Operating Instructions Testomat® 808 2019

Online Analysis Instrument for Water Hardness

EN



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Important safety information

- ➢ Please read these operating instructions carefully and completely prior to working with the instrument.
- ➢ Ensure that these operating instructions are always available for all users.
- ➢ These operating instructions must always be passed on to the new owner should Testomat® 808 change hands.
- ➢ Always adhere to hazard warnings and safety information when using reagents, chemicals and cleaning agents. Please adhere to the respective safety data sheet! Download the safety data sheets for the supplied reagents at http://www.heylanalysis.de.

Intended use

Testomat® 808 has been designed for use in the field of water treatment (e.g. osmosis plants, electroplating, large boiler plants, laundries, canteen kitchens). The feed water must be clear, colourless and free of undissolved particles. The instrument is a limit value measuring instrument which automatically monitors the residual total hardness (water hardness) in water.

- ➢ Always adhere to the performance limits stated in the section entitled Technical data on page 45.
- ➢ Always observe the application areas/application limits of the indicators and the requirements of the medium being measured.

To ensure correct and intended usage, always read and understand these instructions, especially the section entitled Important safety information, prior to use.

The instrument is not used as intended if

- it is used in areas not specified in these instructions.
- it is used in areas which do not correspond to the ones described in these instructions.

Qualification of the staff

Assembly and commissioning require fundamental electrical and process engineering knowledge as well as knowledge of the respective technical terms. Assembly and commissioning should therefore only be carried out by a specialist or by an authorised individual supervised by a specialist.

A specialist is someone who due to his/her technical training, know-how and experience as well as knowledge of relevant regulations can assess assigned tasks, recognise potential hazards and ensure appropriate safety measures. A specialist should always adhere to the relevant technical regulations.

Warning notices in these instructions

The warning notices in these instructions warn the user about potential dangers to individuals and property resulting from incorrect handling of the instrument. The warning notices are structured as follows:

Description of the type or source of danger



SIGNAL WORD!

Description of the consequences resulting from non-observance

➢ Preventive measures. Always adhere to these preventive measures.



"**DANGER**" indicates an immediate hazardous situation which, if not avoided, will result in death or serious injury.



"**WARNING**" indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



"**CAUTION**" indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injuries or property damage.



"**NOTE**" indicates important information. If this information is not observed, it may result in an undesirable result or state.

Notes and instructions to be observed

General instructions



- Adhere to health and safety regulations, electrical equipment safety regulations, and environmental protection regulations valid in the country of use and at the installation site.
- Adhere to national and local regulations during installation and commissioning.
- Always protect the instrument against moisture and humidity. It should never come into contact with condensation or splash water.
- Do not carry out any changes or modifications at the instrument which are not described in these instructions; failure to adhere to these instructions will negatively affect any warranty claims that you make thereafter.

Installation

WARNING

- Always completely disconnect the relevant plant part before installing the instrument or connecting/disconnecting it to/from the power supply. Secure the plant against reconnection.
- Only connect the instrument to the mains voltage specified on the rating plate.
- Always observe technical data and ambient parameters.

NOTE

- Testomat® 808 requires an interference free and stable power supply. If necessary, use a mains filter to protect Testomat® against interference voltages caused, e.g., by solenoid valves or large motors. Never lay connecting cables parallel to power cables.

Operation

- Ensure that the maximum electrical load capacity of the relay outputs is never exceeded.
- Immediately switch off Testomat® 808 and contact service staff if malfunctioning occurs. The warranty will be void if you tamper with or attempt to repair Testomat® 808. Repairs must be carried out by authorised service staff.

Cleaning

- Only use a dry, lint-free cloth for cleaning.

De-installation

- Prior to de-installing a defective instrument, always write down a description of the error (failure effect). It is only possible to repair a defective instrument (irrespective of the warranty period) if it has been de-installed and returned to us with a description of the error. Use to the enclosed error log to describe the error and return it to us together with the instrument. If the error log is no longer available, download it at www.heylanalysis.de.

Disposal

- Dispose of the instrument in accordance with national regulations.

Operating requirements

CAUTION

- In order for Testomat® 808 to operate reliably, use Heyl Testomat® indicators in the pH-range 4 – 10.5!
- Only operate the instrument with the parameters specified under “Technical data”.
- **Attention!** Water that is too cold can lead to foggy viewing windows. Ensure that the temperature difference between the ambient temperature and the water temperature is not too great (be mindful of the dew point!).
- With Testomat® instruments for water hardness monitoring, larger quantities of heavy metal ions in the softened water might influence the colour reaction, especially iron above 0.5 mg/l, copper above 0.1 mg/l and aluminium above 0.1 mg/l (brownish-red colour display).
- If the measuring water contains more than 20 mg/l CO_2 (carbonic acid), incorrect evaluations cannot be excluded. In this case, use an aerator (e.g. special Heyl accessories).
- The concentration of influencing contents can be determined by using our colorimetric TESTOVAL® test kit

NOTE

- **Important! Excessive carbonate hardness and also the existence of disinfectants in the water can result in erroneous evaluations.**
- Replace the sight glass made of glass to sight glass made of PMMA, if the silicate content in the sample water is higher than 15 mg/l and a white film is deposited on the glass.
- Careful handling of the instrument increases both its operational reliability and service life! Therefore, carry out a visual inspection at regular intervals as described below:

  - Has the use-by-date of the indicator expired?
  - Are the hose connections of the dosing pump free of leaks?
  - Is there any air inside the dosing hoses?
  - Are all the water connections free of leaks?
  - Are the doors of the instrument closed properly?
  - Is the instrument heavily soiled?
  - Are the measuring chamber and the drain duct/drain hose clean?
- Trouble-free operation is only possible when maintenance is carried out on a regular basis! For more information, please refer to the section entitled Description of maintenance work on page 38.
- If problems occur, please refer to the section entitled Error messages/Troubleshooting on page 33.

Scope of delivery

1x Testomat® 808 2019

1x plastic bag containing 1 screw cap with a hole and an insert for the screw cap of the indicator bottle (500 ml)

2x fuse

1x operating instructions

Special accessories (available separately): Filter inlet, candle filter as well as pressure regulator

Required hose connections and supply lines for Testomat® 808 are available from Heyl.

Performance specifications

Testomat® 808 is used for the automatic monitoring of residual total hardness (water hardness) in water. The limit value to be monitored is determined by the indicator selection.

- Limit values for residual hardness of 0.02 – 5.0 °dH determinable by indicator selection
- Analysis start:
  - Automatic interval mode
    (interval pause can be set from 0 – 60 minutes)
  - External control
  - Manual start
- Extended operating periods due to 500 ml indicator storage bottle
- RS232 interface for optional firmware update

Indicators for Testomat® 808 instruments

Indicators with various limit values are available for the application of Testomat® 808 instruments according to operational requirements.

Indicator type	Monitoring range	Limit value LEDs (good/poor display)	Measuring result (information on water quality)
300 – 350	Residual hardness 0.02 – 5 °dH	"GOOD" green	Residual hardness < indicator limit value
		"POOR" red	Residual hardness > indicator limit value

All indicator types are available in two bottle sizes (100 ml and 500 ml). Please refer to the section entitled "Testomat® 808 2019 spare parts and accessories" on page 43 for a detailed list of the individual indicator types with the respective article numbers.

Functions of the operating and display elements

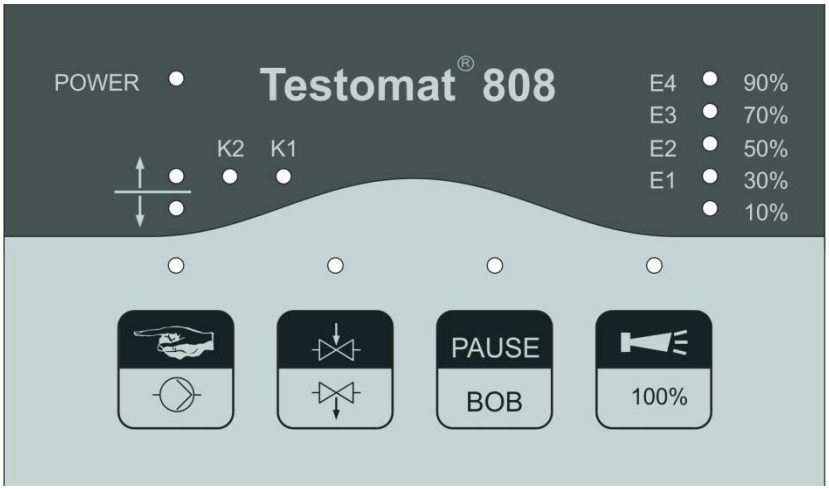
Operating statuses and measuring results are displayed at Testomat® 808 via LEDs. The input keys for operating the instrument are positioned below the LEDs.

Switching Testomat® 808 on/off

(1) External power switch
Switch the device on or off at the external power switch.

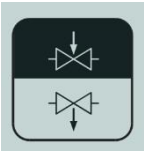
(2) Instrument fuse (internal)
These fuses protect Testomat® 808 and the outputs against overloads and short circuits.
Please refer to the sections entitled Fuses on page 19 and Error messages/Troubleshooting on page 33 for descriptions of the fuses.

Front view Testomat® 808



Operating elements/Function keys

All operating elements/function keys are assigned twice. The respective function is triggered by a short or long (min. 2 seconds) key press.

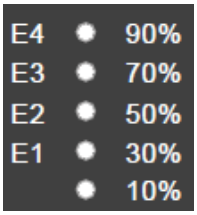
Key 1 (manual) 	Short key press: Starts an analysis (manual start), the respective LED flashes. Long key press: Switches the dosing pump for bleeding the pipes on/off. The LED illuminates while the pump is running.
Key 2 (flushing) 	Short key press*: Switches the internal flush valve on/off, the respective LED flashes as long as the valve is open. Long key press*: Activates an external flush valve via relay 1 (on/off). The LED above key 2 and LED K1 illuminate as long as the external valve is activated.
Key 3 (pause) 	Short key press: Switches the standby function on/off. The respective LED flashes if standby is active. Long key press: The respective LED displays whether operation is possible for longer than 72 h (operation without supervision).
Key 4 (horn) 	Short key press: Acknowledges current errors/alarms. Long key press (min. 5 seconds): Sets the indicator display from 0% to 100% (the LEDs 10% to 90% illuminate). **Note**: It is not possible to enter any indicator level.

* only in standby mode

Display elements/LEDs

All measuring results as well as activated functions are displayed at Testomat® 808 via LEDs.

The LEDs above the function keys illuminate/flash when the respective function is activated.

	The LED lights up when the device is supplied with power and is in operation.
	Limit value LEDs (red/green) for displaying the measuring result: Limit value not achieved => green LED illuminates Limit value exceeded => red LED illuminates When a new measuring is running, the result of the previous measurement flashes.
	The LEDs K1 and K2 display the status of the relays. They illuminate if the respective relay has been switched (also see the section entitled “Switching functions of the relays 1 and 2” on page 24)!
	10% – 90%: These LEDs display the calculated filling level of the indicator bottle (also see the section entitled “Measuring fault analysis” on page 36). E4 – E1: Displays pending errors. Can be acknowledged by pressing the horn button (also see the section entitled “ Error messages/Troubleshooting” on page 33). E4 flashes: The pump head has been in operation for 150 hours and must be replaced (also see the section entitled “Pump head maintenance message” on page 41)

NOTE

Cancelling error messages/warning messages

➤ Press key 4 to acknowledge the messages and, if necessary, eliminate the cause of the fault.



Installation

WARNING

Risks resulting from incorrect installation!

- Install Testomat® 808 at a location where it is protected against dripping or splash water, dust and aggressive substances – e.g. in a control cabinet or on a suitable wall.

NOTE

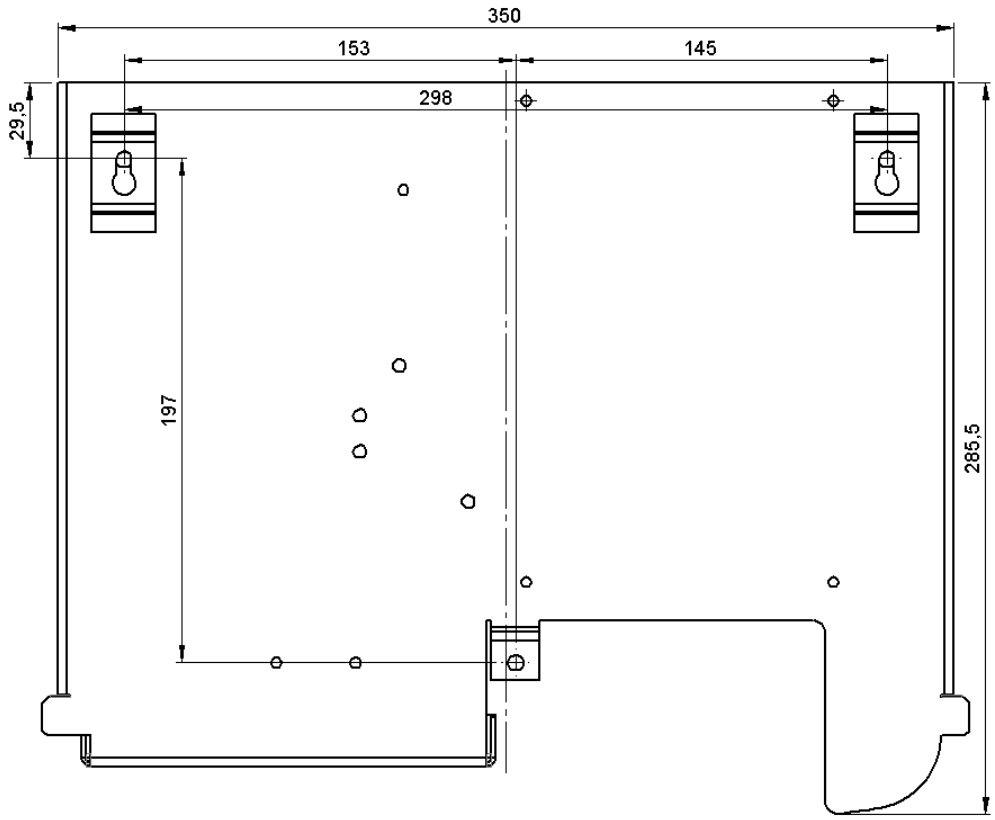
Information for trouble-free operation

- Install Testomat® 808 vertically and without mechanical stress.
- Install Testomat® 808 at a vibration-free site.

Installing Testomat® 808

Select an installation site where the water inlet hose can be kept as short as possible (max. 5 m).

- Drill the mounting holes as shown in the drawing below.
- Use three screws to attach the instrument at a suitable position on the wall.





Operating Testomat® 808 in the pressure range 4 to 8 bar

Prior to installation, please check whether a higher operating pressure (between 4 and 8 bar) is required. Use a pressure controller (art. no. 37602) for ranges between 4 and 8 bar. Optimum operation of Testomat® 808 is achieved with operating pressure of between 2 and 4 bar.

NOTE

Information for trouble-free operation

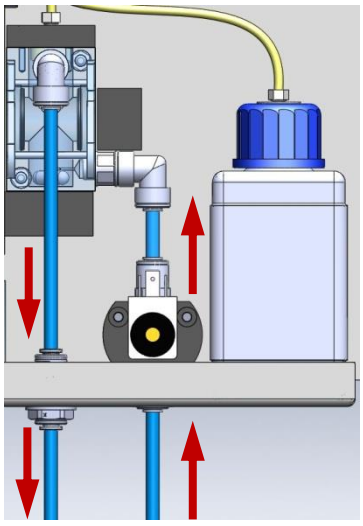
- The water pressure must be between 1 and 8 bar; a pressure reducer should be used for the 4 to 8 bar range (special accessories). This pressure regulator must be set under flow pressure!
- Avoid strong pressure fluctuations.



Connecting the water inlet and outlet

Information for trouble-free operation

- Ensure there are no foreign particles bigger than 150 µm which caused blocking. Use our candle filter (Art. No. 37583) at the front end of the device if you have problems with blocking.
- The measuring water temperature must be between 10°C and 40°C.
- For water temperatures above 40°C, install a cooler in the supply line of Testomat® 808.



Outlet **Inlet**



Water inlet

The measuring water is taken from the main water line of the water treatment plant and fed to the inlet connection of Testomat® 808. The instrument is equipped with a plug connector for plastic hoses 6/4 x 1 (external diameter 6 mm/ internal diameter 4 mm, wall thickness 1 mm) as standard).

- Install the connection for the branch line of Testomat® 808 directly at the main water line directly after the water treatment plant.
- Always lay the branch line connection vertically upwards in order to prevent dirt particles from entering the instrument from the main water line.
- We recommend you to install a manually operated stop valve (see figure “Plant example Testomat® 808” on page 15) in the branch line to Testomat® 808.
- Use an opaque plastic hose 6/4 x 1 (max. length 5 m) for the water inlet ①.
- Flush the supply line to remove any dirt particles.

CAUTION

When using a cooler

➤ **The hot water can cause burns and damage wetted parts of Testomat® 808.**

Water outlet

The feed water flows through the measuring chamber to the drain via the outlet hose.

➤ Remove the red plug from the outlet connection.

➤ Connect the outlet connection of Testomat® 808 to an outlet hose ② (internal diameter 4 mm).

➤ Feed the hose to an outlet.

Transportation plug!

The outlet is sealed with a plug to prevent leakage during transportation. Keep and store the plug for possible transportation at a later date.

Connecting the power supply and devices

WARNING

Risk of electric shocks during installation!

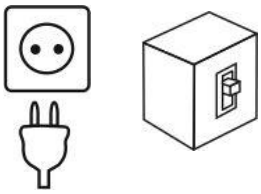
If the power supply is not disconnected prior to installation, it may result in personal injuries, destruction of the product or damage to plant parts.

➤ Always disconnect the relevant plant parts before installing Testomat® 808.

➤ Only use tested cables with sufficient cross-sections for the connections.

Disconnecting device for the power supply

The unit has no power switch!



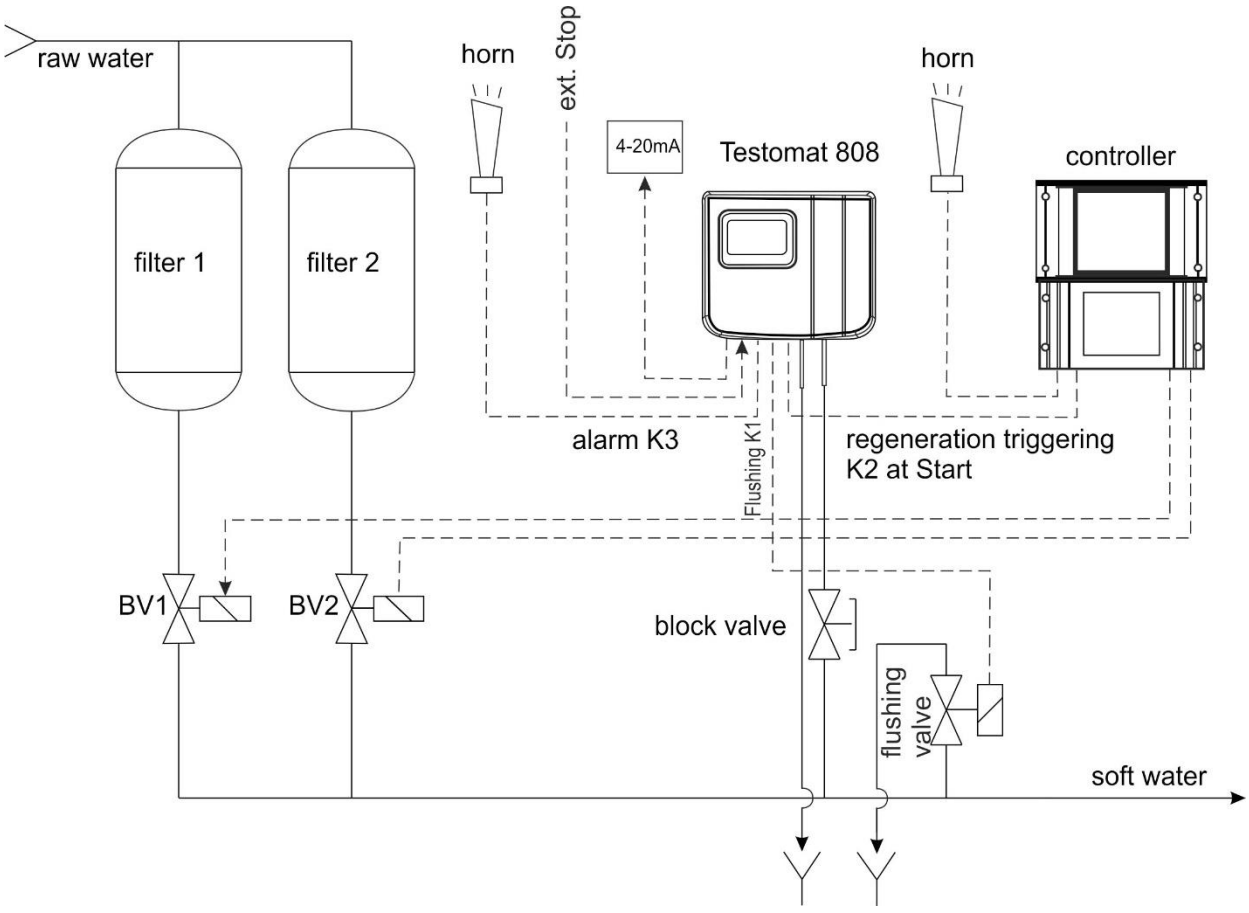
➤ Fit the Testomat® 808 with a switch as a disconnecting device for the power supply. Use an appliance switch or a circuit breaker that meets the requirements of IEC 60947-1 and IEC 60947-3.
The switch must be within easy reach of the user of the Testomat® 808 and clearly marked as a disconnecting device for the Testomat® 808.

NOTE

Risk of damages caused by electromagnetic fields!

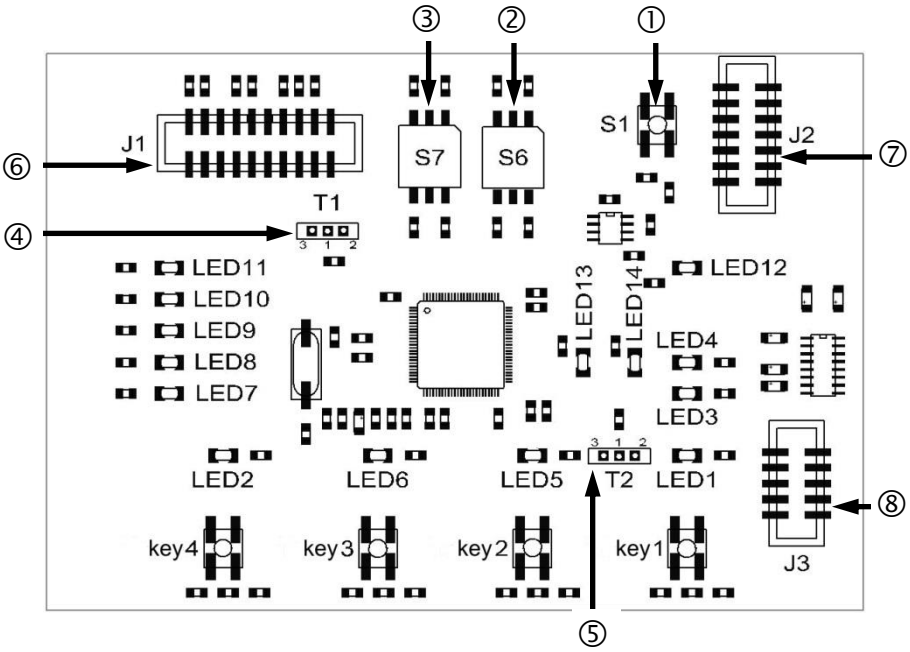
- If Testomat® 808 or the connecting cables are installed parallel to power cables or in close proximity to strong electromagnetic fields, the instrument may be damaged or measurements incorrect.
- Ensure that connecting cables are as short as possible.
- Always install connecting cables and power cables separately.
- Connect the instrument to the protective earth conductor (for 230/115 VAC).
- Shield the instrument against strong electromagnetic fields.

Plant example Testomat® 808



Internal design Testomat® 808

Rear of the controller board

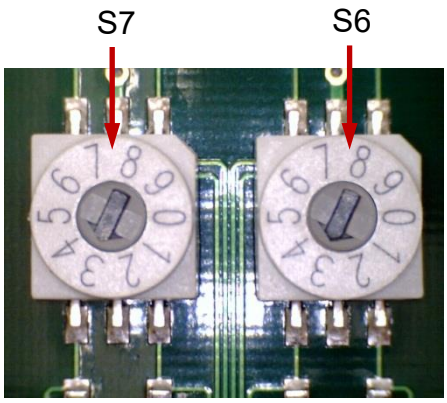


Keys 1 to 4 are located at the front of the board. Please refer to the section entitled “Functions of the operating and display elements” on page 9 for a detailed description of its operating system and the display elements.

The following function keys and slide switches as well as plug connectors are also provided:

Reset key S1

Use reset key S1 ① to execute a reset, i.e. to reset the firmware of Testomat® 808 after an update.



Function key S6

Use function key S6 ② to set the interval pause between measurements. Please refer to the section entitled “Interval pause” on page 31 for an overview of possible switching positions and interval pauses. (The standard setting is 3.)

Function key S7

Use function key S7 ③ to set the switching behaviour of the relays 1 and 2. Please refer to the section entitled “Switching functions of the relays 1 and 2” on page 24 for an overview of possible switching positions. (The standard setting is 3.)

NOTE

Switch position

➤ The respective switch position is read after evaluating a measuring result and after a reset.

Slide switch T1



Switch position left (delivery status)

Switch position LEFT: If the slide switch ④ is in the left position and the instrument is switched on or the reset key pressed while the instrument is switched on, the microcontroller executes the operating program (firmware).

Switch position RIGHT: If the slide switch ④ is in the right position and the instrument is switched on or the reset key pressed while the instrument is switched on, the instrument is set to a mode which enables a firmware update via the serial interface.

If your instrument requires a firmware update, Heyl will provide you with further detailed information.

NOTE

Switch position

➤ The switch position is only read immediately after a reset.

Slide switch T2



Switch position right (delivery status)

Use the slide switch T2 ⑤ to determine the size of the indicator bottle. The following indicator bottle sizes are possible:

Indicator	Switch position
100 ml bottle	Left
500 ml bottle	Right

NOTE

Switch position

➤ The status of the slide switch T2 is read after resetting the indicator display to 100% and after a reset.

Plug connector J1

The plug connector J1 ⑥ is a programming interface. It is not important for instrument operation.

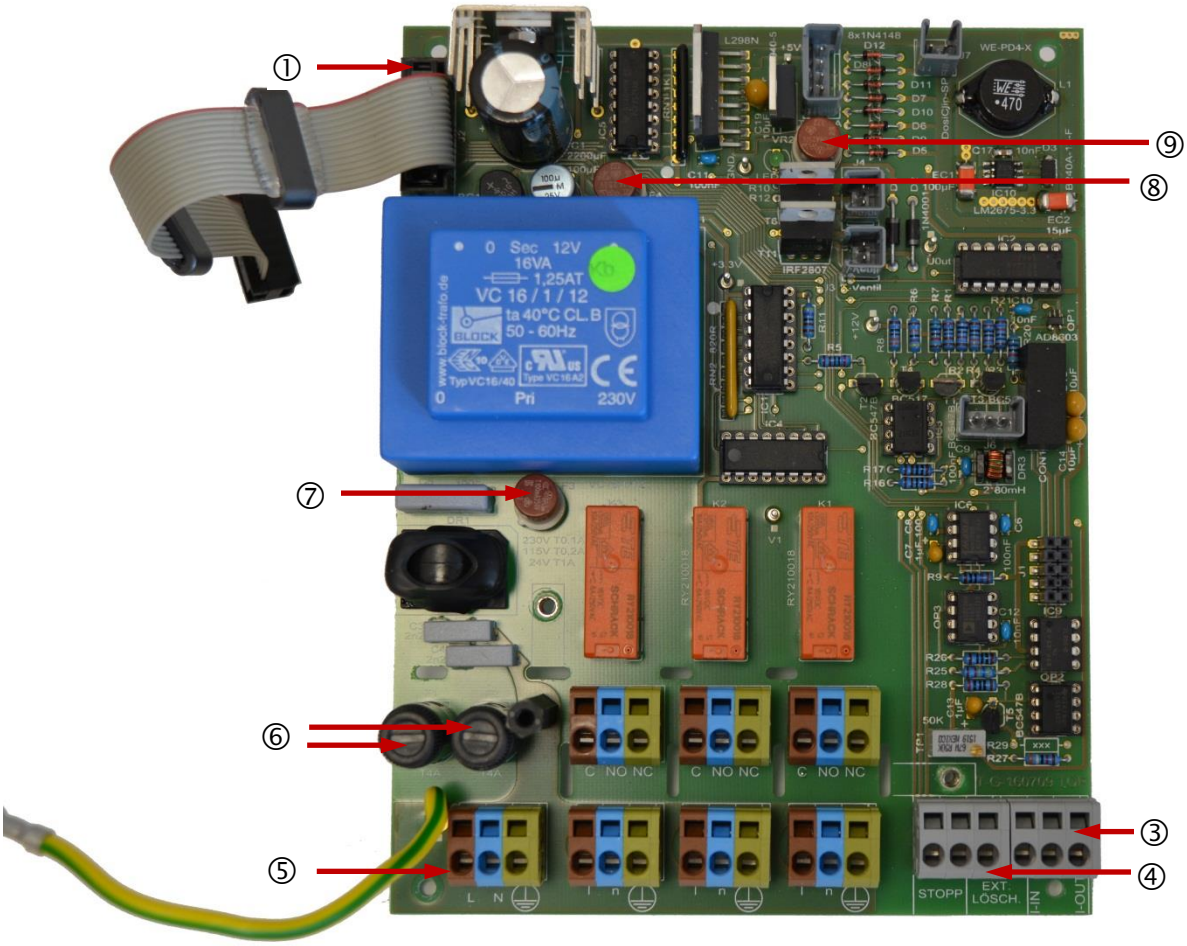
Plug connector J2

The connection to the base circuit board is established via the plug connector J2 ⑦ using a ribbon cable.

Plug connector J3

The connection to the RS232 interface is established via the plug connector J3 ⑧ using a ribbon cable. Please refer to the section entitled “Serial interface RS232” on page 24 for a detailed description.

Base circuit board Testomat® 808



The illustration above provides an overview of the design of the base circuit board.

Plug connector J2

The connection to the controller board is established via the plug connector J2 ① using a ribbon cable.

Current interface

Please refer to the section entitled “Interfaces” on page 23 for a description of the current interface ③.

Inputs EXT. LÖSCH. and STOPP

Please refer to the section entitled “Description of the signal inputs” on page 23 for a description of the inputs “Ext. lösch. (delete externally)” and “Stopp” ④.

Terminal block

Please refer to the sections entitled “Connecting the mains voltage” on page 19 and “Connecting the inputs and outputs” on page 21 for a description of the terminal block ⑤.

Fuses





The following fuses can be found on the base circuit board.

No.	Designation	Function	Comment
⑥	F1 F2	Relay protection fuse	4 A
⑦	F3	Primary fuse	230 V / 0.1 A 115 V / 0.2 A 24 V / 1 A
⑧	F4	Secondary fuse	1 A
⑨	F5	Pump motor fuse	0,315 A

Please refer to the section entitled “Testomat® 808 2019 spare parts and accessories” on page 43 for the article numbers when reordering fuses.

Connecting the mains voltage

DANGER



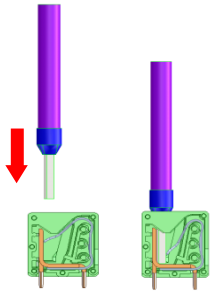
Installation of the terminal compartment cover

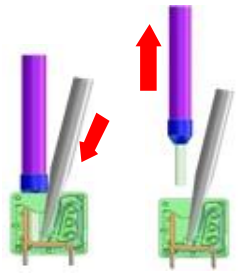
For safety reasons, it is imperative to reinsert the terminal compartment cover after connecting the mains voltage and the system components, as the terminal compartment contains cables that are connected to hazardous voltages. In doing so, you eliminate unintended contact with the terminals and contact of two lines of different voltages and prevent a fatal electric shock.

Please also ensure that the cables are not pinched when installing the terminal compartment cover!

Only connect the instrument to the specified mains voltage. Refer to the rating plate for the appropriate mains voltage. Connect the cables as follows:

➤ Open the housing cover and subsequently loosen the two fastening screws at the top and bottom of the door to the interior of Testomat® 808. The door can now be opened and the terminal box accessed.

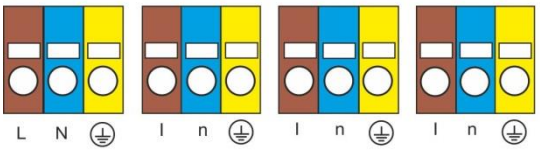


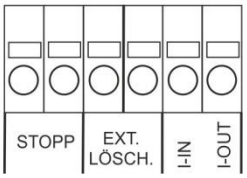


- Loosen the cable ducting strain relief (union nut).
- Remove the closing plugs.
- Lay the cable through the cable ducting underneath the housing into the terminal box.
- Tighten the union nut of the cable ducting and so establish the strain relief.
- Connect the power supply to the terminals PE, N, L.
- To do so, insert the conductors into the round cable input at the terminal block. Ensure that the strands are held securely in the terminals.
- To loosen the connection, insert a screwdriver into the square opening without force in order to open the terminal. Once the terminal has been opened, remove the conductor.

Terminal description	Type	Function	Comment
PE ⏚	IN	Mains protective earth (4x)	Only with mains 115/230 V !
N (U) **L (V)**	IN	Mains, N=neutral (U=24 V) Mains, L=live (V=24 V)	Mains input 50-60 Hz 24 V / 115 V / 230 V
n **l**	OUT	Neutral, protected with 4A (3x) Live, protected with 4A (3x)	Mains for consumers, max. 4 A







Terminal labelling

C = common – shared

NC = normally closed – contact breaker

NO = normally open – contact opener

Connecting the inputs and outputs

CAUTION

Connecting the inputs

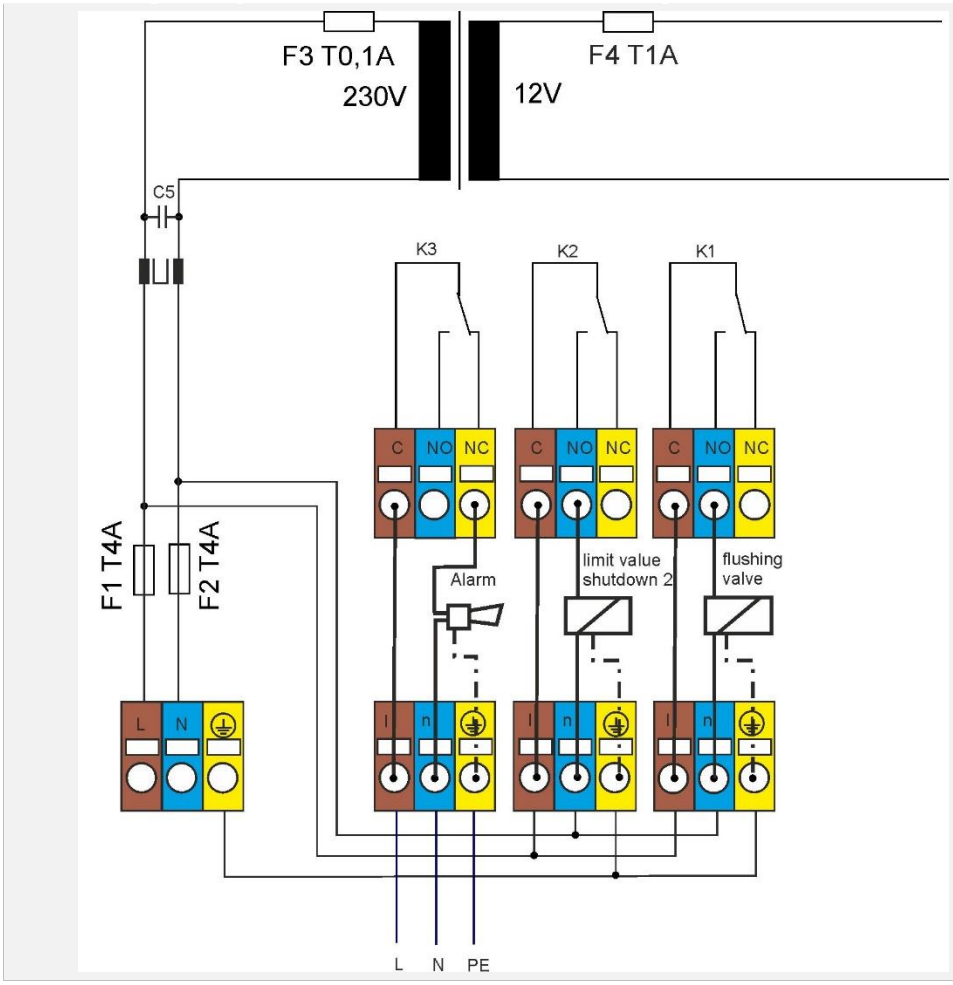
➤ Do not connect external voltage to these connections!

Testomat® 808 has the following connections for control and monitoring functions.

➤ Ensure that the strands are held securely in the terminals.

➤ Use the two fastening screws to close the door once installation has been completed.

Terminal description	Type	Function	Comment
RELAIS 3	OUT	Fault message output – change-over contact	Volt-free relay output*
RELAIS 2	OUT	Control for external application	Volt-free relay output*
RELAIS 1	OUT	Control for external flush valve	Volt-free relay output*
EXT. LÖSCH.	IN	Acknowledgment message input – normally open	Volt-free input
STOPP	IN	Flow controller/Switch input – normally open	Volt-free input



* Please refer to the section entitled “Technical data” on page 45 for the maximum contact load of the relays.





Mark external voltage on the device!

In the event you connect system components that are not powered by the device voltage, you may apply external voltage to the relay contacts. This external voltage cannot be switched off using the device power switch.

Risk of electric shock!

In this case, affix a warning sign to the device (e.g. a sticker as shown on the left).

Please refer to the section entitled “Description of the signal inputs” on page 23 or “Description of the relay outputs” on page 24 for a detailed description.

Description of the signal inputs

CAUTION

Connecting the signal inputs

- Only connect the signal inputs “Delete externally” and “Stop” to *volt-free* contacts!

  The connection of external voltages would damage the instrument!

EXT. LÖSCH. terminals

(EXT. LÖSCH. of relay 3

The input “EXT. LÖSCH. (delete externally)” is used for the external deletion/acknowledgment of current errors/alarms. It reacts the same as key 4 (horn) after a short press, i.e. all fault messages can also be acknowledged via a remote control (normally open).

STOPP terminals

STOPP

The input “Stopp” is the input for an external flow controller or switch (volt-free, normally open). It reacts the same as key 3 (pause) after a short press. The LED above key 3 flashes and the instrument no longer executes analyses. However, an analysis currently in progress will be completed.

NOTE

Priority of input STOPP

- The external stop function has priority over key 3 (pause)!
- If the standby function (key 3) has been activated and subsequently deactivated during an analysis pause, the interval pause time is reset. However, if the standby function is terminated via the “Stopp” input, the analysis starts immediately.

Interfaces

Current interface

I-OUT / I-IN



The results of the analyses or statuses can be registered via the output of the current interface (I-OUT (+) / I-IN (-)). The following defined values for status and error messages are output for this:

5 mA =	Pause
8 mA =	Good measurement
11 mA =	Poor measurement
14 mA =	Low water level
17 mA =	Low indicator level (< 10%)
20 mA =	Indicator is empty or optical fault or no or insufficient indicator in the measuring chamber

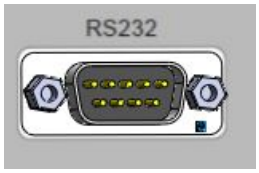
NOTE

Current interface load

➤ The current interface is galvanically decoupled. A maximum load of 500 Ohms should not be exceeded!

For faults and when using very long cables (approx. 20 m), a screened cable should be used if possible.

Serial interface RS232



The serial interface RS232 is located at the front of Testomat® 808 (after opening the housing cover). Use a ribbon cable with a 9-pole Sub-D connector to connect the plug J3 on the controller board to RS232. Use this RS232 interface to connect a computer/notebook to the controller board of Testomat® 808 via a null modem cable and update the instrument's firmware.

Description of the relay outputs

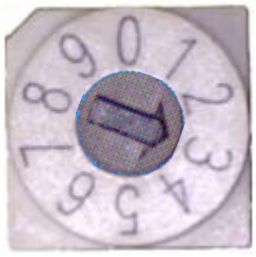
All relay outputs are neutral contacts. This ensures that all connection options are available. The switching of mains voltage and external voltage, and the direct switching of inputs, e.g. a process controller, can thus be realised. Please refer to the chapter entitled "Technical data" on page 45 for the maximum load of the relays.

Relay 3 – fault message

Relay 3 is designed as a change-over contact and used for fault messages indicating low water level, low indicator level, power failure and measuring faults.

NOTE

After several consecutive faulty measurements the relay 3 deactivates and an error message is issued via the current interface. No further measurements will be made. Confirm the error message with key 4 (horn). The device is restarting.



Function key S7

Relays 1 and 2

Two volt-free relay contacts are available to signal that a limit value has been exceeded. Set the function of the relays via the switch position of function key S7.

Switching functions of the relays 1 and 2

NOTE

Switch position

➤ The respective switch position is read after evaluating a measuring result and after a reset.

The following switch positions are possible:

Switch position	**Relay 2** (message poor analysis)	**Relay 1** (external flush)	**Comment** for relay 2
0	Normally open – closes in case of 1 poor analysis, remains closed until the next good analysis	Normally open – closes after a poor analysis for 1 minute	Continuous contact can be deleted via key 4 (horn) or “Delete externally”.
1	Normally open – closes in case of 1 poor analysis, remains closed until the next good analysis	Normally open – closes after a poor analysis for 3 minutes	Continuous contact can be deleted via key 4 (horn) or “Delete externally”.
2	Normally open – closes after 2 poor analyses, remains closed until the next good analysis	Normally open – closes after the first poor analysis for 1 minute and after the second poor analysis for 2 minutes	Continuous contact can be deleted via key 4 (horn) or “Delete externally”. The instrument skips the interval pause after the first poor analysis.
3*	Normally open – closes after 3 poor analyses, remains closed until the next good analysis	Normally open – closes after the first poor analysis for 1 minute, after the second poor analysis for 2 minutes and after the third poor analysis for 3 minutes	Continuous contact can be deleted via key 4 (horn) or “Delete externally”. The instrument skips the interval pause after the first and second poor analysis.
4	Normally open – closes in case of 1 poor analysis and remains closed. Opens again once the alarm has been deleted		Instrument goes into standby. Continuous contact can be deleted via key 4 (horn) or “Delete externally”.
5	Normally open – closes after 2 poor analyses and remains closed. Opens again once the alarm has been deleted	Normally open – closes after the first poor analysis for 1 minute	Instrument goes into standby. Continuous contact can be deleted via key 4 (horn) or “Delete externally”. The instrument skips the interval pause after the first poor analysis.
6	Normally open – closes after 3 poor analyses and remains closed. Opens again once the alarm has been deleted	Normally open – closes after the first poor analysis for 1 minute and after the second poor analysis for 2 minutes	Instrument goes into standby. Continuous contact can be deleted via key 4 (horn) or “Delete externally”. The instrument skips the interval pause after the first and second poor analysis.
7	Normally open – closes in case of 1 poor analysis, remains closed until the next good analysis	Normally open – closes for 90 s before the analysis	Continuous contact can be deleted via key 4 (horn) or “Delete externally”
8	Normally open – closes after the 2 poor analyses for 1 minute	Normally open – closes after the first poor analysis for 1 minute and after the second poor analysis for 2 minutes	The instrument skips the interval pause after the first poor analysis.
9	Normally open – closes after the 3 poor analyses for 1 minute	Normally open – closes after the first poor analysis for 1 minute, after the second poor analysis for 2 minutes and after the third poor analysis for 3 minutes	The instrument skips the interval pause after the first and second poor analysis..

* Delivery status

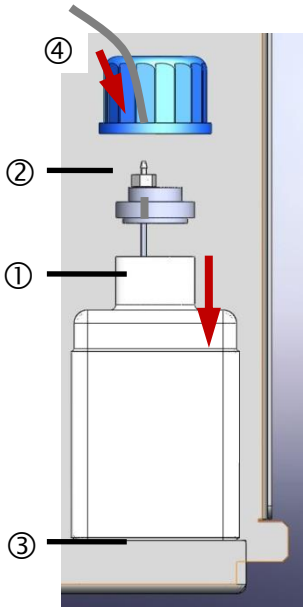
Updated: July 2014

Commissioning

Handling reagents/indicators

CAUTION

- Please adhere to the respective safety data sheet!
- Trouble-free operation of Testomat® 808 is only guaranteed when using Heyl Testomat® indicators!



Inserting the indicator bottle

- Open the housing cover to access the housing.
- Remove the cap from the indicator bottle.
- The supplied plastic bag contains the blue screw cap with a hole and the respective insert for the indicator bottle (500 ml). **Caution!** There are two inserts. One is for the 100 ml indicator bottle (spare part) and the other one is for the 500 ml indicator bottle (scope of delivery). The length of the suction tube indicates which insert is for which bottle. Select the insert that matches your indicator bottle. When inserted, the suction tube should almost reach the bottom of the indicator bottle.
- Place the insert ① into the indicator bottle.
- Screw the blue screw cap with hole ② hand-tight onto the indicator bottle.
- Place the indicator bottle ③ next to the water inlet in the housing.
- Push the intake hose ④ hand-tight onto the hose connector of the insert.

Bleeding the indicator lines

To ensure that indicator is available for the initial analyses, the intake hose and the transport hose must be filled with indicator from the pump up to the measuring chamber.

- Switch on the instrument and press key 3 (pause). The standby function is switched on or off via a short key press. The LED above the key flashes if the function is active.
- Press key 1 (manual) for longer (approx. 2 seconds) to bleed the lines. The dosing pump starts to run.
- Let the pump run until no more bubbles escape from the dosing needle. Then press key 1 (manual) again for approx. 2 seconds to switch off the pump.

During operation, the pump automatically extracts the indicator.

Opening the water inlet

- Slowly open the manual stop valve in the water line to open the water inlet.

Instrument settings and analysis

Please read the following information before carrying out the required settings at the instrument.

Instrument settings

The required instrument settings for executing analyses, e.g. measuring interval pause, indicator bottle size and behaviour of relays 1 and 2, are carried out on the controller board using the function keys and slide switches. Please refer to the section “Internal design Testomat® 808” on page 16 for a detailed description.

NOTE

Double assignment of the function keys

- The four function keys at Testomat® 808 for instrument operation basically have two functions.
- A short or long key press (at least 2 seconds) is required for operation.

A short key press activates the top functional level (displayed in black on the key). A long key press is required to activate the bottom key function (displayed in white). Please refer to the section entitled “Operating elements/Function keys” on page 10 for a description of the individual functions.

NOTE

Displaying operating statuses and measuring results

- Only LEDs are used to display operating statuses and measuring results at Testomat® 808.
- Depending on the status or measuring result, the LEDs can either flash or illuminate continuously (see the section entitled “Display elements/LEDs” on page 11).

NOTE

Limit value display

- Testomat® 808 is a pure limit value measuring instrument which uses two limit value LEDs to display the measuring result.



- The green LED illuminates when the limit value specified by the selected indictor is not achieved during the analysis.
- The red LED illuminates if the limit value is exceeded.
- If a new measurement is running after completion of another measurement, the result of the previous measurement flashes in the display. The respective LED displaying the result of the previous measurement illuminates continuously during the interval pause.

Both LEDs are switched off if an error occurred during the previous measurement.

Selecting the indicator type and bottle size

NOTE

Specifying the measuring/monitoring range of Testomat® 808

- The measuring/monitoring range of Testomat® 808 is specified by the selected indicator type only.
- Please refer to the section entitled "Testomat® 808 2019 spare parts and accessories" on page 43 for a list of available indicators.

All listed indicator types are available in two bottle sizes. To specify the size of the indicator bottle, move slide switch T2 on the rear of the controller board to the respective switch position (see the section entitled "Internal design Testomat® 808" on page 16):

Switch position	Indicator	Range
Left	100 ml bottle	~ 1200 analyses
Right	500 ml bottle	~ 6500 analyses

NOTE

Switch position

- The status of slide switch T2 is read after resetting the indicator display to 100% and after a reset.

NOTE

Set indicator quantity to 100%

- After selecting the bottle size and inserting the bottle, press key 4 (horn) to set the display for the indicator quantity to 100%.

Carrying out an analysis

After switching it on, the instrument commences automatic interval mode. The first analysis starts after 15 seconds. The following analyses start automatically according to the set interval pause.

NOTE

Duration of the interval pause

- The duration of the interval pause between two measurements can be set between 0 and 60 minutes, also see the section entitled "Interval pause" on page 31.
- **Attention!** After a poor analysis, the interval pause is ignored in some switching positions of function key **S6** (2/3/5/6/8 and 9) and **another** analysis is carried out immediately.

Automatic interval mode can be interrupted via standby and analyses started manually.

Operating mode	Function/Process
Standby	The instrument is switched on and in standby. Short press key 3 (pause) to switch standby on/off. Note: During an interval pause, the instrument immediately switches to standby; a started analysis is always completed.
Manual	Precondition: The instrument is in standby or in an interval pause. Short press key 1 (manual) to switch on manual mode. An analysis is started immediately, irrespective of the set interval pause.

Analysis process

The analysis takes approx. 2 minutes. The water analysis process for determining the residual total hardness is as follows:

Analysis start

- ⇒ The solenoid valve for water inlet opens
- ⇒ The measuring chamber is flushed
- ⇒ The solenoid valve closes after the flush time
- ⇒ The optical transmitter is switched on to measure possible turbidity in the water
- ⇒ The measurement continues until the turbidity clears (the water has been fully outgassed)
- ⇒ The measurement starts when the measured value is constant
- ⇒ The dosing pump and stirring bar are activated
- ⇒ The current measured value is read
- ⇒ The colour change in the measuring chamber is evaluated
- ⇒ If necessary, switch relay, result is displayed
- ⇒ The measuring chamber is flushed

Analysis end

Further basic functions and settings

Internal flushing

To ensure that the analysed sample represents the current value, the sampling line must be sufficiently flushed.

NOTE

Duration of the internal flush time

➤ The duration of the internal flush time is preset (10 s before and after a measurement) and cannot be influenced by the operator.

The quantity of flush water for internal flushing depends on the pressure:

Pressure	Max. water quantity per analysis
1 bar	80 ml
2 bar	120 ml
3 bar	160 ml

External flushing

If a very long (approx. 3 – 10 metres) sampling line or a line with a large diameter is used, install an external flush valve upstream of Testomat® 808. Connect the external flush valve to the "Relay 1" outlet.

Flush process – internal/external in manual mode

Proceed as follows to additionally flush the instrument:

➤ At first switch the instrument into standby mode for flushing. Short press key 3 (pause) to achieve this.

➤ If a measurement is running, wait until the measurement has been completed.

Internal flush process:

➤ Short press key 2 (Flush) to open the internal flush valve.

The valve opens and the measuring chamber is flushed.

The LED above key 2 (Flush) flashes as long as the internal flush valve is activated.

➤ Short press key 2 (Flush) again to terminate the flush process.

External flush process:

➤ Long press (approx. 2 seconds) key 2 (Flush) to activate the external flush valve.

The external valve is activated via relay 1 and the line is flushed.

➤ Long key press (approx. 2 seconds) key 2 (Flush) again to terminate the external flush process.

The LED above key 2 (Flush) and LED K1 illuminate as long as the external flush valve is activated.

Interval pause

If the analysis is started via a timer, the interval between two analyses (plus flush time) is determined by the interval pause. The shortest interval can be 0 minutes. In this case, analyses are carried out continuously. The longest interval is 60 minutes.

Set the desired measuring interval pause via function key S6 on the controller board (see the section entitled “Rear of the controller board” on page 16). The following switching positions and interval pauses are possible:

Position	Interval pause
0	0 min.
1	5 min.
2	10 min.
3*	15 min.
4	20 min.
5	25 min.
6	30 min.
7	40 min.
8	50 min.
9	60 min.

* Delivery status

NOTE

Switch position

➤ The current switch position is read after evaluating a measuring result and after a reset.

NOTE

Resetting the interval pause time

➤ However, if the standby function has been activated and subsequently deactivated during an analysis pause, the interval pause time is reset.

Automatic flushing (from software version 45-015ak)

With a longer rest period, it is possible for the water in the Testomat® 808 measurement chamber to become contaminated; therefore, the measurement chamber is automatically flushed every 15 minutes for 5 seconds.

Continuous measurement is not interrupted by this function. If an alarm is pending, or the device is in pause mode, automatic flushing is still performed.

If the measuring interval is set to less than 20 minutes, this function is not performed. For measuring cycles under 20 minutes, the flushing that comes with the analysis process is sufficient.

The automatic flushing function cannot be deactivated.

72 h operation
(operation without permanent supervision)

If the instrument should run for a longer period of time without supervision (e.g. at the weekend), use this function to check whether sufficient indicator is available for a continuous measurement.



On the basis of the still available indicator, the set indicator pause and indicator quantity consumed per measurement, the instrument calculates whether the residual indicator quantity is sufficient for the next 72 operating hours.

➤ Press key 3 (pause) for approx. 2 seconds to check whether 72 h operation is possible.

72 h operation possible	**72 h operation not possible**
The LED above key 3 (pause) illuminates for 4 seconds.	The LED above key 3 (pause) flashes quickly for 4 seconds.

Error messages/Troubleshooting

Alarm/Error message/Relay 3

Testomat® 808 uses LEDs which either illuminate continuously or flash to display alarm/error messages.

NOTE

Error messages

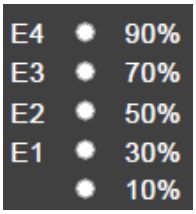
- All status/error messages are lost after a power failure!
- Current error messages can be confirmed by pressing key 4 (horn) briefly or via input EXT. LÖSCH. (page 22).
- We recommend you to carry out a manual analysis after an error message to determine whether the error has been eliminated or not. Further steps as described below.
- If several consecutive faulty measurements have occurred, the LED “POWER” lights and the LED above key 4 (horn) is blinking. In this case press the reset key S1 or switch off/on the instrument to acknowledge the alarm.

Activate the red alarm LED above key 4 (horn) as follows:

LED	Cause
Flashes	• Calculation shows that the indicator filling level is zero • No or insufficient indicator in the measuring chamber after dosing • Optical fault • The instrument is operated outside of the specification (e.g. low temperature or with expired indicator)
Illuminates	• Indicator filling level is between >0 and 10% • All other errors

Error messages are output via the current interface. The following status/error messages are possible:

Pause	5 mA
Good measurement	8 mA
Poor measurement	11 mA
Low water level	14 mA
Low indicator level < 10% (acknowledgeable by pressing key 4)	17 mA
Indicator is empty (not acknowledgeable) or optical fault or no or insufficient indicator in the measuring chamber or the instrument is operated outside of the specification (e.g. low temperature or with expired indicator)	20 mA



If one of the errors from E1 to E4 occurs, the corresponding LED on the device lights up steadily.

After the error has been acknowledged with the alarm button, the LED will show the indicator status again.

The following errors are displayed for 4 seconds:

LED	Cause	Remedy
E4	Insufficient LED power, insufficient light (or hardware error)	➤ Check whether the water is turbid. Strong turbidity can negatively influence the measurement. ➤ Check whether the measuring chamber/sight glass is soiled. ➤ The sensor or LED might be damaged. ➤ Check whether the water level is too low. ➤ Check whether the measuring chamber and the LED fitting have been installed correctly. These elements can loosen during transport. The measurement is no longer being carried out correctly. ➤ If necessary, carry out a visual adjustment as described in the maintenance instructions for the Testomat® 808.
E3	Excessive LED power, excessive light (or hardware error)	➤ Close the housing cover. The environment is too bright (sunlight), thus negatively influencing the measurement. ➤ The sensor or LED might be damaged. ➤ If necessary, carry out a visual adjustment as described in the maintenance instructions for the Testomat® 808.
E2	Measuring fault analysis	➤ Check whether the indicator bottle is empty. ➤ Does the indicator display match the indicator quantity in the bottle? ➤ Check the indicator. Only use indicators which we have approved for use in the Testomat® 808. Indicators for other Testomat instruments produce erroneous measurements or the error, “MST analysis”. ➤ Check whether the stirring bar is present and turns. ➤ Check whether the pump supplies indicator. ➤ Check whether the dosing needle is blocked or its O-ring is damaged. Make sure that the suction and pressure hoses do not draw secondary air. Check the suction lance. Make sure that no air bubbles are escaping from the dosing needle.
E1	Low water level	➤ Make sure the water lines are not leaky. ➤ Are the water lines connected properly? ➤ Are all stop valves in the inlet open? ➤ Ensure there are no foreign particles which caused blocking. ➤ Very dirty or turbid water can also lead to error E1. Check the water quality. Use our particulate filter in the supply line. Clean the filter if necessary.

Low water level

The LED above key 4 (horn) illuminates if the water level is low. The low water level is also registered via relay 3. Contacts C and NC are connected for this purpose.

➤ Press key 4 (horn) or close the contacts of the “EXT. LÖSCH.” input to confirm the alarm.

After confirmation, the LED extinguishes via key 4 and relay 3 is reactivated (contacts C and NO are connected).

NOTE

The alarm is also deleted without it being acknowledged once the low water level has been eliminated after the following analysis.

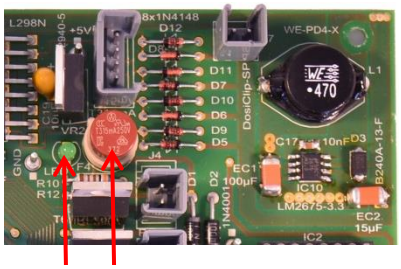
Measuring fault analysis

➤ The red alarm LED above key 4 (horn) illuminates if the calculated indicator quantity is between >0 and 10%. This message is only output once and can be acknowledged by short pressing key 4 (horn) at the instrument or a contact via “EXT. LÖSCH. (delete externally)”.

➤ Both the red alarm LED and the standby LED (via key 3) flash when the calculated indicator quantity is zero. The external inputs “STOPP” and “EXT. LÖSCH. (delete externally)” are ignored. You now have to replace the indicator bottle (see the section entitled “Replacing the indicator bottle” on page 39).

➤ The LED above key 4 (horn) flashes and the instrument goes into standby mode if the measuring fault is due to lack of indicator. Damaged or bent lines can cause this error. The indicator bottle may also be empty if the indicator level has been set incorrectly.

Defective pump motor



LED F5

The F5 fuse on the main board protects the pump motor. After a short circuit, the LED next to fuse F5 is off.

➤ Exchange the pump motor and F5 fuse.

➤ Check that the green LED is lit again.

Caution! The pump motor can also stop without a short circuit. This will not trip the F5 fuse. In the event of a **low indicator level** (measurement disruption analysis), always check the pump motor by pressing the ‘manual’ button down for 2 seconds. If the motor no longer turns, replace it.

Further possible instrument errors

Error	Possible causes	Remedies
Instrument not functioning, even though it is switched on	– Fuses F1, F2 or F3 defective – Power switch defective – Ribbon cable to controller board or – base circuit board is loose – Error at controller board or base circuit board	➤ Replace fuses ➤ Replace power switch ➤ Reconnect ribbon cable ➤ Replace controller or base circuit board

Response of a protective circuit

After a protective circuit (fuse) has been tripped, attempt to eliminate the cause of malfunctioning (e.g. replace a defective valve) before reactivating the protective circuit. Frequent tripping is always due to an error which, in certain circumstances, may also cause damage to the instrument.

Malfunctioning/Repairing a defective instrument

The repair of a defective instrument – irrespective of the warranty period - is only possible when the instrument is dismantled and returned to us with a description of the error. Please also inform us about the currently used indicator.

- ➤ Before you return the instrument for repair work, remove the bottle and ensure that the measuring chamber has been flushed out and is empty.
- ➤ Insert a transportation plug into the outlet pipe to prevent leakage.
- ➤ Use to the enclosed error log to describe the error and return it to us together with the instrument. If the error log is no longer available, download it at www.heylanalysis.de.

Maintenance

NOTE

Required maintenance measures

➤ Regular maintenance is necessary to ensure trouble-free operation of the instrument (every six to twelve months)!

At least carry out the maintenance work described in the following section on a regular basis when

➤ the instrument displays the following error messages:

“Insufficient/Excessive light”, “Low water level” or “Low indicator level”

➤ the last maintenance was carried out no more than six months ago.

CAUTION

Cleaning measures

➤ Never use organic solvents to clean the measuring chamber or other plastic parts!

➤ Always observe the safety regulations when handling cleaning agents!

➤ As a result of continuous operation, a coloured film may form on the sight-glass windows. Use isopropanol to remove this sticky film.

Replace the following components at the respective interval:

Component	Replacement interval
Pump head	• if LED E4 flashes with “pump head maintenance”
Motor block	• Replace together with pump heads.
Measuring chamber	• Check for cleanliness and tightness (see page 39).

Service instructions

The surface of the instrument has not been treated. Therefore, avoid any soiling caused by indicators, oil or grease. However, if the housing becomes soiled, please clean the surface with a commercial plastics cleaner (never use other solvents).

Description of maintenance work

Carry out the maintenance work described below on a regular basis.

NOTE

Bleeding the lines

➤ Bleed the lines after each mechanical step to ensure trouble-free operation of the instrument. To achieve this, proceed as described in the section entitled “Replacing the indicator bottle” on page 39!

Replacing the indicator bottle

➤ If Testomat® 808 displays the error message “Low indicator level”, replace the indicator bottle (refer to the section entitled “

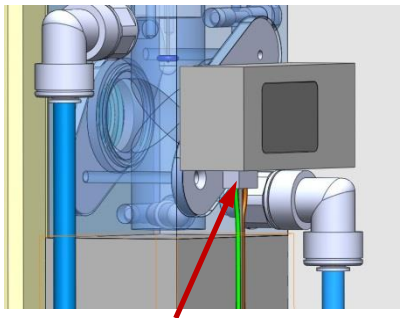
CAUTION

Resetting the analysis counter

Testomat® 808 automatically calculates the number of analyses depending on the set bottle size.

The instrument cannot measure the actual filling level of the indicator bottle!

➤ Only reset the analysis counter to 100% after inserting a new indicator bottle!



Cleaning the measuring chamber and the sight-glass windows

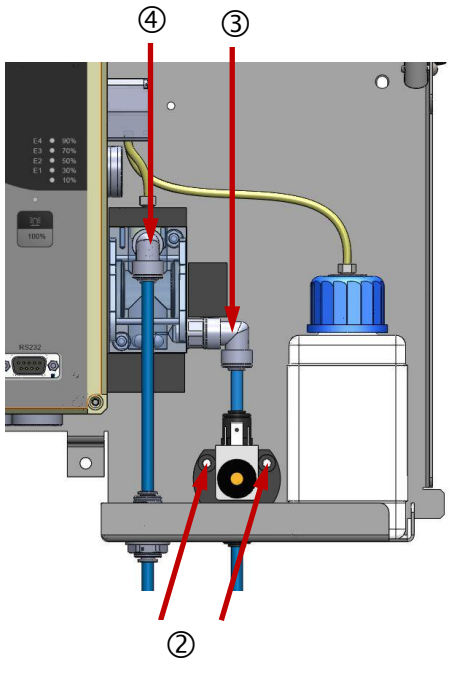
➤ Switch off the instrument.

➤ Close the stop valve in the branch line to Testomat® 808.

➤ Prior to disassembling the measuring chamber, disconnect the cable ① from the LED holder and loosen the pump hose at the hose connector of the measuring chamber.

➤ You can also remove the indicator bottle to facilitate access.

➤ Loosen the two screws ② fixing the solenoid valve to the rear panel. Press down the top locking ring of the solenoid valve to allow the valve to be pushed down onto the support.



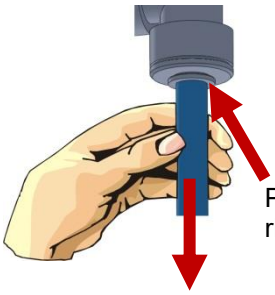
➤ Turn the angled hose connector ③ upwards. Press the locking ring of the top angled hose connector ④ upwards and remove the outlet hose.

➤ Turn this angled hose connector ④ upwards to ensure that any residual water cannot escape from the measuring chamber. Now simply pull the measuring chamber off the retaining bolts towards the front.

➤ To drain the measuring chamber, turn the bottom angled hose connector ③ downwards and let the residual water drain off.

Disassemble the measuring chamber as follows for cleaning:

➤ Loosen the 4 screws (7) of the measuring chamber cover (4) and remove the cover and the flat seal (8).



- Remove the dosing needle (5) from the measuring chamber.
- Loosen 1 screw (6) on each side to remove the sight-glass window holders (2) at the sides of the measuring chamber.
- Remove the sight-glass windows (9) and the respective flat seals (8).
- Use isopropanol to clean the film off the sight-glass windows. If the instrument has been used to measure hard water for a longer period of time, a hard-to-remove film may have formed on the sight-glass windows. In this case, clean the sight-glass windows and the measuring chamber as described below.
- Clean the measuring chamber with a cleaning agent suitable for decalcification and rust removal (max. 5 – 10% solution). Flush the measuring chamber thoroughly after cleaning.
- Once the measuring chamber has been fully cleaned, it can be reinstalled. Reassemble in reverse order to disassembly.

ATTENTION

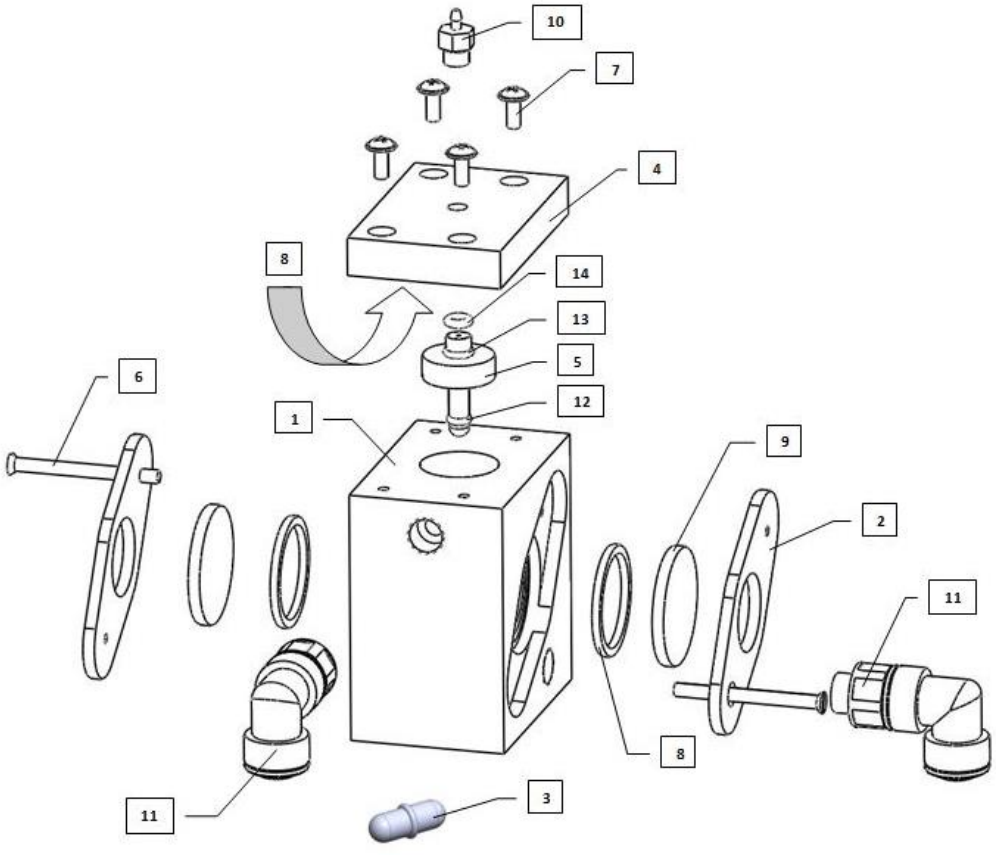
Removal and installation of the sight glass windows

If the sight glass windows cannot be removed from the measurement chamber, open the measurement chamber cover (4) and then carefully push them out from the inside. Do not apply excessive force and do not use sharp objects that may damage the sight glass windows.

Ensure tension-free mounting of the sight glass windows. Tighten the screws (6) equally alternating both sides. Otherwise, the sight glass windows may break.

- Once all assembly work has been completed, bleed the lines before restarting the instrument (see the section entitled “Inserting the indicator bottle” on page 26).

1	Measuring chamber	(Article no 37615 (1-4bar) or 37616 (0,3-1bar))
2	Sight-glass window holder	(Article no. 40176)
3	Magnetic stirrer	(Article no. 40050)
4	Measuring chamber cover	(Article no. 37534)
5	Dosing needle	(Article no. 37621)
6	Screw M3x40	(Article no. 33253)
7	Screw M3x12	(Article no. 33246)
8	Flat seal 24x2	(Article no. 33777)
9	Sight-glass window 30x3	(Article no. 40170)
10	Hose adapter	(Article no. 37538)
11	Angled plug in connector	(Article no. 40157)
12	O-ring 3.68x1.78	(Article no. 33797)
13	O-ring 4.5x1.5	(Article no. 11264)
14	O-ring 1.78x1.78	(Article no. 11245)



Pump head maintenance message

The effective runtime of the pump head is counted during operation. After 150 hours of operation, the LED E4 flashes with the maintenance message for the pump head. This runtime for the pump will be reached during normal operation (analysis interval every 10 minutes) after approx. 2 years or 54000 analyses.

- ➤ Switch off the instrument to acknowledge the message.
- ➤ Press and hold key 4 (horn) when switching on the instrument. The operating time of the pump head is then reset to 0.

NOTE

Replacing the pump head

We recommend you to replace the pump head when the maintenance message for the pump head is displayed.

The maintenance manual Testomat® 808 contains a detailed description of maintenance work.

Motor block maintenance

We recommend that you also replace the motor block each time the pump head is replaced in order to prevent a failure.

Contact your service partner, who can carry out the replacement, or send in the device for maintenance.

Testomat® 808 2019 spare parts and accessories

Caution!

Should you send your Testomat® 808 2019 in for maintenance, please make sure that the measuring chamber has been emptied.

Art. no.	Spare parts – measuring chamber
33777	Flat seal 24x2
40170	Sight-glass window 30x3
40176	Sight-glass window holder
33253	Screw M3x40, A2, DIN 965
33246	Screw M3x12
37615	Measuring chamber T808, complete (1 – 4 bar)
37616	Measuring chamber T808, complete (0.3 – 1 bar)
37534	Measuring chamber cover
37621	Dosing needle, complete
40050	Magnetic stirrer, processed
40157	Angled plug-in connector G1/8“-6
33766	O-ring 4.2x1.9
11264	O-ring 4.5x1.5
11245	O-ring 1.78x1.78
Art. no.	**Spare parts - instrument**
37321	Controller board Testomat 808, SMD
37920	Base circuit board Testomat 808, 230V
37921	Base circuit board Testomat 808, 115V
37922	Base circuit board Testomat 808, 24V
37570	Solenoid valve Testomat 808
40393	Full set with optics board and LED holder for Testomat 808 2019
37562	Pump head Testomat 808
31592	Fuse, soldered T1.0A
31593	Fuse, soldered T0.8A
31585	Fuse, soldered T0.315A
31584	Fuse, soldered T0.2A
31595	Fuse, soldered T0.1A
31666	Fuse GS-T, 5x20, T A4
37734	Cable ducting M16 x 1,5
37735	Nut for cable ducting M16 x 1,5
37736	Blanking plug for cable ducting
Art. no.	**Bottle connection/Suction device**
37579	Bottle insert for screw cap and push-fit suction tube, 500 ml bottle
37580	Bottle insert for screw cap and push-fit suction tube, 100 ml bottle
37538	Hose adapter Testomat 808

Art. no.	Special accessories
37583	Candle filter Testomat 808 complete
37584	Filter insert
37593	Plug D = 6
37576	Conversion set for water inlet and water outlet from Testomat BOB to Testomat 808
37602	Pressure regulator, complete for Testomat
270342	Maintenance case Testomat 808*
270351	Service set Testomat 808*
100494	Gear motor for dosing pump
37653	Set of sight glasses for water containing silicon

Accessories - indicators

Indicator type	Colour change at a limit value of	Art. no. 100 ml bottle	Art. no. 500 ml bottle
300	0.02°dH = 0.4ppm $CaCO_3$ = 0.04°f residual hardness	140001	141001
300 S	0.05°dH = 0.9ppm $CaCO_3$ = 0.09°f residual hardness	140002	141002
301	0.1°dH = 1.8ppm $CaCO_3$ = 0.18°f residual hardness	140003	141003
302	0.2°dH = 3.6ppm $CaCO_3$ = 0.36°f residual hardness	140004	141004
303	0.3°dH = 5.4ppm $CaCO_3$ = 0.54°f residual hardness	140005	141005
305	0.5°dH = 9ppm $CaCO_3$ = 0.9°f residual hardness	140006	141006
310	1°dH = 18ppm $CaCO_3$ = 1.8°f residual hardness	140007	141007
320	2°dH = 36ppm $CaCO_3$ = 3.6°f residual hardness	140008	141008
330	3°dH = 54ppm $CaCO_3$ = 5.4°f residual hardness	140009	141009
350	3°dH = 90ppm $CaCO_3$ = 9.0°f residual hardness	140010	141010

Please refer to our delivery programme for an up-to-date overview of available accessories at **www.heylanalysis.de** .

NOTE

Bottle connection

Testomat® 808 is delivered with a bottle connection for a 500 ml bottle. Please order a bottle connection for a 100 ml bottle upon request.

Technical data

Power supply:	(24 / 115)* 230V, 50 / 60 Hz Instrument protection 230 – 240 V: T0.1 A Instrument protection: 115 V: T0.2 A Instrument protection: 24 V: T0.8 A
Mains protection for consumers:	max. 4 A (n , l)
Power consumption:	max. 16 VA, without external load
Protection class:	I
Degree of protection:	IP 44
Conformity:	EN 61000-6-2, EN 61000-6-4, EN 61010-1 BS EN 61000-6-4+A1, BS EN 61000-6-2, BS EN 61010-1+A1
Ambient temperature:	15 - 25°C / Max. humidity 60%
Measuring range:	See the section entitled "Performance specifications"
Current interface:	Output of defined values (5, 8, 11, 14, 17, 20 mA) for displaying status and error messages, max. load 500 Ohms
Contact load Relay	230V / 4A AC ohm resistive load
Dimensions:	W x H x D = 364 x 314 x 138 mm
Weight:	4,350 g

Mains water supply	
Operating pressure:	0.3 – 1 bar / 0,3 x 10^5 to 4 x 10^5 Pa (use measuring chamber with art. no. 37616!) 1 - 4 bar / 1 x 10^5 to 4 x 10^5 Pa depending on design (a pressure reducer (special accessories) should be used from 4 to 8 bar range)
Water inlet:	Opaque hose with 6 mm external diameter/4 mm internal diameter
Water outlet:	Opaque hose with 6 mm external diameter/4 mm internal diameter
Water temperature:	10 to 40°C

We reserve the right to make technical changes without notice in the interest of constantly improving our products!

Checkliste Testomat® 808 2019

Dear customers and service technicians,
This check list cannot replace your expertise or extensive experience in fault resolution. It is intended to support fast and systematic error diagnosis and error documentation. This list does not claim to be complete. We are therefore always grateful for any advice and information you may be able to provide. General user instructions can be found on the rear of this check list.
The Instrument Manufacturer

Block 1 / Plant and instrument data

		Testomat® 808			
		Instrument type	Instrument number	Indicator type	Software status

Block 2 / Error message and error history — Please mark appropriately (X)

What error messages does the instrument display? (Keys “3” (Standby) and “4” (horn)=> Operating instructions)			
			(LED)
Is the LED above key 4 flashing or lit?	Flashing	Lit	
Are other LEDs lit? Which ones?	Yes	No	
			(LED)

Block 3 / Visual inspection and functional test — Please mark appropriately (X) — If applicable, values / comments

Is the correct mains voltage (according to the rating plate) being supplied to the instrument?	Yes		No	
Does water flow out of the discharge hose during analysis?	Yes		No	
Are the measuring chamber and sight glasses clean?	Yes		No	
Are the measuring chamber and water hoses watertight?	Yes		No	
Does the indicator still have shelf life remaining? (See expiry date on the indicator bottle)	Yes		No	Expiry date:
Has the correct bottle size been set?	Yes		No	Size: 100 ml / 500 ml
Is the water pressure within the prescribed limits (400 ml/min)? (See the instrument’s rating plate)	Yes		No	System pressure:
Has the outlet been installed free of back pressure along its total length? (No “siphon effect”!!)	Yes		No	
Is the outlet hose clear? (Contamination by micro organisms or similar)	Yes		No	
Has it been ensured that fresh measuring water reaches the measuring chamber within the flushing time of 10 seconds before the measurement is carried out?	Yes		No	
Are the dosing pump hoses free of air bubbles? (Operate the pump manually / carry out a manual analysis)	Yes		No	

CARRYING OUT A MANUAL ANALYSIS

Does the indicator pump supply a dose when an analysis is triggered?	Yes		No	
Is the indicator properly mixed in the water during the dosing process in the measuring chamber? Check the magnetic stirring bar!	Yes		No	

PROGRAMMING DATA / OPERATING CONDITIONS

Is the Testomat instrument constantly supplied with mains power - except during maintenance work/emergencies? (Occasional switching off only by means of the “Standby” or “Input stop” keys!)	Yes		No	See “General instructions for operating the Testomat® 808”

Please refer to “Error messages / Troubleshooting” in the **operating instructions** for further information on error messages and possible causes of faults.
Further functional tests and service instructions can be found in the **maintenance manual**

If you have examined the instrument with the aid of the checklist and answered “Yes” to all questions in Block 3 it can be assumed that its functions are operating correctly.
We recommend that you carry out all tests contained in this checklist at every service and when faults have occurred.

General user instructions for Testomat® 808

Basic design of the instrument
As a monitoring instrument, the Testomat® 808 has been designed for permanently monitoring water by means of daily measurements. Several measurements per day are assumed under standard conditions of use. Should the instruments be operated with longer periods between analyses (interval times), attention must be paid to appropriate flushing times and flushing water volumes respectively. In case of non-compliance residual or mixed water from the hoses may be measured, leading to thresholds being exceeded. The indicator expiry date can also be exceeded under certain circumstances.
Long interval times often make little sense. It may be that avoidable problems arise instead of achieving desired savings. The water requirement per analysis also amounts to only 80 to 150 ml.

Switching off the instruments / Stopping the measurements
Interruptions to measurements should only be made using the functions, “Standby” (at the instrument) and “Stop” (external) provided for this purpose. Switching the instruments off by **disconnecting them from the mains does not make sense** because

– when disconnected from the mains, the instruments can stop with their measuring chambers full of water resulting in heavy soiling of measuring chamber, sight glasses and stirring rod

In this case, malfunctions due to an improper restart and unclear error messages cannot be excluded. However, if instruments are switched off for several days, care should be taken to ensure that measuring chambers are only filled with water and the restart is carried out in the same way as a first commissioning. At least the dosing pump should be operated manually until the hose is emptied of air.

Initial start-up of new plants
For new plants we recommend **flushing the pipelines** thoroughly before connecting the instrument. We recommend fitting a fine filter to the water supply hose - see our range of products. This filter should be cleaned or replaced at regular intervals because solid particles can clog the filter when operated for longer periods. If this is not noticed, malfunctions and error messages caused by the reduced flow of water cannot be excluded. In case of a correspondingly high concentration, particles can reach the solenoid valve despite the presence of a filter. This could compromise its function.

Operation/Indicator
The proper operation of Testomat instruments can only be assured **where original Heyl Testomat® indicators are used**. These indicators permit an exact analytic measurement of the smallest quantities of substances. As for all reactive chemical substances, their effectiveness is also influenced by environmental conditions.
The shelf life data which we have calculated are based on use and storage at room temperature (15 – 25 °C) and the exclusion of direct light. Deviating influencing factors and environmental parameters or those not tested by us can result in a variation in the shelf life threshold.

The indicator must be replaced upon the expiry of its shelf life in order to guarantee its reliable function. Please note the expiry date on the bottle’s label.

Water inlet
Compliance with the water inlet pressure limits recorded on the rating plate is essential. Should the water flow be insufficient, (e.g. also in case the filter is soiled) there is no proper exchange of measuring water and therefore a clear analysis cannot be assured.
The measuring process can be repeated several times and ultimately result in error messages.

Water outlet
In assembly, care should be taken to ensure a **discharge free of back pressure** as described in the operating instructions, “Water outlet”.

EC conformity Declaration

EC Conformity Declaration

CE UKCA

for the following product

Testomat® 808 2019
Online Analysis Instrument for Water Hardness

We hereby confirm that the above product confirms to the principal health and safety regulations laid down in the EC Directives 2014/30/EU and 2014/35/EU.
This declaration applies to all units produced in accordance with the attached manufacturing documents which are a constituent part of this declaration.

The product was assessed with reference to the following standards:

CE

EN 61000-6-4: Electromagnetic compatibility, Generic emission standard
EN 61000-6-2: Electromagnetic compatibility, Generic immunity standard
EN 61010-1: Safety requirements for electrical equipment for measurement, control and laboratory use

UKCA

BS EN 61000-6-4+A1 Electromagnetic compatibility (EMC). Generic standards. Emission standard for industrial environments
BS EN 61000-6-2 Electromagnetic compatibility (EMC). Generic standards. Immunity standard for industrial environments
BS EN 61010-1+A1 Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements

This declaration is made on behalf of

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by

Jörg-Tilman Heyl

General Manager

Hildesheim, 12/08/2021

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Testomat_808-2019_EN_261112

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visit us on our website!