IMPORTANT!
Before taking this instrument in use we strongly advise you to read this manual carefully.

Operating Instructions for the

Comprehensive Abrasion Test
This product complies to
- Machinery Directive 2006/42 / EC
- Low Voltage Directive 2006/95 / EC
- EMC Directive 2004/108 / EC

This product is RoHS 2 compliant (2011/65/EU)
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1 GENERAL

1.1 Importance of operating manual
This manual is written in order to become familiar with all the functions and possible applications of the instrument. It contains important instructions about how to use the instrument safely and economically; according to the purpose designated. Following these instructions is not only essential to avoid risks. It also reduces repair costs and down-time and increases the products reliability and service-life. Anyone who works with the instrument should follow the instructions in this manual, particularly the safety related instructions. Additionally local rules and regulations relating to environmental safety and accident prevention should be observed.

1.2 User responsibility
The user should
a) only allow persons to work with the instrument who are familiar with the general instructions on how to work safely and to prevent accidents. The use of the instrument should have been instructed duly The safety chapter and the warnings in this manual should have been read and understood; acknowledged as evidenced by their signature.
b) regularly check the safety-awareness of personnel at work.

1.3 Responsibility of personnel
Before commencing work anyone appointed to work with the instrument should pay attention to the general regulations relating to working safety and accident prevention. The safety chapter and the warnings in this manual should have been read and understood; acknowledged as evidenced by their signature.

1.4 Dangers
This instrument has been designed and constructed in accordance with state-of-the-art technology and the acknowledged safety regulations. Nevertheless, working with the instrument may cause danger to the life and health of the operator or to others, or damage to the instrument or other property. Therefore the instrument should only be used for its designated purpose, and in a perfect technical condition. Any defect that could have a negative effect on safety should be repaired immediately.

1.5 Designated purpose
The TQC Sheen Comprehensive Abrasion Test is exclusively designed to test films of paint and coatings on beverage cans following the instructed procedure. Other applications constitute improper use. TQC Sheen will not be held liable for damage resulting from improper use. Designated purpose also includes properly observing all instructions in the operation manual, and adherence to inspection and maintenance schedules.

1.6 Copyright
The copyright of this operating manual remains with TQC Sheen.
This operating manual is intended solely for the user and his personnel. Its instructions and guidelines may not be duplicated, circulated or otherwise passed on to others, neither fully, nor partly. Infringement of these restrictions may lead to legal action may be taken if this restrictions are infringed upon.

1.7 Manufacturer's/Supplier's address
TQC Sheen - Molenbaan 19, 2908 LL Capelle aan den IJssel - The Netherlands, T +31(0)10 7900100, F +31 (0)10 7900129

www.tqcsheen.com | 7
2 SAFETY INSTRUCTIONS

2.1 Meaning of Symbols
The following symbols for dangers are used in this instruction manual.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Explanation</th>
<th>Warning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Danger</td>
<td>Possible immediate danger to the life or health of personnel</td>
<td>If this guideline is not noted it can lead to severe danger to health, up to fatal injury</td>
</tr>
<tr>
<td>Warning</td>
<td>A dangerous situation could be caused</td>
<td>Non observance of this guideline can lead to injury or to damage to equipment.</td>
</tr>
<tr>
<td></td>
<td>Special tips and particular information</td>
<td>Guidelines to make optimal use of the instrument.</td>
</tr>
</tbody>
</table>

2.2 Availability of Safety Information
The instruction manual should be kept at the place where the instrument operates. In addition to the information contained in the instruction manual, general and local regulations for accident prevention and environmental protection shall be kept available and observed. Always ensure all guidelines in respect of safety and dangers on the instrument are in readable condition.

2.3 Training of Personnel
- Anyone who operates the instrument should be trained properly.
- It has to be clear who has which responsibility regarding commissioning, set-up of maintenance and repairs, installation, and operation.
- Anyone who hasn’t finished training should be supervised by an experienced person while working with the instrument.

2.4 Dangers from Electrical Energy
- Work on the electrical supply may only be done by a qualified electrician.
- The electrical equipment of the instrument must be checked regularly. Loose connections and cable damaged by heat must be corrected immediately.
- Always make sure the instrument’s power is turned off and the mains is unplugged while adjusting any electrical component.

2.5 Points of Special Danger

Do not tamper any safety switches of the machine!

Do not use excessive water nor high pressure washing and make sure the machine is unplugged while cleaning.

2.6 Care, Maintenance, Repairs
- Always make sure the instrument is connected to an earthed socket.
- Maintenance and inspection should be carried out at the correct intervals
- Operating personnel should be informed before starting with maintenance or repair work
- Always make sure the instruments power is turned off and the instrument is not connected to a socket while adjusting any electrical component whenever maintenance, inspection or repair work is done.
• Do not open the instrument. In case of malfunction always consult the manufacturer.

2.7 Modifications to the Equipment
• Any modifications or additions or alterations to the instrument may solely be made with permission from the manufacturer.
• All measures involving modifications require written confirmation of approval from TQC.
• Instruments which are not in fault-free condition must immediately be switched off.
• Only use replacement parts from the original supplier. Parts used from other sources aren’t guaranteed to take the loading and meet the safety requirements.

2.8 Cleaning of the Instrument and Disposal of Materials
• Do not use compressed air to remove loose particles or metal dust as this brings the particles inside the mechanism of the machine.
• Try to keep the instrument as clean as possible to prevent distortions of functions. In case of leakage of a beverage clean spill immediately with hand warm water. Note that especially liquids that contain sugar may cause failures over time when not removed.
• Cleaning materials must always be used and disposed of correctly.

2.9 Safety measure
Safety first is TQC Sheen’s motto. Hence all TQC Sheen is equipped with an array of safety measures. TQC Sheen CAT is equipped with the following:
1. Emergency stop switch that instantly cuts the machine’s power once pressed.
2. Front door that prevents the users from touching moving parts whilst the machine is in operation.
3. Safety switch on the front door that stops the machine when the door is opened during operation.
4. Safety switch on the side panel that shuts down the machine once opened.

3 TRANSPORT AND STORAGE

3.1 Packing
Please take note of pictorial symbols on the packing.

3.2 User: Check on Receipt
• Check packing for damage
• After unpacking check complete supply.

3.3 Reporting Transport Damage and Documentation
Any damage should be documented as accurately as possible (possibly photographed) and reported to the relevant insurers or, in the case of sales “delivered to customers works”, to the supplier.

3.4 Storage and Protective Measures when not in use
The instrument must be stored in a dry place at a temperature between 10 - 40°C / 50 - 104 °F.
4 INSTRUMENT DATA

4.1 Scope of Supply

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TQC Sheen Comprehensive Abrasion Test + Power cord + User and installation manual</td>
</tr>
<tr>
<td>Laptop computer with Windows 10 + CAT control application + USB cable</td>
</tr>
<tr>
<td>Three sets (60, 80 and 100 mm) of two side plate assembly + top pressure plate assembly + bottom can carrier plate</td>
</tr>
<tr>
<td>5 m air tube Ø6 mm + 4 mm hexagonal wrench + can positioning bar</td>
</tr>
</tbody>
</table>

4.2 Specifications

<table>
<thead>
<tr>
<th>Weight</th>
<th>125 kg / 276 lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (w x h x d)</td>
<td>1050 x 790 x 760 mm / 3.44 x 2.6 x 2.5 ft</td>
</tr>
<tr>
<td>Stroke length</td>
<td>0.5 to 2 inch</td>
</tr>
<tr>
<td>Frequency</td>
<td>0 to 2.5 Hz</td>
</tr>
<tr>
<td>Ramp up/down time</td>
<td>0.25 Hz per cycle</td>
</tr>
<tr>
<td>Test duration</td>
<td>0 to 24 hours</td>
</tr>
<tr>
<td>Pressure top cylinder</td>
<td>0 to 6 bar / 0 to 87 psi</td>
</tr>
<tr>
<td>Pressure side cylinders</td>
<td>0 to 6 bar / 0 to 87 psi</td>
</tr>
<tr>
<td>Can size</td>
<td>150 to 1000 ml / 5.07 to 33.8 fl. oz. (US) / 5.28 to 35.2 fl. oz. (UK)</td>
</tr>
<tr>
<td>Min / max can height</td>
<td>88 to 205 mm / 3.5 to 8.1 inch</td>
</tr>
<tr>
<td>Min / max can diameter</td>
<td>53 to 84 mm / 2.1 to 3.3 inch</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>0 to 50 °C / 32 to 122 °F</td>
</tr>
<tr>
<td>Operating humidity</td>
<td>0 to 90% rH (non-condensing)</td>
</tr>
<tr>
<td>Power Supply</td>
<td>100 to 240 VAC, 50 to 60 Hz</td>
</tr>
<tr>
<td>Max. power consumption</td>
<td>265 Watt</td>
</tr>
<tr>
<td>Air supply</td>
<td>8 bar ± 20%</td>
</tr>
<tr>
<td>Noise Level</td>
<td>&lt; 70 dB</td>
</tr>
</tbody>
</table>

4.3 Standards

- IEC 61326-1, EMC
- IEC 61340-5-1, ESC
- IEC 61010-1, Safety requirements for electrical equipment
- Directive 2011/65/EU, RoHS2
4.4 Instrument controls and functions

1. Front door
2. Front cover
3. Side cover
4. Top pressure plate
5. Side pressure plate
6. Shake table
7. Can positioner
8. Can carrier
9. Emergency stop switch
10. Side panel
11. Spill drawer
12. Lifting eye
13. Support feet
14. Power on/off switch
15. Air supply connector
16. Air filter
17. Air regulator
18. Power socket
19. Junction box
20. USB Port
5 INSTALLATION

5.1 Installation requirements

- The TQC Sheen CAT must be placed on a large flat bench, suitable for holding a minimum of 150 kg.
- A scissor lift or an eye hook lift is needed to lift and place the machine.
- Two power sockets are required to power the machine and the laptop.
- One air connection, with moisture trap, rated 8 to 10 bar.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Placement</td>
</tr>
<tr>
<td></td>
<td>Place the TQC Sheen CAT on a sturdy, vibration-free table or work area, capable of holding a minimum of 250 kg / 550 lbs.</td>
</tr>
<tr>
<td>2</td>
<td>Adjusting the feet</td>
</tr>
<tr>
<td></td>
<td>Make sure all 4 support feet are turned in, so the machine balanced in the 2 right feet and the levelling foot. Turn the 2 left feet outward until the feet are aligned with the levelling foot, see image A for detailed location of these feet.</td>
</tr>
<tr>
<td>3</td>
<td>Check all parts</td>
</tr>
<tr>
<td></td>
<td>Carefully unpack the machine and the accessories, and check complete supply.</td>
</tr>
<tr>
<td>4</td>
<td>Connect the power cord</td>
</tr>
<tr>
<td></td>
<td>Connect one end of the power cord to the power socket on the back of the CAT and the other end to a power outlet.</td>
</tr>
<tr>
<td>5</td>
<td>Connect the air hose</td>
</tr>
<tr>
<td></td>
<td>Connect one end of the air hose to the air supply connector on the back of the CAT and the other end to the air supply.</td>
</tr>
<tr>
<td>6</td>
<td>Turn on the TQC Sheen CAT</td>
</tr>
<tr>
<td>7</td>
<td>Turn on the laptop</td>
</tr>
<tr>
<td>8</td>
<td>Connect the laptop to the TQC Sheen CAT</td>
</tr>
<tr>
<td></td>
<td>Connect the USB-B end of the USB cable to the USB port on the back of the CAT and the USB-A end to the USB port on the laptop.</td>
</tr>
</tbody>
</table>
Make sure the machine and its supporting table remain in position during testing of various can sizes at various conditions.

If machine or supporting table rock and / or move during testing abort test and investigate its cause or contact the manufacturer.
6 RUNNING A TEST

6.1 Preparing the machine
1 Confirm if the stroke length is set as required. (see Annex A)
2 Place Can carrier and manually check if it slides in and out the machine smoothly.
3 Place Top pressure plate as described in Annex B.
4 Place the correct set of side pressure plates.

⚠️ Warning
Make sure the side plates match the can size. Side plates should always be lower than the can height

6.2 Loading the machine
1 Slide Can carrier to the forward position.
2 Place Can positioning bar in the correct position.
3 Place 6 cans against the Can positioning bar.
4 Push Can Positioners to each other to center the cans.
5 Pull Can Positioners back when cans are centered.
6 Carefully remove the Can positioning bar.
7 Slowly slide Can carrier onto the shake table.
8 Close Front door.

6.3 Preparing the CAT Control application
Open the TQC Sheen CAT Control application on the laptop.

The TQC Sheen CAT Control application consists of 4 sections
|   | **Run setup**  
|---|-------------------
|   | This section shows the setup for the current setup.  
|   | *The last used setup is shown when opening the application.*

|   | **Run pre setup**  
|---|-------------------
|   | This section shows the saved setups. More information about setups in chapter 6.7

|   | **Run values**  
|---|-------------------
|   | This section shows the real-time Frequency, Top and Side Pressure, and the Remaining Time of the test.

|   | **Control panel**  
|---|-------------------
|   | This section shows the system status and contains the buttons to control the CAT.

### 6.4 Starting a manual test

|   | **Initializing**  
|---|-------------------
|   | Press **Initialize** to connect to the TQC Sheen CAT.  
|   | *The system status should be ‘Ready’ after initializing, if not: see chapter 7*

|   | **Run Setup**  
|---|-------------------
|   | Enter the Duration, Frequency, Top Pressure, and Side Pressure.

|   | **Loading the setup into the TQC Sheen CAT**  
|---|-------------------
|   | Press **Start** to start a test with the current setup.

|   | **Test is running**  
|---|-------------------
|   | The test will stop when the duration time has been reached.  
|   | To pause the test, press **Pause**. To abort the test, press **Stop**.

|   | **Test is finished**  
|---|-------------------
|   | When the duration time has been reached, you can choose to extend the test or to stop the test.

|   | **Stop test**  
|---|-------------------
|   | When the duration time has been reached and you have chosen to stop the test, the system will stop the motor and release the top and side cylinders.  
|   | *Important: Do not open the front door until the system status is Ready.*
### 6.5 Starting a pre setup test

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1    | **Initializing**  
Press **Initialize** to connect to the TQC Sheen CAT.  
*The system status should be ‘Ready’ after initializing, if not: see chapter 7* |
| 2    | **Selecting a saved setup**  
Select a saved setup from the list and press **Select** to load the setup into the TQC Sheen CAT. |
| 3    | **Loading the setup into the TQC Sheen CAT**  
Check if the run setup is correct and press **Start** to start a test with the current setup. |
| 4    | **Test is running**  
The test will stop when the duration time has been reached.  
To pause the test, press **Pause**. To abort the test, press **Stop**. |
| 5    | **Test is finished**  
When the duration time has been reached, you can choose to extend the test or to stop the test. |
| 6    | **Stop test**  
When the duration time has been reached and you have chosen to stop the test, the system will stop the motor and release the top and side cylinders.  
*Important: Do not open the front door until the system status is Ready.* |

### 6.6 Test finished

When the test is finished and the system status is Ready, you can open the Front door.

- Clean any spill immediately to keep the machine in proper condition.
- Always remove any debris from previous tests before starting a new test as this may affect the results.
6.7 Run pre setup
Add new setup:

1. **Add a new pre setup**
   Press New to open the pre setup form.

2. **Enter the values**
   Set the Name, Duration, Frequency, Top Pressure, Side Pressure, and Span.

3. **Press OK to save**

Edit a setup:

1. **Select the setup and press Edit**

2. **Edit the values you want**

3. **Press OK to save**

Delete a setup:

1. **Select the setup**

2. **Press Delete**

6.8 CAT Settings
To open the CAT Settings, go to Settings > CAT Settings. Changing these values will increase or decrease the time it takes to start/finish the test.

<table>
<thead>
<tr>
<th>Motor acceleration / deceleration</th>
<th>The ramp up/down speed of the motor. (Default value: 0.3 Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumatic actuation time</td>
<td>The time to build up the pressure in the top and side cylinders. (Default value: 5 seconds)</td>
</tr>
</tbody>
</table>
## 7 SYSTEM STATUS AND TROUBLESHOOTING

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
<th>What to do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Initialized</td>
<td>The system is not initialized</td>
<td>Press <strong>Initialize</strong></td>
</tr>
<tr>
<td>Ready</td>
<td>The system is ready to start</td>
<td>Press <strong>Start</strong> to start a test. See chapter 7.4 and 7.5</td>
</tr>
<tr>
<td>Running</td>
<td>The test is running</td>
<td>Wait until the test is finished, or Press <strong>Pause</strong> to pause the test, or Press <strong>Stop</strong> to abort the test</td>
</tr>
<tr>
<td>Run Paused</td>
<td>The test is paused</td>
<td>Press <strong>Resume</strong> to continue test, or Press <strong>Stop</strong> to abort the test</td>
</tr>
<tr>
<td>Emergency stop</td>
<td>The emergency stop button is active</td>
<td>Release the emergency power button and restart the TQC Sheen CAT</td>
</tr>
<tr>
<td>Front door open</td>
<td>The front door is open</td>
<td>Close the front door</td>
</tr>
<tr>
<td>Side panel open</td>
<td>The side panel is open</td>
<td>Close the side panel</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine does not start</td>
<td>Front door is not closed entirely.</td>
<td>Close front door</td>
<td>Front door equipped with safety switch</td>
</tr>
<tr>
<td>Machine does not start</td>
<td>Side panel is not positioned correctly</td>
<td>Position side panel correctly</td>
<td>Side panel equipped with safety switch</td>
</tr>
<tr>
<td>Machine does not start</td>
<td>Emergency switch is active</td>
<td>Turn emergency switch clockwise to release</td>
<td></td>
</tr>
<tr>
<td>Machine does not start or switch on</td>
<td>Power cord not plugged in</td>
<td>Plug in the power cord</td>
<td></td>
</tr>
<tr>
<td>Machine does not start or switch on</td>
<td>Mains switch is turned off</td>
<td>Turn on main switch</td>
<td></td>
</tr>
<tr>
<td>Shake table starts but stops spontaneously, machine makes loud humming sounds</td>
<td>Load on can carrier too high.</td>
<td>Check type and positioning of cans</td>
<td>Only use cans that match the side pressure plates in use.</td>
</tr>
<tr>
<td>Shake table stops instantly and a loud humming sound is heard</td>
<td>Can carrier not in correct position</td>
<td>Slide can carrier fully in the machine until it clicks into position</td>
<td></td>
</tr>
</tbody>
</table>
8 ADDITIONAL INFORMATION

8.1 Carbonated fluids
Spillage of carbonated fluids on the pads can dissolve the glue on the pads. We advise to clean the pads immediately after a spillage. To ensure test can continue after a spillage, we advise to have additional pads.

If the rubber layer is coming off the pad and became unusable for testing, place the pad in a bath of carbonated water and let the remaining glue dissolve. The rubber layer and the glue can be removed off the pad and a new rubber layer can be installed.

8.2 Pressure gauge behaviour
Due to the adiabatic compression of the air in the side cylinders during operation, thermal energy transfers might influence the actual pressure in the cylinders. The A-Pad and B-Pad on the front cover will:

1. Indicate a (static) pressure that is applied prior to a test.
2. Indicate a (dynamic) pressure during the first few minutes of a test.
23. Indicate a (equilibrated) pressure during the remaining time of the test.
9 CLEANING THE MACHINE

When tests are performed with original beverages inside the cans leakage and spill may occur. This is no problem as the TQC Sheen CAT is designed to be cleaned with lukewarm water and is required a mild soap.
DO NOT use solvents or any chemicals to clean the machine. Do not use high pressure wash.

Make sure to clean the machine immediately after a spill has taken place. Sugar and other ingredients of the beverages may form a sticky or hard layer on the inner components of the machine which eventually may lead to malfunctioning.

Use the pictured guidelines for cleaning the TQC Sheen CAT.
9.1 Removing panel work for cleaning and maintenance purposes

Always unplug the power supply from machine before cleaning!

1 Open
Open the front door

2-3-4 Unlock front cover
Place hands under the front cover and push upwards to unlock the cover. Then pull forwards.

5 Tilt panel
Carefully tilt the panel as on picture.

6-7 Remove airlines
Release quick disconnect fittings to remove air lines.

8 Unfasten bolts
Unfasten the bolts at the bottom of the side covers.
9-10 Remove side covers
Remove side covers as shown in the pictures.

11 Easy to reach
All mechanical parts are now easy to reach.

9.2 Cleaning and rinsing TQC Sheen CAT

Always unplug the power supply from machine before cleaning!

1 Remove Can Carrier
Open the front door and remove can carrier.

2-3-4 Rinse with water
Rinse polluted components with lukewarm water (no high pressure wash!). Water will be retained in the spill drawer.

5 Use cleaning cloth…
If necessary use a cleaning cloth, sponge or soft brush.

6 Use dry cloth
Dry parts with a soft dry cloth.
7 Open drawer
Open the spill drawer

8 Unfold tube
Unfold drain tube.

9-10-11-12-13-14 Unplug drain
Lower into a container as shown and unplug drain.

15 Reposition drain tube
When spill drawer is fully drained plug drain tube and reposition. If required slide out spill drawer fully and clean.
16-17-18 **Remove top pressure plate**
Remove top pressure plate (as described in §9.1)

19-20 **Rinse and clean**
Rinse top pressure plate and can carrier under lukewarm water and clean.

21 **Place parts**
Dry parts and place back into the machine.
10 CARE AND MAINTENANCE

10.1 Inspection and Maintenance
- Though robust in design, this instrument is precision-machined. Never drop it or knock it over.
- Always clean the instrument after use.
- Clean the instrument using a soft dry cloth or hand warm water.
- Never clean the instrument by any mechanical means such as a wire brush or abrasive paper. This may cause, just like the use of aggressive cleaning agents, permanent damage.
- Generally the TQC Sheen CAT does not require any maintenance.

![Warning]

Make sure that no shattered glass, paint or other liquids are spilled on the electronics or left in the test compartment

10.2 Disposal of Materials
Disposal of materials used in the operation of the instrument or for auxiliary functions and exchanged items should be dealt with safety and in a manner that will not harm the environment. Follow the local regulations.

10.3 Customer Service
Customer service is provided on request by
TQC Sheen - Molenbaan 19, 2908 LL Capelle aan den IJssel - The Netherlands,
T +31(0)10 7900100, F +31 (0)10 7900129 or by local representatives.

The right of technical modifications is reserved.

11 DISCLAIMER

The information given in this manual is not intended to be exhaustive and any person using the product for any purpose other than that specifically recommended in this manual without first obtaining written confirmation from us as to the suitability of the product for the intended purpose does so at his own risk. Whilst we endeavor to ensure that all advice we give about the product (whether in this manual or otherwise) is correct we have no control over either the quality or condition of the product or the many factors affecting the use and application of the product. Therefore, unless we specifically agree in writing to do so, we do not accept any liability whatsoever or howsoever arising for the performance of the product or for any loss or damage (other than death or personal injury resulting from our negligence) arising out of the use of the product. The information contained in this manual is liable to modification from time to time in the light of experience and our policy of continuous product development.
Always unplug mains power from machine before starting!

1. Stroke adjustment device is positioned at left side of the machine.
2. Move metal cover in an upwards direction to unlock.
3. Adjustment tool is placed at the inside of the cover.
4. Now the stroke scale and set device (see arrow) are visible.
5. Untighten set device.
6. Align arrow with the desired stroke length on the stroke scale and tighten again.
7. Close Metal cover of stroke adjustment device.
ANNEX B - POSITIONING TOP PRESSURE PLATE

1 Press black pawl at the left side to release top pressure plate and pull outwards simultaneously.

2 Pull top pressure plate outwards.

3 Remove top pressure plate for maintenance or control.

4 Replace top pressure plate by sliding inwards until a “click” is heard.