

Technical Manual

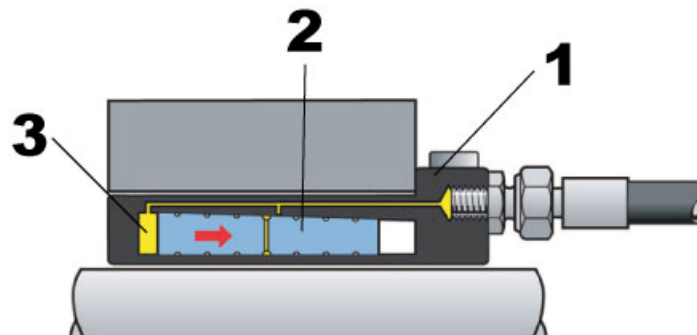
ETP-HYLOC



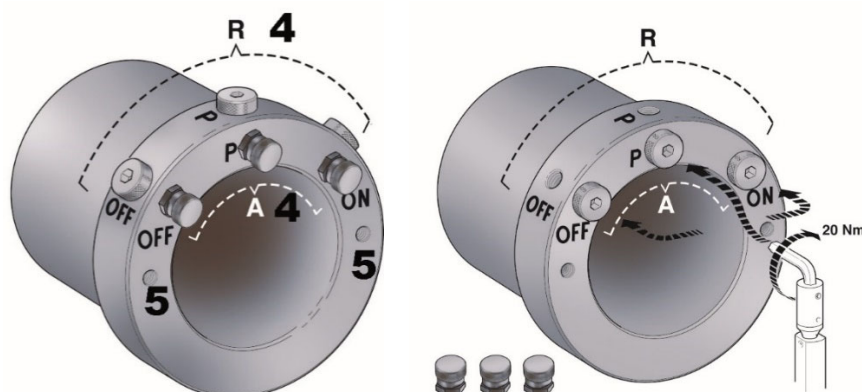
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Technical parts description



1. Double-walled hardened steel sleeve with the same characteristics as for ETP-CLASSIC.
2. Axial movable piston of cast iron.
 - tapered on one side to create expansion when it moves.
 - with a channel through and spiral grooves on both sides where a small amount of the oil is led, to facilitate the movement of the piston.
3. Pressure medium
 - The oil for the pump should be a transmission oil type SAE 80W.
4. Ports
 - axial and radial connections with three high-pressure steel plugs and three connection nipples.



- ETP-HYLOC is prepared for axial connection of the pump hoses (where the nipples are located). If radial connection is to be made, the steel plugs are moved to the axial connections and tightened with a torque wrench to 20 Nm.
5. Threaded holes (M8/M12/M16, depending on ETP-HYLOC size).
In these, a hand tool can be connected to move ETP-HYLOC along the shaft.

Mounting/dismantling tips

Mounting

Comments to the instruction which is enclosed with each product.

- For max torque capacity all the contact surfaces should be cleaned with a solvent.
- A thin oil on the surfaces will reduce the torque capacity slightly but make the mounting easier.
- If there is a keyway in the shaft or hub, it has to be filled in the same way as described for ETP-CLASSIC.
- When dismantling you might need an initial oil pressure which is max 200 bar (3000 PSI) higher than the mounting pressure, to start the movement of the piston. Please allow for this when selecting the mounting pressure, compared to the max pressure the pump can produce.
- There is no risk the piston loosens by itself because of vibrations, as the angle is small (self locking) and the surface pressure high. Extensive vibration tests have proved this.
- Different pumps, both manual and motor operated, are available depending on how ETP-HYLOC is going to be used and the customer's requirements.
- If other pressure nipples, hoses or pumps than we recommend is used, make sure they are approved for these high pressures.
- Always use the correct type of oil: Transmission oil type SAE 80 W.
- Make sure the high pressure steel plugs mounted in the connections not used are in place and correctly tightened to 20 Nm.

Dismantling

- ETP-HYLOC should loosen immediately from the hub and shaft when the dismantling procedure has been carried through.
- Make sure, according to the dismantling instructions, the pressure increase some after being brought down to zero. This makes sure the piston is completely back at its original position.

In case you encounter difficulties during dismantling follow this procedure to release ETP-HYLOC:

1. Connect the pressure hoses to OFF and P, leave ON open.
2. Pressurize to 100 MPa (14500 psi) for approx. 10-15 min (pressure may decrease a little after a couple of minutes, try to keep it at 100 MPa) . If a lot of oil comes out through ON the outer or inner sleeve might be deformed and the oil just go through ETP-HYLOC without moving the piston. Please try the second procedure down below.
3. Pressurize additional approx. + 20 MPa (2 900 psi) as quick as possible! (For example mounting pressure = 80 MPa --> 80+20M Pa=100 MPa dismantling pressure)
4. ETP-HYLOC might now "unlock", the piston moves and the pressure will drop. Keep on pumping until you reach 0 MPa, continue pumping and let the pressure increase a little to approx. 15 MPa (only to be sure the piston is in the end position).
5. Release the pressure and disconnect the hoses, remove ETP-HYLOC.

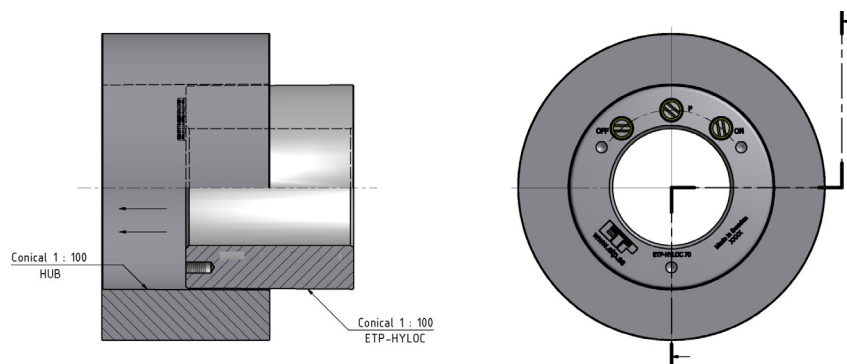
If this doesn't work please try the following:

1. Pressurize both ON and OFF at the same time to approx. 120MPa
2. Release the pressure from the ON-connection as quick as possible (you have to use a valve or two pumps*) to be able to release only the ON connection!)
3. The piston should now start to move, the pressure will drop on the OFF connection. Keep on pumping until you reach 0 MPa, then continuer pumping and let the pressure increase a little to approx. 15 MPa (only to be sure the piston is in the end position).
4. Release the pressure and disconnect the hoses, remove ETP-HYLOC.

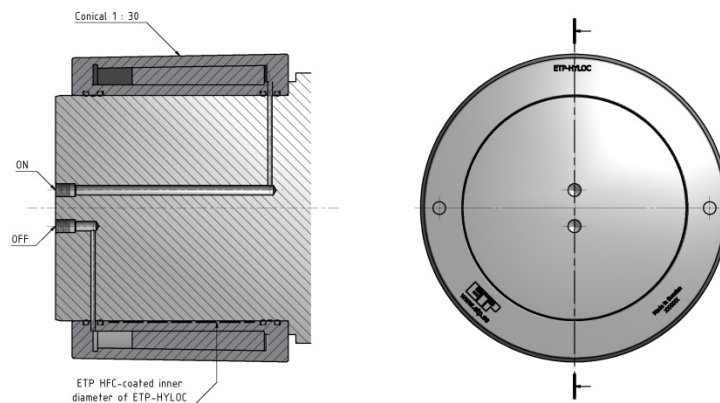
*) If You have two pumps, one with two pressure hoses and one with one hose, connect the pump with two hoses to OFF and P the other one to ON. It is important to have same pressure on ON and OFF during pressurizing! This to lubricate the piston and cause it to start moving.

Tips

- ETP-HYLOC is suitable for customer made solutions, where a hydraulic operated sleeve could fill the purpose of locating a hub precisely, quickly and reliably on a shaft. We are open for any type of tailor made types where the potential could allow for a customized solution.
- By varying the mounting pressure and the shaft tolerance the transmittable torque can be changed to a great extent. (See brochure for technical data).
- When the mounting pressure is changed the min outer diameter of the hub might also need to be changed. (See brochure for technical data).
- Never apply pressure with the pump when shaft & hub is not in place, it will plastically deform the outer & inner sleeve.
- Use our motor pump for frequent mountings.
- The pump is equipped with a safety pressure release valve, it opens at 150 MPa, which takes the oil back into the pump.



- Also as customized we can make the outer diameter conical (hub has to be conical in the ID) thus getting an improved concentricity and less clearance to absorb.

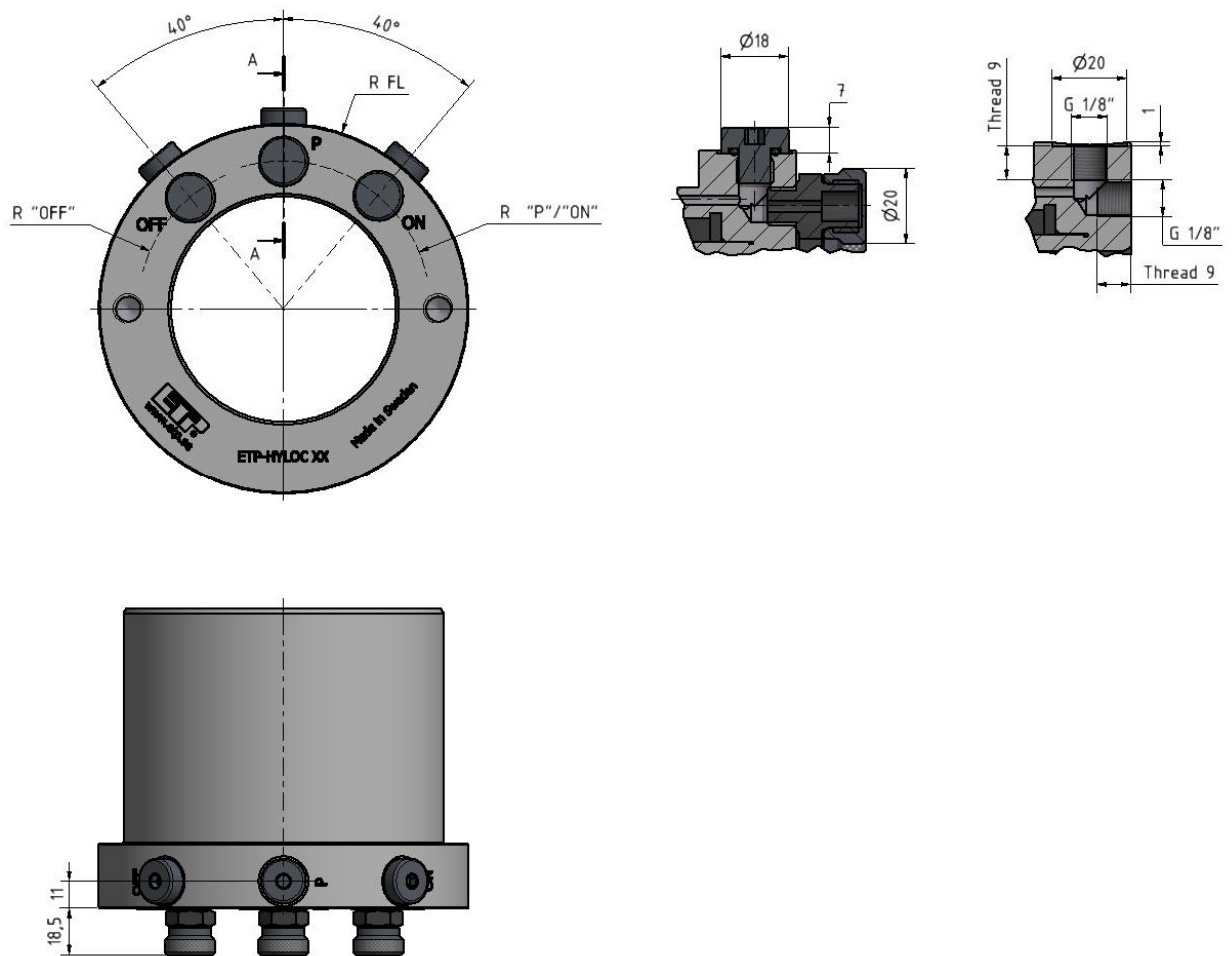


- As a customized design we can also supply ETP-HYLOC with the pressure setting going through the center of the shaft and coated with ETP-HFC for higher torque capacity.
- In case only hydraulic connections in radial or axial direction are requested, ETP-HYLOC can be customized, by deleting the connections in one direction.
- The transmittable torque can be increased by ETP-HFC coating on ID, OD or both for sizes 100 – 220 mm.
- As an option high pressure steel plugs can be delivered for all the six G 1/8" connections.

Technical data

ON, P and OFF ports, location

For design and production reasons the location of the ON, P and OFF ports, in the axial direction, are not on the same radius. The ports in the radial direction have a more symmetrical location.



Ports location "ETP-HYLOC" mm			
ETP-HYLOC Size	R ("OFF")	R ("P" / "ON")	R FL
50	35,5	35,5	50,5
60	41,5	41,5	56,5
70	46	46	61
80	52	52,5	67,5
90	58	59	74
100	63,5	65	80
110	70	71,5	86,5
120	75,5	78	93
130	81	85	100
140	87	91,5	106,5
150	93	98,5	113,5
160	99,5	105	120
180	112	118,5	133,5
200	124	131,5	146,5
220	136,5	145	160

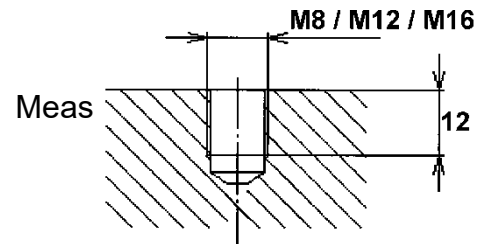
Threads for withdrawing tool

When ETP-HYLOC is going to be taken off the shaft - after it has been loosened - it can sometimes be of great help to connect some kind of simple withdrawing tool to the two extra threads in the flange, in order to generate an axial force to slide the sleeve off the shaft.

The ON, P and OFF ports should not be used for this purpose as they can be damaged.

Size and depth of the threads:

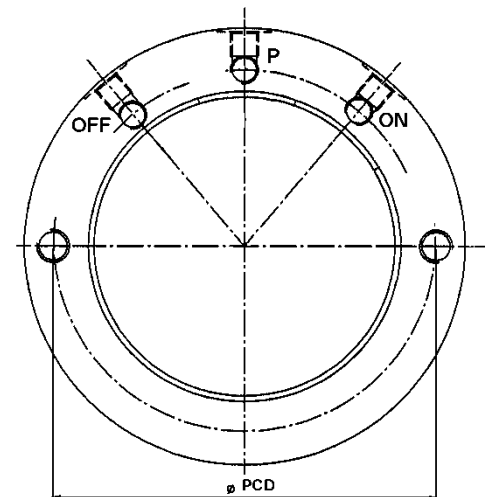
ETP-HYLOC size	Thread size	Depth mm
50 – 80	M8	12
90 – 120	M12	12
130 - 220	M16	12



Location:

Table below gives the PCD-values for the threaded holes.

ETP-HYLOC size	Ø PCD mm
50	75
60	86
70	96
80	107
90	124
100	140
110	150
120	160
130	175
140	185
150	195
160	205
180	223
200	247
220	280



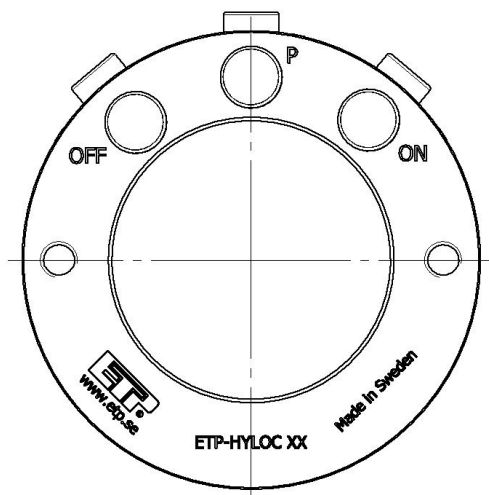
Marking

ETP-HYLOC is marked according to sketch below.

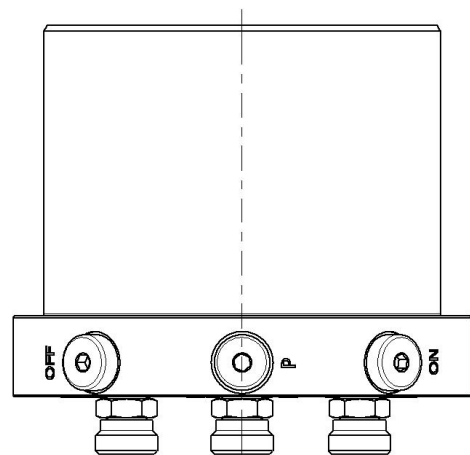
When mounting port "ON" and "P" are pressurised.
When dismantling port "OFF" and "P" are pressurised.
(For detailed instruction see. mounting instruction).

All sizes of ETP-HYLOC have the "ON" port located to the right and the "OFF" port located to the left.

Axial view



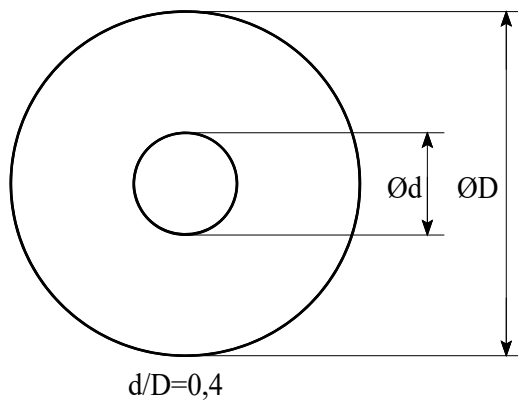
Radial view



Hollow shaft

The choice of min outer diameter for the hub and the hub material itself is described in the brochure. At increased mounting pressure the hub must be thicker.

Hollow shafts can be used with ETP-HYLOC but with the following restrictions:
Max allowed $d/D = 0,4$



Note:

If ETP-HYLOC is put on a hollow shaft with too thin thickness of the walls (too big d/D) the following will happen:

- The piston moves to its end position at a low pressure.
- The surface pressure will be low and ETP-HYLOC slip.
- A deformation can occur in the bore of ETP-HYLOC.

Handpump H-11



This pump is suitable for sizes up to 220 mm. The bigger the size is, the more effort and time has to be used.

This is a 2-stage hydraulic pump with a built-in combined low pressure and high pressure system, which changes automatically from low pressure (big flow) to high pressure (little flow) at about 2,5 MPa.

The pump has two pressure connections and one return connection.

The release valve is built into the pump's valve housing but operated from the outside.

The pump is equipped with a safety valve, preventing the oil pressure to be pumped up more than the max working pressure for the pump, 150 MPa.

DIRECTIONS FOR USE

Connect ETP-HYLOC to the pressure connections for the pump and to the return connection.

NOTE: Equipment to be connected to this pump must be dimensioned for a hydraulic pressure of 150 MPa.

Turn the release valve clockwise until STOP without using great force. The pump is now ready for use.

The hydraulic pressure can be read from the pressure gauge.

The oil returns/the pressure is released by turning the release valve carefully counter-clockwise.

The oil level can easily be controlled by loosening the oil filling plug.

NOTE: When using the pump, cleanliness must be considered. Metal clips or other impurities can destroy the valves.



Motor pump A-04



When the mounting/dismantling is to be done very frequent a motor pump can be used.

The pump A-04 is a complete air driven pump. The max. pressure depends on the pressure of the compressed air. The flow capacity of the pump is big.

Only a normal air system with 6 bar is needed to reach an operating pressure of 1 500 bar.

The pump is foot operated and includes an easily operated handle with manometer and 2 pressure hose connections. The return hose is connected to the pump end.



Time to mount

To give an idea of how fast it is to pressurise ETP-HYLOC we have measured the time for different sizes and pumps (pumping time in minutes):

ETP-HYLOC size	Handpump H-11	Motorpump A-04
50	0,2	0,1
90	0,5	0,3
150	6	0,5
200	15	1

The time figures do not include connection of the pump. This could be reduced to a minimum by using the "quick connections".

Pressure medium = Oil

For ETP-HYLOC and the different pumps we recommend using transmission oil of type **SAE 80 W**.

When filling oil into the pump, please make sure that no impurities enter the pump, it might cause malfunction of ETP-HYLOC.

The oil consumption when mounting/dismantling ETP-HYLOC is very small. It is more or less limited to the leakage when connecting/disconnecting the hoses.

N.B. When working with oil under high pressure, it is important not to open any connections which are under pressure, without covering them first. A thin oil stream under high pressure can enter the body with the risk of life.

Do not use incorrect/faulty accessories when working with high pressures.

FAQ

How do we know that the piston has moved and built up the correct surface pressure?

The fitter will when pressurising "feel" (and might hear also) that the piston is moving in the sleeve.

He will also "see" it on the pressure gauge.

To ensure the piston is at the right location and has created the correct surface pressure, is our responsibility and is built into the design and the accurate manufacturing.

Why is the dismantling pressure higher than the mounting pressure?

When ETP-HYLOC is mounted, a high surface pressure between the piston and the sleeves will be built up. This causes elastic deformation of the surfaces. It is to overcome this higher static friction, that the higher pressure is needed. If you still have difficulties to loosen ETP-HYLOC, see under section dismantling above.

Is the mounting sensitive to impurities in the oil?

To give a safe answer to this we have to say yes. However, we have not heard about any problems so far which have caused malfunction. Small impurities will probably be deformed and compressed into the surfaces. Larger amounts could damage the surfaces and cause a greater leakage through the sleeve, thus increasing the mounting time. In the worst case they could cause the piston to get stuck against the surfaces.

What happens if the hub is too small or too weak?

You will not get the necessary surface pressure against the hub and ETP-HYLOC might get deformed and cause functional problems.

What happens if the shaft is too small?

You will not get the necessary surface pressure against the shaft and ETP-HYLOC might slip if the torque is high. Also the inner sleeve of ETP-HYLOC might get deformed and cause functional problems.

What happens if we use a thinner or thicker oil than recommended?

A too thin oil will make the mounting time longer and cause a higher leakage through the sleeve.

A too thick oil could cause the pressure to build up without moving the piston (will not be lubricated), thus giving a false impression that the sleeve is mounted. The fitter will probably notice this as there will be a too small flow of oil through the return hose.

Can ETP-HYLOC be overpressurized and what happens then?

If you use too high pressure when mounting (say close to max capacity of the pump 150 MPa) the worst thing that could happen is that the pressure capacity for the pump is not high enough for dismantling, because you have to add approx. 200 bar to the mounting pressure. There is also a risk of deforming the hub and ETP-HYLOC.

Can we use our own oil pump?

If you feel comfortable with it and it can be safely operated at this high Pressure, it is OK. It also must be able to generate a certain critical oil flow to lubricate and move the piston. Please make sure to use the oil we recommend.