

## 11 Control stops and faults

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### 11.1 General

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The boiler is fitted with an advanced control unit. The heart of the control is a microprocessor, the **Comfort Master**, which both protects and controls the boiler.

### 11.2 Control stops and faults

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#### Control stop

The control stop is a (temporary) boiler operating mode due to an abnormal situation. The boiler switches to the neutral position so that it can return to a normal state. The display then shows the shutdown status (with code 9) again. The boiler control unit will, at first, try several times to start the boiler again. The boiler shall operate again when the causes of the control stop have been removed.

#### Fault



If the shutdown condition still exists even after various automatic control unit start attempts have been made or if a non-reproducible phenomenon has arisen, the boiler switches to fault mode (also known as lock-out). The boiler can only resume operation if the cause of the fault is rectified and the **reset**-key is pressed.

### 11.3 Control stop codes

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The boiler display will show code **9**.

The control stop codes can be read out as follows:

- Push the -key, and then the -key;
- The display shows **SE:9**;
- Push the **[+]**-key one time; the display shows **SL** and the control stop code.



The boiler shall start automatically when the causes of the control stop have been removed.

# Control stop codes

| Code | Description   | Possible cause  | Check/solution  |
|------|---|---|---|
| 0    | Parameter fault   |   | <ul style="list-style-type: none"> <li>Reset dF and dU</li> </ul>   |
| 1    | Maximum flow temperature exceeded   | <ul style="list-style-type: none"> <li>No flow or insufficient flow</li> </ul>  | Check: <ul style="list-style-type: none"> <li>Flow and/or reason for heat demand</li> </ul>   |
| 3    | Maximum heat exchanger temperature exceeded                               | <ul style="list-style-type: none"> <li>No flow or insufficient flow during heat demand</li> </ul>                           | Check: <ul style="list-style-type: none"> <li>Flow (direction, pump, valves)</li> <li>That the system has been correctly bled</li> <li>Temperature sensors for deviations</li> <li>Water pressure in the system</li> <li>Whether the heat exchanger is dirty</li> </ul> |
| 4    | Maximum heat exchanger temperature increase exceeded                      | <ul style="list-style-type: none"> <li>No flow or insufficient flow</li> <li>Sensor fault</li> </ul>                        | Check: <ul style="list-style-type: none"> <li>Flow (direction, pump, valves)</li> <li>That the system has been correctly bled</li> <li>Temperature sensors for deviations</li> <li>Water pressure in the system</li> <li>Whether the heat exchanger is dirty</li> </ul> |
| 5    | Maximum difference between heat exchanger and return temperature exceeded | <ul style="list-style-type: none"> <li>No flow or insufficient flow during heat demand</li> <li>Sensor fault</li> </ul>     | Check: <ul style="list-style-type: none"> <li>Flow (direction, pump, valves)</li> <li>That the system has been correctly bled</li> <li>Temperature sensors for deviations</li> <li>Water pressure in the system</li> <li>Whether the heat exchanger is dirty</li> </ul> |
| 6    | Maximum difference between heat exchanger and flow temperature exceeded   | <ul style="list-style-type: none"> <li>No flow or insufficient flow during heat demand</li> <li>Sensor fault</li> </ul>     | Check: <ul style="list-style-type: none"> <li>Flow (direction, pump, valves)</li> <li>That the system has been correctly bled</li> <li>Temperature sensors for deviations</li> <li>Water pressure in the system</li> <li>Whether the heat exchanger is dirty</li> </ul> |
| 8    | Waiting time release signal drift   | <ul style="list-style-type: none"> <li>External cause</li> <li>Incorrectly set parameter</li> <li>Bad connection</li> </ul> | <ul style="list-style-type: none"> <li>Remove external cause</li> <li>Check the parameter</li> <li>Check the connection</li> </ul>  |
| 9    | Phase and neutral of mains supply mixed up                                | <ul style="list-style-type: none"> <li>Mains supply incorrectly wired</li> <li>Floating or 2-phase system</li> </ul>        | <ul style="list-style-type: none"> <li>Reconnect phase and neutral</li> <li>Set parameter 32 to 0</li> </ul>  |
| 10   | Shutdown interlock active   | <ul style="list-style-type: none"> <li>External cause</li> <li>Incorrectly set parameter</li> <li>Bad connection</li> </ul> | <ul style="list-style-type: none"> <li>Remove external cause</li> <li>Check the parameter</li> <li>Check the connection</li> </ul>  |
| 11   | Shutdown interlock active or frost protection active                      | <ul style="list-style-type: none"> <li>External cause</li> <li>Incorrectly set parameter</li> <li>Bad connection</li> </ul> | <ul style="list-style-type: none"> <li>Remove external cause</li> <li>Check the parameter</li> <li>Check the connection</li> </ul>  |
| 13   | Communication fault with SCU (= optional PCB)                             | <ul style="list-style-type: none"> <li>BUS connection inadequate or non-</li> </ul>   | <ul style="list-style-type: none"> <li>Reconnect</li> <li>Carry out automatic detection</li> </ul>  |

| Code  | Description  | Possible cause  | Check/solution  |
|-------|--|---|---|
|       |  | <ul style="list-style-type: none"> <li>existent</li> <li>SCU PCB not present (any longer) in boiler</li> </ul>  |   |
| 114   | Water pressure too low   | <ul style="list-style-type: none"> <li>Water pressure non-existent or too low</li> <li>Incorrect water pressure parameter adjustment</li> <li>Water leakage</li> </ul>  | Check: <ul style="list-style-type: none"> <li>Water pressure in the system</li> <li>Minimum water pressure</li> <li>That hydraulic pressure sensor is properly installed /connected</li> </ul>  |
| 115   | Gas pressure too low   | <ul style="list-style-type: none"> <li>No flow or insufficient flow</li> <li>Incorrect GPS switch adjustment</li> <li>Wiring defect or switch faulty</li> </ul>   | Check: <ul style="list-style-type: none"> <li>That the gas cock is fully opened</li> <li>That there is adequate gas pressure</li> <li>That the GPS switch is properly installed</li> <li>Replace the GPS switch if necessary</li> </ul>   |
| 116 * | Configuration fault or SU not recognised                           | <ul style="list-style-type: none"> <li>Incorrect SU PCB for this boiler</li> </ul>  | <ul style="list-style-type: none"> <li>Replace SU PCB</li> </ul>  |
| 117 * | Configuration fault or default parameters table incorrect          | <ul style="list-style-type: none"> <li>PCU-01 unit parameters incorrect</li> </ul>  | <ul style="list-style-type: none"> <li>Replace PCU-01 unit</li> </ul>   |
| 118 * | Configuration fault or parameter storage unit (PSU) not recognised | <ul style="list-style-type: none"> <li>Incorrect PSU PCB for this boiler</li> </ul>   | <ul style="list-style-type: none"> <li>Replace PSU PCB</li> </ul>   |
| 119 * | Configuration fault or dF-dU parameters unknown                    |   | <ul style="list-style-type: none"> <li>Add/check dF and dU</li> </ul>   |
| 210 * | Configuration procedure active                                     | <ul style="list-style-type: none"> <li>Standard briefly activated following boiler switch-on</li> </ul>   | <ul style="list-style-type: none"> <li>No action</li> </ul>   |
| 211   | Communication fault with SU-01                                     | <ul style="list-style-type: none"> <li>Bad connection</li> </ul>  | <ul style="list-style-type: none"> <li>Check that the PCB is inserted in the correct connector</li> </ul>   |
| 222   | No flame during operation  | <ul style="list-style-type: none"> <li>No ionization current</li> </ul>   | Check: <ul style="list-style-type: none"> <li>That the gas cock is fully opened</li> <li>That the gas pressure is sufficient</li> <li>That the gas block is appropriately adjusted and working correctly</li> <li>Whether the air supply or flue gas discharge are blocked</li> <li>The flue gas circulation; inspect the flue gas discharge system for installation faults and the heat exchanger for leaks</li> </ul> |
| 224   | VPS test failed  | <ul style="list-style-type: none"> <li>Gas pressure non-existent or too low</li> <li>Faulty gas valve</li> <li>Incorrect adjustment of the VPS switch</li> <li>Wiring fault</li> <li>Faulty VPS switch</li> </ul> | Check: <ul style="list-style-type: none"> <li>That the gas cock is fully opened</li> <li>That the gas pressure is sufficient</li> <li>That the VPS switch is properly installed</li> <li>Whether the gas valve is leaking or in the open position</li> <li>That the wiring is OK; mix up of the V1 and V2 plugs</li> <li>The adjustment of the VPS switch</li> </ul>  |




| Code  | Description                                      | Possible cause | Check/solution  |
|---|--|----------------|---|
|   |  |                | <ul style="list-style-type: none"> <li>Replace the VPS switch if necessary</li> <li>Replace the gas valve if necessary</li> </ul> |
|  | Internal gas valve fault<br>Internal fault SU-01 |                | <ul style="list-style-type: none"> <li>Replace the gas valve if necessary</li> <li>Replace SU-01</li> </ul>                       |
| * These lock-outs are not stored in the failure memory.                           |  |                |   |

Table 19 Control stop codes

## 11.4 Fault codes

The boiler displays the fault codes as follows:

 (the display shows the  symbol and the fault code flashes). The meaning of the fault codes can be found in the fault table, see Table 20.

**In the event of faults, proceed as follows:**

- Note the fault code.







The fault code is needed to find the cause of the fault quickly and correctly and for any support from our Customer Care Department.

- Press the **reset**-key for 2 seconds. If the fault code continues to appear, look for the cause in the following fault table and rectify the fault.



If the display does not show RESET but SERVICE, the boiler must be switched off and switched on again after 10 seconds before the fault can be reset.

### Control Fault (Lock-out) codes

| Fault code  | Description                                       | Possible cause   | Check/solution  |
|---|---|--|---|
|  | Storage unit parameter not found                  | <ul style="list-style-type: none"> <li>Bad connection</li> </ul>   | <ul style="list-style-type: none"> <li>Check the cable bundle</li> </ul>  |
|  | Safety parameters not in order                    | <ul style="list-style-type: none"> <li>Bad connection</li> </ul>   | <ul style="list-style-type: none"> <li>Check the cable bundle</li> </ul>  |
|  | Heat exchanger temperature sensor short circuited | <ul style="list-style-type: none"> <li>Bad connection</li> <li>Defective sensor</li> <li>Sensor not correctly mounted</li> </ul> | <ul style="list-style-type: none"> <li>Check the cable bundle</li> <li>Replace the sensor if necessary</li> <li>Check if sensor is correctly mounted</li> </ul> |
|  | Heat exchanger temperature sensor open circuit    | <ul style="list-style-type: none"> <li>Bad connection</li> <li>Defective sensor</li> <li>Sensor not correctly mounted</li> </ul> | <ul style="list-style-type: none"> <li>Check the cable bundle</li> <li>Replace the sensor if necessary</li> <li>Check if sensor is correctly mounted</li> </ul> |

| <b>Fault code</b>          | <b>Description Possible</b>  | <b>cause</b>  | <b>Check/solution</b>  |
|----------------------------|--|---|--|
| <b>E:04</b>                | Heat exchanger temperature exceeded below normal range   | <ul style="list-style-type: none"> <li>• Bad connection</li> <li>• Defective sensor</li> <li>• Sensor not correctly mounted</li> <li>• No or too little flow</li> </ul> | <ul style="list-style-type: none"> <li>• Check the cable bundle</li> <li>• Replace the sensor if necessary</li> <li>• Check: <ul style="list-style-type: none"> <li>• flow (direction, pump, valves)</li> <li>• if system has been correctly bled</li> </ul> </li> <li>• temperature sensors for deviations</li> <li>• if sensor is correctly mounted</li> <li>• water pressure in the system</li> <li>• if heat exchanger is dirty</li> </ul> |
| <b>E:05</b>                | Heat exchanger temperature exceeded above normal range<br>(high limit thermostat)                |   |  |
| <b>E:06</b>                | Return temperature sensor short circuited  | <ul style="list-style-type: none"> <li>• Bad connection</li> <li>• Defective sensor</li> <li>• Sensor not correctly mounted</li> </ul>                                  | <ul style="list-style-type: none"> <li>• Check the cable bundle</li> <li>• Replace the sensor if necessary</li> <li>• Check if sensor is correctly mounted</li> </ul>  |
| <b>E:07</b>                | Return temperature sensor open circuit   | <ul style="list-style-type: none"> <li>• Bad connection</li> <li>• Defective sensor</li> <li>• Sensor not correctly mounted</li> </ul>                                  | <ul style="list-style-type: none"> <li>• Check the cable bundle</li> <li>• Replace the sensor if necessary</li> <li>• Check if sensor is correctly mounted</li> </ul>  |
| <b>E:08</b><br><b>E:09</b> | Return temperature exceeded below normal range<br>Return temperature exceeded above normal range | <ul style="list-style-type: none"> <li>• Bad connection</li> <li>• Defective sensor</li> <li>• Sensor not correctly mounted</li> <li>• No or too little flow</li> </ul> | <ul style="list-style-type: none"> <li>• Check the cable bundle</li> <li>• Replace the sensor if necessary</li> <li>• Check: <ul style="list-style-type: none"> <li>• flow (direction, pump, valves)</li> <li>• if system has been correctly bled</li> </ul> </li> <li>• temperature sensors for deviations</li> <li>• if sensor is correctly mounted</li> <li>• water pressure in the system</li> <li>• if heat exchanger is dirty</li> </ul> |
| <b>E:10</b><br><b>E:11</b> | Too great a difference between heat exchanger and return temperature                             | <ul style="list-style-type: none"> <li>• Defective sensor</li> <li>• No or too little flow</li> <li>• Sensor not correctly mounted</li> </ul>                           | <ul style="list-style-type: none"> <li>• Replace the sensor if necessary</li> <li>• Check: <ul style="list-style-type: none"> <li>• flow (direction, pump, valves)</li> <li>• if system has been correctly bled</li> </ul> </li> <li>• temperature sensors for deviations</li> <li>• water pressure in the system</li> <li>• if heat exchanger is dirty</li> <li>• if sensor is correctly mounted</li> </ul>                                   |
| <b>E:12</b>                | Trap protection activated  | <ul style="list-style-type: none"> <li>• Bad connection</li> <li>• Pressure in flue gas discharge duct is (was) too high</li> <li>• Air supply obstructed</li> </ul>    | <ul style="list-style-type: none"> <li>• Check the cable bundle</li> <li>• Check that the trap is not empty; top up if necessary</li> <li>• Blockage in flue gas discharge/RGA covered</li> </ul>  |

| Fault code | Description Possible          | cause  | Check/solution  |
|------------|-------------------------------|--|---|
|            |                               |  | <ul style="list-style-type: none"> <li>• Cascade valve does not open</li> <li>• Trap is blocked</li> <li>• Heat exchanger is dirty</li> <li>• Check the air supply</li> </ul>   |
| E: 14      | 5 failed burner starts        | <ul style="list-style-type: none"> <li>• No ignition spark</li> </ul>  | <ul style="list-style-type: none"> <li>• Check: connection between ignition cable and transformer</li> <li>• electrode distance, this must be 1/8 - 1/6 inch (3 - 4 mm)</li> <li>• breakdown to earth</li> <li>• condition of the burner set (burner set/electrode seal)</li> <li>• earthing</li> <li>• bad actuation on SU board</li> </ul>  |
| E: 14      | 5 failed burner starts        | <ul style="list-style-type: none"> <li>• Ignition spark, but no flame</li> </ul>   | <ul style="list-style-type: none"> <li>• Check: <ul style="list-style-type: none"> <li>• is the gas cock opened?</li> <li>• is the inlet gas pressure sufficient?</li> <li>• is the gas pipe vented?</li> <li>• correct gas block operation and adjustment?</li> <li>• is the air supply or flue gas discharge blocked?</li> <li>• condition of cable bundle to gas block</li> <li>• bad actuation on SU board</li> </ul> </li> </ul> |
| E: 14      | 5 failed burner starts        | <ul style="list-style-type: none"> <li>• Flame, but insufficient ionization</li> </ul>   | <ul style="list-style-type: none"> <li>• Check: <ul style="list-style-type: none"> <li>• condition of the electrode and earthing</li> <li>• condition of cable bundle between ignition cable and transformer</li> <li>• if gas cock is fully opened</li> <li>• if the gas pressure is sufficient</li> </ul> </li> </ul>   |
| E: 15      | 5 failed gas leakage controls | <ul style="list-style-type: none"> <li>• Defective gas valve</li> <li>• No or to little gas pressure</li> <li>• VPS switch wrongly adjusted</li> <li>• Bad connection</li> <li>• Defective sensor</li> <li>• Sensor not correctly mounted</li> </ul> | <ul style="list-style-type: none"> <li>• Is the gas cock opened?</li> <li>• Is the gas pressure sufficient?</li> <li>• Are the VPS switches correctly fitted?</li> <li>• Gas valve is leaking or is stuck in the open position.</li> <li>• Is the wiring in order, plugs V1, V2 not mixed up?</li> <li>• Check the VPS settings</li> <li>• Replace the sensor if necessary</li> <li>• Check if sensor is correctly mounted</li> </ul> |
| E: 16      | False flame signal            | <ul style="list-style-type: none"> <li>• Ionization current has been measured, while there may not be a flame</li> </ul>   | <ul style="list-style-type: none"> <li>• Burner glows as a result of a high CO<sub>2</sub> percentage (adjust CO<sub>2</sub>).</li> <li>• Check the ignition / ionization electrode</li> <li>• Gas valve is leaking or is stuck in the open position.</li> </ul>  |

| <b>Fault code</b> | <b>Description Possible</b>                   | <b>cause</b>  | <b>Check/solution</b>   |
|-------------------|---|---|---|
| E:17              | Gas valve control fault                       | <ul style="list-style-type: none"> <li>Bad connection</li> <li>Defective gas valve</li> </ul>   | <ul style="list-style-type: none"> <li>Check the cable bundle</li> <li>Replace the gas valve if necessary</li> </ul>  |
| E:32              | Flow temperature sensor short circuited       | <ul style="list-style-type: none"> <li>Bad connection</li> <li>Defective sensor</li> <li>Sensor not correctly mounted</li> </ul>                                      | <ul style="list-style-type: none"> <li>Check the cable bundle</li> <li>Replace the sensor if necessary</li> <li>Check if sensor is correctly mounted</li> </ul>   |
| E:33              | Flow temperature sensor open circuit          | <ul style="list-style-type: none"> <li>Bad connection</li> <li>Defective sensor</li> <li>Sensor not correctly mounted</li> </ul>                                      | <ul style="list-style-type: none"> <li>Check the cable bundle</li> <li>Replace the sensor if necessary</li> <li>Check if sensor is correctly mounted</li> </ul>   |
| E:34              | Fan fault                                     | <ul style="list-style-type: none"> <li>Bad connection</li> <li>Defective fan</li> </ul>   | <ul style="list-style-type: none"> <li>Fault in fan cabling</li> <li>Defect in fan</li> <li>(Too) much draught over boiler, so that the fan starts to rotate</li> </ul>   |
| E:35              | Flow and return swapped                       | <ul style="list-style-type: none"> <li>Defective sensor</li> <li>Wrong flow direction</li> <li>Bad sensor connection</li> <li>Sensor not correctly mounted</li> </ul> | <ul style="list-style-type: none"> <li>Check:</li> <li>Flow direction</li> <li>temperature sensors for deviations</li> <li>Replace the sensor if necessary</li> </ul>   |
| E:36              | Flame loss occurs 5 times                     | <ul style="list-style-type: none"> <li>Ionization current drops out</li> </ul>  | <ul style="list-style-type: none"> <li>Inlet gas pressure sufficient? Inlet gas pressure controller in order?</li> <li>Correct gas block operation and adjustment?</li> <li>Blockage in air supply or flue gas discharge?</li> <li>Flue gas circulation, check flue gas system for installation faults and the heat exchanger for possible leaks</li> </ul> |
| E:37              | Communication fault with SU board             | <ul style="list-style-type: none"> <li>Bad connection</li> </ul>  | <ul style="list-style-type: none"> <li>Check SU board is correctly inserted in the connector on the PCU-01</li> </ul>   |
| E:38              | Communication fault with SCU board (optional) | <ul style="list-style-type: none"> <li>Bad connection</li> </ul>  | <ul style="list-style-type: none"> <li>Check the cable bundle</li> </ul>  |
| E:39              | Shutdown input in locked-out mode             | <ul style="list-style-type: none"> <li>External cause</li> <li>Incorrectly set parameter</li> <li>Bad connection</li> </ul>   | <ul style="list-style-type: none"> <li>Remove external cause</li> <li>Check the parameter</li> <li>Check the cable bundle</li> </ul>  |

Table 20 Fault codes

## 11.5 Control stop - and fault memory

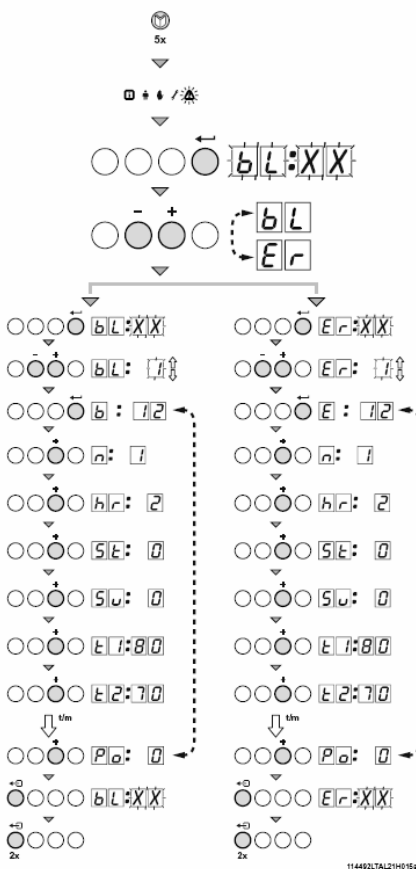
The boiler control unit has a control stop and fault memory. This stores the last 16 control stops and the last 16 faults that have occurred.

With each fault, the following data is saved:

- **b** or **E** = control stop or fault code

- $\overline{n}$  = number of times that the fault has occurred in succession
- $\overline{Hr}$  = burner operating hours since time of fault
- $\overline{St}$  = status
- $\overline{Su}$  = sub status
- $\overline{t1}$  = flow temperature [°F]
- $\overline{t2}$  = return temperature [°F]
- $\overline{t4}$  = outside temperature [°F]
- $\overline{t6}$  = boiler block temperature [°F]
- $\overline{Sp}$  = internal set point [°F]
- $\overline{Fl}$  = ionization current [ $\mu$ A]
- $\overline{nF}$  = fan rotation speed [rpm]
- $\overline{Pr}$  = water pressure [inches w.c.]
- $\overline{Pa}$  = relative output supplied [%]

### 11.5.1 Reading faults



- Press the -key several times until the symbol flashes in the menu bar;
- Press the  $\leftarrow$ -key;  $\overline{bL:XX}$  will flash in the display, together with the number of shutdowns that have been memorised;
- Press the  $+$  or  $-$ -key to select either the control stops  $\overline{bL}$  or faults  $\overline{Er}$ .
- Press the  $\leftarrow$ -key;  $\overline{bL:XX}$  will flash in the display, together with the number of shutdowns that have been memorised;
- Press the  $+$  or  $-$ -key to go forwards or backwards in the list of faults.
- Press the  $\leftarrow$ -key to take a closer look at the fault. Press the  $+$  or  $-$ -key to view the following information:  $\overline{b:12}$  (shut down code b with fault number e.g.  $\overline{12}$ );  $\overline{St:3}$  (status code  $\overline{St}$  with number e.g.  $\overline{3}$ ; appliance burned for central heating);  $\overline{n:1}$  number of  $\overline{n}$  with the 'number of times that the fault has occurred' as number);  $\overline{t1:170}$  (temperature  $\overline{t1}$ , the flow temperature  $\overline{170}$  when the fault occurred);  $\overline{t2:160}$  (temperature  $\overline{t2}$ , the return temperature  $\overline{160}$  when the fault occurred);
- Press the  $\leftarrow$ -key to stop the cycle,  $\overline{bL:XX}$  will appear flashing in the display with the number of the last fault;
- Press the  $+$  or  $-$ -key to view any subsequent fault information.

Fig. 35 Reading faults or control stops



### 11.5.2 Deleting control stops or faults

The last message in the list in the display is **Er:CL** (or **bl:CL** with shutdowns)

- Press the **←**-key; the display will show: **0**
- Press the **[+]**-key to set the parameter to 1.
- Press the **←**-key; the fault memory is cleared
- Press the **←**-key twice to exit the fault memory.

**i** With faultfinding, retrieving the operating status when the fault occurred can contribute to faster rectification of the cause.

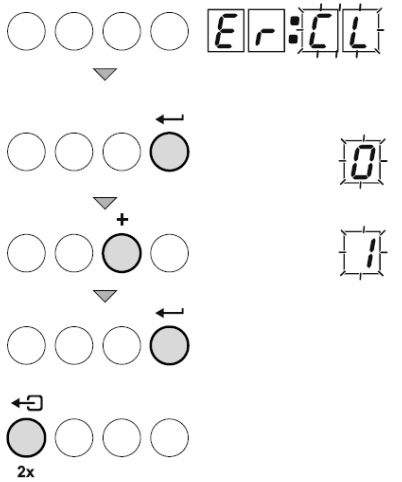


Fig. 36 Deleting faults