

LINEAR HYDRAULIC THRUSTER - LECOMBLE & SCHMITT

Autopilot Linear Hydraulic Drive Unit:

The linear hydraulic drive unit is a "closed loop" hydraulic system comprising an electric motor pump set with by-pass valve and hydraulic cylinder (ram).

These systems are available in 12 or 24 volt DC and have adjustable flow rates (speed of ram movement). Also, two ram versions are available:

- i) a system where the pump and valve is an integral fit on a balanced ram;
- ii) a system utilising an unbalanced ram with the pumpset remotely mounted.

System (i) is the standard fit and the most common. However, in smaller spaces the system (ii) is used where piston movement of the ram may be restricted.

NOTE: Before commencing installation, ensure you have the right system for your needs.

Mechanical Connections:

The linear drive must be mounted horizontally in a dry position and is connected directly to a quadrant or a tiller as shown in the drawings.

You will need to purchase the correct size bolt (diameter and length) for connecting the rod end bearing of the ram to the quadrant or tiller. Use only high quality fasteners eg: marine grade stainless steel.

The ram trunnion mounting should be bolted to a strong base as the linear drive is capable of exerting considerable thrust (up to 1500ft/lbs).

Electrical Connections:

Power to the drive unit is supplied from the autopilot control unit:

1. The two **motor** wires of the drive pumpset are connected to the **MOTOR** terminals of the control unit.
2. Two wires from the **solenoid** by-pass valve must be connected to the **CLUTCH** terminals of the autopilot control unit. The solenoid valve is identified by the square cover of the "Hirschmann" connector. (Remove the centre screw and cover to access the connector terminals).

NOTE: If a drive unit cable is supplied, this is plugged into the socket at the motor end but you will need to check the wiring colour code before connecting to the autopilot.

Connection cable:

1. Where a connection cable is supplied, the wiring colour code is:

Green	MOTOR
Brown	MOTOR
Blue	CLUTCH -
Black	CLUTCH +

2. Where a cable is not supplied, a suitable cable capable of conducting 15 amps should be used. If the cable needed is to be longer than 10 metres, choose a larger diameter cable to avoid unnecessary voltage drop.

Testing & Commissioning:

1. When mechanical installation is complete, check all fittings and connections for security.
2. Ensure the reservoir on the drive pump is at least half full with oil (this is how the system is supplied from the factory and should not need refilling unless the system has been drained for some reason).
3. Before applying power to the autopilot system, ensure the ram movement does not foul anywhere by slowly turning the helm by hand and checking the movement. Checks should include the autopilot rudder feedback unit.
4. Refer to your autopilot manual for commissioning checks when power is to be applied to the autopilot system.

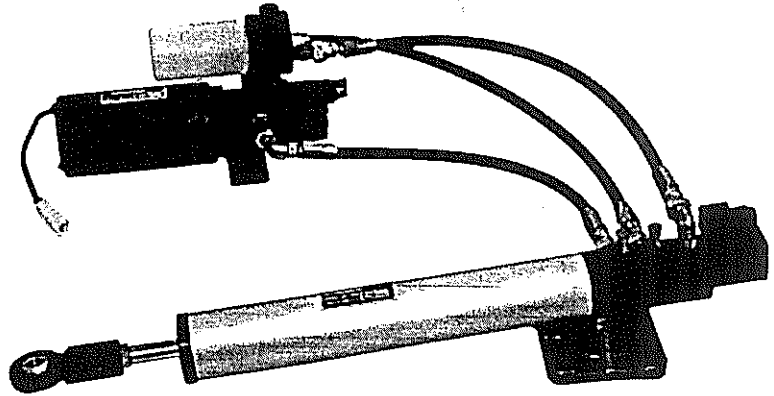
Periodic Maintenance:

1. Periodically check the tightness of all connections both mechanical and electrical (eg: 6 monthly).
2. Ensure the pump reservoir maintains a constant oil level. After initial installation the oil level may drop slightly. However, if the reservoir constantly requires topping up then an oil leak may be present. If this is the case check the full system thorough. (The drive system is self bleeding but may require several hard over/hard over movements to purge all air from a system which has undergone repairs).
3. After extended cruising or after 3 years the brushes on the pump motor should be checked for wear.

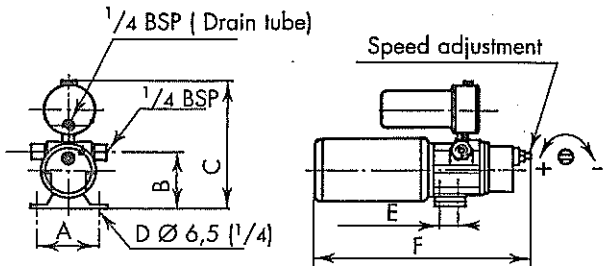
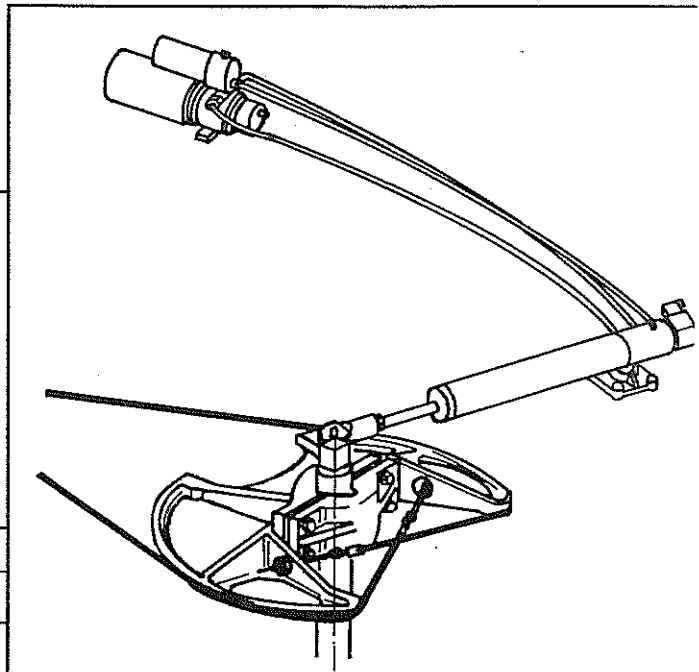
SINGLE ROD LINEAR HYDRAULIC CYLINDERS WITH ADJUSTABLE SPEED FOR AUTOPILOTS



- Single rod hydraulic cylinder with integrated electrical by-pass.
- Compact over-all dimensions allowing installation on virtually all types of boats.
- Directly fitted on the quadrant.
- Speed adjustment from the reversible drive unit.
- Separate reversible drive unit which can be installed where selected.
- The kit is delivered assembled and bled, with 1,200 mm flexible tube *.
- * Other lengths upon request.

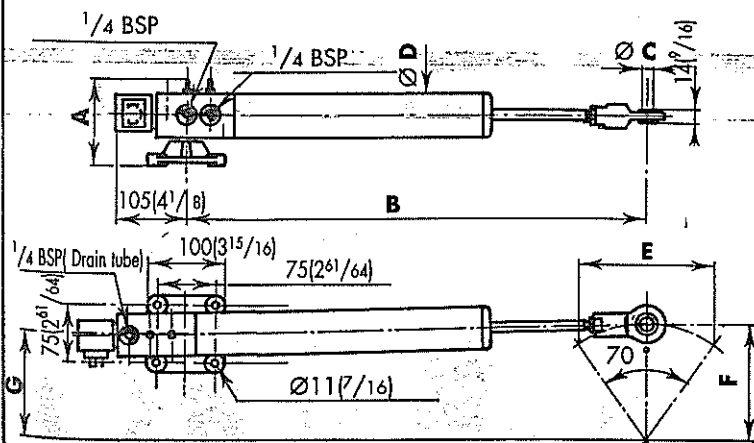


2201109	LINEAR DRIVE KIT 40 ST 16 DE BP 12 V
2201110	LINEAR DRIVE KIT 40 ST 16 DE BP 24 V
2201111	LINEAR DRIVE KIT 50 ST 20 DE BP 12 V
2201112	LINEAR DRIVE KIT 50 ST 20 DE BP 24 V
2201124	LINEAR DRIVE KIT 50 ST 203 DE BP 12V
2201125	LINEAR DRIVE KIT 50 ST 203 DE BP 24 V



2201100	RV2 - ST - 12 V	2201160	RV3 - ST - 12 V
2201101	RV2 - ST - 24 V	2201161	RV3 - ST - 24 V

	A	B	C	D	E	F
RV2 ST	80 35/32	70 23/4	170 611/16	4	24 15/16	280 11
RV3 ST	100 315/16	95 33/4	195 711/16	2	0	315 1225/64

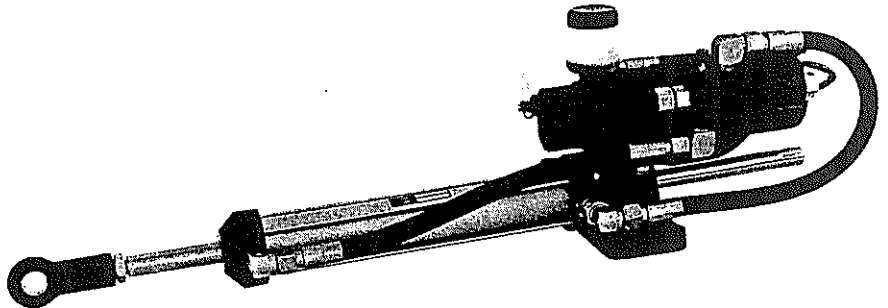


TECHNICAL DATA				
TYPE	VHM 40 ST 16 DE BP		VHM 50 ST 20 DE BP	
Code 12 V	2201096		2201098	
Code 24 V	2201097		2201099	
Maximum torque	100 mkg	739 ft.lbs	200 mkg	1478 ft.lbs
Weight	3,5 kg	7,71 lbs	5 kg	11 lbs
A	120 mm	4 23/32"	130 mm	5 1/8"
B	627 mm	24 11/16"	727 mm	28 5/8"
C	15 mm	19/32"	17 mm	43/64"
D	56 mm	4 55/64"	70 mm	2 3/4"
E	240 mm	9 7/16"	300 mm	11 13/16"
F	210 mm	8 17/64"	260 mm	10 15/64"
G	190 mm	7 31/64"	240 mm	9 7/16"

LINEAR HYDRAULIC THRUSTORS WITH ADJUSTABLE SPEED FOR AUTOPILOTS

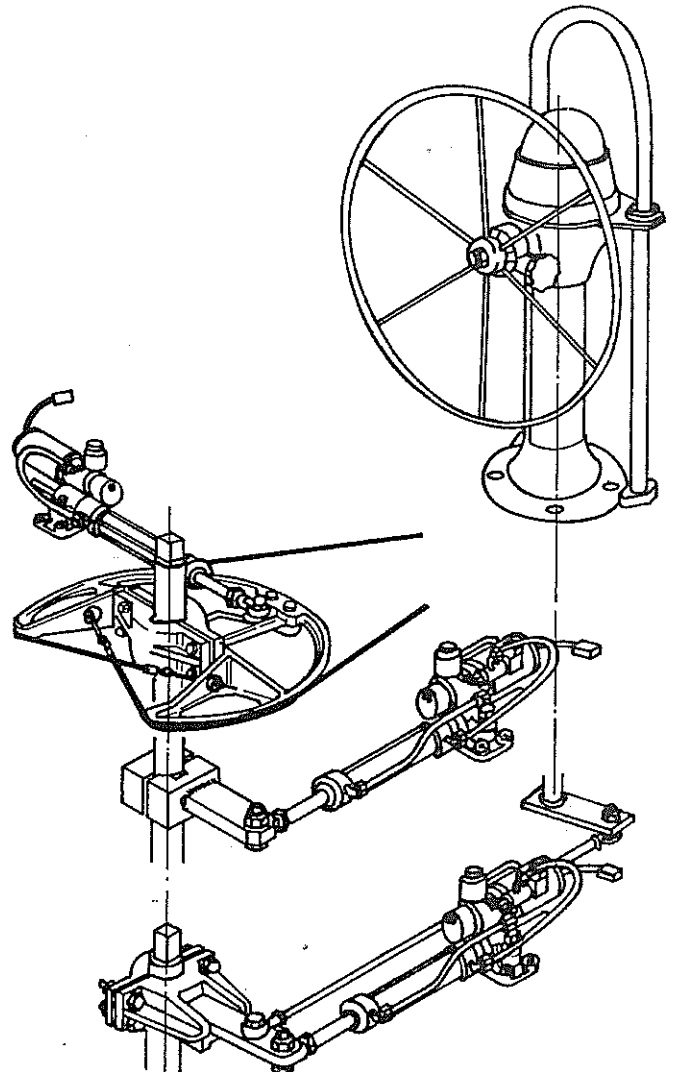
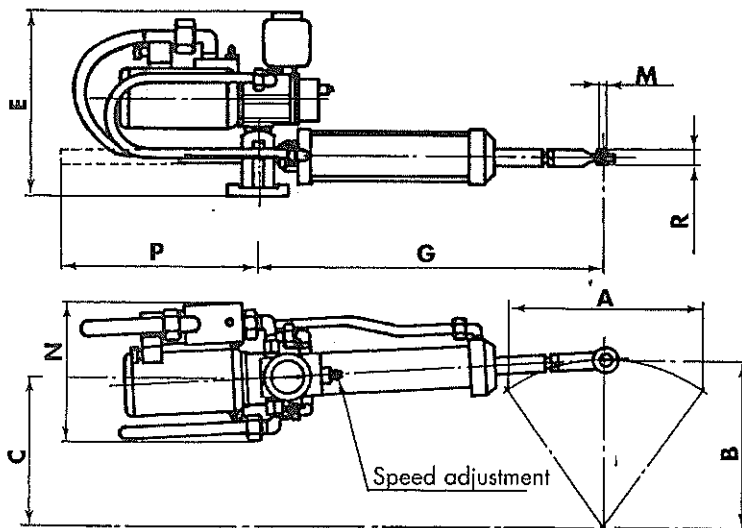


- Can be fitted on practically all types of boats in function of the rudder torque.
- Linear hydraulic thrusters with adjustable speed can be directly mounted on the quadrant.
- The thruster speed is adjustable on the unit which features the same characteristics as the RV2 unit.



TECHNICAL DATA

Type	V2 H32		V2 H40		V2H50	
Code 12 V	2200623		2200411		2200597	
Code 24 V	2200961		2200962		2200963	
Torque	50 mkg	369 ft.lbs	100 mkg	739 ft.lbs	150 mkg	1108 ft.lbs
A	200	7 ⁷ / ₈ "	240	9 ⁷ / ₁₆ "	228	9"
B	180	7 ³ / ₃₂ "	210	8 ¹⁷ / ₆₄ "	200	7 ⁷ / ₈ "
C	163	6 ²⁷ / ₆₄ "	180	7 ³ / ₃₂ "	180	7 ³ / ₃₂ "
E	240	9 ⁷ / ₁₆ "	240	9 ⁷ / ₁₆ "	245	9 ⁴¹ / ₆₄ "
G	497	19 ⁹ / ₁₆ "	589	23 ³ / ₁₆ "	691	27 ¹³ / ₆₄ "
M	15	1 ⁹ / ₃₂ "	17	4 ¹ / ₆₄ "	20	5 ¹ / ₆₄ "
N	160	8 ¹⁹ / ₆₄ "	200	7 ⁷ / ₈ "	220	8 ¹¹ / ₁₆ "
P	240	9 ⁷ / ₁₆ "	260	10 ¹⁵ / ₆₄ "	320	12 ³⁹ / ₆₄ "
R	12	1 ¹⁵ / ₃₂ "	14	9 ¹ / ₁₆ "	16	5 ⁵ / ₈ "



Ets LECOMBLE & SCHMITT - B.P. n°2 - 64240 URT - FRANCE