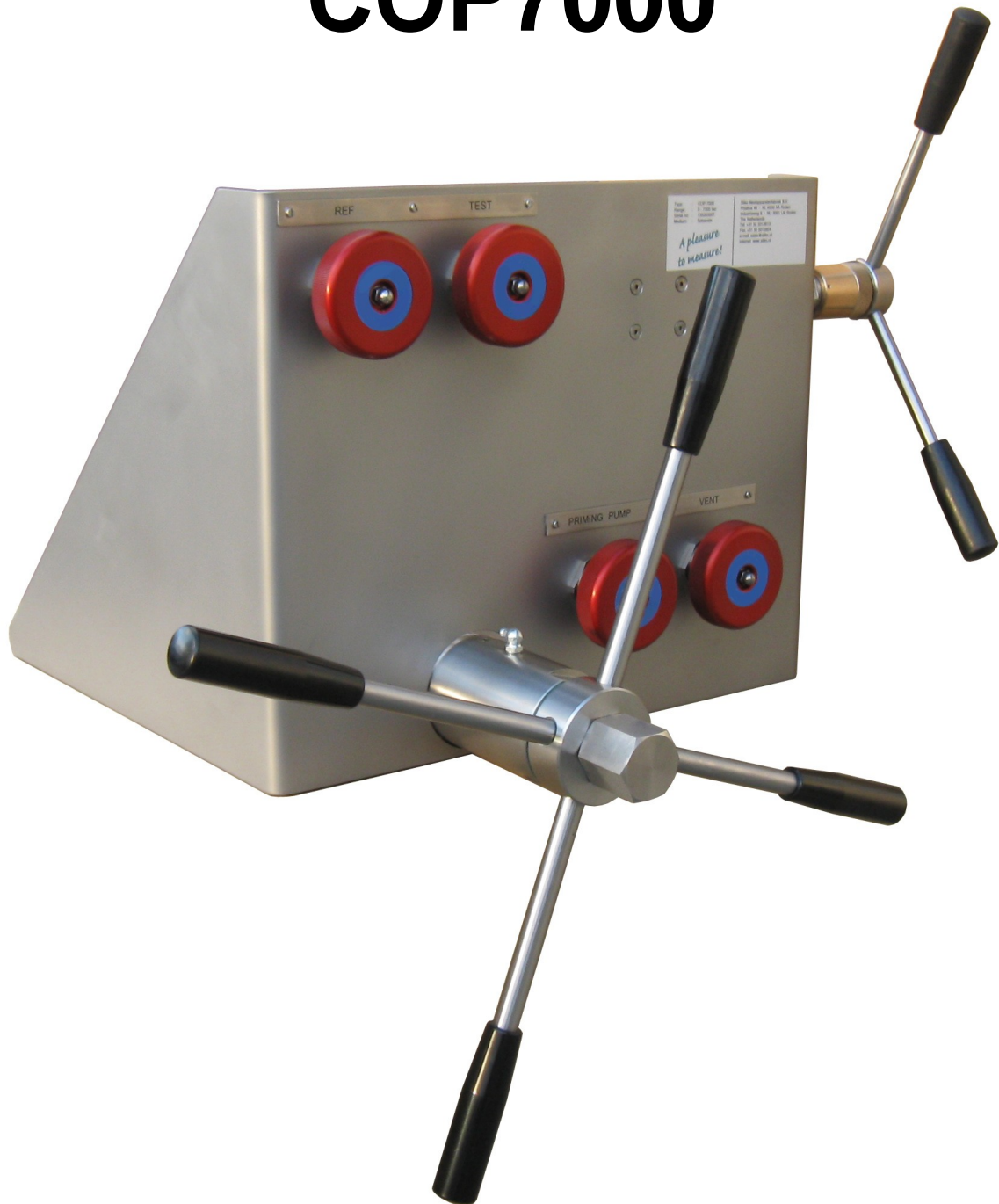


COP7000



Operating manual for oil pressure controller COP7000



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1 introduction

1.1 general product description

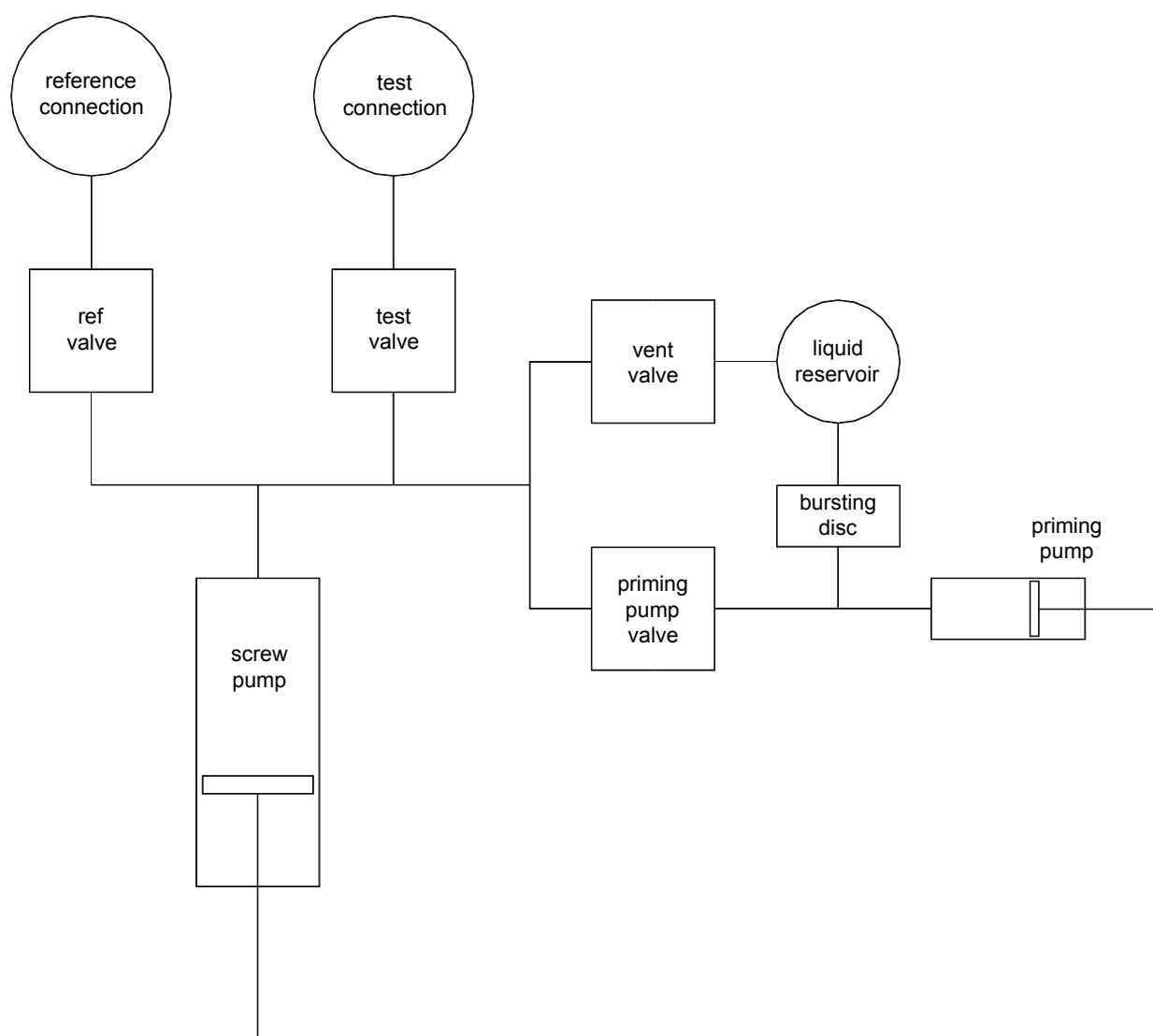
The COP7000 oil pressure controller is designed to manually adjust and control hydraulic circuits with low internal volumes such as a deadweight tester or device under test (DUT) setup. The device is built around the following main components :

- | | | |
|--|---------|--------------------|
| • low pressure priming pump | 70 Mpa | 26 cc displacement |
| • safety protection low pressure circuit | 100 MPa | |
| • high pressure screw pump | 700 MPa | 3 cc displacement |
| • 4 high pressure valves | 700 MPa | |

1.2 specifications

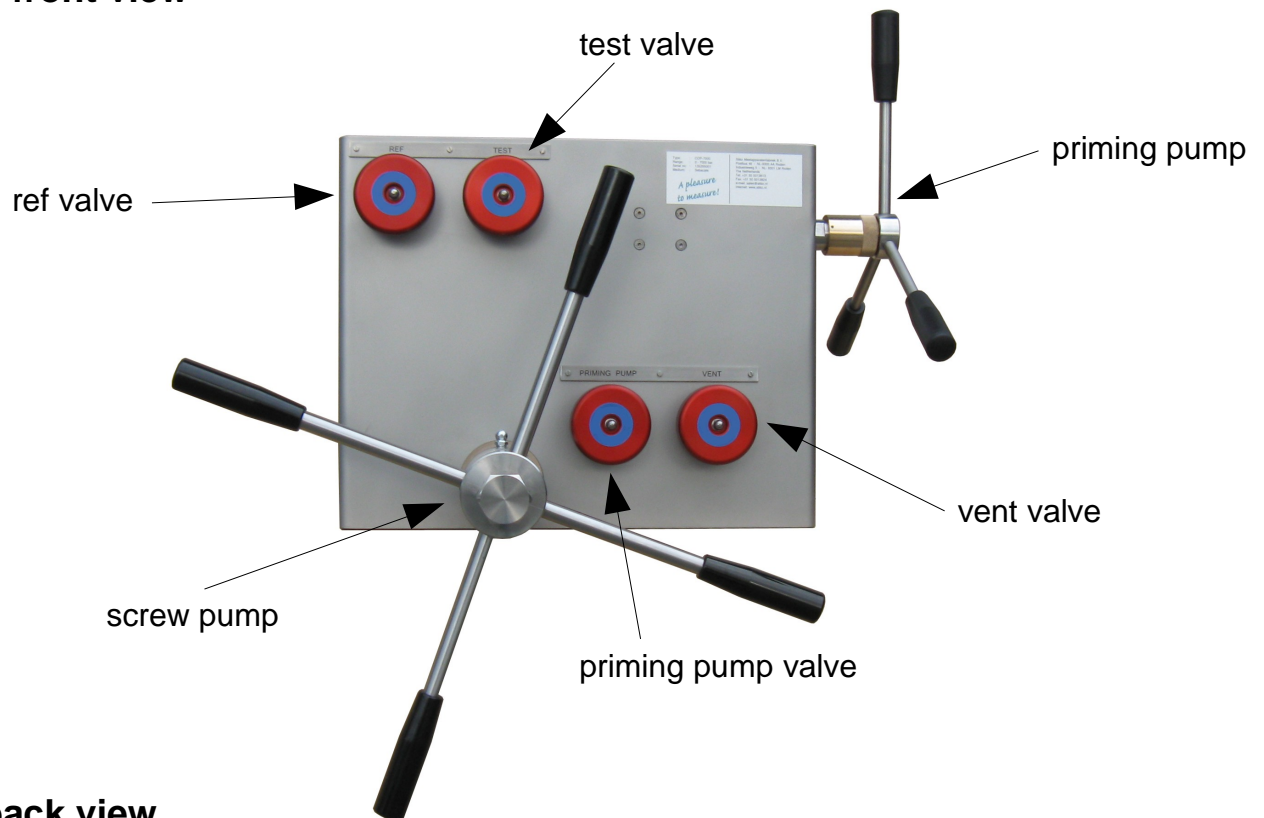
pressure range	max. 700	MPa g
pressure media	Sebacate oil	
frame	460 x 405 x 370 (wxdxh)	mm
outer dimensions	805 x 585 x 510 (wxdxh)	mm
pressure connections	gland M16x1,5 collar M6x0.75 LH	
tubing	HP-160 6 mm 700 MPa rated	
valves	2 way straight 700 MPa	R-V1-2-70
tee	700 Mpa rated	R-F1-3-70
cross	700 MPa rated	R-F1-4-70
screw pump	3 cc 700 MPa rated	R-SP-70
overpressure protection head	100 MPa rated	R-RDHM1-70
overpressure protection disc	100 MPa rated	R-RD-1000
priming pump	70 MPa rated	save upto overpressure disc

1.3 schematics

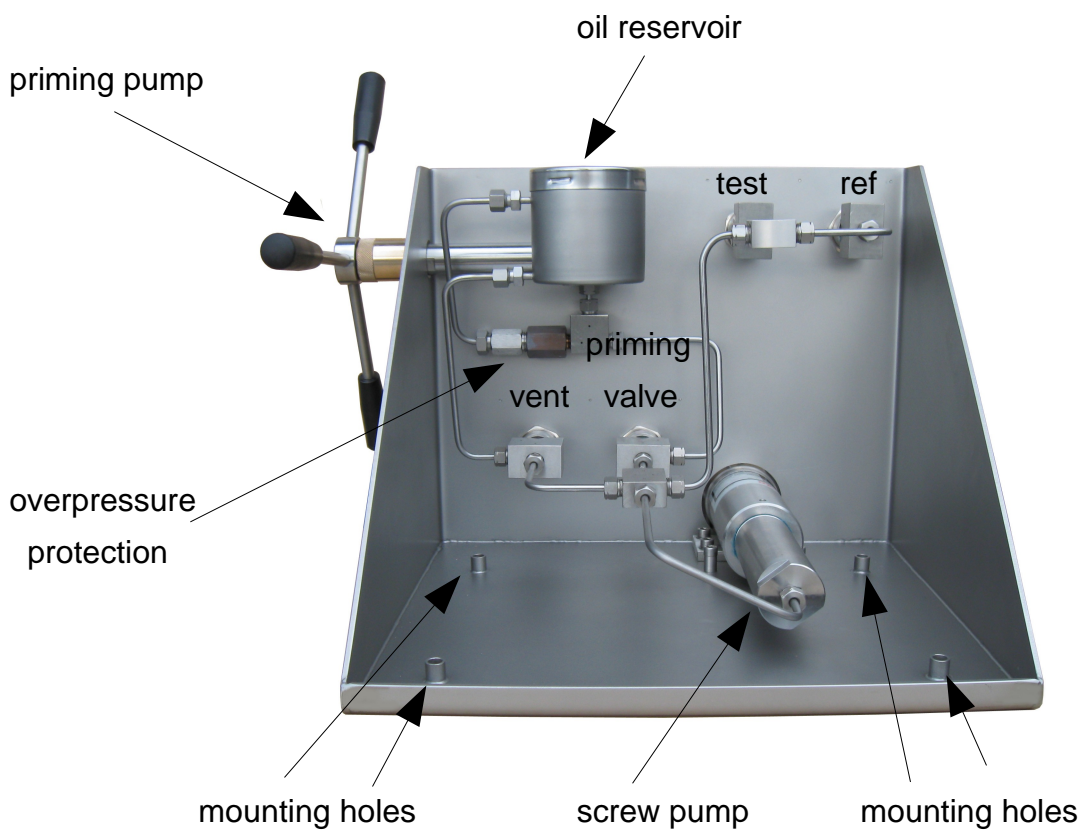


2 instrument outline

2.1 front view



2.2 back view



3 installation

The COP7000 is designed to be placed on the left side of the reference instrument for example a deadweight tester. The left far most pressure connection is designated to be connected to the reference instrument.

3.1 filling up the COP7000

Before connecting any external device it is good practice to full up the COP7000 first.


1. make sure there is sufficient oil in the oil reservoir
2. open all valves
3. rotate the screw pump clockwise until it hits its end stop
4. rotate the priming pump clockwise until it hits its end stop
5. close ref valve and test valve
6. rotate the priming pump anticlockwise until it hits its end stop
7. close vent valve
8. rotate the priming pump clockwise until oil reaches the ref and test connections
9. close ref valve and test valve
10. open the vent valve
11. rotate the priming pump anticlockwise until it hits its end stop
12. rotate the screw pump anticlockwise until it hits its end stop
13. close vent valve
14. open ref valve & test valve
15. rotate the priming pump clockwise until all air is released from the ref and test connections
16. rotate the screw pump clockwise until all air is released from the ref and test connections
17. if necessary repeat steps 9 - 16

After this most of the air is purged out of the system, to purge the last air out, step through the following :

1. close ref valve & test valve
2. open the vent valve and the priming pump valve
3. rotate the priming pump anticlockwise until it hits its end stop
4. close the vent valve
5. rotate the priming pump clockwise until some pressure is made (pump will rotate less easy)
6. open the vent valve, air will be released in the oil reservoir
7. if necessary repeat steps 4 - 6
8. rotate the screw pump anticlockwise until it hits its end stop
9. close the vent valve
10. rotate the screw pump 4 revolutions clockwise
11. open the vent valve
12. repeat steps 9 and 10 until the variable volume hits its end stop

3.2 connect reference device and/or device under test (DUT)

1. close ref valve & test valve
2. vent the system by opening the vent and priming valve
3. close the vent valve
4. rotate the priming pump clockwise until oil reaches the ref and/or test connections
5. connect reference device (or device under test) to the pressure port using properly rated tubing
6. open the test valve
7. purge external tubing with priming pump

 It is very important to remove as much air as possible

3.3 leak test

The COP7000 is designed to make leak testing on several subsections of a test setup possible.

- with the ref valve closed you can isolate the reference device to monitor its natural leak rate
- with the ref valve open and the test valve closed you can detect a possible leak in the COP7000 by detecting a change in leak rate compared to the natural leak rate
- with ref valve and test valve open a possible leak of the device under test can be determined

4 operating COP7000

4.1 setting a line pressure

After installing & purging both a reference device and a DUT the COP7000 can be used to generate and set a line pressure.

1. close the ref valve and the test valve
2. open the vent valve and the priming valve
3. rotate the screw pump counterclockwise until it hits its end stop
4. rotate the priming pump counterclockwise until it hits its end stop
5. rotate the variable volume 10 revolutions clockwise
6. close the vent valve
7. open ref valve & test valve
8. carefully operate the priming pump up to a maximum of 700 bar
9. close the priming valve
10. carefully rotate the screw pump clockwise to increase the pressure / counterclockwise to reduce the pressure


Dependant on the amount of external volume connected & the quality of purging, it is possible that the variable volume hits its end stop while the desired line pressure is not reached. If this is the case use the following procedure :

1. record the pressure which has been reached
2. close the test valve
3. rotate the screw pump counterclockwise until it hits its end stop
4. open the vent valve
5. open the priming valve
6. if necessary rotate the priming pump counterclockwise until it hits its end stop
7. close the vent valve
8. carefully operate the priming pump up to a maximum of 700 bar
9. close the priming valve
10. rotate the screw pump clockwise until the reference device indicates the earlier recorded pressure
11. open the test valve
12. rotate the screw pump clockwise to set the desired line pressure

4.2 venting the system

It is good practice -if possible- to vent the system from the DUT side as this assures that possible contamination does not enter the COP7000. If the DUT does not have this capability, use the following procedure :

1. make sure that the ref valve and -if applicable- the test valve are open
2. rotate the screw pump counterclockwise until either the reference or the DUT indicates a low enough pressure
3. carefully open the vent valve to fully vent the system
4. open carefully the priming valve

 before dismantling external tubing make sure the system is fully vented

5 maintenance

The COP7000 is built out of low maintenance parts, most of the maintenance will be caused by contamination of external sources.

5.1 changing hydraulic oil

Dependant on the frequency of use It is good practice to change hydraulic fluid every 1 to 5 years.

1. open the vent valve and the priming valve
2. close the ref valve and the test valve
3. remove both reference device & DUT
4. connect clear flexible tubes to the reference and DUT pressure port to collect leaking oil
5. rotate the screw pump clockwise until it hits its end stop
6. rotate the priming pump clockwise until it hits its end stop
7. empty oil reservoir
8. clean the interior of the oil reservoir
9. fill the oil reservoir with clean hydraulic oil (sebacate oil)
10. rotate the priming pump anticlockwise until it hits its end stop
11. close the vent valve
12. open ref valve & test valve
13. operate the priming pump until the oil which is coming out of the reference and DUT pressure ports has the same color as the new oil poured in the oil reservoir
14. close the priming valve, the test valve and the ref valve
15. open the vent valve
16. rotate the screw pump anticlockwise until it hits its end stop
17. close the vent valve
18. open the ref valve and the test valve
19. operate the screw pump until the oil which is coming out of the reference and DUT pressure ports has the same color as the new oil poured in the oil reservoir

5.2 maintenance on sub assemblies

If maintenance on sub assemblies like the valves or the pumps is required, please contact the manufacturer of the sub assemblies as servicing of these parts are normally performed by the manufacturer.



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