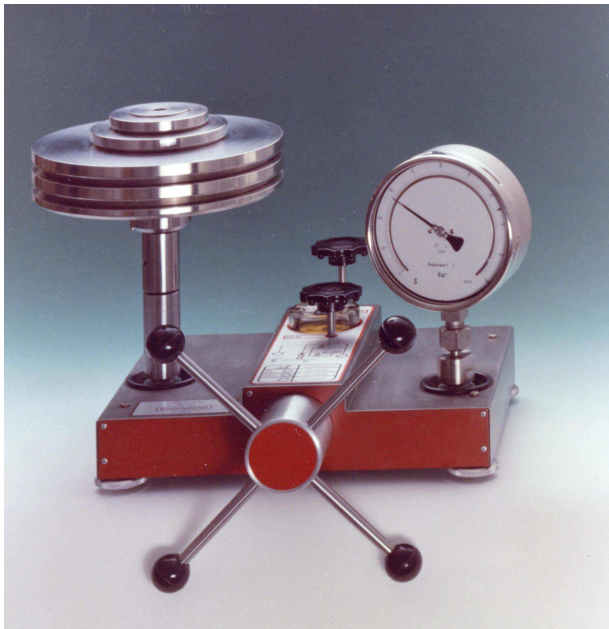
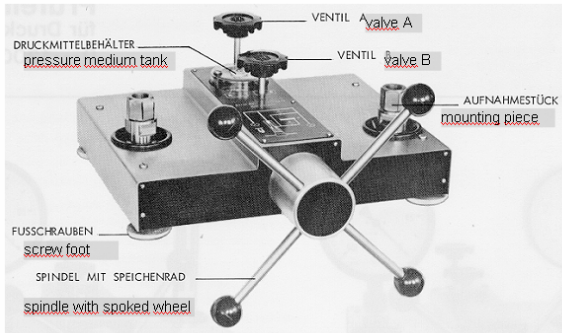


Operating manual



P1870
Hydraulic testing device

GB



INSTALLATION

The testing device must be set up on a rigid work bench at a height of approx. 800 mm (for working when sitting down).

- 1.1 Bolt the supplied four foot plates to the work bench to ensure that the testing device mounted on the plates is securely fastened.
- 1.2 Screw on piston and cylinder unit or connection piece for precision pressure measuring instrument.
- 1.3 By using a spirit level (which is to be placed on the piston head with the piston and cylinder unit when testing) align piston cylinder unit exactly horizontal by means of the screw feet.
- 1.4 Screw on connection piece for specimen.

2. TO FILL THE HYDRAULIC SYSTEMS

- 2.1 Remove plug closure from pressure medium tank.
- 2.2 Open valve A and valve B.
- 2.3 Turn spoked wheel as far as it will go in clockwise direction.
- 2.4 Fill pressure medium tank.
- 2.5 Turn spoked wheel anti-clockwise as far as it will go. The system will fill with pressure medium.

3. PRESSURE PUMP WITH PRECISION PRESSURE MEASURING INSTRUMENT

3.1 Pressure up to 140 bar.

3.1.1 Close valve B (valve A remains open)

3.1.2 Turn spoked wheel clockwise until pressure medium can be seen in the open mounting pieces.

3.1.3 Screw-fit specimen and precision pressure measuring instrument

Important: the pressure measuring instrument to be tested must be thoroughly cleaned beforehand when necessary. Under no circumstances must dirt, liquid or aggressive residue be allowed to get into the testing device.

3.1.4 Set the required pressure by turning the spoked wheel clockwise.

Note: each specimen takes more or less pressure medium depending upon the volume of the bourdon tube. Should the required pressure not be attained, close valve A and open valve B. The system will then have to be refilled again as described under Point 2.3 to 2.5.

3.1.5 Compare the specimen reading with that of the precision pressure measuring instrument. To overcome the inner friction of the measuring system the housing should be tapped lightly before taking the reading where pointer pressure measuring instruments are used.

3.1.6 As soon as the test has been completed turn spoked wheel anticlockwise and open valve B in pressureless state.

3.2 Pressures from 140 to 1200 bar /1400 bar

3.2.1 Set pressure of approx. 140 bar as described under Points 3.1.1 to 3.1.4.

3.2.2 Close valve A, open valve B

(It is essential to proceed in this order).

3.2.3 By turning the spoked wheel in clockwise direction increase pressure again until the required testing pressure has been attained.

3.2.4 Compare specimen reading with the reading given on the precision pressure measuring instrument.

3.2.5 After the test has been completed turn spoked wheel anticlockwise and slowly open valve A in pressureless state.

4. PRESSURE PUMP WITH PISTON AND CYLINDER UNIT

4.1 Testing pressure up to 140 bar

- 4.1.1 Close valve B (valve B remains open)
- 4.1.2 Turn spoked wheel in clockwise direction until pressure medium appears in the open mounting piece.
- 4.1.3 Screw on specimen.

Important: the pressure measuring instrument to be tested must be thoroughly cleaned beforehand when necessary. Under no circumstances must dirt, liquid or aggressive residue be allowed to get into the testing device.

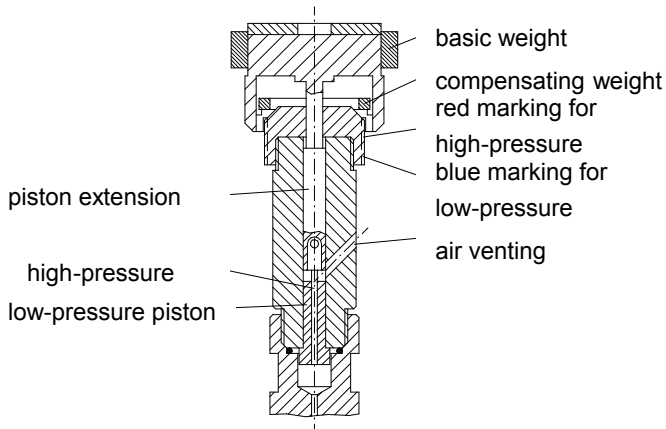
- 4.1.4 Place the basic weight on the piston head. In this way the initial testing pressure is attained. Set the required testing pressure by placing the appropriate plate weights on the piston head (see plate weight table).
- 4.1.5 Turn the spoked wheel in clockwise direction until the generated pressure lifts the weight-loaded piston with piston head from the upper part of the cylinder and this floats between the upper and lower level.

The piston and cylinder unit for the testing ranges of 1 ... 700 bar and 1 ... 1200 bar work with a double piston for the low and high pressure range. In this case the piston must be raised until the bottom edge of the piston head is within the blue (low pressure range) or red (high pressure range) marking ring.

- 4.1.6 Fit the piston head with the plate weights in position and turn by hand.
- 4.1.7 After the test has been completed turn the spoked wheel in anticlockwise direction and open the valve B in pressureless state.

4.2 Testing pressures from 140 to 1200 bar /1400 bar

- 4.2.1 Set pressure of approx. 140 bar as described under Points 4.1.1 to 4.1.4.
- 4.2.2 Close valve A, open valve B.
(It is essential to proceed in this order).
- 4.2.3 Further testing as described under Point 4.1.5 to 4.1.6.
- 4.2.4 After the test has been completed turn spoked wheel anticlockwise and open valve A in pressureless state.



5. CORRECT MEASURED VALUES

It will be necessary to correct the measured values if the maximum precision of the testing device is to be exploited for precision measurements should the ambient temperature and/or acceleration due to gravity at the place of measurement deviate from standard values.

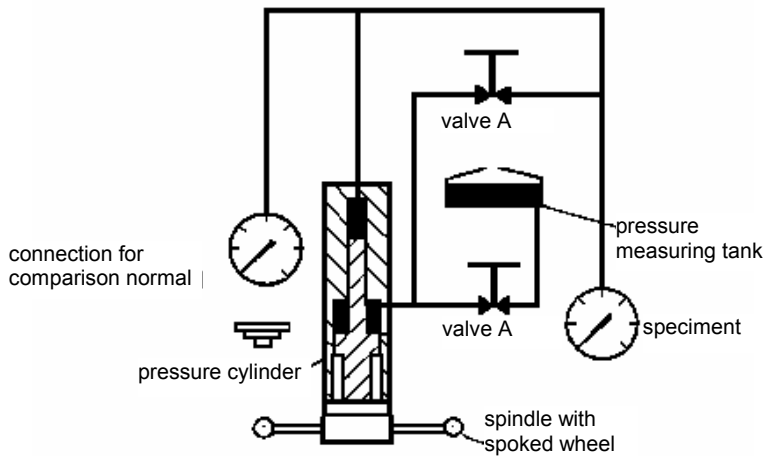
The following can be considered in this case.

5.1 Deviation from reference temperatures 20°C.

Multiply set measured value P by correction factor

$$P_t = P * [1 + 11 * 10^{-6} (20 - t)]$$

- 5.2 Deviation from standard gravitational acceleration value
 g_n = standard gravitational acceleration (9.80665 m/s^{-2})
 g = local gravitational acceleration
 P_n = standard pressure
 $P_g = P_n \times g / g_n$
 P_n = Normdruck
 $P_g = P_n \times g / g_n$



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