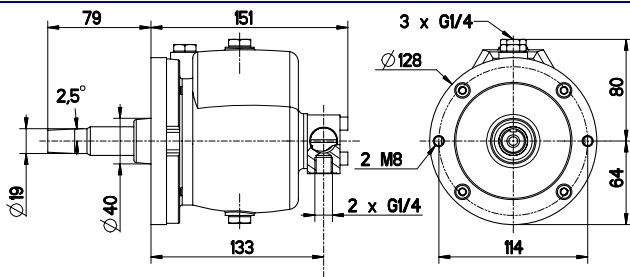
ACCESSORIES			
DEXRON II oil, 2 litre can	2200017	Ø8 mm flexible tube (per metre)	2200024
Tilt system for power assistance	2202432	Pump bezel	2201058
Tie rod 470 – 710 mm (232)	2202041	Bulkhead strain relief	2201753
Tie rod 580 – 810 mm (300 PRO)	2202103	Steering wheels, see page 40	

* Available in 24 Volt upon request

HYDRAULIC STEERING SYSTEMS FOR RACE BOATS



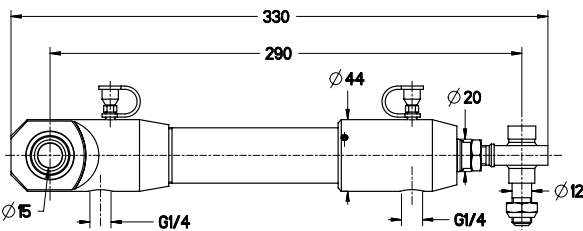
SINGLE-ENGINE INSTALLATION



2200073 Pump 40 CT with lock valve **Weight: 4.1 kg**

The steering system will be composed of:

- 1 Pump 40 CT with LV **2200073**
- 3 Sets of pump fittings **2200021**
- 1 Distribution block **2210002**
- 2 Sets of cylinder fittings **2200023**
- 2 "Race" cylinders 28 C158 **2210000**
- x Metres of Ø8 flexible tube **2200024**

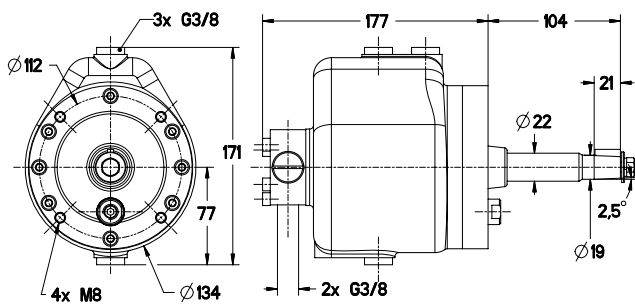


2210000 Race cylinder 28 C158 **Weight: 1.1 kg**

We recommend oil type **DEXRON II**
or
oil with viscosity **ISO 22**



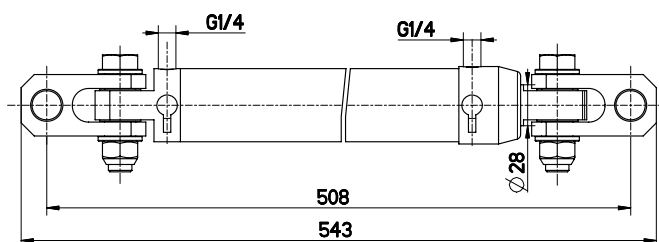
TWIN-ENGINE INSTALLATION



2202068 Pump 30-90 CT with lock valve **Weight: 7.5 kg**

The steering system will be composed of:

- 1 Pump 30-90 CT with LV **2202068**
- 1 Distribution block **2210002**
- 2 Sets of cylinder fittings **2200023**
- 2 S/steel cylinders 40 - 28 C220 **2201976**
- x Metres of Ø10 flexible tube **2200070**
- x Metres of Ø8 flexible tube **2200024**
- + Various fittings



2201976 Race cylinder 40 C220 **Weight: 6.4 kg**

Photo: Laurent PLASSE
OFFSHORE PASSION

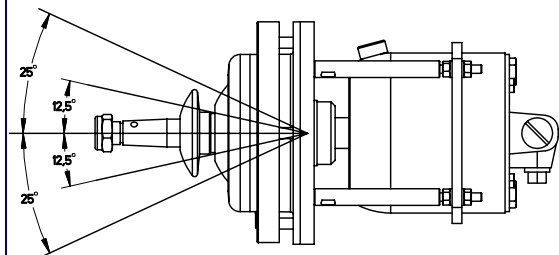
French Champion 2003 – 2005 – 2006
World Champion 2005

ACCESSORIES FOR OUTBOARD STEERING SYSTEMS



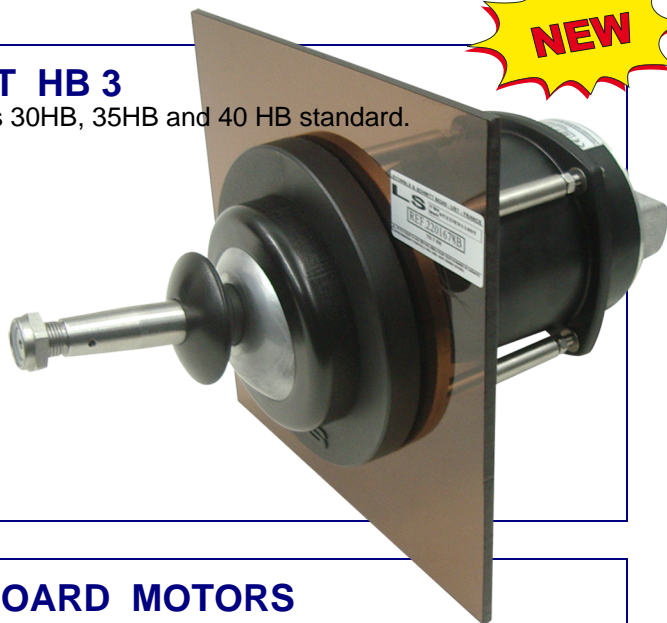
2202655 TILT HB 3

This system can be fitted on pump types 30HB, 35HB and 40 HB standard.



ORIENTATION CAPACITY

Possible orientation angle:
plus or minus 25° (5 positions).



TIE RODS FOR OUTBOARD MOTORS



Allow the tilting of one motor independently of the other one

2202041	Length 470 – 710 mm	
2202102	Length 710 – 940 mm	
2202103	Length 580 – 810 mm	<i>To be fitted with 1 VHM 300 PRO</i>
2202123	Length 660 – 900 mm	<i>To be fitted with 2 VHM 300 PRO</i>

2201058 PUMP BEZEL



2201753 BULKHEAD STRAIN RELIEF

(Suitable for all LS flexible tubes and all other flexible tubes with an outer diameter of 8 to 12 mm)



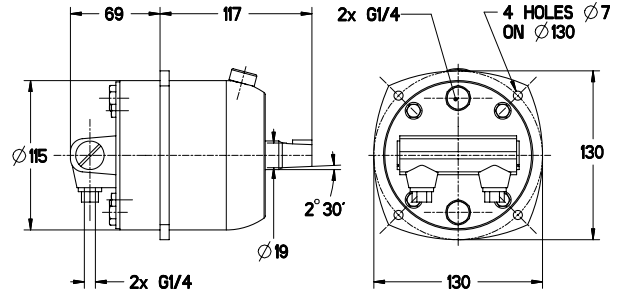
HYDRAULIC STEERING SYSTEMS FOR STERN-DRIVES

HYDRAULIC STEERING SYSTEMS FOR POWER ASSISTED STERN-DRIVES

Cylinder type 28 ST HB AS is fitted directly on the power assisted steering system of the stern-drive motor. No additional mounting kit is required. It is suitable for Volvo, OMC, Mercruiser, Yamaha and others...

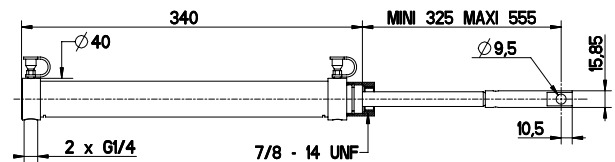
The kit for a single steering station consists of:

- 1 pump type 30 HB with lock valve **2200950**
- 1 set of pump fittings **2200021**
- 1 set of cylinder fittings **2200022**
- 1 cylinder type VHM 28 ST HB AS **2200358**
- x metres of Ø 8 mm flexible tube **2200024**



For a double steering station, add the following to the above kit:

- 1 pump type 30 HB with lock valve **2200950**
- 2 sets of pump fittings **2200021**
- 1 set of tees **2200047**
- x metres of Ø 8 mm flexible tube **2200024**




CYLINDERS FOR STERN-DRIVES WITHOUT POWER ASSISTANCE

These cylinders are fitted on in the same way as a cable steering system. Fittings and tubes are the same as for cylinder VHM 28 ST HB AS above (2200358).

Number of turns lock to lock in function of the PUMP / CYLINDER selection	2200948 26 HB-L.V. Page 19	2200950 30 HB-L.V. Page 19	2201105 35 HB-L.V. Page 19	2201107 40 HB-L.V. Page 20	TYPE OF MOTOR TYPE OF CYLINDER (Other types on request)
	4	3.6	3	2.6	Up to 175 H.P. VOLVO 2200546 28 ST HB DT
	5	4.5	3.7	3.2	Up to 260 H.P. VOLVO 2200460 32 ST HBV DT
	4.7	4.2	3.5	3	Up to 175 H.P. MERCUISER - OMC 2200344 32 ST HBM DT
					2200950 2201105 2201107 30 HB with lock valve 35 HB with lock valve 40 HB with lock valve

HYDRAULIC STEERING SYSTEMS FOR INBOARD MOTOR BOATS

Number of turns lock to lock in function of the PUMP / CYLINDER selection 		T Y P E O F P U M P						
		Page 19 2200804 20 HB with lock valve	Page 19 2200948 26 HB with lock valve	Page 19 2200949 30 HB without lock valve 2200950 30 HB with lock valve	Page 19 2201104 35 HB without lock valve 2201105 35 HB with lock valve	Page 20 2201106 40 HB without lock valve 2201107 40 HB with lock valve	Page 20 2201732 50 HB without lock valve 2201728 50 HB with lock valve	Page 20 2200194 70 CT without lock valve 2200088 70 CT with lock valve
T Y P E O F C Y L I N D E R	Page 21 2200831 VHM 26 DTP 27 kpm 200 ft.lbs 265 N.m.	3						
	Page 21 2200051 VHM 28 DTP 30 kpm 217 ft.lbs 295 N.m.		2.6	2.4	2			
	Page 21 2200059 VHM 32 DTP 50 kpm 361 ft.lbs 490 N.m.		4.6	4.1	3.4			
	Page 22 2200075 VHM 40 DTP 84 kpm 620 ft.lbs 823 N.m.			6.5	5.5	4.7		
	Page 22 2200496 VHM 40-254 105 kpm 759 ft.lbs 1030 N.m.				6.8	6	4.8	3.4
	Page 22 2200497 VHM 50 DTP 185 kpm 1350 ft.lbs 1813 N.m.					8.8	7.1	5
	Page 22 2200498 VHM 50-300 240 kpm 1750 ft.lbs 2350 N.m.					11.6	9.3	6.6

PUMPS



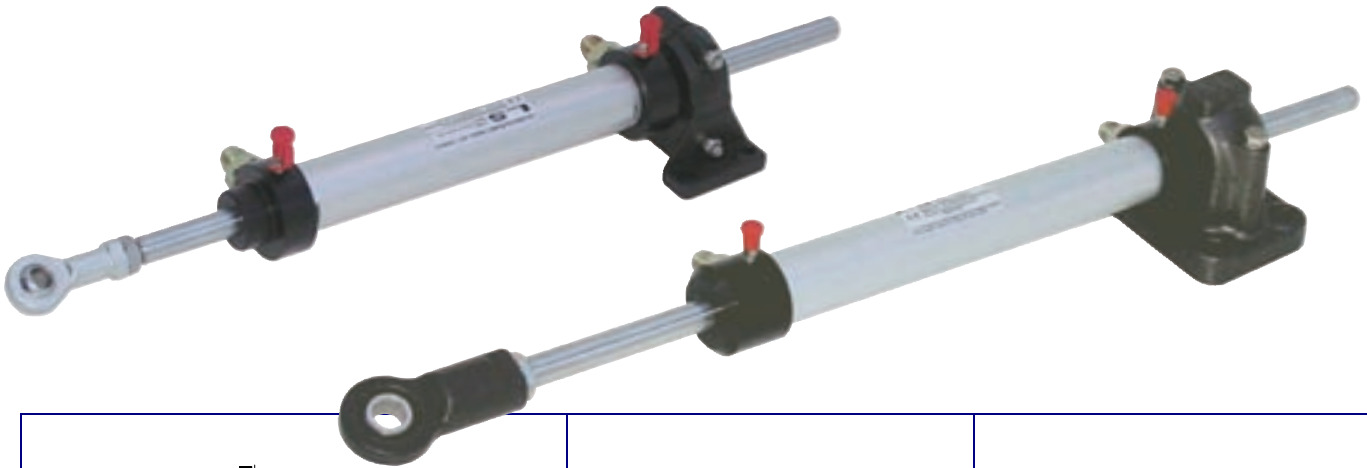
	<p>2200804 Pump 20 HB with lock valve</p> <p>2200807 Set of straight fittings for Ø 6 mm flexible tube</p> <p>2200809 Set of tees for Ø 6 mm flexible tube</p> <p>2200996 Wooden wheel Ø 420 mm</p>	<p>Flow rate 20 cc/t 1.2 cu.in</p> <p>Minimum size of tubing Ø 6 mm .25 "</p> <p>Weight 2.3 kg 5 lbs</p> <p>Volume 400 cc 24.4 cu.in</p> <p>Recommended wheel Ø 420 mm 16 ½ "</p>
	<p>2200948 Pump 26 HB with lock valve</p> <p>2200021 Set of elbow fittings for Ø 8 mm flexible tube</p> <p>2200048 Set of straight fittings for Ø 10mm inflexible tube</p> <p>2200047 Set of tees for Ø 8 mm flexible tube</p> <p>2200046 Set of tees for Ø 10 mm inflexible tube</p> <p>2200996 Wooden wheel Ø 420 mm</p>	<p>Flow rate 26 cc/t 1.6 cu.in</p> <p>Minimum size of tubing 8x10 mm .31"x.39"</p> <p>Weight 2.3 kg 5 lbs</p> <p>Volume 400 cc 24.4 cu.in</p> <p>Recommended wheel Ø 420 mm 16 ½ "</p>
	<p>2200949 Pump 30 HB without lock valve</p> <p>2200950 Pump 30 HB with lock valve</p> <p>2200021 Set of elbow fittings for Ø 8mm flexible tube</p> <p>2200048 Set of straight fittings for Ø 10mm inflexible tube</p> <p>2200047 Set of tees for Ø 8 mm flexible tube</p> <p>2200046 Set of tees for Ø 10 mm inflexible tube</p> <p>2200029 Adaptable cone + locking pin</p> <p>2200996 Wooden wheel Ø 420 mm</p>	<p>Flow rate 29 cc/t 1.7 cu.in</p> <p>Minimum size of tubing 8x10 mm .31"x.39"</p> <p>Weight 3.4 kg 7.5 lbs</p> <p>Volume 400 cc 24.4 cu.in</p> <p>Recommended wheel Ø 420 mm 16 ½ "</p>
	<p>2201104 Pump 35 HB without lock valve</p> <p>2201105 Pump 35 HB with lock valve</p> <p>2200021 Set of elbow fittings for Ø 8mm flexible tube</p> <p>2200048 Set of straight fittings for Ø 10mm inflexible tube</p> <p>2200047 Set of tees for Ø 8 mm flexible tube</p> <p>2200046 Set of tees for Ø 10 mm inflexible tube</p> <p>2200029 Adaptable cone + locking pin</p> <p>2200996 Wooden wheel Ø 420 mm</p>	<p>Flow rate 35 cc/t 2.14 cu.in</p> <p>Minimum size of tubing 8x10 mm .31"x.39"</p> <p>Weight 3.4 kg 7.5 lbs</p> <p>Volume 400 cc 24.4 cu.in</p> <p>Recommended wheel Ø 420 mm 16 ½ "</p>

PUMPS



	<p>2201106 Pump type 40 HB without lock valve</p> <p>2201107 Pump type 40 HB with lock valve</p> <p>2200068 Set of straight fittings for Ø 10mm flexible tube</p> <p>2200048 Set of straight fittings for Ø 10mm inflexible tube</p> <p>2200072 Set of tees for Ø 10mm flex. tube</p> <p>2200046 Set of tees for Ø 10mm inflex. tube</p> <p>2200029 Adaptable cone + locking pin</p> <p>2200997 Wooden wheel Ø 520 mm</p>	<p>Flow rate 40 cc/t 2.44 cu.in</p> <p>Minimum size of tubing 8x10mm .31"x.39"</p> <p>Weight 3.4 kg 7.5 lbs</p> <p>Volume 400 cc 24.4 cu.in</p> <p>Recommended wheel Ø 520 mm 20 ½ "</p>
	<p>2201732 Pump type 50 HB without lock valve</p> <p>2201728 Pump type 50 HB with lock valve</p> <p>2200068 Set of straight fittings for Ø 10mm flexible tube</p> <p>2200048 Set of straight fittings for Ø 10mm inflexible tube</p> <p>2200072 Set of tees for Ø 10mm flex. tube</p> <p>2200046 Set of tees for Ø 10mm inflex. tube</p> <p>2200029 Adaptable cone + locking pin</p> <p>2200997 Wooden wheel Ø 520 mm</p>	<p>Flow rate 50 cc/t 3.05 cu.in</p> <p>Minimum size of tubing 8x10 mm .31"x.39"</p> <p>Weight 3.4 kg 7.5 lbs</p> <p>Volume 400 cc 24.4 cu.in</p> <p>Recommended wheel Ø 520 mm 20 ½ "</p>
	<p>2200194 Pump 70 CT without lock valve</p> <p>2200088 Pump 70 CT with lock valve</p> <p>2200089 Set of straight fittings G 3/8 Ø12 mm</p> <p>2200102 Set of tees for Ø12 mm inflex. tube</p> <p>2200175 Wooden wheel Ø 600 mm</p>	<p>Flow rate 70 cc/t 4.27 cu.in</p> <p>Minimum size of tubing 10x12 mm .39"x.47"</p> <p>Weight 7.5 kg 16 lbs</p> <p>Volume 660 cc 40 cu.in</p> <p>Recommended wheel Ø 600 mm 23 5/8 "</p>

CYLINDERS



	<p>2200831 VHM 26 DTP + fittings 2201994 Set of fittings for VHM 224 2200810 Ø 6 mm flexible tube (per metre) 2200803 By-pass for Ø 6 mm flexible tube 2200003 Rough tiller arm LS 30 P + screws & bolts 2200017 Oil (2 litre can)</p>	<p>Maximum torque 27 kpm 200 ft.lbs Stroke 150 mm 5²⁹/32" Maximum pressure 50 bars 725 PSI Volume 62.6 cc 3.8 cu.in Radius of tiller arm 129 mm 5⁵/64" Total rudder angle 70° Weight 0.9 kg 1.98 lbs</p>
	<p>2200051 VHM 28 DTP 2200123 Set of straight fittings G ¼ for Ø 8 mm flexible tube 2200049 Set of flexible tube and fittings G ¼ Ø 10 mm 2200024 Ø 8 mm flexible tube (per metre) 2200027 By-pass for Ø 8 mm flexible tube 2200045 By-pass for Ø 10 mm inflexible tube 2200003 Rough tiller arm LS 30 P + screws & bolts 2200017 Oil (2 litre can)</p>	<p>Maximum torque 30 kpm 217 ft.lbs Stroke 150 mm 5²⁹/32" Maximum pressure 50 bars 725 PSI Volume 69.2 cc 34.22 cu.in Radius of tiller arm 129 mm 5⁵/64" Total rudder angle 70° Weight 1.1 kg 2.4 lbs</p>
	<p>2200059 VHM 32 DTP 2200123 Set of straight fittings G ¼ for Ø 8 mm flexible tube 2200049 Set of flexible tube and fittings G ¼ Ø 10 mm 2200024 Ø 8 mm flexible tube (per metre) 2200027 By-pass for Ø 8 mm flexible tube 2200045 By-pass for Ø 10 mm inflexible tube 2200060 Rough tiller arm LS 50 P + screws & bolts 2200017 Oil (2 litre can)</p>	<p>Maximum torque 50 kpm 361 ft.lbs Stroke 200 mm 7⁷/8" Maximum pressure 50 bars 725 PSI Volume 120.5 cc 7.35 cu.in Radius of tiller arm 180 mm 7³/32" Total rudder angle 70° Weight 2.4 kg 5.3 lbs</p>

CYLINDERS



	<p>2200075 VHM 40 DTP</p> <p>2200068 Set of straight fittings G ¼ for flexible tube Ø 10 mm</p> <p>2200049 Set of flex. tubes & fitt. G¼ Ø10 mm</p> <p>2200070 Flexible tube Ø 10 mm per metre</p> <p>2200067 By-pass for flex. tube Ø 10 mm</p> <p>2200045 By-pass for inflex. tube Ø 10 mm</p> <p>2200499 Tiller arm LS 75 P + screws & bolts</p> <p>2200017 Oil (2 litre can)</p>	<p>Maximum torque 84 kpm 620 ft.lbs</p> <p>Stroke 204 mm 8"</p> <p>Maximum pressure 50 bars 725 PSI</p> <p>Volume 191 cc 11.6 cu.in</p> <p>Radius of tiller arm 180 mm 7³/₃₂"</p> <p>Total rudder angle 70°</p> <p>Weight 4.2 kg 9.3 lbs</p>
	<p>2200496 VHM 40 - 254</p> <p>2200049 Set of flex. tubes & fitt. G¼ Ø10 mm</p> <p>2200045 By-pass for inflex. tube Ø 10 mm</p> <p>2200533 Tiller arm LS 105P + screws & bolts</p> <p>2200017 Oil (2 litre can)</p>	<p>Maximum torque 105 kpm 759 ft.lbs</p> <p>Stroke 254 mm 10"</p> <p>Maximum pressure 50 bars 725 PSI</p> <p>Volume 239 cc 14.5 cu.in</p> <p>Radius of tiller arm 220 mm 8²/₃₂"</p> <p>Total rudder angle 70°</p> <p>Weight 4.5 kg 9.9 lbs</p>
	<p>2200497 VHM 50 DTP</p> <p>2200096 Set of flexible tubes & fittings G 3/8 Ø 12 mm</p> <p>2200097 By-pass for inflex. tube Ø 12 mm</p> <p>2200534 Tiller arm LS 185 P + screws & bolts</p> <p>2200017 Oil (2 litre can)</p>	<p>Maximum torque 185 kpm 1350 ft.lbs</p> <p>Stroke 228 mm 9"</p> <p>Maximum pressure 60 bars 870 PSI</p> <p>Volume 352 cc 21.5 cu.in</p> <p>Radius of tiller arm 200 mm 7⁷/₈"</p> <p>Total rudder angle 70°</p> <p>Weight 5 kg 11 lbs</p>
	<p>2200498 VHM 50 - 300</p> <p>2200096 Set of flexible tubes & fittings G 3/8 Ø 12 mm</p> <p>2200097 By-pass for inflex. tube Ø 12 mm</p> <p>2200535 Tiller arm LS 240 P + screws & bolts</p> <p>2200017 Oil (2 litre can)</p>	<p>Maximum torque 240 kpm 1750 ft.lbs</p> <p>Stroke 300 mm 11¹³/₁₆"</p> <p>Maximum pressure 60 bars 870 PSI</p> <p>Volume 464 cc 28.5 cu.in</p> <p>Radius of tiller arm 260 mm 10¹/₄"</p> <p>Total rudder angle 70°</p> <p>Weight 5.5 kg 12 lbs</p>

HYDRAULIC STEERING SYSTEMS FOR INBOARD MOTOR BOATS

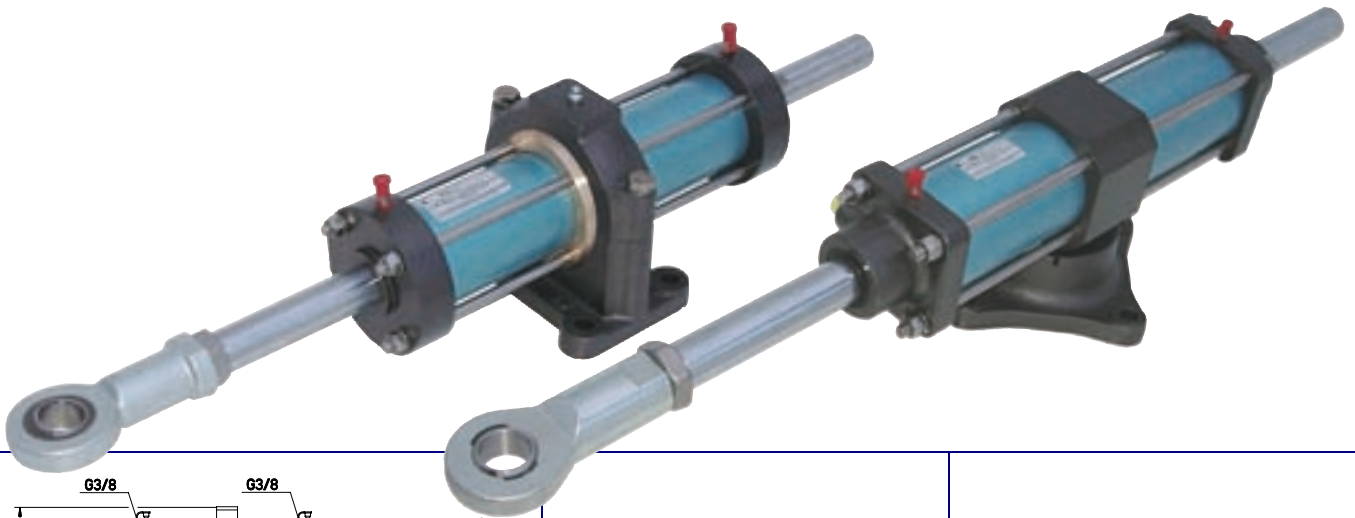
Number of turns lock to lock in function of the PUMP / CYLINDER selection 		T Y P E O F P U M P				
		Page 24 2200194 70 CT without lock valve 2200088 70 CT with lock valve	Page 24 2200494 90 CT without lock valve 2200489 90 CT with lock valve	Page 24 2200106 105 CT without lock valve	Page 24 2200130 150 CT without lock valve	Page 24 2200135 200 CT without lock valve
T Y P E O F C Y L I N D E R	Page 25 2200093 VHM 45-228 140 kpm 1033 ft.lbs 1372 N.m.	3.8				
	Page 25 2200094 VHM 60 DT 265 kpm 1957 ft.lbs 2597 N.m.	7.2	5.6			
	Page 25 2200095 VHM 60-300 344 kpm 2540 ft.lbs 3510 N.m.	9.5	7.4	6.3		
	Page 25 2201539 VHM 63 DT 345 450 kpm 3250 ft.lbs 4591 N.m.	12.3	9.6	8.2	5.75	
	Page 26 2200294 VHM 80 DT 600 kpm 4430 ft.lbs 5880 N.m.		13	11	7.8	
	Page 26 2200295 VHM 90 DT 840 kpm 6076 ft.lbs 8230 N.m.			15	10.4	7.8
	Page 26 2202622 VHM 90 DT C400 1000 kpm 7233 ft.lbs 9806 N.m.			19	14	11.7
	Page 27 2201931 VHM 110 DT C300 1200 kpm 8660 ft.lbs 11765 N.m.			22	15.5	11.5
	Page 27 2200296 VHM 110 DT 1600 kpm 11800 ft.lbs 15680 N.m.				20.5	15.4
	Page 27 2200297 VHM 120 DT 2000 kpm 14770 ft.lbs 19600 N.m.					19

PUMPS



	<p>2200194 Pump 70 CT without lock valve 2200088 Pump 70 CT with lock valve 2200089 Set of straight fittings for pump G 3/8 Ø 12 mm 2200102 Set of tees for Ø 12 mm inflex. tube 2200175 Wooden wheel Ø 600 mm</p> <p><i>Ø 12-17 fittings available on request</i></p>	<p>Flow rate 70 cc/t 4.27 cu.in Minimum size of tubing 10x12 mm .39"x.47" Weight 7.5 kg 16 lbs Volume 660 cc 40 cu.in Recommended wheel Ø 600 mm 23 5/8 "</p>
	<p>2200106 Pump 90 CT without lock valve 2200489 Pump 90 CT with lock valve 2200089 Set of straight fittings for pump G 3/8 Ø 12 mm 2200102 Set of tees for Ø 12 mm inflex. tube 2200175 Wooden wheel Ø 600 mm</p> <p><i>Ø 12-17 fittings available on request</i></p>	<p>Flow rate 90 cc/t 5.5 cu.in Minimum size of tubing 10x12 mm .39"x.47" Weight 7.5 kg 16 lbs Volume 660 cc 40 cu.in Recommended wheel Ø 650 mm 25 9/16 "</p>
	<p>2200106 Pump 105 CT without lock valve 2200107 Set of straight fittings for pump G 1/2 Ø 18 mm 2200110 Lock valve LS 170 2200111 Set of straight fittings for lock valve G 1/2 Ø 18 mm 2200115 Set of tees for Ø 18 mm inflex. tube 2200177 Wooden wheel Ø 700 mm</p> <p><i>Ø 15-21 fittings available on request</i></p>	<p>Flow rate 105 cc/t 6.41 cu.in Minimum size of tubing 15x18 mm .59"x.70" Weight 16 kg 35 lbs Volume 2000 cc 122 cu.in Recommended wheel Ø 700 mm 27 9/16 "</p>
	<p>2200130 Pump 150 CT without lock valve 2200107 Set of straight fittings for pump G 1/2 Ø 18 mm 2200110 Lock valve LS 170 2200111 Set of straight fittings for lock valve G 1/2 Ø 18 mm 2200115 Set of tees for Ø 18 mm inflex. tube 2200178 Wooden wheel Ø 830 mm</p> <p><i>Ø 15-21 fittings available on request</i></p>	<p>Flow rate 150 cc/t 9.15 cu.in Minimum size of tubing 15x18 mm .59"x.70" Weight 16 kg 35 lbs Volume 2000 cc 122 cu.in Recommended wheel Ø 830 mm 32 3/4 "</p>
	<p>2200135 Pump 200 CT without lock valve 2200107 Set of straight fittings for pump G 1/2 Ø 18 mm 2200110 Lock valve LS 170 2200111 Set of straight fittings for lock valve G 1/2 Ø 18 mm 2200115 Set of tees for Ø 18 mm inflex. tube 2200179 Wooden wheel Ø 1000 mm</p> <p><i>Ø 15-21 fittings available on request</i></p>	<p>Flow rate 200 cc/t 12.2 cu.in Minimum size of tubing 15x18 mm .59"x.70" Weight 16 kg 35 lbs Volume 2000 cc 122 cu.in Recommended wheel Ø 1000 mm 39 3/8 "</p>

CYLINDERS



	<p>2200093 VHM 45-228</p> <p>2200096 Set of flexible tube and fittings G 3/8 Ø 12 mm</p> <p>2200097 By-pass for Ø 12 mm inflexible tube</p> <p>2200098 Tiller arm LS 105 + screws & bolts</p> <p>2200017 Oil (2 litre can)</p> <p><i>On request: Ø 12-17 fittings, flexible tube and by-pass</i></p>	<p>Maximum torque 140 kpm 1033 ft.lbs</p> <p>Stroke 228 mm 9"</p> <p>Maximum pressure 60 bars 870 PSI</p> <p>Volume 268 cc 16.3 cu.in</p> <p>Radius of tiller arm 200 mm 7 7/8"</p> <p>Total rudder angle 70°</p> <p>Weight 11.5 kg 25 lbs</p>
	<p>2200094 VHM 60 DT</p> <p>2200096 Set of flexible tube and fittings G 3/8 Ø 12 mm</p> <p>2200097 By-pass for Ø 12 mm inflexible tube</p> <p>2200099 Tiller arm LS 155 + screws & bolts</p> <p>2200017 Oil (2 litre can)</p> <p><i>On request: Ø 12-17 fittings, flexible tube and by-pass</i></p>	<p>Maximum torque 265 kpm 1957 ft.lbs</p> <p>Stroke 228 mm 9"</p> <p>Maximum pressure 60 bars 870 PSI</p> <p>Volume 505 cc 30.8 cu.in</p> <p>Radius of tiller arm 200 mm 7 7/8"</p> <p>Total rudder angle 70°</p> <p>Weight 16 kg 35 lbs</p>
	<p>2200095 VHM 60 DT 300</p> <p>2200096 Set of flexible tube and fittings G 3/8 Ø 12 mm</p> <p>2200097 By-pass for Ø 12 mm inflexible tube</p> <p>2200100 Tiller arm LS 330 + screws & bolts</p> <p>2200017 Oil (2 litre can)</p> <p><i>On request : Ø 12-17 fittings, flexible tube and by-pass</i></p>	<p>Maximum torque 344 kpm 2540 ft.lbs</p> <p>Stroke 300 mm 11 13/16"</p> <p>Maximum pressure 60 bars 870 PSI</p> <p>Volume 664 cc 40.5 cu.in</p> <p>Radius of tiller arm 260 mm 10 1/4"</p> <p>Total rudder angle 70°</p> <p>Weight 16.5 kg 36 lbs</p>
	<p>2201539 VHM 63 DT 345</p> <p>2200109 Set of flexible tube and fittings G 1/2 Ø 18 mm</p> <p>2200015 By-pass for Ø 18 mm inflexible tube</p> <p>2201540 Equipped rough tiller arm LS 450</p> <p>2200017 Oil (2 litre can)</p> <p><i>On request : Ø 15-21 fittings, flexible tube and by-pass</i></p>	<p>Maximum torque 450 kpm 3250 ft.lbs</p> <p>Stroke 345 mm 13 19/32"</p> <p>Maximum pressure 60 bars 870 PSI</p> <p>Volume 862 cc 52.6 cu.in</p> <p>Radius of tiller arm 300 mm 11 13/16"</p> <p>Total rudder angle 70°</p> <p>Weight 25 kg 55 lbs</p>

CYLINDERS



	<p>2200294 VHM 80 DT</p> <p>2200109 Set of flexible tubes and fittings G ½ Ø 18 mm</p> <p>2200015 By-pass for Ø 18 mm inflex. tube</p> <p>2200113 Tiller arm LS 550 - 840 + screws & bolts</p> <p>2200017 Oil (2 litre can)</p> <p><i>On request: Ø 15-21 fittings, flexible pipe and by-pass</i></p>	<p>Maximum torque 600 kpm 4430 ft.lbs</p> <p>Stroke 300 mm 11 13/16"</p> <p>Maximum pressure 60 bars 870 PSI</p> <p>Volume 1167 cc 71.2 cu.in</p> <p>Radius of tiller arm 260 mm 10 ¼"</p> <p>Total rudder angle 70°</p> <p>Weight 30 kg 66 lbs</p>
	<p>2200295 VHM 90 DT</p> <p>2200109 Set of flexible tubes and fittings G ½ Ø 18 mm</p> <p>2200015 By-pass for Ø 18 mm inflex. tube</p> <p>2200113 Tiller arm LS 550 - 840 + screws & bolts</p> <p>2200017 Oil (2 litre can)</p> <p><i>On request: Ø 15-21 fittings, flexible pipe and by-pass</i></p>	<p>Maximum torque 840 kpm 6076 ft.lbs</p> <p>Stroke 300 mm 11 13/16"</p> <p>Maximum pressure 60 bars 870 PSI</p> <p>Volume 1567 cc 95.6 cu.in</p> <p>Radius of tiller arm 260 mm 10 ¼"</p> <p>Total rudder angle 70°</p> <p>Weight 35 kg 77 lbs</p>
	<p>2202622 VHM 90 DT C400</p> <p>2200109 Set of flexible tubes and fittings G ½ Ø 18 mm</p> <p>2200015 By-pass for Ø 18 mm inflex. tube</p> <p>2202626 Tiller arm LS 1000 + screws & bolts</p> <p>2200017 Oil (2 litre can)</p> <p><i>On request: Ø 15-21 fittings, flexible pipe and by-pass</i></p>	<p>Maximum torque 1000 kpm 7233 ft.lbs</p> <p>Stroke 400 mm 15 3/4"</p> <p>Maximum pressure 60 bars 870 PSI</p> <p>Volume 2090 cc 128 cu.in</p> <p>Radius of tiller arm 350 mm 13 3/4"</p> <p>Total rudder angle 70°</p> <p>Weight 45 kg 100 lbs</p>



CYLINDERS

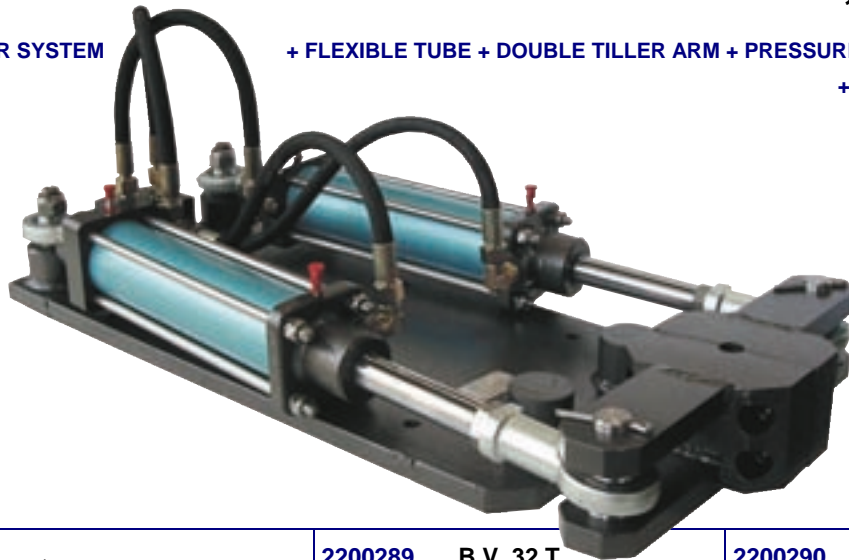


	<p>2201931 VHM 110 DT C300</p> <p>2200109 Set of flexible tubes and fittings G ½ Ø 18 mm</p> <p>2200015 By-pass for Ø 18 mm inflex. tube</p> <p>2201935 Tiller arm LS 1200 + screws & bolts</p> <p>2200017 Oil (2 litre can)</p> <p><i>On request: Ø 15-21 fittings, flexible pipe and by-pass</i></p>	<p>Maximum torque 1200 kpm 8660 ft.lbs</p> <p>Stroke 300 mm 11 13/16"</p> <p>Maximum pressure 60 bars 870 PSI</p> <p>Volume 2307 cc 141 cu.in</p> <p>Radius of tiller arm 260 mm 10 ¼"</p> <p>Total rudder angle 70°</p> <p>Weight 50 kg 110 lbs</p>
	<p>2200296 VHM 110 DT</p> <p>2200109 Set of flexible tubes and fittings G ½ Ø 18 mm</p> <p>2200015 By-pass for Ø 18 mm inflex. tube</p> <p>2200134 Tiller arm LS 1350 - 1660 + screws & bolts</p> <p>2200017 Oil (2 litre can)</p> <p><i>On request: Ø 15-21 fittings, flexible pipe and by-pass</i></p>	<p>Maximum torque 1600 kpm 11800 ft.lbs</p> <p>Stroke 400 mm 15 ¾"</p> <p>Maximum pressure 60 bars 870 PSI</p> <p>Volume 3076 cc 87.7 cu.in</p> <p>Radius of tiller arm 350 mm 13 ¾"</p> <p>Total rudder angle 70°</p> <p>Weight 53 kg 116 lbs</p>
	<p>2200297 VHM 120 DT</p> <p>2200109 Set of flexible tubes and fittings G ½ Ø 18 mm</p> <p>2200015 By-pass for Ø 18 mm inflex. tube</p> <p>2200134 Tiller arm LS 1350 - 1660 + screws & bolts</p> <p>2200017 Oil (2 litre can)</p> <p><i>On request: Ø 15-21 fittings, flexible pipe and by-pass</i></p>	<p>Maximum torque 2000 kpm 14770 ft.lbs</p> <p>Stroke 400 mm 15 ¾"</p> <p>Maximum pressure 60 bars 870 PSI</p> <p>Volume 3798 cc 231.8 cu.in</p> <p>Radius of tiller arm 350 mm 13 ¾"</p> <p>Total rudder angle 70°</p> <p>Weight 60 kg 132 lbs</p>

DOUBLE CYLINDER SYSTEMS FROM 105 TO 2,495 KPM

DOUBLE CYLINDER SYSTEM

+ FLEXIBLE TUBE + DOUBLE TILLER ARM + PRESSURE RELIEF VALVE
+ SUPPORT BASE



	2200289 B.V. 32 T	2200290 B.V. 40 T		
	Max. torque	105 kpm 760 ft.lbs	165 kpm 1192 ft.lbs	
	Max. pressure	50 bars 725 PSI	50 bars 725 PSI	
	Volume	242 cc 14.7cu.inch	378 cc 23 cu.inch	
	Stroke	172 mm 6 49/64"	172 mm 6 49/64"	
	Weight	11 kg 24 lbs	13.5 kg 30 lbs	
	A	B	A	B
	586 mm 23"	480 mm 18 7/8"	596 mm 23 1/2"	490 mm 19 5/16"

	2201059 B.V. 60 ST C183	2201060 B.V. 63 ST C216	
	Max. torque	407 kpm 2944 ft.lbs	540 kpm 3906 ft.lbs
	Max. pressure	60 bars 870 PSI	60 bars 870 PSI
	Volume	923.6 cc 56 cu.inch	1213 cc 74 cu.inch
	Stroke	183 mm 7 13/64"	216 mm 8 1/2"
	Weight	60 kg 133 lbs	100 kg 220 lbs
	2201061 B.V. 80 ST C155	2201062 B.V. 80 ST C183	
	Max. torque	610 kpm 4412 ft.lbs	722 kpm 5222 ft.lbs
	Max. pressure	60 bars 870 PSI	60 bars 870 PSI
	Volume	1382 cc 84.3 cu.inch	1631 cc 99.5 cu.inch
	Stroke	155 mm 6 3/32"	183 mm 7 13/64"
	Weight	75 kg 165 lbs	80 kg 176 lbs
	2201063 B.V. 90 ST C216	2201064 B.V. 110 ST C216	
	Max. torque	1110 kpm 8028 ft.lbs	1650 kpm 11935 ft.lbs
	Max. pressure	60 bars 870 PSI	60 bars 870 PSI
	Volume	2502 cc 153 cu.inch	3713 cc 226.5 cu.inch
	Stroke	216 mm 8 1/2"	216 mm 8 1/2"
	Weight	110 kg 242.5 lbs	148 kg 327 lbs

CODE	TYPE	A	B	C	D	E	F maxi	G	
2201059	BV 60 ST C 183	150 5 ^{7/8}	80 3 ^{5/32}	550 21 ^{21/32}	280 11 ^{1/32}	270 10 ^{5/8}	80 3 ^{5/32}	592 23 ^{19/64}	2201065 B.V. 110 ST C268
									Max. torque
									2050 kpm 14827 ft.lbs
									Max. pressure
									60 bars 870 PSI
									Volume
									4606 cc 281 cu.inch
									Stroke
									268 mm 10 35/64"
									Weight
									187 kg 415 lbs
2201061	BV 80 ST C 155	150 5 ^{7/8}	80 3 ^{5/32}	650 25 ^{19/32}	320 12 ^{19/32}	230 9 ^{1/16}	80 3 ^{5/32}	674 26 ^{17/32}	2201066 B.V. 120 ST C268
									Max. torque
									2495 kpm 18046 ft.lbs
									Max. pressure
									60 bars 870 PSI
									Volume
									5574 cc 340 cu.inch
									Stroke
									268 mm 10 35/64"
									Weight
									192 kg 425 lbs
2201062	BV 80 ST C 183	150 5 ^{7/8}	80 3 ^{5/32}	650 25 ^{19/32}	320 12 ^{19/32}	270 10 ^{5/8}	80 3 ^{5/32}	715 28 ^{5/32}	
2201063	BV 90 ST C 216	150 5 ^{7/8}	80 3 ^{5/32}	740 29 ^{1/8}	340 13 ^{3/8}	320 12 ^{19/32}	100 3 ^{15/16}	775 30 ^{33/64}	
2201064	BV 110 ST C 216	150 5 ^{7/8}	110 4 ^{3/8}	765 30 ^{1/8}	360 14 ^{11/64}	320 12 ^{19/32}	100 3 ^{15/16}	825 32 ^{31/64}	
2201065	BV 110 ST C 268	200 7 ^{7/8}	110 4 ^{3/8}	900 35 ^{7/16}	400 15 ^{3/4}	400 15 ^{3/4}	120 4 ^{23/32}	901 35 ^{15/32}	
2201066	BV 120 ST C 268	200 7 ^{7/8}	110 4 ^{3/8}	900 35 ^{7/16}	400 15 ^{3/4}	400 15 ^{3/4}	120 4 ^{23/32}	891 35 ^{5/64}	

HYDRAULIC ELECTRO-PUMP UNITS WITH ADJUSTABLE FLOW FOR AUTOPILOTS

Hydraulic power packs in 12 or 24 V for pleasure, fishing and work boats. Reversible by changing the polarity on the motor terminals, or non reversible, in this case fitted with an electro-distributor and an oil reservoir. Flow adjustment is achieved through a screw which allows to regulate with accuracy the time required for lock to lock displacement.

Type of power pack	RV1	RV2	RV3	EV2	EV3	HVR
Maximum cylinder capacity (cc)	216	432	650	432	650	860
Flow rate (l/mn)	0.1 to 1	0.2 to 2	0.3 to 3	0.2 to 2	0.3 to 3	0.3 to 4
Oil reservoir capacity	0	0	0	1.5 L	1.5 L	1.5 L
Recommended protection 12/24 V	15 A / 6 A	23 A / 13 A	29 A / 16 A	24 A / 14 A	30 A / 16 A	37 A / 21 A


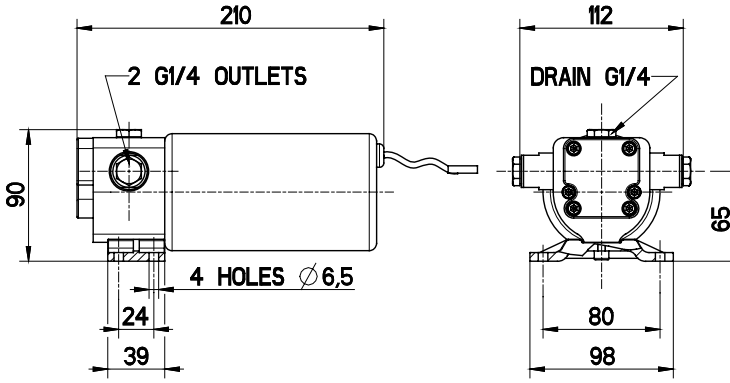
REVERSIBLE POWER PACKS		
	12 VOLTS	24 VOLTS
RV 1	2200843	2200944
RV 2	2200410	2200945
RV 3	2200403	2200946
NON REVERSIBLE POWER PACKS		
EV 2	2200409	2200980
EV 3	2200844	2200981
HVR	2200147	2200982

	A	B	C	D	E	F	H	K
RV 1	80 (3 ⁵ /32)	98 (3 ⁷ /8)	260 (10 ¹⁵ /64)	24 (1 ⁵ /16)	39 (1 ³⁵ /64)	70 (2 ³ /4)	4	0
RV 2	80 (3 ⁵ /32)	98 (3 ⁷ /8)	280 (11)	24 (1 ⁵ /16)	39 (1 ³⁵ /64)	70 (2 ³ /4)	4	0
RV 3	100 (3 ¹⁵ /16)	120 (4 ²³ /32)	315 (12 ²⁵ /64)	0	35 (1 ³ /8)	95 (3 ³ /4)	2	0
EV 2	80 (3 ⁵ /32)	98 (3 ⁷ /8)	280 (11)	24 (1 ⁵ /16)	39 (1 ³⁵ /64)	0	4	220 (8 ¹¹ /16)
EV 3	100 (3 ¹⁵ /16)	120 (4 ²³ /32)	315 (12 ²⁵ /64)	0	35 (1 ³ /8)	0	2	250 (9 ²⁷ /32)

<p>RV 1 RV 2 RV 3</p>	
<p>EV 2 EV 3</p>	
<p>HVR</p>	

REVERSIBLE HYDRAULIC ELECTRO-PUMP UNITS WITH FIXED FLOW FOR AUTOPILOTS

Hydraulic power packs with fixed flow in 12 or 24 volts, reversible by changing the polarity on the motor terminals. These power packs are fitted with lock valves.

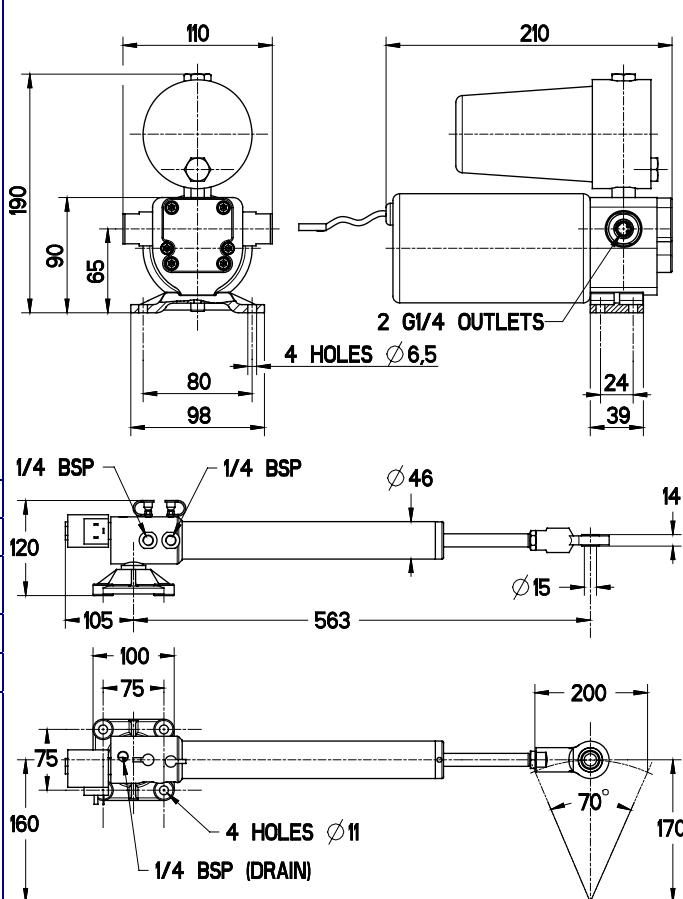
2201738	RV07 power pack – 12 V	
2201739	RV07 power pack – 24 V	
		
Maximum cylinder volume	160 cc	
Flow rate	0.6 l/mn	
Maximum pressure	25 bars	
Average consumption	2 to 3 A/h	
Recommended protection 12/24 V	13 A / 6 A	

SINGLE ROD HYDRAULIC LINEAR DRIVES WITH FIXED FLOW RATE FOR AUTOPILOTS

- Single rod hydraulic cylinder with integrated electrical by-pass.
- Compact overall dimensions for installation on virtually all types of boats.
- Directly fitted on the quadrant.
- Separate reversible power unit which can be installed where selected.
- The linear drive kit is delivered assembled and bled, with 1,200 mm flexible tube.*

* Other lengths upon request.

2201947	Linear drive kit RV07 – 32 ST 16 DE BP 12 V RI
2201948	Linear drive kit RV07 – 32 ST 16 DE BP 24 V RI
2201929	RV 07 ST power pack - 12 V
2201930	RV 07 ST power pack - 24 V
Maximum thrust 200 kg	



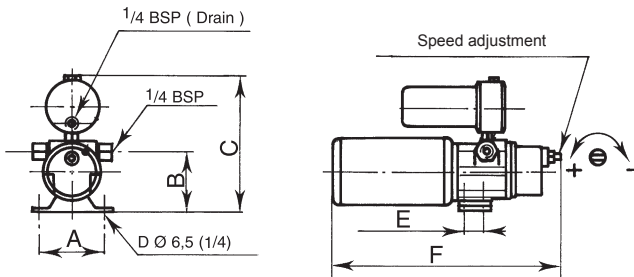
SINGLE ROD HYDRAULIC LINEAR DRIVES WITH ADJUSTABLE SPEED FOR AUTOPILOTS

- Single rod hydraulic cylinder with integrated electrical by-pass.
- Compact overall dimensions for installation on virtually all types of boats.
- Directly fitted on the quadrant.
- Speed adjustment on the reversible power pack.
- Separate reversible power pack which can be installed where selected.
- The linear drive kit is delivered assembled and bled, with 1,200 mm flexible tube.*
- All fittings in stainless steel.

* Other lengths on request.

COMPLETE KITS

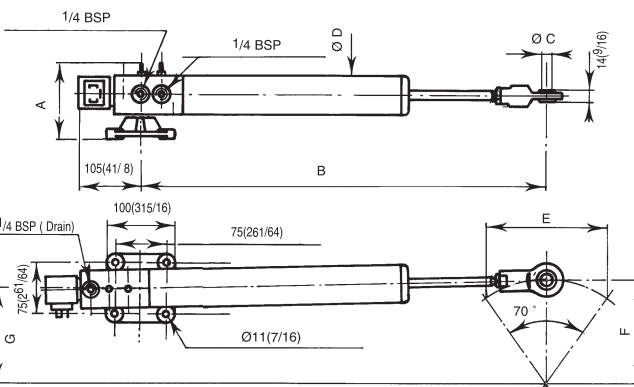
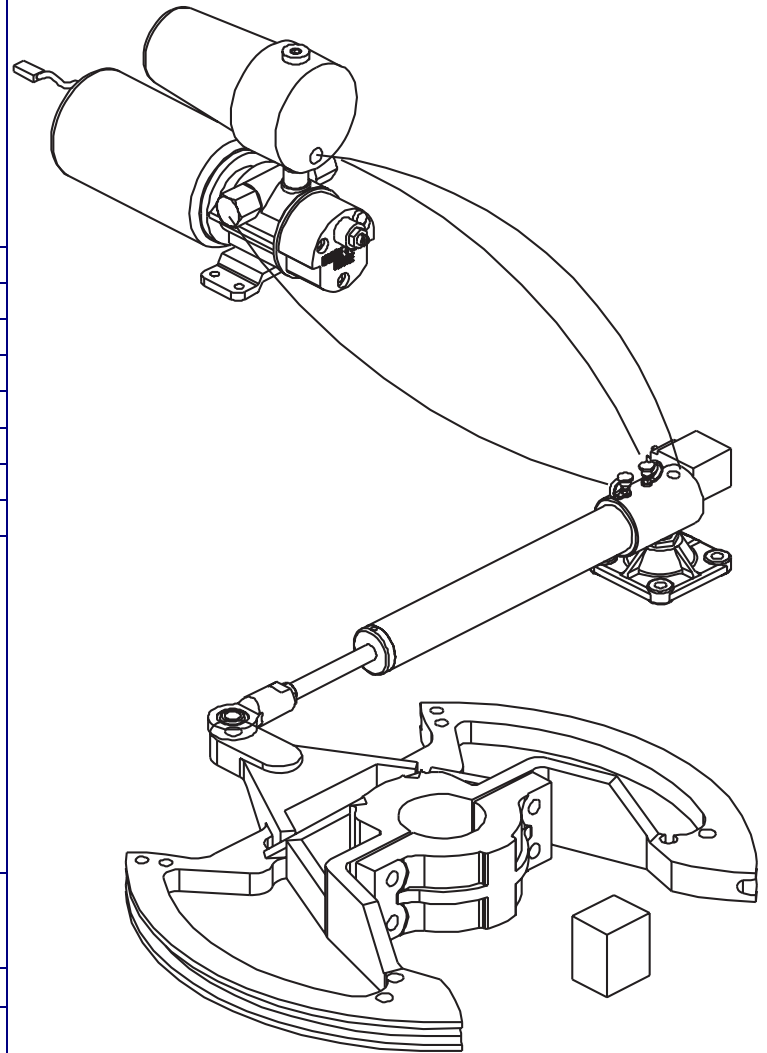
2201786	Linear drive kit 32 ST 16 DE BP 12 V RI
2201787	Linear drive kit 32 ST 16 DE BP 24 V RI
2201788	Linear drive kit 40 ST 16 DE BP 12 V RI
2201789	Linear drive kit 40 ST 16 DE BP 24 V RI
2201790	Linear drive kit 50 ST 20 DE BP 12 V RI
2201791	Linear drive kit 50 ST 20 DE BP 24 V RI
2201792	Linear drive kit 50 ST 203 DE BP 12 V RI
2201793	Linear drive kit 50 ST 203 DE BP 24 V RI



2201186 RV1 – ST – 12 V
2201100 RV2 – ST – 12 V
2201160 RV3 – ST – 12 V

2201187 RV1 – ST – 24 V
2201101 RV2 – ST – 24 V
2201161 RV3 – ST – 24 V

	A	B	C	D	E	F
RV1 ST	80	70	170	4	24	280
RV2 ST	3 5/32	2 3/4	6 11/16	4	15/16	11
RV3 ST	100	95	195	2	0	315
	3 15/16	3 3/4	7 11/16			12 25/64



TYPE	VHM 32ST16 DEBP	VHM 40ST16 DEBP	VHM 50ST20 DEBP
Code 12V	2201371	2201096	2201098
Code 24V	2201372	2201097	2201099
Max. Thrust	280 kg 617 lbs	450 kg 992 lbs	700 kg 1543 lbs
Weight	3.5 kg 7.71 lbs	3.5 kg 7.71 lbs	5 kg 11 lbs
A	120 mm 4 23/32"	120 mm 4 23/32"	130 mm 5 1/8"
B	563 mm 22 11/64"	613 mm 24 1/8"	715 mm 28 9/64"
C	15 mm 19/32"	15 mm 19/32"	17 mm 43/64"
D	46 mm 1 13/16"	56 mm 2 55/64"	70 mm 2 3/4"
E	200 mm 7 7/8"	240 mm 9 7/16"	300 mm 11 13/16"
F	170 mm 6 11/16"	190 mm 7 31/64"	240 mm 9 29/64"
G	160 mm 6 19/64	172 mm 6 61/64"	218 mm 8 37/64"

SINGLE ROD HYDRAULIC LINEAR DRIVES WITH ADJUSTABLE SPEED FOR AUTOPILOTS

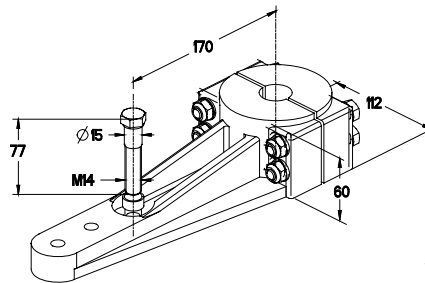


LINEAR DRIVES ACCESSORIES

TILLER ARMS

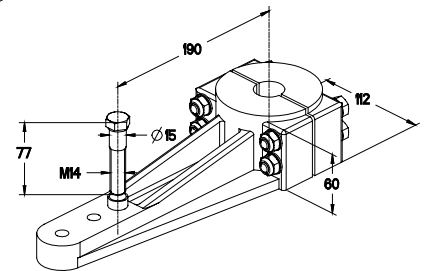
2202106

Rough equipped tiller arm 32 ST 16
 Ø 28 rough boring – maxi Ø 50



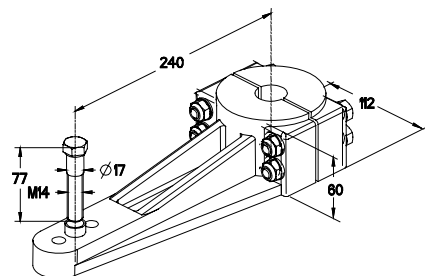
2201291

Rough equipped tiller arm 40 ST 16
 Ø 28 rough boring – maxi Ø 50



2201441

Rough equipped tiller arm 50 ST 20
 Ø 28 rough boring – maxi Ø 50



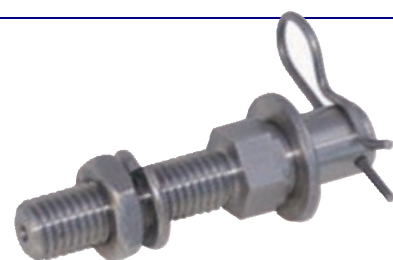
QUICK COUPLINGS

2201557

S/steel quick coupling Ø 15

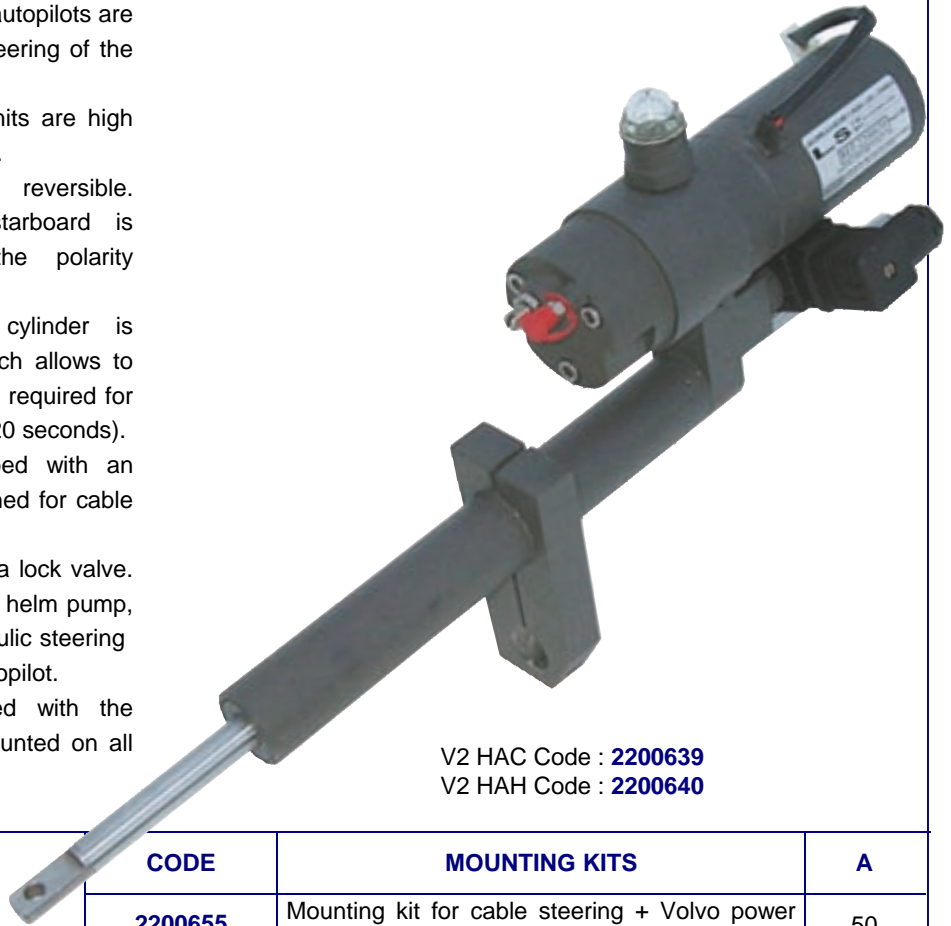
2201558

S/steel quick coupling Ø 17

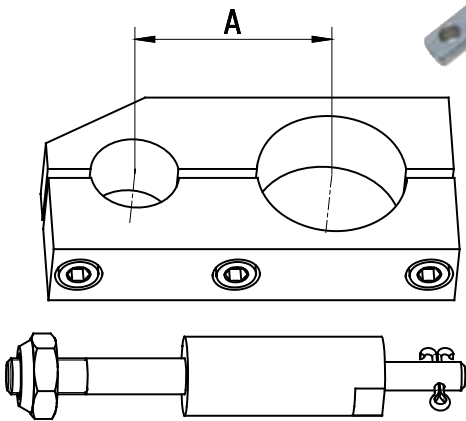


LINEAR HYDRAULIC DRIVES FOR AUTOPILOTS ON POWER ASSISTED STERN-DRIVES

- Linear hydraulic drive units for autopilots are fitted on the power assisted steering of the motor.
- The main features of these units are high reliability and speed adjustment.
- The electrical motor is reversible. Displacement to port or starboard is achieved in function of the polarity connection at the terminals.
- Speed adjustment of the cylinder is achieved through a screw which allows to regulate with accuracy the time required for lock to lock displacement (3 to 20 seconds).
- The V2 HAC unit is equipped with an electrical by-pass and is designed for cable steering applications.
- The V2 HAH unit is fitted with a lock valve. When connected to a hydraulic helm pump, it will fulfil two functions: hydraulic steering function and power pack for autopilot.
- These units can be supplied with the accessories required to be mounted on all types of power assistance.



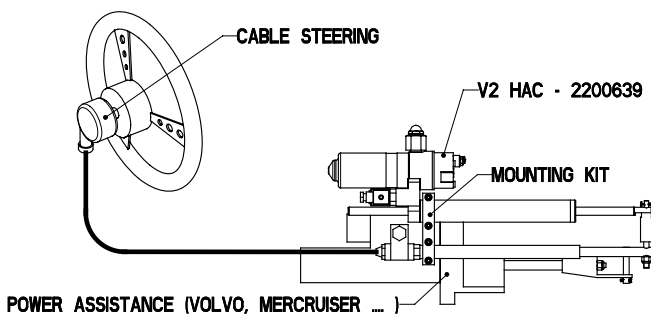
V2 HAC Code : **2200639**
V2 HAH Code : **2200640**



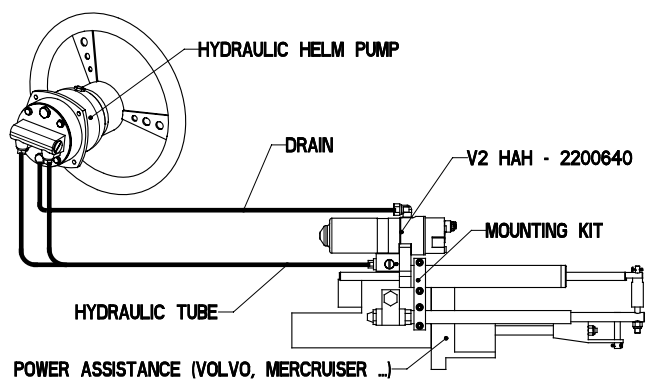
CODE	MOUNTING KITS	A
2200655	Mounting kit for cable steering + Volvo power assisted steering	50
2200656	Mounting kit for hydraulic steering + Volvo power assisted steering	50
2200657	Mounting kit for cable steering + Mercruiser & Yamaha power assisted steering	70
2200658	Mounting kit for hydraulic steering + Mercruiser & Yamaha power assisted steering	70
2201155	Mounting kit for hydraulic steering + Mercruiser D-Tronic 165 et 250 H.P. assisted steering	162
2201659	Mounting kit for hydraulic steering + Mercruiser D-Tronic 220 H.P. power assisted steering	115
2200677	Axis for Volvo twin motorisation	

MOUNTING OF LINEAR HYDRAULIC DRIVE UNITS FOR AUTOPILOTS

Autopilot function
V2 HAC Code : **2200639**



Autopilot + hydraulic steering functions
V2 HAH Code : **2200640**



HYDRAULIC ELECTRO-PUMP UNITS WITH FIXED FLOW FOR AUTOPILOTS

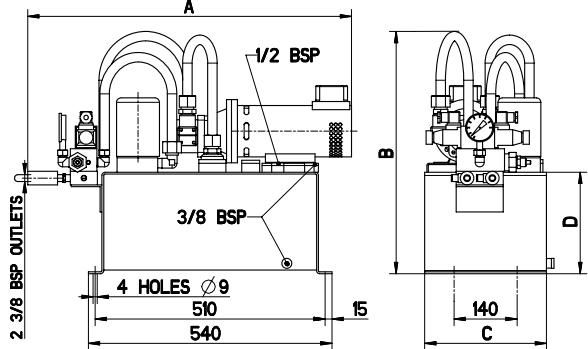
HF 1-2.5 – HF 1-3 – HF 1-4
 HF 1-6 – HF 1.5-9 – HF 1.5-11
 HF 1.5-15 – HF 1.5-18

Hydraulic H.F. units are mainly designed for large pleasure boats, fishing and work crafts.

Owing to a very strong construction, large oil tanks, high reliability of the pumps and distributors and to the easily accessible external mounting of elements connected with flexible tubes, these devices are the leaders on the market in the field of hydraulic electro-pump units.

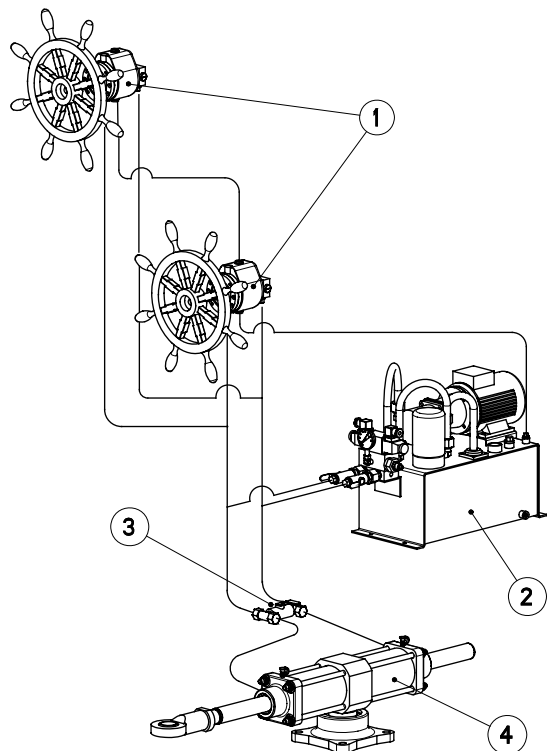
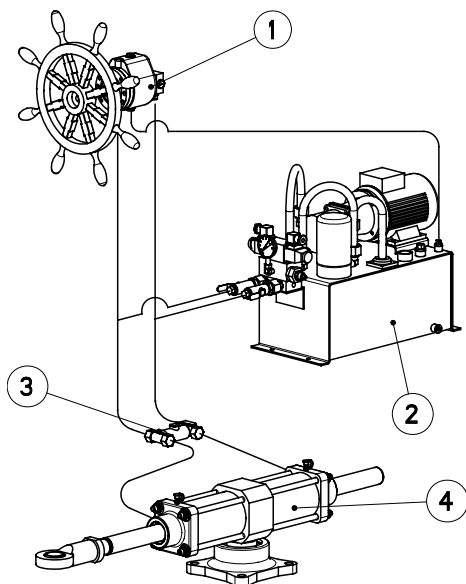


Type code	Tank volume	Flowrate weight	A	B	C	D
HF 1-2.5 2200190	10 litres 2.65 US.gall	2.5 l/mm 35 kg	700 27 ⁹ /16	284 11 ¹ / ₄	220 8 ⁵ / ₈	125 4 ⁵⁹ / ₆₄
HF 1-3 2200148	10 litres 2.65 US.gall	3 l/mm 35 kg	700 27 ⁹ /16	284 11 ¹ / ₄	220 8 ⁵ / ₈	125 4 ⁵⁹ / ₆₄
HF 1-4 2200149	10 litres 2.65 US.gall	4 l/mm 35 kg	700 27 ⁹ /16	284 11 ¹ / ₄	220 8 ⁵ / ₈	125 4 ⁵⁹ / ₆₄
HF 1-6 2200150	25 litres 6.62 US.gall	6 l/mm 45 kg	720 28 ⁵ /16	384 15 ¹ / ₈	270 10 ⁷ / ₈	225 8 ⁷ / ₈
HF 1.5-9 2200151	25 litres 6.62 US.gall	9 l/mm 57 kg	720 28 ⁵ /16	420 16 ¹ / ₂	270 10 ⁷ / ₈	225 8 ⁷ / ₈
HF 1.5-11 2200195	25 litres 6.62 US.gall	11 l/mm 57 kg	720 28 ⁵ /16	420 16 ¹ / ₂	270 10 ⁷ / ₈	225 8 ⁷ / ₈
HF 1.5-15 2200955	50 litres 13.2 US.gall	15 l/mm 61 kg	760 30	645 25 ¹³ / ₈	270 10 ⁷ / ₈	450 17 ³ / ₈
HF 1.5-18 2200562	50 litres 13.2 US.gall	18 l/mm 62 kg	760 30	645 25 ¹³ / ₈	270 10 ⁷ / ₈	450 17 ³ / ₈



60 bars maximum pressure
 Nota : Standard 24 VDC. Other voltages upon request

- 1 Pump + lock valve
- 2 Electro-pump unit
- 3 By-pass valve
- 4 Cylinder

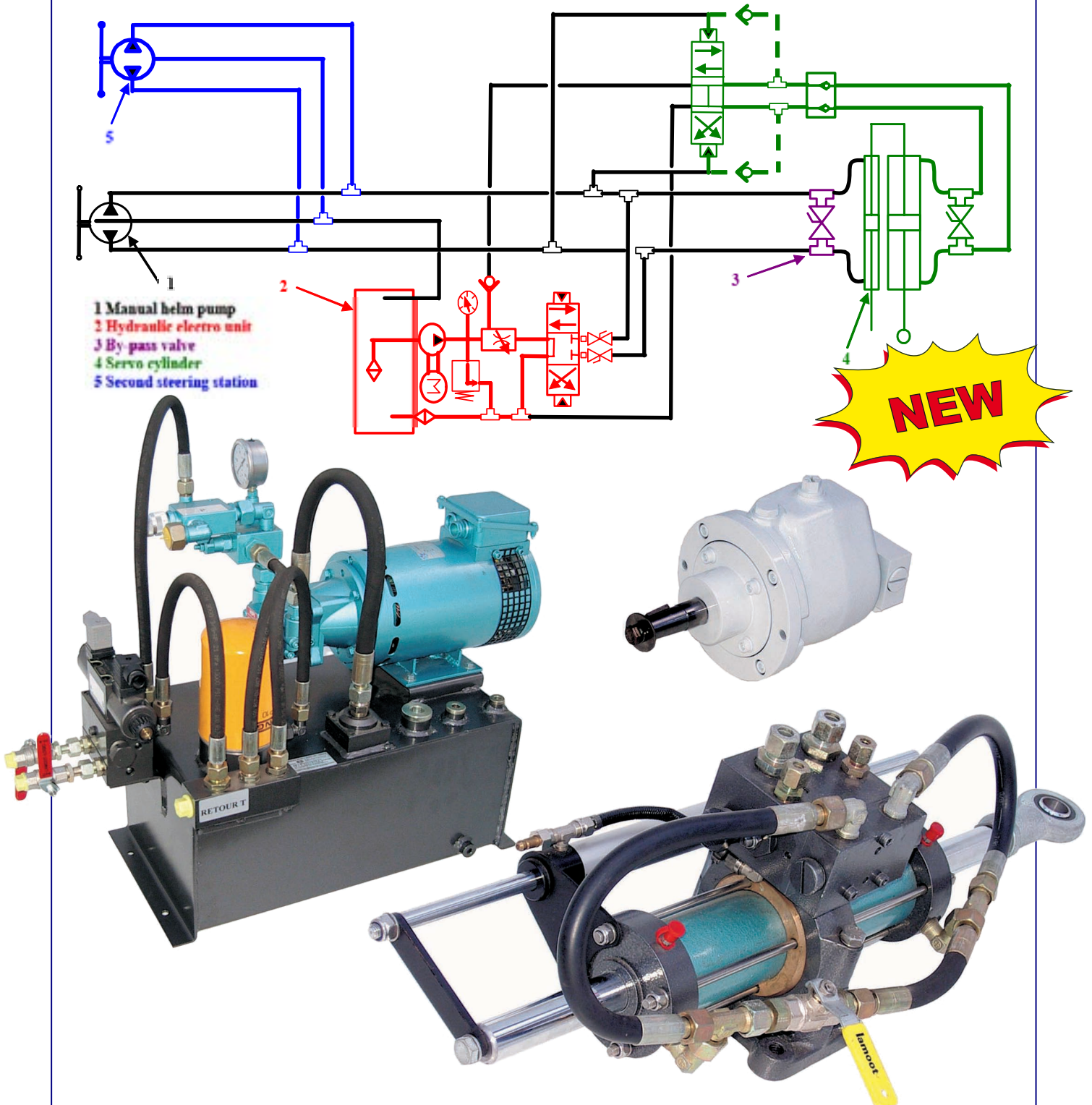


LS POWER ASSISTED STEERING SYSTEMS 185 to 2,000 kpm

LS power assisted steering systems feature comfort, reliability and accuracy and are designed for luxury 15 to 40 metre vessels with rudder torque ranging from 185 to 2,000 kpm.

A specific catalogue enables the engineering and design department to select the correct steering system amongst 10 possible solutions.

The ease of use of the catalogue makes it possible for the shipyards engineering and design departments to define straightaway the correct system in function of the rudder torque, the power supply on board and the number of steering stations.



**OUR CATALOGUE "LS POWER ASSISTED HYDRAULIC STEERING SYSTEMS"
IS AVAILABLE ON REQUEST**

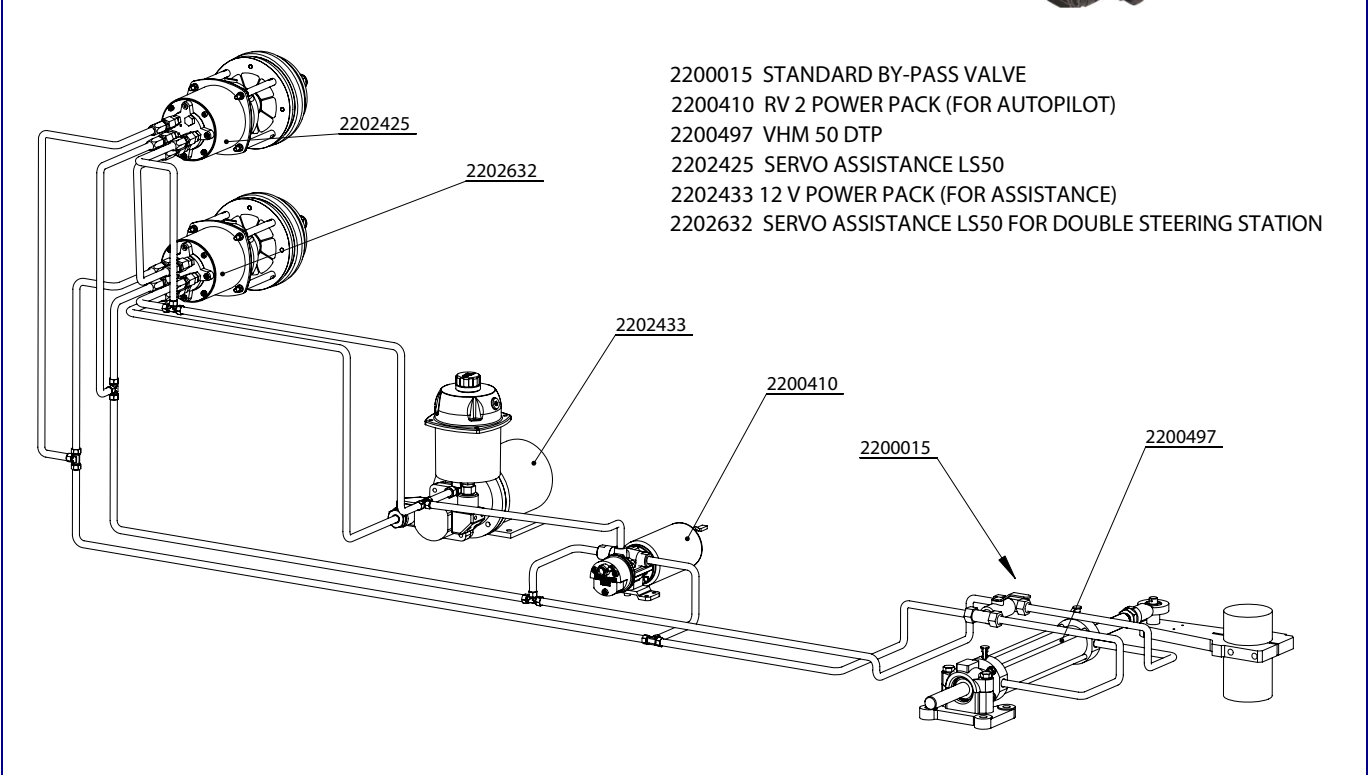
LS 185 kpm POWER ASSIST STEERING



<p>2202425 Servo assistance LS 50 2202632 Servo assistance LS 50 Double steering station</p> <p>Volume 50 cc/rev 3.1 cu.in/rev Minimum size of tubing 8x10 mm .31"x.39" Weight 5 kg 11 lbs Recommended wheel diam. \varnothing 420 mm 16 1/2 ' Number of turns 7 turns</p>		
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<p>2200497 VHM 50 DTP</p> <p>Maximum torque 185 kpm 1350 ft.lbs Stroke 228 mm 9" Maximum pressure 60 bars 870 PSI Volume 352 cc 21.5 cu.in Radius of tiller arm 200 mm 7 7/8" Total rudder angle 70° Weight 5 kg 11 lbs</p>		
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<p>2202433 12 V power pack 2202613 24 V power pack</p> <p>Maximum flow rate 4 l/mn Volume 1.5 litre 0.4 US gall Maximum pressure 60 bars 870 PSI Weight 10 kg 22 lbs</p>		
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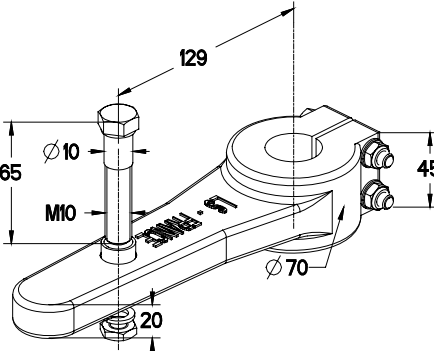
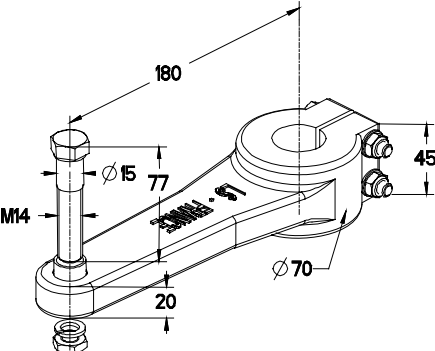
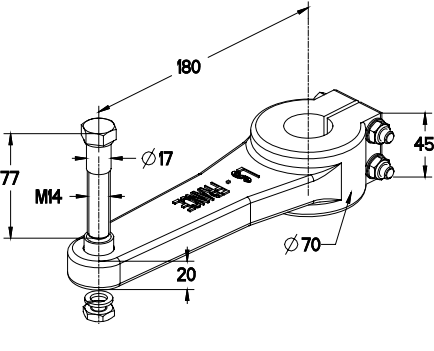
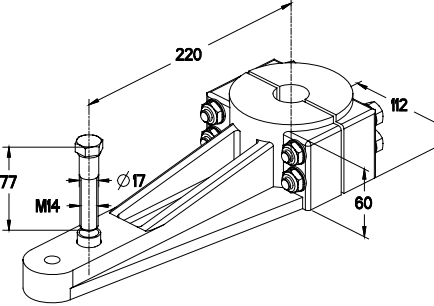
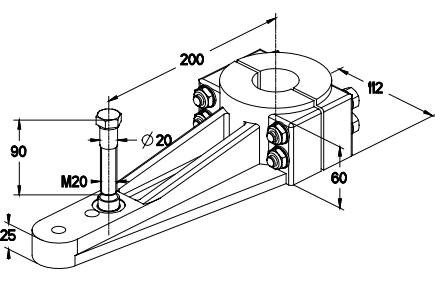
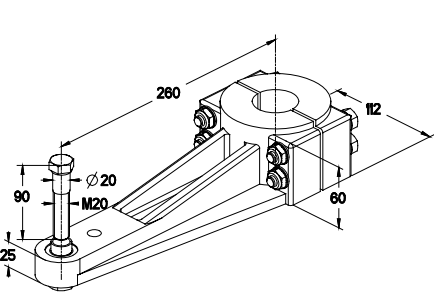
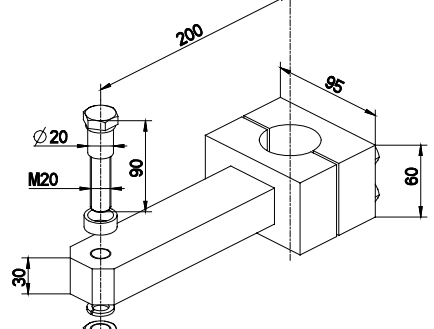
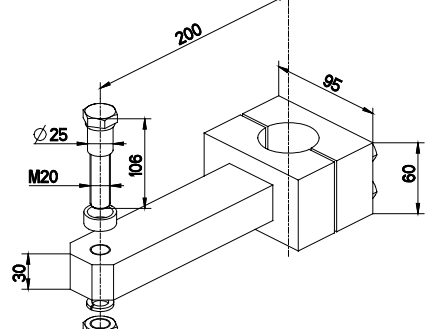
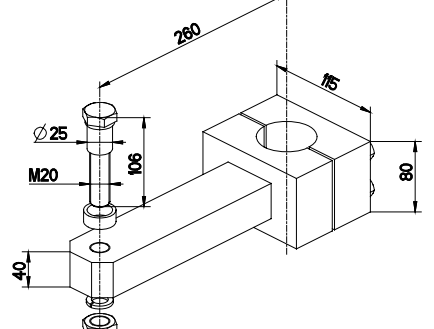
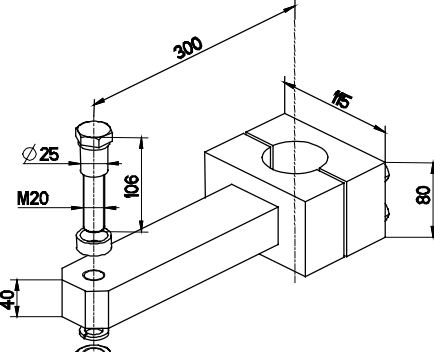
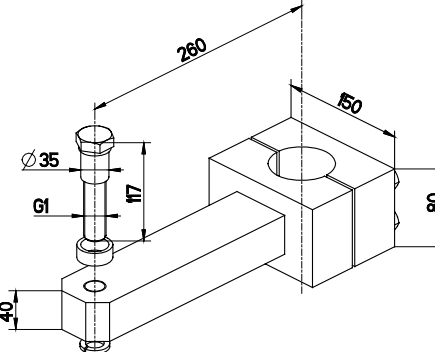
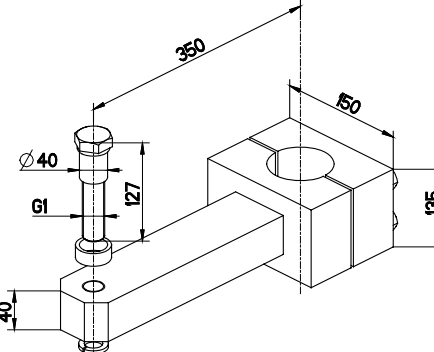


- 2200015 STANDARD BY-PASS VALVE
- 2200410 RV 2 POWER PACK (FOR AUTOPILOT)
- 2200497 VHM 50 DTP
- 2202425 SERVO ASSISTANCE LS50
- 2202433 12 V POWER PACK (FOR ASSISTANCE)
- 2202632 SERVO ASSISTANCE LS50 FOR DOUBLE STEERING STATION

REFERENCE	12 V DC	24 V DC
Single steering station + autopilot function + fittings	2202560	2202561
Double steering station + autopilot function + fittings	2202562	2202563

Please contact us to determine the lengths of the flexible tubes required.

TILLER ARMS

<p>2200003 Rough equipped tiller arm LS 30 P ∅ 22 rough boring – maxi ∅ 40</p>  <p>Technical drawing of tiller arm 2200003. Dimensions: total length 129, mounting hole diameter ∅10, mounting hole offset M10, mounting hole depth 65, mounting hole diameter ∅70, mounting hole offset 45, mounting hole diameter ∅20.</p>	<p>2200060 Rough equipped tiller arm LS 50 P ∅ 22 rough boring – maxi ∅ 40</p>  <p>Technical drawing of tiller arm 2200060. Dimensions: total length 180, mounting hole diameter ∅15, mounting hole offset M4, mounting hole depth 77, mounting hole diameter ∅70, mounting hole offset 45, mounting hole diameter ∅20.</p>	<p>2200499 Rough equipped tiller arm LS 75 P ∅ 22 rough boring – maxi ∅ 40</p>  <p>Technical drawing of tiller arm 2200499. Dimensions: total length 180, mounting hole diameter ∅17, mounting hole offset M4, mounting hole depth 77, mounting hole diameter ∅70, mounting hole offset 45, mounting hole diameter ∅20.</p>
<p>2200533 Rough equipped tiller arm LS 105 P ∅ 28 rough boring – maxi ∅ 50</p>  <p>Technical drawing of tiller arm 2200533. Dimensions: total length 220, mounting hole diameter ∅17, mounting hole offset M4, mounting hole depth 77, mounting hole diameter ∅60, mounting hole offset 112.</p>	<p>2200534 Rough equipped tiller arm LS 185 P ∅ 28 rough boring – maxi ∅ 50</p>  <p>Technical drawing of tiller arm 2200534. Dimensions: total length 200, mounting hole diameter ∅20, mounting hole offset M20, mounting hole depth 90, mounting hole diameter ∅60, mounting hole offset 112.</p>	<p>2200535 Rough equipped tiller arm LS 240 P ∅ 28 rough boring – maxi ∅ 50</p>  <p>Technical drawing of tiller arm 2200535. Dimensions: total length 280, mounting hole diameter ∅20, mounting hole offset M20, mounting hole depth 90, mounting hole diameter ∅60, mounting hole offset 112.</p>
<p>2200098 Rough equipped tiller arm LS 105 ∅ 20 rough boring – maxi ∅ 50</p>  <p>Technical drawing of tiller arm 2200098. Dimensions: total length 200, mounting hole diameter ∅20, mounting hole offset M20, mounting hole depth 90, mounting hole diameter ∅95, mounting hole offset 60.</p>	<p>2200099 Rough equipped tiller arm LS 155 ∅ 20 rough boring – maxi ∅ 50</p>  <p>Technical drawing of tiller arm 2200099. Dimensions: total length 200, mounting hole diameter ∅25, mounting hole offset M20, mounting hole depth 106, mounting hole diameter ∅95, mounting hole offset 60.</p>	<p>2200100 Rough equipped tiller arm LS 330 ∅ 20 rough boring – maxi ∅ 50</p>  <p>Technical drawing of tiller arm 2200100. Dimensions: total length 280, mounting hole diameter ∅25, mounting hole offset M20, mounting hole depth 106, mounting hole diameter ∅115, mounting hole offset 80.</p>
<p>2201540 Rough equipped tiller arm LS 450 ∅ 20 rough boring – maxi ∅ 64</p>  <p>Technical drawing of tiller arm 2201540. Dimensions: total length 300, mounting hole diameter ∅25, mounting hole offset M20, mounting hole depth 106, mounting hole diameter ∅115, mounting hole offset 80.</p>	<p>2200113 Rough equipped tiller arm LS 550-840 ∅ 20 rough boring – maxi ∅ 88</p>  <p>Technical drawing of tiller arm 2200113. Dimensions: total length 260, mounting hole diameter ∅35, mounting hole offset GI, mounting hole depth 117, mounting hole diameter ∅150, mounting hole offset 80.</p>	<p>2200134 Rough equipped tiller arm LS 1350-1660 ∅ 20 rough boring – maxi ∅ 100</p>  <p>Technical drawing of tiller arm 2200134. Dimensions: total length 350, mounting hole diameter ∅40, mounting hole offset GI, mounting hole depth 127, mounting hole diameter ∅150, mounting hole offset 135.</p>

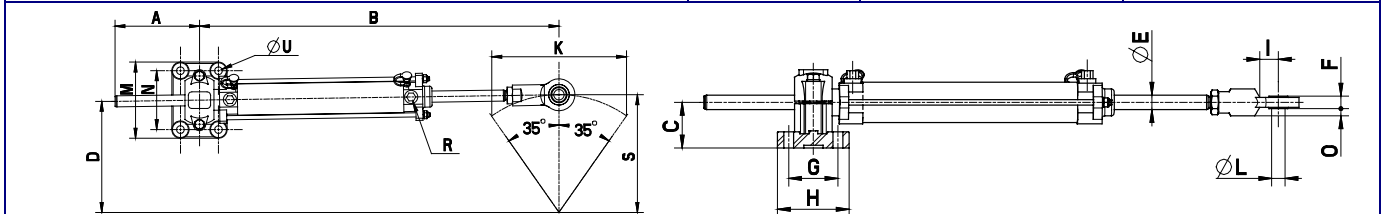
OTHER PUMP AND CYLINDER MODELS

	Flow rate (cc/t)	
29	2200050 29 CT HB-without L.V.	2200037 29 CT HB-with L.V.
35	2200058 35 CT HB-without L.V.	2200019 35 CT HB-with L.V.

	Flow rate (cc/t)	
29	2200352 29 CT 30-without L.V.	2200282 29 CT 30-with L.V.
40	2200074 40 CT-without L.V.	2200073 40 CT-with L.V.

	Flow rate (cc/t)	
36	2200260 36 CT-without L.V.	2200248 36 CT-with L.V.
60	2200261 60 CT-without L.V.	2200353 60 CT-with L.V.

	Flow rate (cc/t)	
60		2201941 60 CT-with L.V.-8°
70		2201942 70 CT-with L.V.-8°
90		2201857 90 CT-with L.V.-8°
115	2200605 115CT-without L.V.-8°	2201420 115 CT-with L.V.-8°
170	2201421 170 CT-without L.V.-8°	

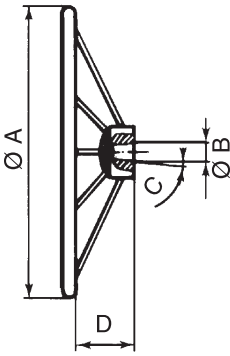


TYPE		A	B	C	D	E	F	G	H	I	K	L	M	N	O	U	R	S
Vérins	2200249 VHM 32 DT	100	434	42	117	16	14	40	56	20	150	15	91	75	9	8,5	¼BSP	129
	2200222 VHM 35 DTP	122	520	51	163	16	14	55	80	20	200	15	110	85	9	11	¼BSP	180
Cylinders	2200249 VHM 32 DT	4	17 ³ / ₃₂	1 ⁵ / ₈	4 ⁵ / ₈	⁵ / ₈	⁹ / ₁₆	1 ³⁷ / ₆₄	2 ³ / ₁₆	⁵¹ / ₆₄	5 ²⁹ / ₃₂	1 ⁹ / ₃₂	3 ⁹ / ₁₆	2 ⁶¹ / ₆₄	³ / ₈	1 ¹¹ / ₃₂	¼BSP	5 ¹ / ₁₆
	2200222 VHM 35 DTP	4 ¹ / ₃₂	20 ⁹ / ₁₆	2 ³ / ₆₄	6 ⁷ / ₁₆	⁵ / ₈	⁹ / ₁₆	2 ⁵ / ₃₂	3 ⁵ / ₃₂	⁵¹ / ₆₄	7 ⁷ / ₈	1 ⁹ / ₃₂	4 ³ / ₈	3 ¹¹ / ₃₂	³ / ₈	7 ⁷ / ₁₆	¼BSP	7 ³ / ₃₂

S/STEEL AND WOODEN STEERING WHEELS



S/STEEL WHEELS

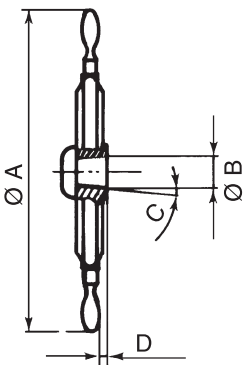


CODE	DESIGNATION	Ø A	Ø B	C	D
2200985	S/steel wheel 350 – 19	350	13 ²⁵ / ₃₂ "	19 ³ / ₄ "	2°30' 75 2 ⁶¹ / ₆₄ "
2200986	S/steel wheel 400 – 19	400	15 ³ / ₄ "	19 ³ / ₄ "	2°30' 75 2 ⁶¹ / ₆₄ "
2200987	S/steel wheel 600 – 22	600	23 ⁵ / ₈ "	22 ⁷ / ₈ "	2°30' 26 1"
2200988	S/steel wheel 700 – 22	700	27 ⁹ / ₁₆ "	22 ⁷ / ₈ "	2°30' 26 1"
2200989	S/steel wheel 700 – 8°	700	27 ⁹ / ₁₆ "	25.4 1"	8° 26 1"
2200990	S/steel wheel 800 – 19	800	31 ¹ / ₂ "	19 ³ / ₄ "	2°30' 26 1"
2200991	S/steel wheel 800 – 8°	800	31 ¹ / ₂ "	25.4 1"	8° 26 1"
2200992	S/steel wheel 1000 – 28	1000	39 ³ / ₈ "	28 1 ³ / ₃₂ "	0° 26 1"
2201409	S/steel wheel 1000 – 8°	1000	39 ³ / ₈ "	25.4 1"	8° 26 1"
2200994	S/steel wheel 1200 – 28	1200	47 ¹ / ₄ "	28 1 ³ / ₃₂ "	0° 26 1"
2201431	S/steel wheel 1200 – 8°	1200	47 ¹ / ₄ "	25.4 1"	8° 26 1"

LEATHER COVERED S/STEEL WHEELS (BURGUNDY)

CODE	DESIGNATION	Ø A	Ø B	C	D
2201844	S/steel wheel 800 – 8°	800	31 ¹ / ₂ "	25.4 1"	8° 26 1"
2201845	S/steel wheel 1000 – 8°	1000	39 ³ / ₈ "	25.4 1"	8° 26 1"
2202052	S/steel wheel 1200 – 8°	1200	47 ¹ / ₄ "	25.4 1"	8° 26 1"

WOODEN WHEELS



CODE	DESIGNATION	Ø A	Ø B	C	D
2200173	Wooden wheel 420 – 22	420	16 ¹⁷ / ₃₂ "	22 ⁷ / ₈ "	2°30' 15 ¹⁹ / ₃₂ "
2200996	Wooden wheel 420 – 19	420	16 ¹⁷ / ₃₂ "	19 ³ / ₄ "	2°30' 15 ¹⁹ / ₃₂ "
2200174	Wooden wheel 500 – 22	500	19 ¹¹ / ₁₆ "	22 ⁷ / ₈ "	2°30' 15 ¹⁹ / ₃₂ "
2200997	Wooden wheel 500 – 19	500	19 ¹¹ / ₁₆ "	19 ³ / ₄ "	2°30' 15 ¹⁹ / ₃₂ "
2200175	Wooden wheel 600 – 22	600	23 ⁵ / ₈ "	22 ⁷ / ₈ "	2°30' 15 ¹⁹ / ₃₂ "
2200998	Wooden wheel 700 – 22	700	27 ⁹ / ₁₆ "	22 ⁷ / ₈ "	2°30' 15 ¹⁹ / ₃₂ "
2200177	Wooden wheel 700 – 28	700	27 ⁹ / ₁₆ "	28 1 ³ / ₃₂ "	0° 15 ¹⁹ / ₃₂ "
2200178	Wooden wheel 800 – 28	800	31 ¹ / ₂ "	28 1 ³ / ₃₂ "	0° 15 ¹⁹ / ₃₂ "
2200272	Wooden wheel 900 – 28	900	35 ⁷ / ₁₆ "	28 1 ³ / ₃₂ "	0° 15 ¹⁹ / ₃₂ "
2200179	Wooden wheel 1000 – 28	1000	39 ³ / ₈ "	28 1 ³ / ₃₂ "	0° 15 ¹⁹ / ₃₂ "

RANGE OF STEERING WHEELS



<p>2200181 Plastic Wheel \varnothing 320</p>	<p>2200182 Imitation Leather/Anodised Alu \varnothing 320</p>
<p>2202461 S/Steel Wheel \varnothing 320</p>	<p>2202462 S/Steel Wheel with knob \varnothing 275</p>
<p>2202463 Covered S/Steel Wheel \varnothing 340</p>	<p>2202464 Covered S/Steel Wheel with knob \varnothing 340</p>
<p>2200985 S/Steel Wheel \varnothing 350</p>	<p>2200986 Covered S/Steel Wheel \varnothing 400</p>

HYDRAULIC FLEXIBLE TUBES

FLEXIBLE TUBES FOR CRIMP CONNECTIONS

Only the sole use of LS flexible tubes in Ø6, 8 or 10 mm will guarantee the global performances of LS steering systems.

A few references:

- Ø6 Flexible tube - per metre	2200810
- Ø8 Flexible tube - per metre	2200024
- Ø10 Flexible tube - per metre	2200070
- Ø6 Flexible tube - length 8 m	1204267
- Ø6 Flexible tube - length 10 m	1204268
- Ø6 Flexible tube - length 12 m	1204740
- Ø6 Flexible tube - length 25 m	1204985
- Ø6 Flexible tube - length 35 m	1205301
- Ø6 Flexible tube - length 400 m	1205359
- Ø8 Flexible tube - length 8 m	1224986
- Ø8 Flexible tube - length 12 m	1204742
- Ø8 Flexible tube - length 20 m	1205245
- Ø8 Flexible tube - length 35 m	1205300
- Ø8 Flexible tube - length 400 m	1205360



FLEXIBLE TUBES WITH PRE-CRIMPED CONNECTIONS

High pressure flexible tubes of various lengths with pre-crimped connections of various kinds (several diameters, straight fittings, 90° elbow fittings). Stainless steel fittings available.

A few references in 10 L :

- Flex. tube R1T8 lg 500 – 2 x EFT10L	1290013
- Flex. tube R1T8 lg 1000 – 2 x EFT10L	1290023
- Flex. tube R1T8 lg 1500 – 2 x EFT10L	1290025
- Flex. tube R1T8 lg 2000 – 2 x EFT10L	1290027
- Flex. tube R1T8 lg 3000 – 2 x EFT10L	1290117

A few references in 12 L :

- Flex. tube R1T10 lg 500 – 2 x EFT12L	1290042
- Flex. tube R1T10 lg 1000 – 2 x EFT12L	1290052
- Flex. tube R1T10 lg 1500 – 2 x EFT12L	1290054
- Flex. tube R1T10 lg 2000 – 2 x EFT12L	1290056
- Flexi. tube R1T10 lg 3000 – 2 x EFT12L	1290130

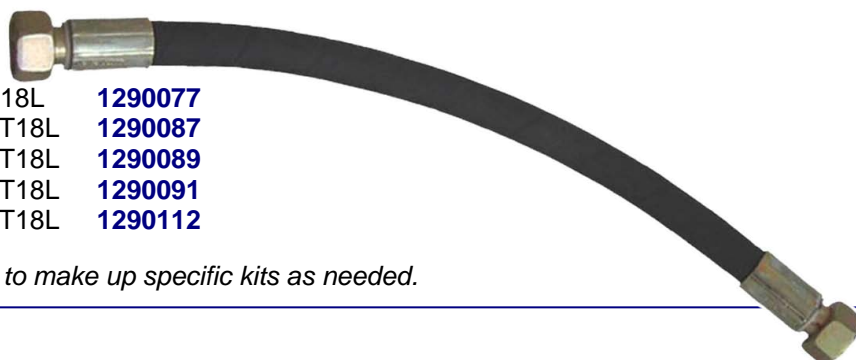
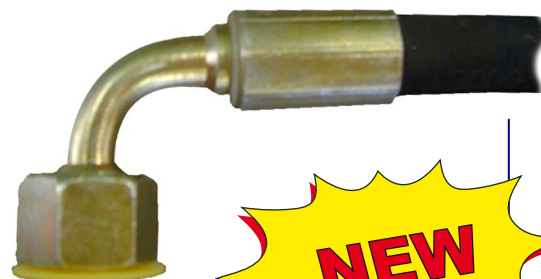
A few references in 15 L :

- Flex. tube R1T13 lg 500 – 2 x EFT15L	1290385
- Flex. tube R1T13 lg 1000 – 2 x EFT15L	1290376
- Flex. tube R1T13 lg 2000 – 2 x EFT15L	1290387
- Flex. tube R1T13 lg 2500 – 2 x EFT15L	1290378










A few references in 18 L :

- Flex. tube R1T16 lg 500 – 2 x EFT18L	1290077
- Flex. tube R1T16 lg 1000 – 2 x EFT18L	1290087
- Flex. tube R1T16 lg 1500 – 2 x EFT18L	1290089
- Flex. tube R1T16 lg 2000 – 2 x EFT18L	1290091
- Flex. tube R1T16 lg 3000 – 2 x EFT18L	1290112





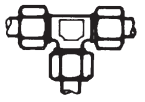

Other lengths on request. Possibility to make up specific kits as needed.



FITTINGS

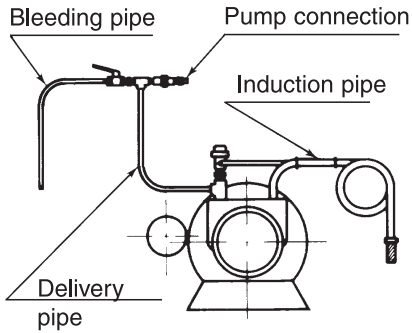
FOR FLEXIBLE TUBE			
Type	Designation	Code for steel	Code for s/steel
 Elbow fittings 90°	G 1/4 conic JIC M. 9/16	2200321	2200309
	G 3/8 conic JIC M. 9/16	2200426	
 Straight fittings	G 1/4 conic JIC M. 9/16	2200427	2200447
	G 1/4 cylindric JIC M. 9/16	2200199	2200448
	G 3/8 conic JIC M. 9/16	2200428	
	G 3/8 cylindric JIC M. 9/16	2200429	2202039
 Adapters	G 1/4 conic JIC F.T. 9/16	2200430	
	G 3/8 conic JIC F.T. 9/16	2200356	
 Connection fitt.	JIC M. 9/16	2200288	
 Tee fittings	G 1/4 conic 2 x JIC M. 9/16	2200431	2202100
	G 3/8 conic 2 x JIC M. 9/16	2200432	
 Equal tee fittings	JIC M. 9/16	2200433	2202009
 Straight fittings	JIC M. 9/16 inner diam. 8	2200299	2200449
	JIC M. 9/16 inner diam. 10	2200301	
 Elbow fittings	JIC M. 9/16 inner diam. 8	2200302	
	JIC M. 9/16 inner diam. 10	2200303	
 Connection fitt.	Inner diam. 8	2200373	
	Inner diam. 10	2200434	

FOR INFLEXIBLE TUBE

 Straight fittings	G 1/4 cylindric diam. 8	2200435	
	G 1/4 cylindric diam. 10	2200436	
	G 3/8 cylindric diam. 10	2200437	
	G 3/8 cylindric diam. 12	2200438	
	G 3/8 cylindric diam. 17	2201016	
	G 1/2 cylindric diam. 18	2200439	
	G 1/2 cylindric diam. 21	2200388	
 Elbow fittings	G 1/4 conic diam. 10	2200440	
	G 3/8 conic diam. 12	2200306	
	G 3/8 conic diam. 17	2201541	
	G 1/2 conic diam. 18	2200441	
	G 1/2 conic diam. 21	1202330	
 Tee fittings	G 1/4 conic diam. 10	2200442	
	G 3/8 conic diam. 12	2200443	
	G 3/8 conic diam. 17	2201542	
	G 1/2 conic diam. 18	2200339	
	G 1/2 conic diam. 21	2201543	
 Connection fitt.	Diam. 10	2200469	
	Diam. 12	2200585	
	Diam. 17	2201302	
	Diam. 18	2200270	
	Diam. 21	2201303	
 Equal tee fittings	Diam. 8	2200444	
	Diam. 10	2200259	
	Diam. 12	2200445	
	Diam. 17	2201544	
	Diam. 18	2200446	
	Diam. 21	2201545	
 Reductions	G 1/8 M -- G 1/4 F	1202438	
	G 1/4 M -- G 3/8 F	2200390	
	G 1/4 M -- G 1/2 F	2200389	
	G 3/8 M -- G 1/4 F	2200374	
	G 3/8 M -- G 1/2 F	2200396	
	G 1/2 M -- G 1/4 F	2200221	
	G 1/2 M -- G 3/8 F	2200332	

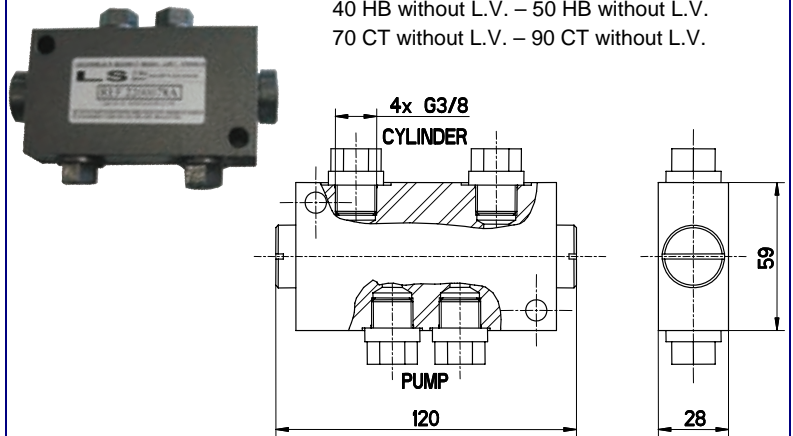
OPTIONAL ADDITIONS TO OUR STEERING SYSTEMS

2200685 3 l/mn filling unit



2200078 Lock valve on line LS 115

For pumps: 30 HB without L.V. – 35 HB without L.V.
40 HB without L.V. – 50 HB without L.V.
70 CT without L.V. – 90 CT without L.V.

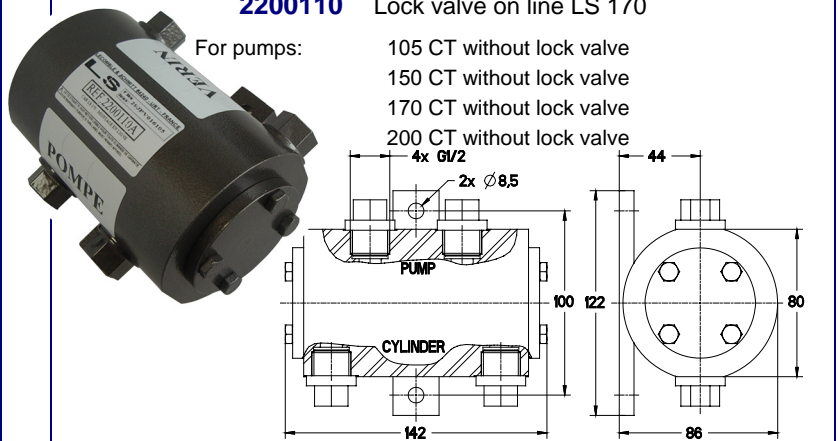


- 2200376** Electrical by-pass NO 06 12 VDC
- 2201479** Electrical by-pass NO 06 24 VDC
- 2200566** Electrical by-pass NO 12 12 VDC
- 2201438** Electrical by-pass NO 12 24 VDC

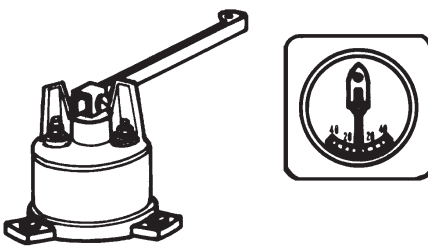


2200110 Lock valve on line LS 170

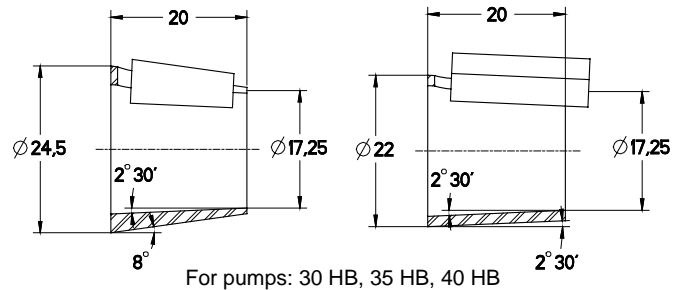
For pumps: 105 CT without lock valve
150 CT without lock valve
170 CT without lock valve
200 CT without lock valve



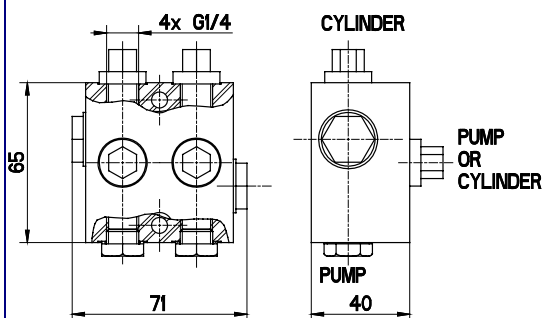
2200183 Rudder angle indicator
(Transmitter + receiver)



2200029 Adaptable cone + pin $\varnothing 24.5 - 8^\circ$ angle
2201138 Adaptable cone + pin $\varnothing 22 - 2.30^\circ$ angle



2200121 Pressure relief valve



2200213 Synchro valve

