

ECON ELECTRIC HYDRAULIC POWER PACK

Fig. 21301 Single Acting Hydraulic Power pack, type EHP-SA



Fig. 21302 Double Acting Hydraulic Power pack, EHP-DA



Scan for manual

**Installation & Operation Manual for Electric Hydraulic Power pack:
Fig. 21301, 21302**

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1 INTRODUCTION

1.1 Purpose

The purpose of this manual is to introduce and explain the installation, operation and maintenance of the EHP Electric Hydraulic Power pack.

1.2 Safety Notices

This manual contains safety notices and precautions the user must take to reduce the risk of personal injury and damage to the equipment. The user(s) must read these instructions before the installation, operation or maintenance of the EHP Electric Hydraulic Power pack.



DANGER: Refers to personal safety and alerts the user for danger and/or injury.
Hazardous or unsafe practice may result in severe injury or death.



WARNING: Refers to personal safety. Alerts the user for potential danger.
Not following warning notices could result in personal injury or death.



CAUTION: Directs the user's attention to general precautions that, if not followed, could result in personal injury and/or equipment damage.

Note: Information in this manual is critical to the user's understanding of the actuator's installation and operation.

2 PRODUCT IDENTIFICATION

2.1 Product Identification

The product name plate is located on the lower part of the main housing. The name plate contains the following:

2.1.1 Marking

- ECON logo (trademark)
- Figure number
- Serial number
- Hydraulic pressure
- Test pressure
- Electrical power supply
- Pump speed
- Duty cycle
- Ingress protection rate
- Options



2.1.2 Applied Standards

- CEI EN 60529 1997-06
- IEC529 ex CEI 70-1, A1 2000-06

2.1.3 Certification

- LRS Type Approval Certificate

2.2 Initial Inspection

Upon the receipt of the actuator, the user should inspect the condition of the product and ensure that the product specification stated on the name plate matches with the order sheet.

- Remove the packing wrap or wooden box carefully. Inspect the product for any physical damage that may have occurred during shipment.
- Check the product specification of the received product. If a wrong product has been supplied, please immediately report this to the distributing company.

2.3 Storage

Power packs must be stored in a clean, cool and dry area. The unit should be stored with the cover installed and the conduit openings sealed. Storage must be off the floor, covered with a sealed dust protector.

3 GENERAL INFORMATION AND FEATURES

3.1 General Information

ECON EHP electric hydraulic Power packs are designed for operation together with ECON hydraulic actuators mounting directly or connected through hydraulic piping.

The Power pack has a pump output capacity of maximum 0,80 l/min at a pressure of 135 bar.

3.1.1 Standard Technical Data

Enclosure Rated	IP68, at 50 meter for 48 hours
Enclosure	High grade aluminium alloy, corrosion coated
Power Supply	230VAC ±5% 1Ph, 50/60Hz
Duty Type	S3 / 15%
Motor	Electric asynchronous motor 4 pole and 2 pole
Power	4 pole 115/140 Watts / 2 pole 230/280 Watts
Pump Capacity	4 pole 0,35/0,40 l/min / 2 pole 0,70/0,80 l/min
Oil Tank Capacity	0,6 liter
Protection	Internal protected by removable fuses
Indicator	2 color LED indicator
Local Control	Inside switch on PCB
Cable Glands	1x M32, 1x M25, 2x M20 (1 plug)
Outlet	M8 threaded ports A - B
Ambient Temperature	-20°C (-4°F) up to +80°C (176°F)
External Coating	Pulverit 50 powder coating, RAL5015
Weight	10 Kg

3.1.2 Power pack Versions

Fig. 21301	Operation	Control		
EHP-SA-E4	Single acting, 4-pole	Basic	ECON Hardwired (std)	ECON CAN-Open
EHP-SA-E2	Single acting, 2-pole	Basic	ECON Hardwired (std)	ECON CAN-Open
Fig. 21302	Operation	Control		
EHP-DA-E4	Double acting, 4-pole	Basic	ECON Hardwired (std)	ECON CAN-Open
EHP-DA-E2	Double acting, 2-pole	Basic	ECON Hardwired (std)	ECON CAN-Open
EHP-DAT-E4	Double acting, Proportional, 4-pole	Basic	ECON Hardwired (std)	ECON CAN-Open
EHP-DAT-E2	Double acting, Proportional, 2-pole	Basic	ECON Hardwired (std)	ECON CAN-Open

3.1.3 Duty Cycle

Duty cycle rating according IEC60034-1 S3.

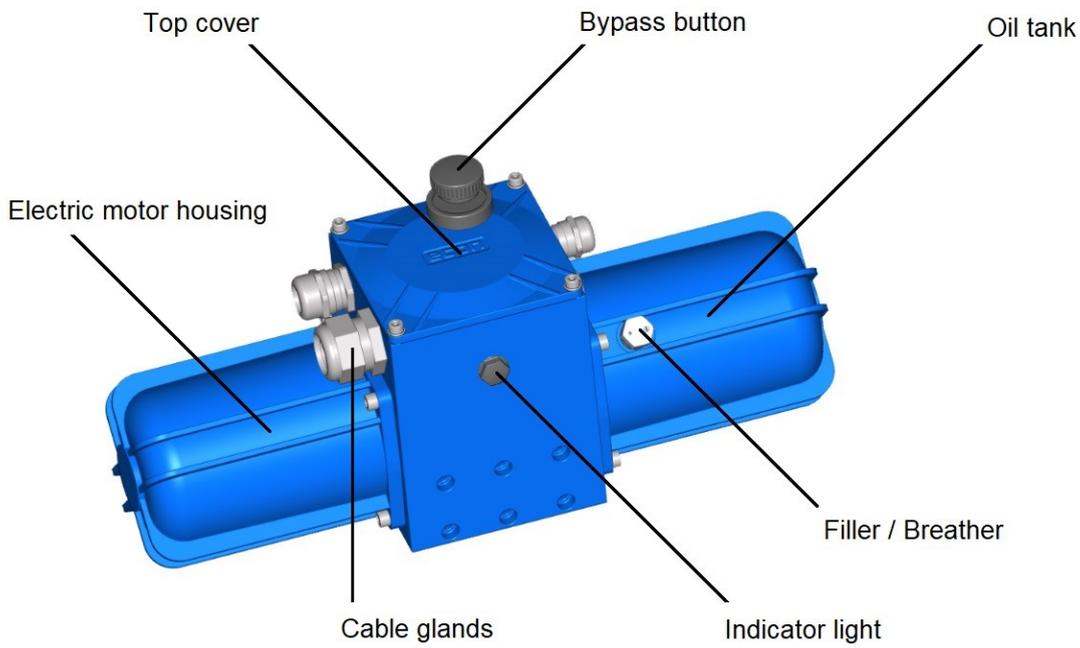
Exceeding the actuator's rated duty cycle may cause thermal overload.

Intermittent duty S3

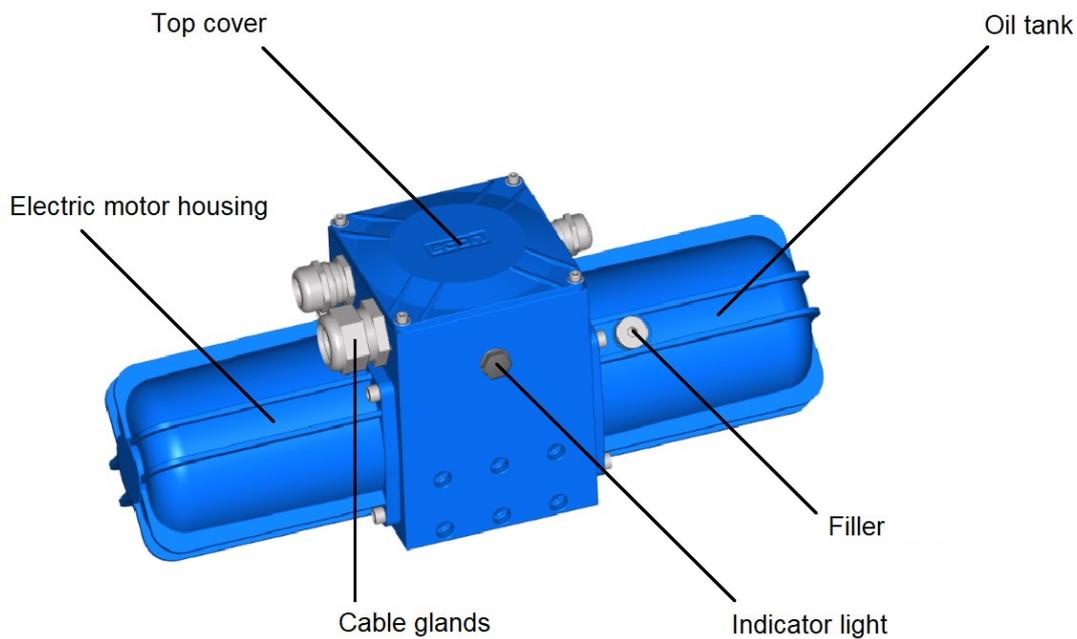
The duty is a sequence of identical run and rest cycles with constant load. Starting current has little effect on temperature rise. The rest period allows the machine to cool down so that thermal equilibrium is not reached. The relative on-time at S3-15% is limited to 15%.

3.2 External Parts for Standard Models

3.2.1 EHP-SA



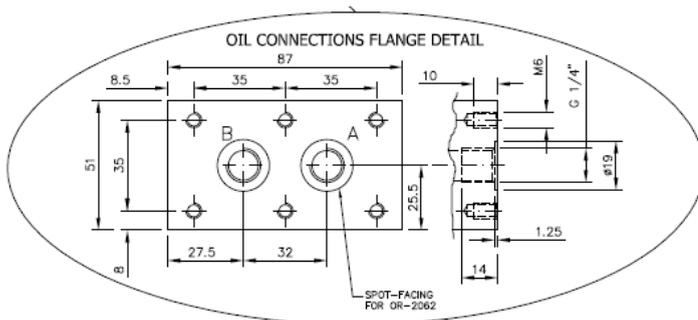
3.2.2 EHP-DA



3.2.3 Oil Connection ports

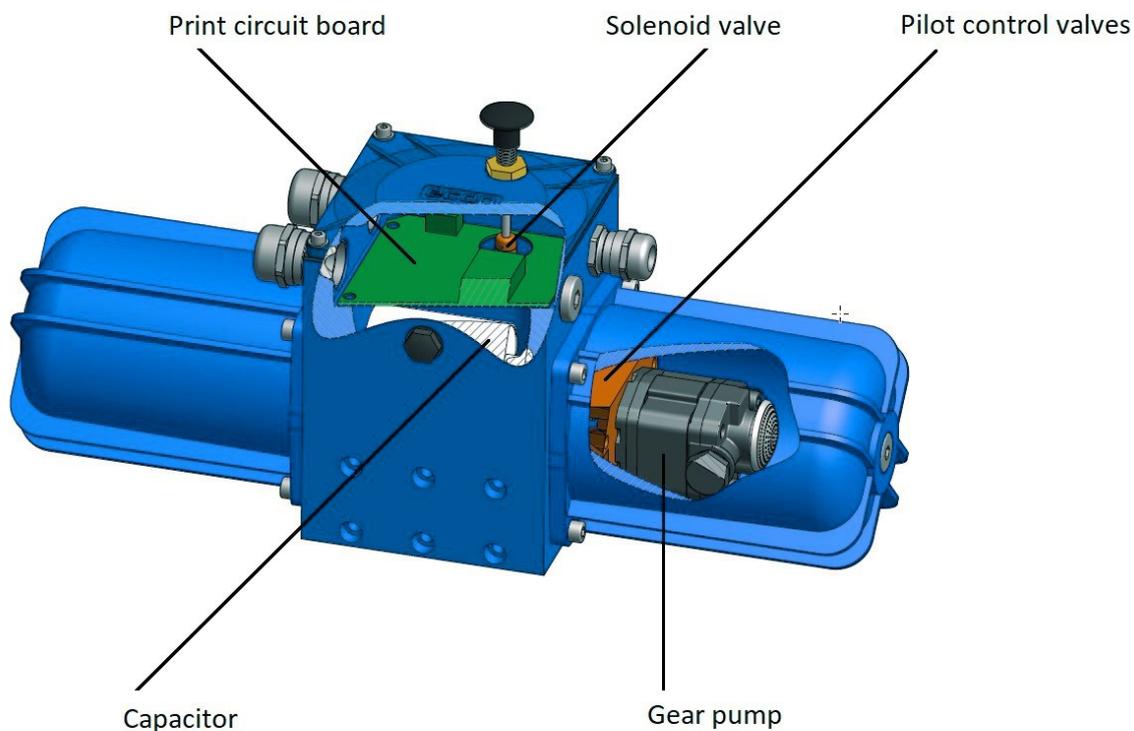
The treaded ports in the main housing of the Power pack are not suitable to install couplers. If the Power pack is not mounted directly to an actuator a hydraulic connection block must be installed.

Below a drawing of the actuator mounting flange, where the B-port (open) is on the left and the A-port (closed) on the right. On the Power pack this will be the opposite and **A-port (closed) on the left and B-port (open) on the right.**



3.3 Internal Parts for Standard Models

3.3.1 EHP-SA



Note: EHP-DA does not have a solenoid valve assembly!

4 INSTALLATION

4.1 Pre-installation

- Please check if the electric power supply corresponds with your specification and the information on the actuator type plate.
- Make sure the power supply has been switched off before you start wiring the actuator.

4.1.1 Use in General Service

Verify the actuator's nameplate to ensure that model number, torque output, operating speed, voltage and enclosure type are correct before installation or use.

4.2 Actuator Mounting

Note: *Prior to mounting, actuator assembly must be checked for any damage.
Damaged parts must be replaced by original spare parts*

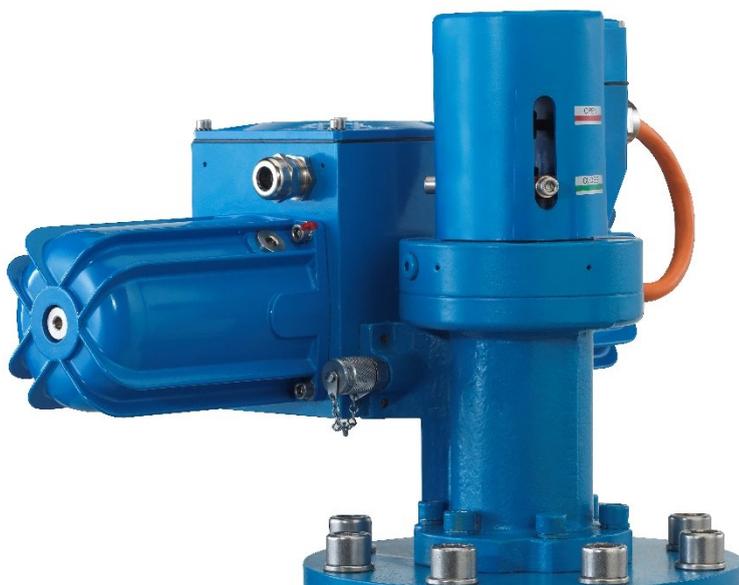


CAUTION:

*Do not attempt to work on your ECON actuator without first shutting off the power supply
Do not attach ropes or hooks to the unit for lifting purposes*

4.2.1 Power pack installation

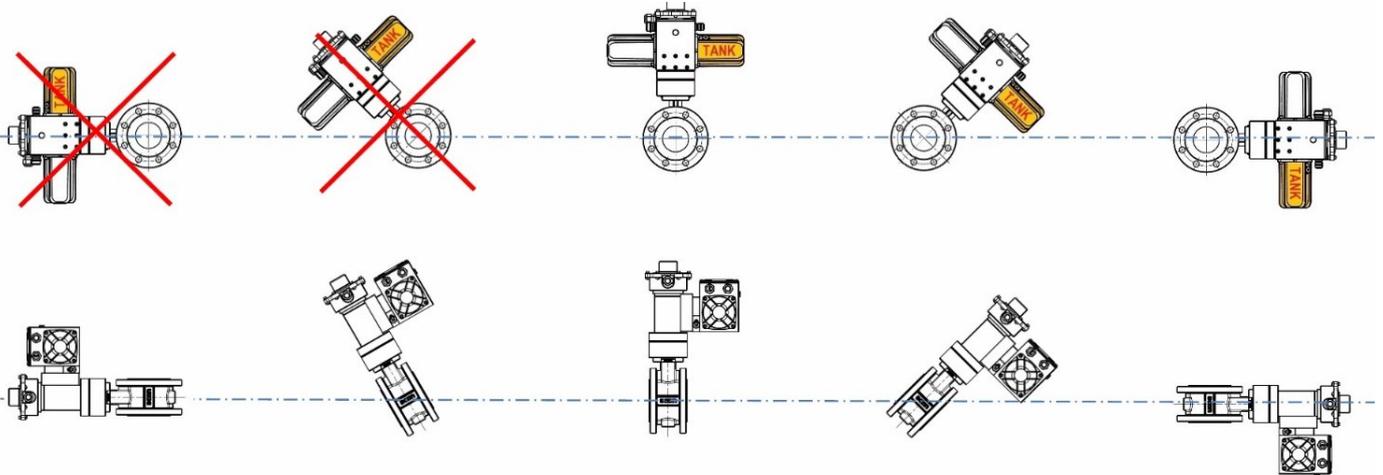
The power pack can be mounted on to an ECON hydraulic actuator with use of 6 Allen key bolts. On the following actuator type the power pack can be mounted directly: ESR, EDR, ESL, EDL. On Actuator type ESH, EDH installation requires an additional mounting block.



The power pack can be mounted separate from the ECON hydraulic actuator and connected through hydraulic piping. This will require a Mounting Bracket and hydraulic connection block. Please contact your Eriks contact person for the possibilities.

4.2.2 Actuator installation orientation

Electric-Hydraulic actuators cannot be installed in any orientation, see allowable orientation below.



For single acting actuators: the bleeder valve must be mounted at the highest position.

5 EMERGENCY OPERATION

5.1 EHP-SA

The single acting power pack contains a solenoid valve for fail safe operation (closing or opening the valve on power shutdown) In order to operate the actuator by handpump in case of emergency the solenoid valve in the power pack has to be operated by hand.

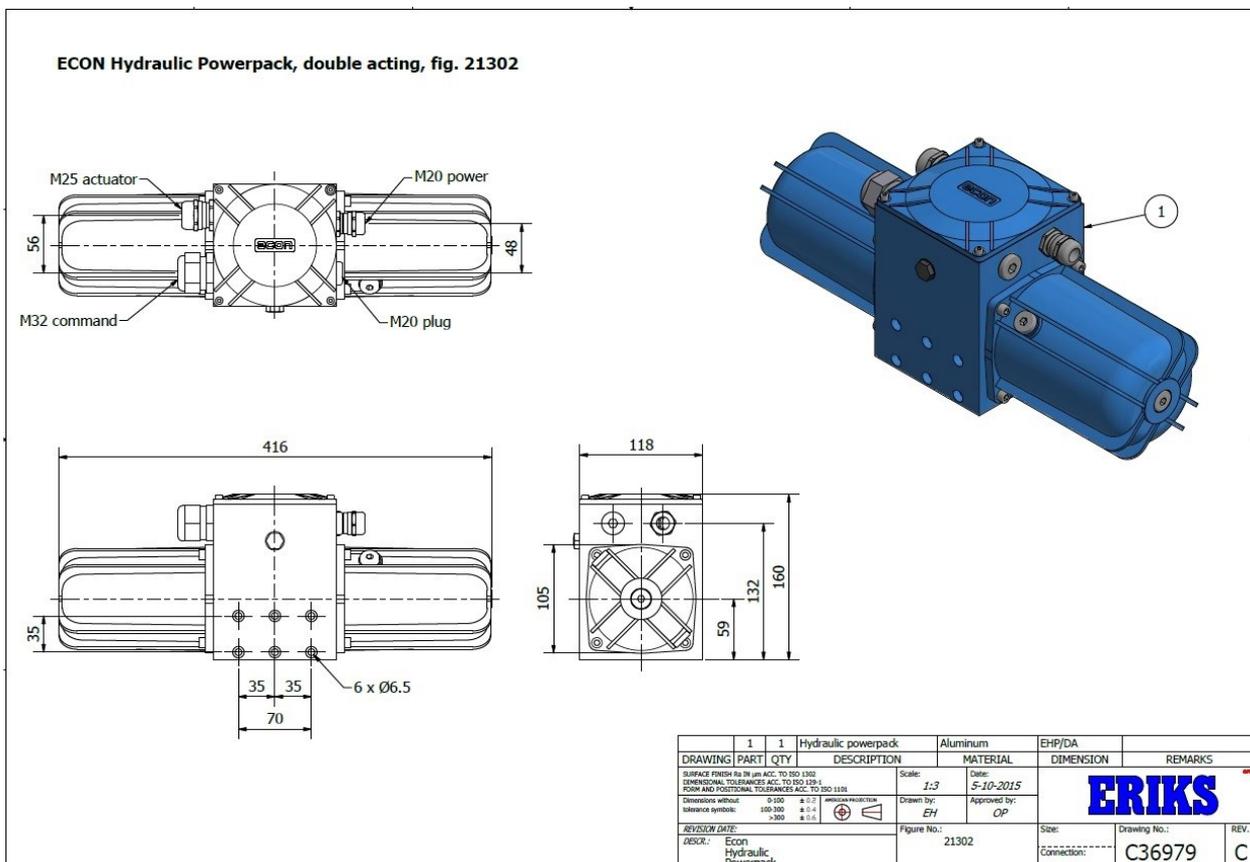
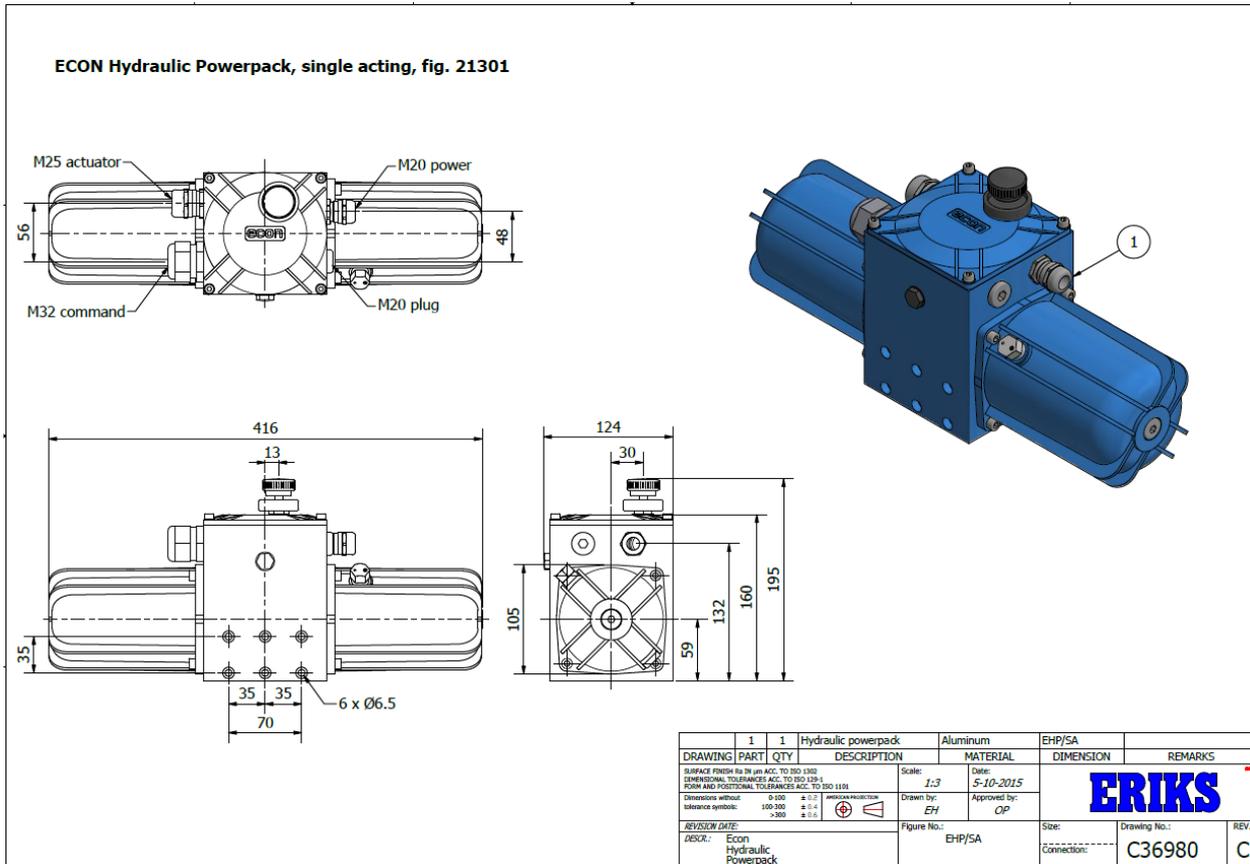
For this the “bypass button” on top of the Power pack must be used, below the emergency operation procedure for a single acting electric hydraulic actuator

1. CONNECT THE HANDPUMP TO THE QUICK-CONNECTION COUPLING
2. UNLOCK THE BYPASS BUTTON BY SCREWING THE BOTTOM WHEEL UP
3. ACTIVATE THE BYPASS VALVE BY TURNING THE TOP WHEEL CLOCKWISE
4. OPEN THE ACTUATOR WITH THE HANDPUMP
5. RETURN THE OIL IN THE HANDPUMP AND DISCONNECT
6. TURN THE TOPWHEEL COUNTER CLOCKWISE TO RELEASE THE BYPASS
7. LOCK THE BYPASS BUTTON BY SCREWING THE BOTTOM WHEEL DOWN

5.2 EHP-DA

The double acting power pack does not contain a solenoid valve. In order to operate an actuator by handpump in case of emergency the “pilot control valves” inside the power pack route the oil to the actuator.

6 POWER PACK DIMENSIONS



7 OPERATION

7.1 Electrical Connections and Preliminary Test

- For testing purposes, loosen the bolts of the power pack cover and remove the cover.
- Make sure that the power supply voltage is in accordance with the information on the nameplate of the actuator.
- Cables shall be passed through the cable glands: M32, M25 or M20.
- Connect wires according to the enclosed wiring diagram.
- Test the actuator and check whether the limit switches work correctly
- After testing, check if all cable glands are correctly tightened. Use cables that are in line with cable gland specifications.
- Put the cover back on the actuator and tighten the bolts.



DANGER:

HAZARDOUS VOLTAGE. *Electrical power must not be connected until all wiring and limit switch adjustments have been completed. Once the power is supplied to the actuator, precautions must be taken if the cover is not mounted.*

7.2 EHP-SA Operative description (ECON Hardwired):

1. Provide 230VAC power supply.
2. In order to open the (fail-close) valve, send an impulse to close the corresponding contacts and the command will be self-maintained. When the position is reached and the relevant limit switch is activated, the command will be kept active for additional 7 seconds in order to hydraulically lock the non-return valve.
3. In order to close the valve, send an impulse to close the corresponding contacts. The power will be switched of the solenoid valve allowing the actuator to close by the actuators spring force.
4. Valve position feedback is provided as free potential contacts outputs.
5. 0-100% position lit the local indication Leds.
6. Located under the cap there is a LOCAL OPEN CMD and LOCAL CLOSE CMD control for maintenance/commissioning electrically connected in parallel with the remote.
7. In case of loss of power supply, the valve will automatically move to its safe position (CLOSE for FAIL-CLOSE control and OPEN for FAIL-OPEN control) using the gas spring on the actuator.
8. If a command is sent while another one is still active, the first one is interrupted and the last one will be executed.

7.2.1 PLC Control:

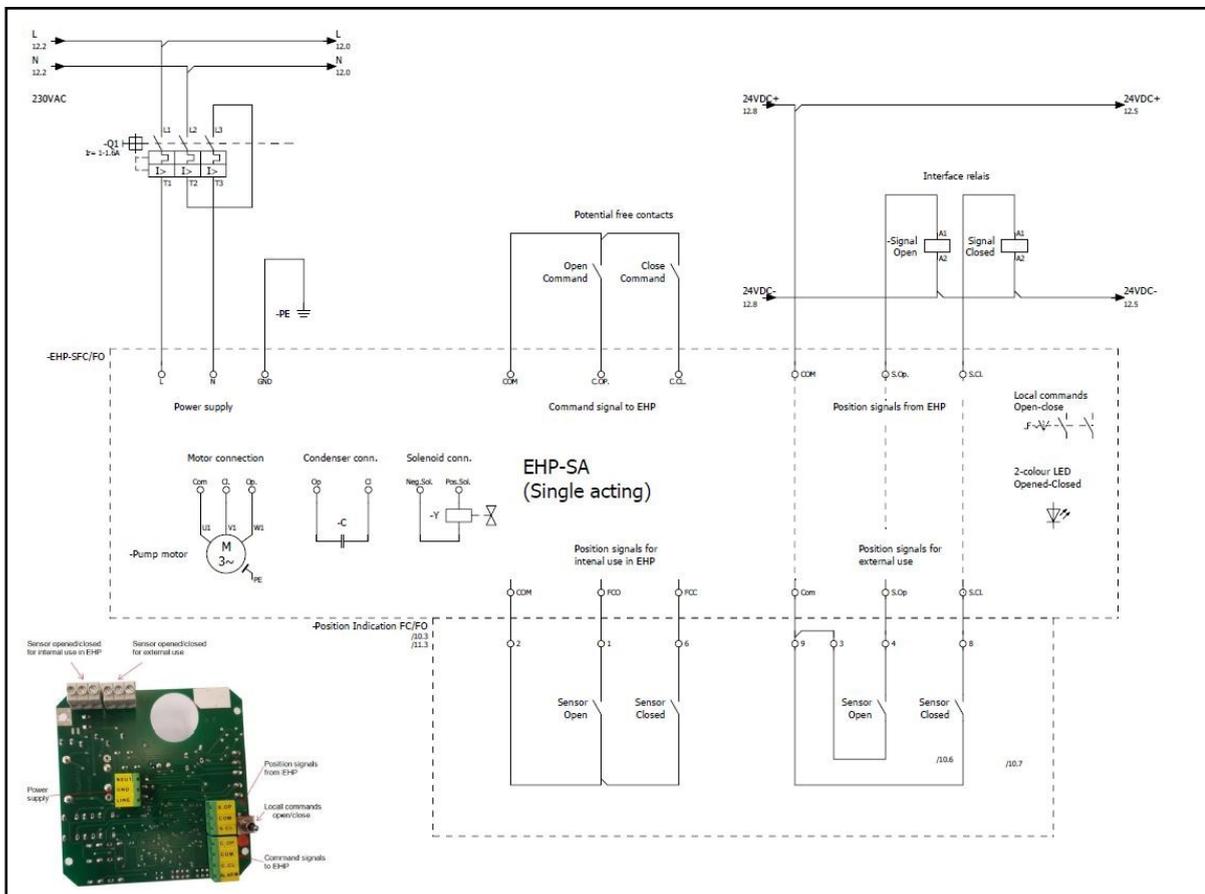
Besides the normal PLC programming our single acting power packs require a simple program for repositioning of the spring closing actuator in open position when necessary.

For this we use the open limit switch on the actuator as indicator and when it loses connection the PLC should generate an open (pulse) command to reposition the actuator/valve in open position.

To prevent the unit from damage of repositioning to often we advise to implement an alarm/trip function in the PLC. We usually tolerate repositioning twice in 1 hour or 5 times in 10 hours. In addition we advise to stop the repositioning in case a failure signal is received.

The reason why it is essential for this type of power pack is because of the internal solenoid valve. This EHP-SA power pack (single acting) contains a solenoid valve to keep the valve open when operated. When the power shuts down, the valve automatically closes (fail safe operation). The high pressure generated by the actuator spring causes this solenoid valve to internally leak a very small amount of oil over time. This is normal for these components, but the downside is that the valve will close itself over time without your intention.

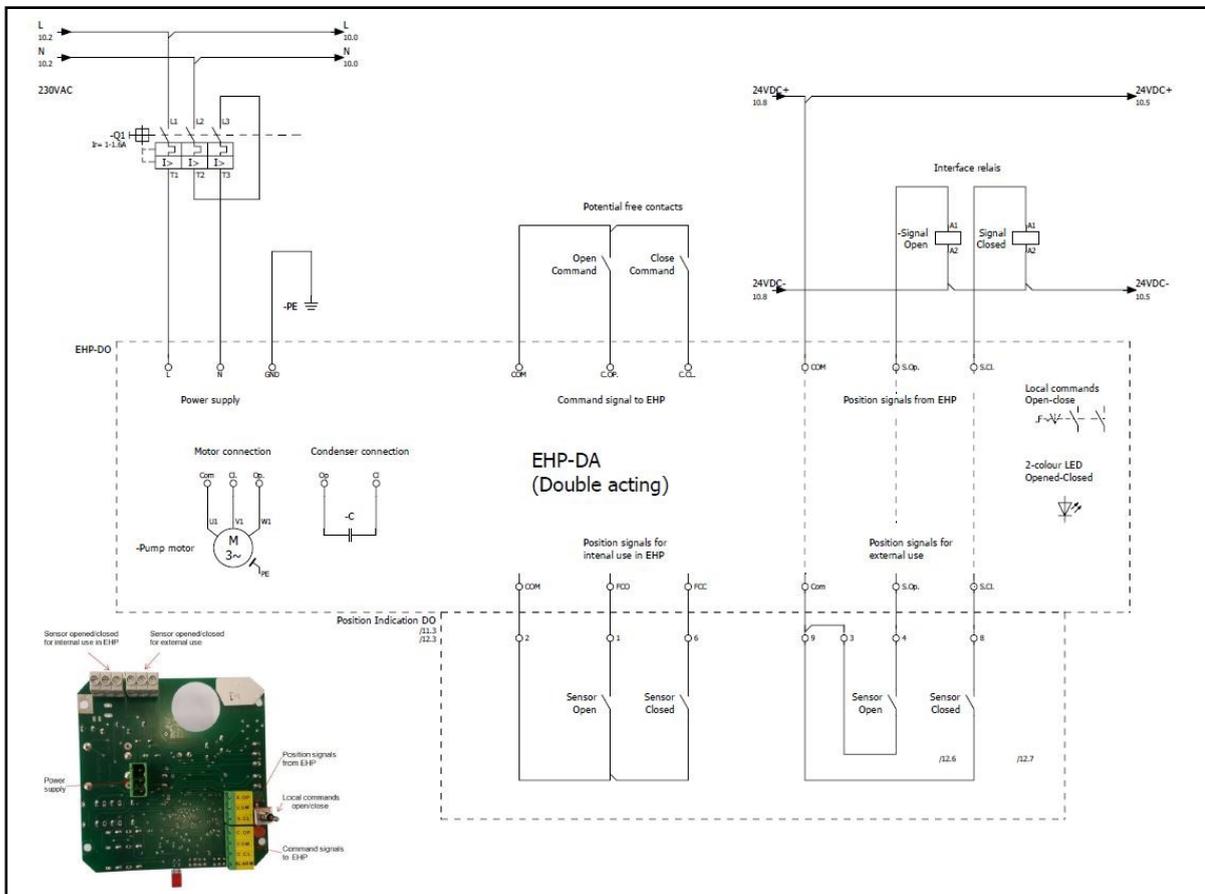
7.3 EHP-SA Electric Schedule (ECON Hardwired)



7.4 EHP-DA Operative description (ECON Hardwired):

1. Provide 230VAC power supply
2. In order to open the valve, send an impulse to close the corresponding contacts and the command will be self-maintained. When the position is reached and the corresponding limit switch is activated, the command will be kept active for additional 7 seconds in order to hydraulically lock the non-return valve.
3. In order to close the valve, send an impulse to close the corresponding contacts and the command will be self-maintained. When the position is reached and the corresponding limit switch is activated, the command will be kept active for additional 7 seconds in order to correctly compress the valve and hydraulically lock the non-return valve.
4. Valve position feedback is provided as free potential contacts outputs.
5. 0-100% position lit the local indication Leds
6. Located under the cap there is a LOCAL OPEN CMD and LOCAL CLOSE CMD control for maintenance/commissioning electrically connected in parallel with the remote.
7. In case of loss of power supply, the valve will stay in its last position.
8. If a command is sent while another one is still active, the first one is interrupted and the last one will be executed.

7.5 EHP-DA Electric Schedule (ECON Hardwired)

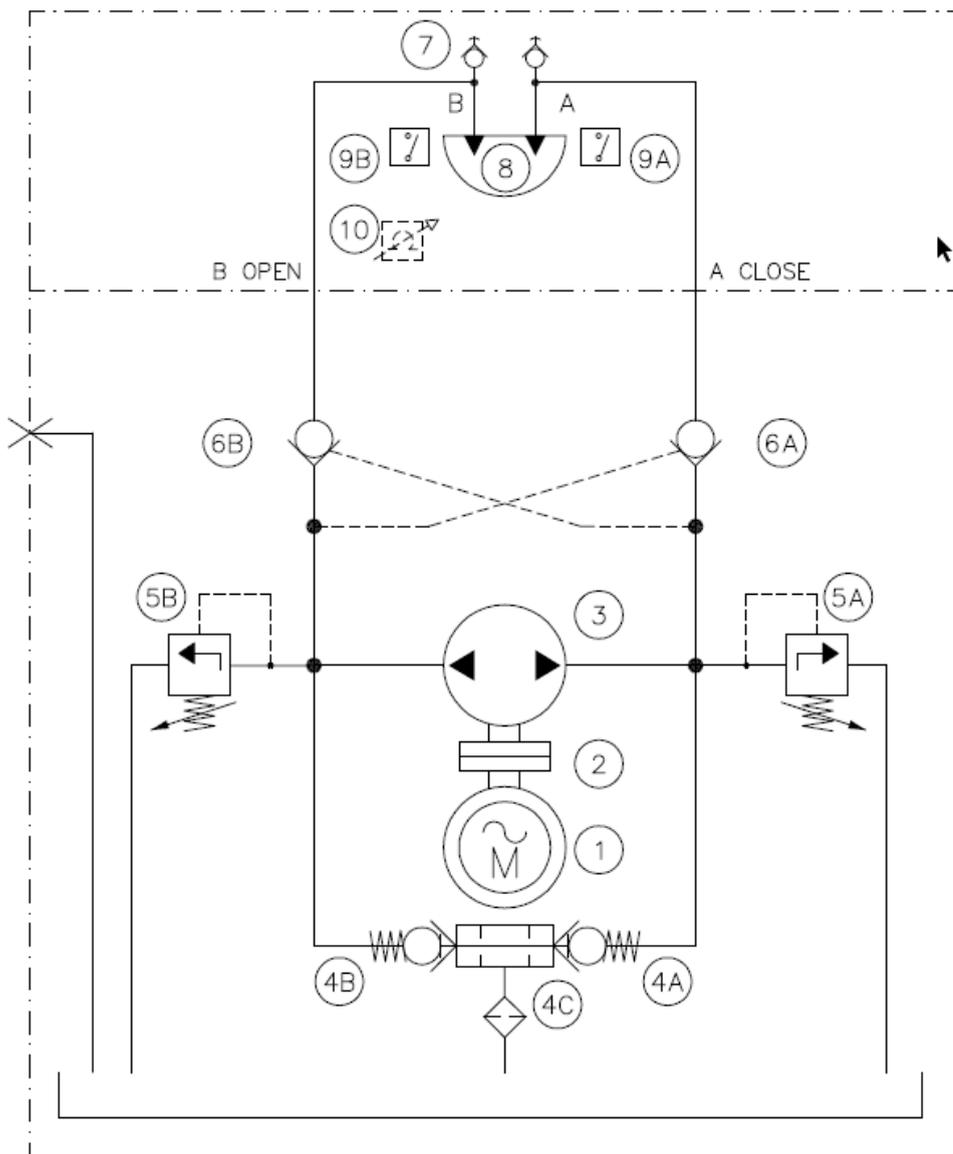


8 HYDRAULIC SCHEDULE & COMPONENTS

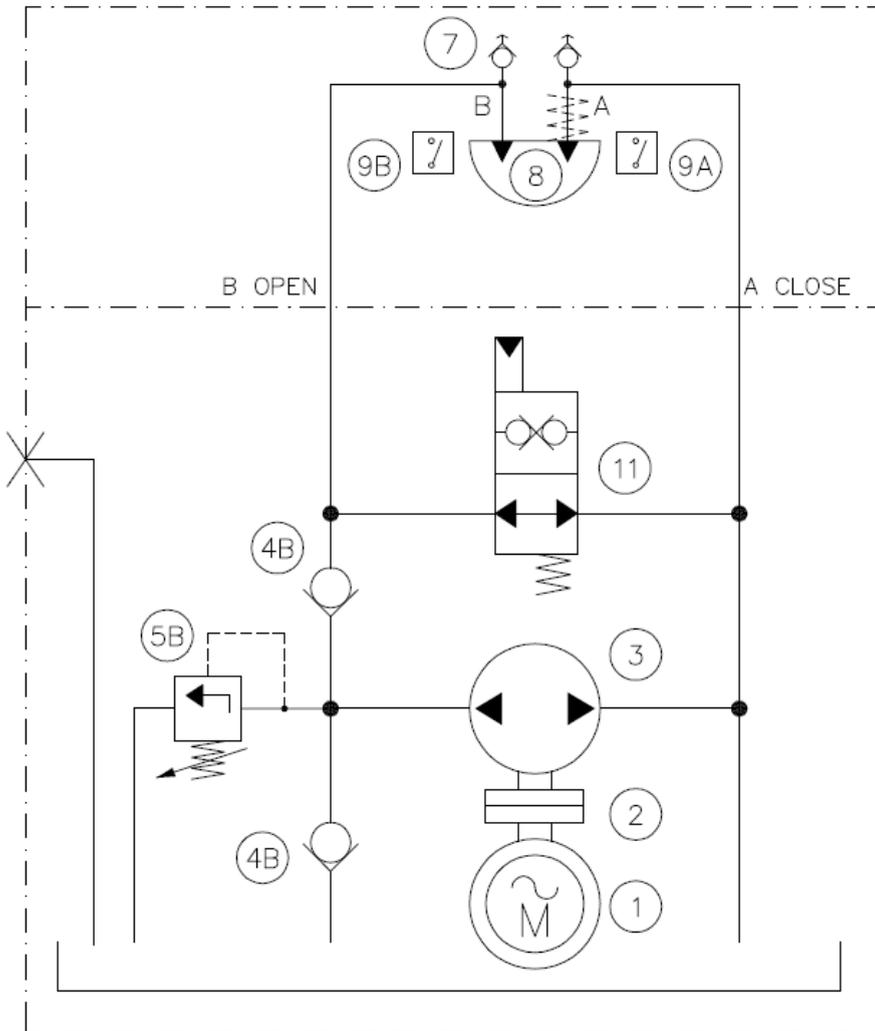
8.1 Hydraulic oil

The electric/hydraulic power unit is oil filled on delivery and ready to use. Any type of mineral oil can be used, the HLP types (DIN 51524-2) are recommended. A viscosity of VG 46 mm²/sec (DIN 51519) is recommended, for other types of fluid please contact ERIKS.

8.2 Hydraulic Schedule EHP-DA



8.3 Hydraulic Schedule EHP-SA

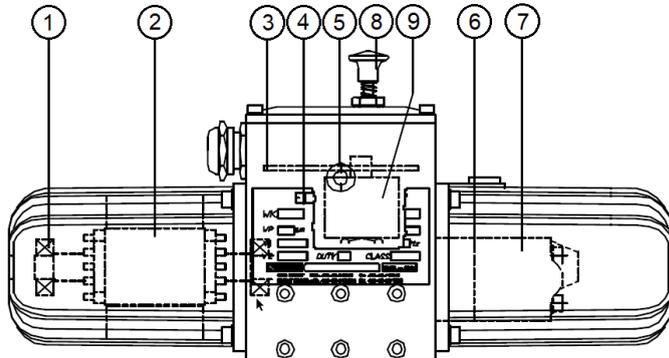


8.4 Hydraulic Components

Position	Item	Power pack
1	Electric Motor	EHP-SA & EHP-DA
2	Motor to pump coupling	EHP-SA & EHP-DA
3	Gear pump	EHP-SA & EHP-DA
4 a-b	Check valve	EHP-SA & EHP-DA
4 c	Piston	EHP-DA only
5 a-b	Pressure Relief valve	EHP-SA & EHP-DA
6 a-b	Pilot operated Check valve	EHP-DA only
7	Quick connection couplings	EHP-SA & EHP-DA
8	Hydraulic actuator	EHP-SA & EHP-DA
9 a-b	Limit switches	EHP-SA & EHP-DA
10	Potentiometer	EHP-DA only

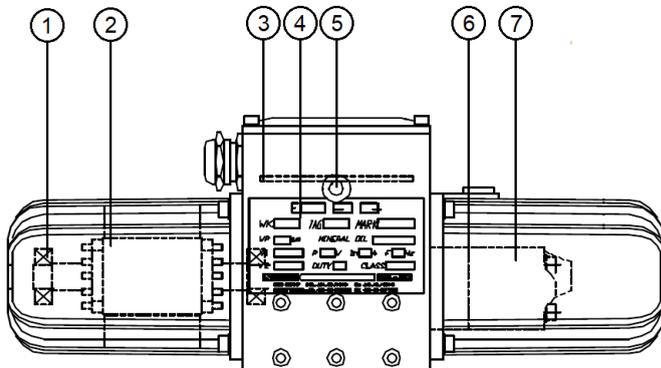
9 SPARE PARTS

9.1 Fig. 21301 Single Acting Hydraulic Power pack, EHP-SA



position	part description	article code
1	Ball bearing	13494599
2	Electric motor E4 (4 pole)	13494601
	Electric motor E2 (2 pole)	13607718
3	Print Circuit Board Basic	13542122
	Print Circuit Board ECON HW	13494602
	Print Circuit Board ECON CAN-Open	-
4	Condenser E4 (4 pole)	13494600
	Condenser E2 (2 pole)	13607744
5	Indication Glass	13607699
6	Gasket & soft seal kit	13494598
7	Hydraulic pump set SA	13494596
8	Bypass button	13491534
9	Solenoid valve	13494597

9.2 Fig. 21302 Double Acting Hydraulic Power pack, EHP-DA



position	part description	article code
1	Ball bearing	13494599
2	Electric motor E4 (4 pole)	13494601
	Electric motor E2 (2 pole)	13607718
3	Print Circuit Board Basic	13494520
	Print Circuit Board ECON HW	13495831
	Print Circuit Board ECON CAN-Open	-
4	Condenser E4 (4 pole)	13494600
	Condenser E2 (2 pole)	13607744
5	Indication Glass	13607699
6	Gasket & soft seal kit	13607700
7	Hydraulic pump set DA	13542120

10 MAINTENANCE

**WARNING:**

Turn off all power before performing maintenance on the power pack.

POTENTIALLY HIGH-PRESSURE VESSEL. *Before removing or disassembling your power pack, ensure that the actuator or other actuated device is isolated and not under pressure.*

10.1 Hydraulic section

10.1.1 How to verify and to change the oil

The oil volume must be checked after about 1000 valve maneuvers and at least every 5 years. The oil must be clear and of the same color and transparency as new oil and the level must be no lower than ten millimeters below the filler opening. The oil volume in the tank is between 650 ÷ 700cc. The oil must be HLP DIN 51524-2, standard viscosity class VG 46mm²/sec DIN 51519.

An oil test is suggested after 5 years: no sludge or oil contamination is tolerated by the system.

The oil cleanliness must be according NAS 3801 class 9.

It's not uncommon that some very small aluminum particles are on the bottom of the oil tank.

To change the oil; unscrew the four tank screws, drain the oil in a container, clean the inside of the tank and install it again; fill the oil until the level is no more than ten millimeters below the filler opening.

10.1.2 How to clean contaminated power pack

When the oil is contaminated and not as clean as required, it is mandatory to perform maintenance to the electric hydraulic power pack.

Remove the oil tank and pump set, All the parts must be properly cleaned by grease cleaner fluid, dried and the hydraulic ports must be carefully cleaned with compressed air.

The hydraulic pump set must be replaced or completely disassembled and thoroughly cleaned / rinsed with grease cleaner fluid and assembled (this particular operation must be done by a specialist).

10.1.3 How to replace the pump set

Remove the oil tank as described above, unscrew the four screws of the hydraulic flange.

Visually check the new pump set to be well lubricated and pour some oil in the suction and delivery ports.

Mount the new pump set, mount the oil tank and fill the unit with new oil.

10.1.4 How to replace the solenoid valve (single acting EHP-SA only)

Sometimes oil leakage over the solenoid valve can result into an unintended closing (FC) or opening (FO) of the actuator. If this happens within 30 minutes the solenoid valve is at fault and needs to be replaced.

Disconnect and remove the Print Circuit Board, unscrew the solenoid valve and remove by pulling it upwards. Install a new solenoid valve, mount and connect the PCB, start the Power pack and cycle the actuator to bleed the air.

**CAUTION:**

Regular inspection and maintenance should be performed by qualified and trained personnel

If working in potentially explosive areas, be sure to comply with the standard EN 60079-14 "Electrical Installations in Hazardous Areas".

Working on the actuator that is in open position and under voltage must only be performed if it is assured that there is no danger of explosion for the duration of the work.

Pay attention to national regulations

10.2 Electric section

10.2.1 How to replace the print circuit board

Remove the lid by unscrewing the four top cover screws of the power pack. Carefully disconnect all connectors from the print circuit board, unscrew the four screws holding the card into the main body. Mount the new card vice-versa.

10.2.2 How to replace the capacitor

Remove the PCB as described above, loosen the condenser from the holding clip and replace it.

10.2.3 How to replace the electric motor

Remove the PCB, the oil tank and the pump set as mentioned above. Unscrew the four electric motor holding screws and remove the cover; extract the rotor and remove all components carefully paying attention to the pump, O-ring and motor shafts coupling. Mount the new electric motor vice-versa paying attention in connecting the wires and their colors.

10.2.4 How to start the power pack after maintenance

Keep the tank filler plug opened, connect 2 hoses to the actuator delivery port and lead them into a container; pulse operate the power pack two, three times for two seconds in both directions (for the double acting type) to self prime the pump and bleed the air. Top off the oil tank according the procedure above.

If this procedure does not work and the pump has still air trapped inside, you can pressurize the oil tank at 1 - 1,5 bar by connecting a pneumatic hand pump to the tank port and repeat the pulse sequence.

11 TROUBLESHOOTING

The main issues on the electro-hydraulic micro power pack and the right actions are schematized in below trouble shooting table. The table helps the operator to detect the problem and how to solve it.

▶ **The motor does not run**

Check; The voltage at the terminals.

If the proper voltage is present, check the condenser and if it is working replace the electric motor.

▶ **The motor runs but the actuator does not move**

Check; pressure gauge on the quick connectors.

If the pressure is close to 135 bar the needed operating torque/force of the valve is too high for mechanical reasons.

If the pressure is too low check the oil volume, pulse the actuator with loose hoses to purge air (as described above) or replace the pump set if necessary.

▶ **The oil tank volume is very low**

Check, if there is oil leaking out of the actuator.

If yes replace the damaged gasket.

▶ **There is no position signal**

Check; the signal at the switch terminals and the voltage supply.

Replace the PCB or the switch signal transmitters if necessary.

▶ **The actuator position is not maintained**

Check; connect pressure gauges on the quick connectors of the actuator.

If the pressure drops directly after the pump is switched off the pilot control valve is at fault.

Replace the pump set if necessary.

**If you have questions about this product,
Please contact the nearest ECON distributor.
You can find them on www.eriks.com**

ERIKS

ERIKS Flow Control

Cypresbaan 63,
2908 LT Capelle aan den IJssel,
The Netherlands

Phone: +31 (0)88 855 8100