Concrete Water-Impermeability Testing System
CN820
Impact Test Equipment Ltd
www.impact-test.co.uk & www.impact-test.com
Operating Manual

Water Impermeability Tester
with quantitative measurement of water penetration
Importance of this Operating Manual:

Warning: It is expected that users and operators read and understand this entire Operating Manual before putting the system into operation. Reading and understanding this entire Operating Manual is absolutely necessary before operating the system. It is not allowed to operate this device without the required protective devices, or to make any modifications to this device.

Contents

1. General instructions .................................................................3
2. Scope of delivery........................................................................3
3. Technical data ...........................................................................4
4. Placing the Water Impermeability Tester into operation............5
   4.1 Place of installation ...............................................................5
   4.2 Preparation of the pneumatic connection ..............................5
   4.3 Preparation of the hydraulic connection ..............................6
   4.4 Preparation for emptying the water from the unit .................6
   4.5 Setting the test pressure ......................................................6
5. Operating the Water Impermeability Tester ...............................6
6. Placing the system out of operation ..........................................8
7. After-sales service and spare parts ..........................................9
   7.1 Date of issue of this Operating Manual ...............................9
   7.2 Copyright ..............................................................................9
   7.3 Contact for help and spare parts .......................................9

Attachments to this Operating Manual:

- hydraulic diagram
- Testing Record
1. **General instructions**

This Water Impermeability Tester has been designed and produced in accordance with DIN 1048. It is designed for the purpose of carrying out standardised testing of concrete test cubes with either of the following dimensions:

- $150 \times 150 \times 120$ mm
- $200 \times 200 \times 120$ mm.

Testing pressure is 5 bar = $0.5$ N/mm², in accordance with DIN 1048 and DIN EN 12390-8.

It is not permissible to use this Water Impermeability Tester to perform tests under the following conditions:

With the use of test cubes which are not in accordance with the pertinent standards. With the improper use of the compressed-air / water jets (nozzles) in the sealing clamps. Operation at air pressure > 10 bar.

We cannot accept any responsibility for testing attempted under the above-listed conditions.

2. **Scope of delivery**

The scope of delivery for the Water Impermeability Tester includes the following:

Water Impermeability Tester including:

- Sealing clamp for test cubes with the following dimensions:
  - $150 \times 150 \times 120$ mm
  - $200 \times 200 \times 120$ mm.

- Rubber rings for sealing clamps (standard version for test cubes with dimensions:
  - $200 \times 200 \times 120$ mm)

- Inspection windows (sight glass) with a scale for reading off the quantitative amount of water penetration

- Feet to set up the machine system

Options:

Air compressor, especially quiet operating, with a 3-meter safety hose and a fast-fitted coupling
### 3. Technical data

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>Approximate dimensions (L x W x H):</strong></td>
<td>1375 mm × 450mm × 1280 mm</td>
</tr>
<tr>
<td><strong>Weight (mass):</strong></td>
<td>approx. 120 kg</td>
</tr>
<tr>
<td><strong>Maximum air pressure produced by the compressor:</strong></td>
<td>8 bar</td>
</tr>
<tr>
<td><strong>Operating pressure at the Water Impermeability Tester</strong></td>
<td>5 bar = 0.5 N/mm² (in accordance with DIN 1048, DIN EN 12390-8)</td>
</tr>
<tr>
<td><strong>Air compressor</strong></td>
<td>The air compressor is available as an optional accessory. It is especially quiet in operation.</td>
</tr>
<tr>
<td><strong>3 test points, with separate shutoff</strong></td>
<td>For test cubes with the following dimensions: 150 × 150 × 120 mm or 200 × 200 × 120 mm</td>
</tr>
<tr>
<td><strong>3 inspection windows (sight glass) with scale</strong></td>
<td>For reading off the amount of water penetration at each individual test point</td>
</tr>
<tr>
<td><strong>Clamping of the test cubes</strong></td>
<td>By means of a central spindle with self-locking acme thread (tetragonal thread)</td>
</tr>
<tr>
<td><strong>ON / OFF switch, designated as a compressed-air valve</strong></td>
<td>For activation of test pressure in accordance with relevant testing standards</td>
</tr>
<tr>
<td><strong>Compressed-air controller</strong></td>
<td>For setting the desired testing pressure acting on the test cube; the factory setting is 0.5 N/mm², in accordance with DIN 1048</td>
</tr>
</tbody>
</table>
4. **Placing the Water Impermeability Tester into operation**

4.1 **Place of installation**

Do not operate the Water Impermeability Tester in a moist room; the room must be dry.

We recommend to operate the Water Impermeability Tester under those conditions of ambient temperature and relative humidity as they usually apply to laboratory operations.

The Water Impermeability Tester can be set up on the feet which are delivered with it, or the frame can be bolted into the floor.

Proceed as follows to remove the transport packing:

- Unscrew the nuts on the bottom of the crate by using a no. 13 engineer’s wrench.
- Use a hammer to knock the bolts out into the inside of the crate.
- Take off the crate from the square beam.
- Remove the cardboard and the plastic sheeting.
- Remove the lower rear wall on both rear sides by using a Phillips screwdriver.
- Remove the four mounting bolts on the foot of the frame by using a no. 16 engineer’s wrench.

4.2 **Preparation of the pneumatic connection**

Use the fast-fitted coupling to connect the hose of the compressor and of the compressed-air line. Now connect in the compressed air by switching on the compressor, or by opening the compressed-air line.

The incoming air pressure must be $\geq 5$ bar to ensure proper testing in accordance with DIN 1048.
4.3 Preparation of the hydraulic connection

First close the water valve by turning it to the right. Only then connect the water supply from the public water mains to the connection point on the left-hand side of the unit.

Now tightly install the water hose and turn on the water.

4.4 Preparation for emptying the water from the unit

The drain connection for the system must be tightly installed to the drain system. This is because the drain connection must bear the full operational pressure (5 bar) when the system is drained. The drain connection for the working surface, however, can be routed down to a bucket, since the water being drained here is not under pressure.

4.5 Setting the test pressure

Set the desired test pressure by adjusting the pressure controllers on the bottom side of the Water Impermeability Tester. Setting is infinitely variable from 0 ... 8 bar; the pressure set at the factory is 5 bar (= 0.5 N/mm²).

5. Operating the Water Impermeability Tester

The operating valves have been equipped with turning knobs. The valve has a switching position of 90° between its closed and opened positions. The valves are closed when they are turned to the right (clockwise) until they definitely reach their limit position. The valves are open when they are turned to the left (anti-clockwise) until they definitely reach their limit position. The black marking on the turning knob indicates its present position.

- Close the valves designated water and water drain [marked with water and discharge].
- Close the valves for test points 1, 2, and 3 [marked with test point 1/2/3] and for the inspection windows (sight glass) 1, 2, and 3 [marked with water gauge glass 1/2/3].
- Place the compressed-air switch in the OFF position [marked with off].
- Open the valve for water [marked with water].
- Cautiously open the valve for test point 1 and fill water up to the upper edge of the rubber sealing ring of the test point. Then close this valve for test point 1.
- Cautiously open the valve for inspection window no. 1 [marked water gauge glass 1]. Fill this inspection window with water up to the “0” mark. It is possible to
perform a correction here by shifting the water-level scale by approximately 5mm.

If you accidentally fill the inspection window above the "0" mark, then proceed as follows: Close all valves. Place the compressed-air switch on switch position ON. Open the drain valve [marked with discharge]. Now use the valve for the inspection window [marked with water gauge glass] to carefully drain out the required amount of water. Place the compressed-air switch in the OFF position. Then again close the drain valve [marked with discharge] and then close the inspection window [marked with water gauge glass].

- Repeat this procedure for test points 2 and 3 and for inspection windows no. 2 and 3, until all of the test points and inspection windows are filled. It is possible to run the test with less than 3 test cubes. For this purpose leave the according valves closed.
- After you have finished filling the test points and the inspection windows, close the valve for water [marked with water].
- Place the concrete test cubes in the centre of the sealing clamps and use the star-handle palm grips to firmly and uniformly clamp the cubes into place.
- Open the valve for test points 1, 2, and 3.
- Place the compressed-air switch in position ON. The system will then produce the pressure which you have set, which will then act on the test cubes.

If leaks occur at the sealing clamps for a test point, then shut off the valves for this test point. Check to ensure that the concrete test cube has been correctly clamped in place. If necessary, correct the clamping of the cube, or again clamp it into place.

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**Caution**

Before clamping a cube into place for the second or more time, first be sure to shut off the valves for this test point.

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**End of testing:**

- Close the valves for test points 1, 2, 3. Loosen the cube clamping system by turning the star-handle palm grips to the left (anti-clockwise).
- Take the test cubes out of the sealing clamps.
- Check the water level and, if necessary, fill as described in paragraph 5 points 4 to 8.
- Now clamp a new test cube into place.
- Follow instructions as described in paragraph 5 points 9 to 10.
6. Placing the system out of operation

- Close the valves for water and drain water [discharge].
- Close the valves for test points 1, 2, and 3 and inspection windows 1, 2, and 3 [water gauge glass 1/2/3].
- Open water drain valve [discharge]. The water will now run out of the unit.
- Place the compressed-air switch in the OFF position.
- **Warning:** The system is still under pressure!
- Cautiously open the valves for inspection windows 1, 2, and 3. The water will now run out of the inspection windows.
- Open valves for test points 1, 2, and 3. The water will run out without pressure. Use a sponge to remove remaining water.
- The water on the stainless-steel drain pan will flow through the drain hose without pressure.
- close all valves.
7. After-sales service and spare parts

A great deal of care has been taken to ensure that this Operating Manual is correct. We cannot, however, guarantee that it is without mistakes or errors, or that all information contained herein will continue to remain valid in the event of technical changes.

7.1 Date of issue of this Operating Manual

Edition no. 4
Date of issue: September of 2005

7.2 Copyright

This Operating Manual is intended only for the Operator, the User, and his staff. The information in this Operating Manual may not be:

- Reproduced, or
- Distributed, or
- Provided to any other persons.

Any person acting in violation of the above stipulations may be prosecuted before a court of law.

7.3 Contact for help and spare parts

If you have any technical questions, or if you require spare parts, please get directly in touch with Impact Test Equipment Ltd.

www.impact-test.co.uk
| Test certificate  
for the final test of the Water Impermeability Tester  
according to standard |
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mechanical test criterions</strong></td>
</tr>
<tr>
<td>• Clamping device with central spindel</td>
</tr>
<tr>
<td>• Operation of the valves</td>
</tr>
<tr>
<td>• On/Off function of the compressed-air valve</td>
</tr>
<tr>
<td>• Fast-fitted coupling for compressed air and connection adapter</td>
</tr>
<tr>
<td><strong>Hydraulic / pneumatic test criterions</strong></td>
</tr>
<tr>
<td>• Pressure resistance of the inspection windows</td>
</tr>
<tr>
<td>• Pressure resistance of the system under 8 bar test pressure</td>
</tr>
<tr>
<td>• Pressure setting according to EN-12390-8 (0,5 N/mm²)</td>
</tr>
<tr>
<td><strong>Sight control</strong></td>
</tr>
<tr>
<td>• Clean varnish and working surfaces</td>
</tr>
<tr>
<td>• Correct assembly of all operating elements</td>
</tr>
<tr>
<td><strong>Final operational test</strong></td>
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<tr>
<td></td>
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<tr>
<td>Modell designation: <strong>CN820</strong></td>
</tr>
<tr>
<td>Serial number : ____</td>
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<tr>
<td>Test date : _________</td>
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<td>Examiner : _________</td>
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