EC Declaration of Conformity

In accordance with EC Machinery Directive 2006/42/EC, Annex II, part 1, A

We declare herewith that the below-mentioned machine, with regard to its design and construction and to the model we have released onto the market, complies with the basic health and safety requirements as set out in the EC Machinery Directive. This declaration shall become invalid if the machine is used or adapted in any manner whatsoever without our consent.

Supplier: Impact Test Equipment Limited

Machine Description: Impact Tester according to EN 1097 - 2

Machine No.: 

Applicable EC Directives:
- EC Machinery Directive (2006/42/EC)
- EC Low Voltage Directive (2006/95/EC)

Applied Harmonized Standards
- EN 12100- Part 1 and 2 Machine Safety
- EN 60 204 - 1 Electrical Equipment for Industrial Machinery

Important!
Only those materials as described in the instruction manual may be used for the tests. The machine may only be used by qualified personnel with due regard to the instructions as set out in the instruction manual. Training on the operation of this machinery is available on request.
Translation of the original operating instructions

Impact Tester according to EN 1097 – 2

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Annexes supplied with actual machine
1. Technical data

<table>
<thead>
<tr>
<th>Dimensions</th>
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<tbody>
<tr>
<td>Height</td>
<td>2775 mm</td>
</tr>
<tr>
<td>Width</td>
<td>780 mm</td>
</tr>
<tr>
<td>Depth</td>
<td>800 mm</td>
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Weight (load on the surface)

| Static | 16000 N |
| Dynamic | 27000 N |
| Load period | ca. 1 ms. |

Electrical connection:

- CEE connector CEKON
- 5-pole 3P+N+PE/400 V 16A/6h
- Right-hand phase rotation

| Power | 0.6 kW |
| Voltage: | 400 V 50 Hz |
| Base: | |

See annex „Dimension diagram N100006.003“.

2. Setting up and connection

The machine is normally delivered in 2 parts:
- Base plate with anvil and fixed mortar
- Housing with mounted lift drives, guiding frame with drop weight and electric control
- Screw set to fix the housing to the base plate

Adjust the base plate with the anvil on the applicable base by means of a precision spirit level and grout it with a high-tensile grouting component. Then lift the base plate on the base via stud bolts.

After the component has hardened mount the housing above the base. Therefore the covers and reinforcements at the bottom have to be unscrewed. The housing can be fixed to the upper part with the 4 ring bolts and can be put over the base plate by lifting it slightly passing the anvil. If the adjusting screws for the height adjustment have not been shifted it is assumed that the machine can be placed in correct position. The piston must dip centrically into the mortar. If this is not the case the machine has to be readjusted.

For shipment the guiding frame is secured via 3 screws. They can be reached from the upper side of the machine in the area of the lifting chain. The counter weight of the drop hammer is secured via 2 screws at the side panel on the left. Additionally the lifting arm is screwed with the support plate at the bottom. All safety screws are red and are marked with red arrows. When the frame is placed above the anvil these safety devices must be removed.

The electrical connection to the mains is made by connector CEKON 400V/50Hz-16A. The correct connection of the phases is controlled via a phase protective relay.

For start-up the stroke of the drop hammer shall only be set to minimum stroke (approx. 200 mm). This may avert major damage in case of malfunction due to problems of adjustment.

For re-start (re-adjustment) always start the machine in the maintenance menu or with single impact.
3. Description of the machine functions

1. The preventer at the tripping device must be inserted in the working space before starting to work
2. Release the brake lever of the mortar
3. Lift off the mortar from the anvil via lifting device by turning the nut and unlock the spigot of the lifting arm
4. Swivel the mortar by means of the lifting arm without tilting
5. Fill the mortar with the quantity of test material that is indicated in the standard
6. Level the test material in the mortar. ATTENTION: The maximum setting of 50 mm per impact must not be exceeded in no case
7. Make sure that the ground surface of the anvil and the bottom side of the mortar are absolutely clean (dust, sand and other particles damage the surfaces)
8. Carefully swivel the mortar with the lifting arm
9. Lower and lock the lifting arm by turning the nut
10. Clamp the mortar with the brake lever
11. If necessary adjust the release catch to the required drop height after unlocking the locking screws. Move the release catch to the correct drop height and clamp it with the locking screws. The release position can be read off the scale on the left guide rod of the frame. The reference point is the bottom edge of the crosshead of the release wedge
12. Close the front door
13. Turn the main switch on that is on the right-hand side next to the protective door
Handling of the OP3 display and operation panel
Display after turning on the main switch following the self test of the control

By pressing the ENTER key you will get to the start window "program Impact Tester". After pressing the ENTER key again the requested number of impacts can be preselected. By pressing ESC you will always get to the level that you have used at last. All inputs are displayed and must be confirmed by pressing the ENTER key. From here it is possible to go with the arrow key ► in menu Total impacts – Service – Maintenance (alternatively back with ◄)
After getting to menu „Maintenance“ the Access key must be entered. After having confirmed the access key by ENTER the display shows "Maintenance on/off. SHIFT + F2 switches the maintenance mode on, SHIFT + F3 switches it off.

For safety reasons the maintenance mode must always be switched off after completion. The easiest way is to shortly switch off the main switch.
With arrow key ►the display shows Output 0....1 in maintenance mode.
With SHIFT + F3 this function is activated and it is possible to operate manually via the keyboard. “Guiding frame up/down” is displayed and with arrow key ► “Motor drop weight up/down”, “Release drop weight” and “test run” are displayed. The movements resp. procedures are made in jog mode by pressing simultaneously the function key + SHIFT.
In the test run each step is initiated one after the other by pressing the start button. The next step is displayed.
For changing the language the displayed text can be changed by selecting one of the stored languages at Maintenance – System – Language with the SHIFT + arrow key. The selection has to be confirmed by Enter.
14. For the normal test procedure the requested number of impacts is set and the procedure is started with the start button. During the test procedure the current number of executed impacts is displayed.

15. After the preselected number of impacts has been completed the machine stops in starting position. The entry mask for the number of impacts is displayed.

16. Before starting the test the red safety interlock must be unlocked by pulling it into the front position. After having closed the door and pressed the start key the frame is lowered until the piston is positioned on the sample, the frame presses onto it and the lifting spindle 50 mm is released. This is controlled by the end switch at the spindle end. If the rammer that is held by the lifting chain with the release mechanism approaches to the tripping area, the lift drive lowers the rammer. This is controlled by the end switch at the tripping device.

17. Then the rammer that is docked to the lifting chain is lifted until it is undocked from the release mechanism by the release curve. This is controlled by the end switch at the release mechanism. The rammer strikes the piston and compacts the sample. At the same time the lift drive with the release mechanism is lowered until the end switch quits the docking of the rammer. The drive for the frame lowers the lifting spindle. So it is ensured that the stroke of the next impact is sufficient. The rammer is lifted again. This procedure is repeated according to the set number of impacts. After the last impact the guide frame and the drop weight are lifted together in starting position. The end positions of the frame and the limiter of the balancing weight are controlled by the end switch. They show incorrect operation modes and create error messages on the display.

18. The door can be opened after completion of the test. Secure the release mechanism by pushing the safety interlock that is marked red before handling the machine.

19. For further impacts it is necessary to select additionally the requested number of impacts. Before starting again the protective door must be opened and closed with main switch activated. Press the “start” button. (The set number of impacts is proceeded.) The impact procedure can be interrupted by pressing the „stop“ button. The machine interrupts the current procedure and is set back to its starting position. The impact counter for the single impacts is set back and the machine remains in BASIC POSITION.

20. ATTENTION: Only use EMERGENCY-STOP resp. STOP in case of danger !!!! Clear the fault before turning on the main switch again. When the door is opened the process will be stopped!!!!
21. Open the protective door when the test is finished

22. **Insert red preventer**

23. Release the brake lever of the mortar

24. Raise the lifting device and the mortar. By turning clockwise the knurled nut the mortar is lifted from the anvil and the lifting device can be swivelled out of the indexing

25. Swivel the mortar out of the working space without tilting

26. Empty the mortar by tilting with the lever

27. For further tests see item 5

28. Stop the machine – swivel mortar in the working space, close the protective door and turn off the main switch.

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### 4. Safety instructions

Only carry out work at the open machine when the release mechanism is locked.

**Attention:** If in maintenance mode the release mechanism is placed above the switch curve the end switches at the release mechanism may be damaged on striking the frame.

Avoid dirt.

Keep the contact surfaces between anvil and mortar clean.

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### 5. Description of the protective equipment

- Error locking of protective door – end switch at the door is not turned on due to open door or malfunction
- Error locking mortar – the mortar panel is not correctly inserted in its indexing and therefore the control switch is not turned on or the switch is defective
- Impact process cannot be started – switch at the protective door has not been switched over (door open/closed) or another error is displayed
- Error mains – phase protective relay signalises wrong rotating field – change the phases at the electric connection
- Motor protection for frame or drop weight, motor protection relay of the corresponding drive has deactivated – identify and eliminate the cause by an expert – reset the relay
- Error frame limitation at the bottom – specimen is too low, the test is interrupted and the machine is set to basic position
- Error counter weight in end position at the top – lock has not correctly docked or the control switch for the coupling to the drop weight is defective

For other errors please call the plant.

Before calling please write down the notifications on the display and the switching status of the in- and outputs of the control in the control box. This will facilitate our search for errors.
6. Start-up and conducting the test

For start-up please pay attention to the processes that are described in part 3 „Description of the machine functions“ and observe the values that are given in the standard for the stroke and the number of impacts when conducting the tests.

7. Maintenance

The machine is mainly maintenance-free. Depending on the ambient conditions the machine shall regularly be cleaned. Grease the lifting spindle and the lifting chain once a month. Also grease the guidance of the frame and the lock of the lifting device for the drop weight carriage in the same time interval.

8. Emissions data

The machine causes acoustic emission due to the impacts. When the machine is operated in delivery status with closed protective door it is to assume that the impacts cause maximum values of 100 dBA. However, the real acoustic emission also depends on the damping behaviour of the specimen and on the place of installation.

9. Precautionary measures by the operator

The acoustic emission during operation of the machine can significantly be reduced by damping the interior of the machine (approx. to 85 dBA). For this purpose the machine shall be equipped with a noise-absorbent mat after setting up and adjustment. Otherwise it is recommended to operate the machine in a sound insulating cabinet.
Activation of the maintenance program

1. See part 3.
2. Ask authorised person or manufacturer for code word
3. It is possible to use jog mode for each step
4. Select test run

Test run – Measuring of drop height and impact force

**Test run** - during operation in test run the door locking switch and the control switch for the mortar panel is out of function. To verify the impact effect a **load cell** is placed on the anvil instead of a mortar. When pressing the start button for the first time the frame is placed on the load cell until the end switch of the lifting spindle is pressed and thus signalises the positioning of the piston. Then the magnet is placed on the left guide bar of the drop weight and is attached against the upper side of the drop weight. By pressing the start button an impact is tripped. After the tripping process all drives are stopped and the real drop height can be verified by measuring the distance between drop weight and magnet. After having read the drop height the magnet is pushed down again. By pressing the start button a further check measurement can be done. After the number of impacts on the impact counter have been reached the drop weight and the lifting frame are raised in basic position. The maintenance menu is stopped by pressing „Jog out“ or by switching the main switch off or on. Remove the load cell and the magnet. Thus all safety devices that have been out of operation are reactivated and the machine is ready for normal operation.