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MITTELSTANDES

Gebrüder Heyl
Analysentechnik
GmbH & Co. KG

PRODUCT CATALOG 2022

Analysis Instruments, Controllers, Indicators, Analysis Kits and Test Kits

Our new e-mail and web address:
wwwheylanalysis.de
info@heylanalysis.de

To make it easy for you to find our products quickly, we‘ve marked off our product sectors with different colors. This shows you at a glance what product area you‘re in.

Selection help

Since our selection of Testomat devices has gotten quite large, we offer your our selection help table on page 31 as a special overview which will tell you what device is especially appropriate for what application

Gebrüder Heyl process photometers and titration instruments have been putting their reliability and practicality to the test since 1958.

With improved accuracy and resolution, in combination with analysis functions that have undergone consistent further development, the current generation of instruments helps water treatment system operators reduce costs and guarantee optimal water quality.

Improve your water treatment process with online analysis instruments

Plant operators and plant technicians can increase the efficiency of the water softening process with constant water quality monitoring.

This enables operators to recognize whether the regeneration process is running correctly, the resin quality is still sufficient, and sufficient regeneration conditioning agents are present in the right consistency.

The combination of **Testomat 2000®**, **Softmaster® MMP2** and **MultiControl CT** leads to less waste water, low conditioning agents use, and cost savings thanks to low energy requirements.

Which companies can benefit from online analytical devices?

Every company that has to monitor its process water cycle. We offer analytical devices for 14 different parameters including water and carbonate hardness, phosphate, sulphite, chromium VI, chlorine and chlorine dioxide.

Each of these parameters can be monitored continuously with one device. The data is then stored to provide documented evidence of the monitoring.

- bakeries
- meat processing plants
- steam generation sterilization
- laundry companies
- food and beverage industry (breweries, dairies)
- pulp and paper industry
- chemical industry
- pharmaceutical industry
- construction materials industry

For plant operators who want to comply with increasingly stringent process and effluent limit values, continuous online monitoring of their water treatment process is the safest solution.

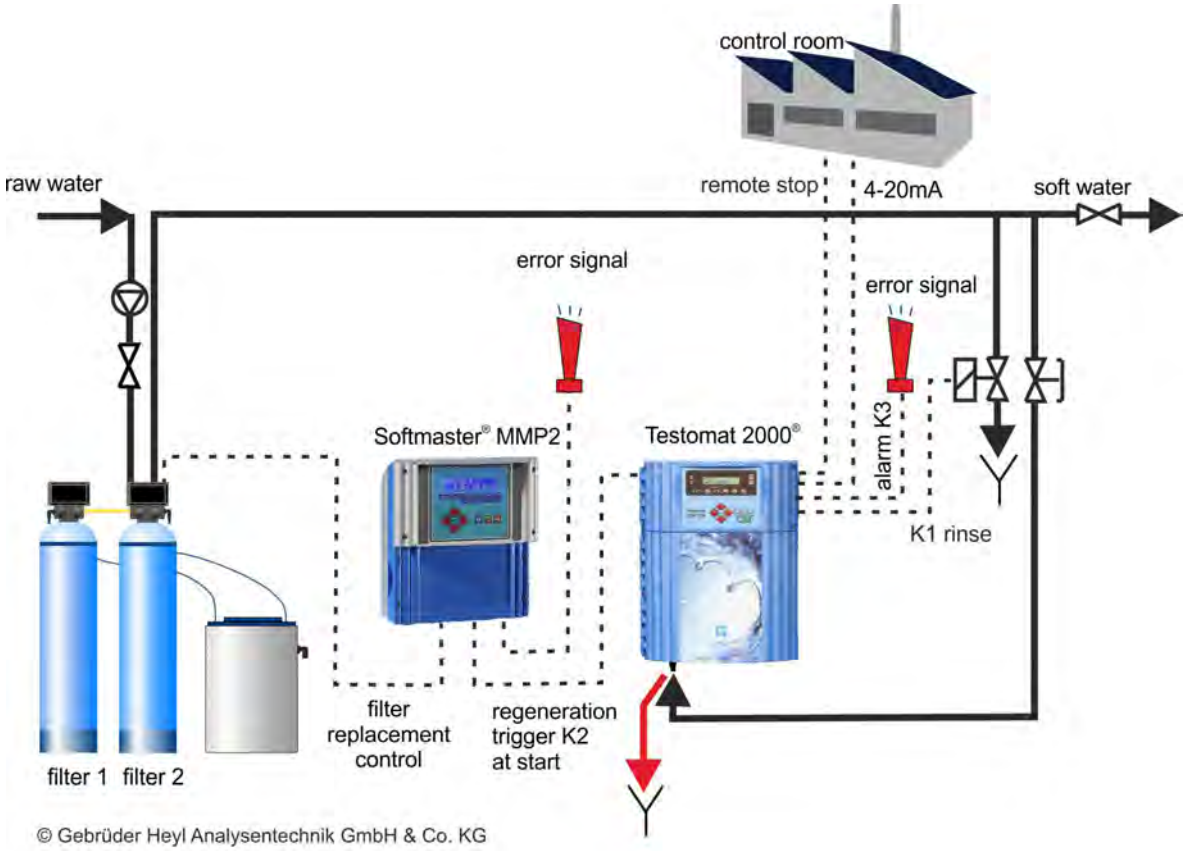
Technical information:

Energy cost reduction through online water quality monitoring

This technical information concerns the effect of calcium and other deposits in steam boiler plants and cooling towers. Problems are that arise from deposits and possible solutions are highlighted.

The complete technical information can be found under Applications on our homepage, www.heylanalysis.de.

Online monitoring of water quality with Gebrüder Heyl instruments



Desalination
To prevent corrosion caused by salt, the conductivity of the feed water is controlled by the MultiControl monitoring instrument.

The MultiControl monitoring instrument controls the desalination of boiler water with a high salt concentration and regulates the water supply as needed in order to maintain the correct salinity.

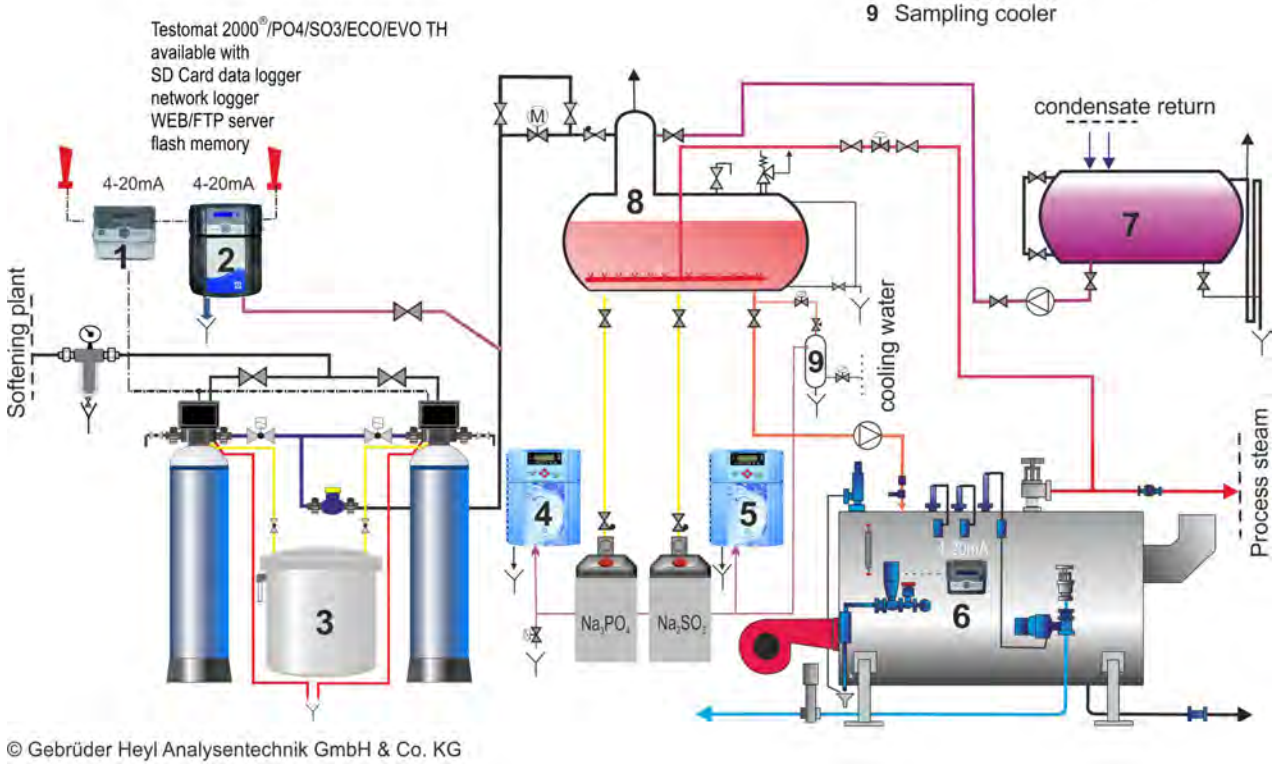
The desalination electrode is located in the upper region of the steam generator at the height of the lower water level.

WÜ 100

Our **Testomat 2000®** checks the hardness of your feed water and condensate water in your hot water boiler and steam boiler systems according to the current **TÜV WÜ 100** regulation and supports you in maximizing the cost-efficiency of your system.

Boiler house concept with Heyl measuring and control devices

1 Softmaster® MMP compact control of softening plant
2 Testomat® 2000/ECO/EVO hardness measurement
3 Softening plant
4 Testomat® PO4 phosphate dosing
5 Testomat® SO3 sulfite dosing
6 MultiControl
7 Condensation collector
8 Feed water tank
9 Sampling cooler



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Precise control attuned to the application can contribute to a significant improvement of the entire production process.

Therefore, we made it our mission decades ago to provide our customers with application-oriented solutions in which every individual component is attuned exactly to every other.

Monitoring and control of water treatment example: softening plant

The following Parameterss must be monitored:

- quality
- salt deficiency in the brine tank
- correct regeneration cycle

You can achieve this by using our controllers and measuring instruments in combination:

Testomat 2000 ®
+ Softmaster® MMP2
+ Softmaster® ROE1 and ROE2

Result:

- less waste water
- lower salt use
- cost savings thanks to lower energy requirements

1- and 2-filter systems

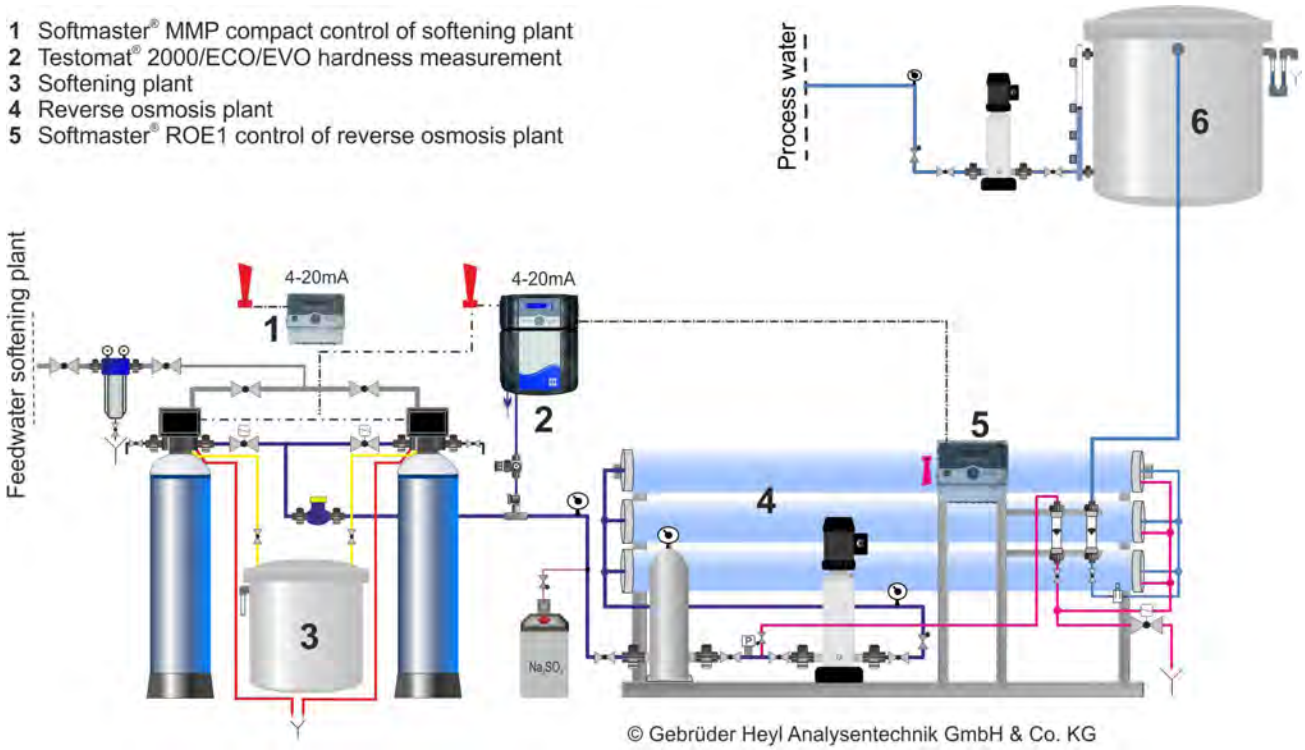
All Softmaster® MMP controllers can be connected to many current valves of 1- and 2-filter systems, e.g., valves from

- Autotrol
- Fleck
- Siata

To support you, you can request connection diagrams for various valves from us or download the current operating instructions from our homepage www.heylanalysis.de.

Softmaster® controllers monitoring a reverse osmosis system together with Testomat 2000®

1 Softmaster® MMP compact control of softening plant
2 Testomat® 2000/ECO/EVO hardness measurement
3 Softening plant
4 Reverse osmosis plant
5 Softmaster® ROE1 control of reverse osmosis plant



Mobile monitoring system for cooling towers with integrated Testomat 2000® Polymer for monitoring the conditioning agent.

Control and monitoring of recooling plants

Today, cooling water controlling and monitoring are indispensable components of advanced energetic and hygiene-compliant operation of cooling towers according to VDI 2047-2 and VDI 3803-3.4.

A wide variety of recooling plants exists worldwide:

- Closed cooling systems
- Semi-open cooling systems
- Continuous flow cooling systems

More than 100,000 recooling plants of the above categories are installd in Germany.

What is the responsibility of the plant operator according to the new VDI 2047-2 directive?

Recooling plants and cooling towers are required in the industry and with large buildings to allow for the quick dissipation of excess heat in production processes or buildings.

Although measures have been employed over the past few years to operate these systems more economically and more safely in terms of hygiene, malfunctions and downtime still often occur due to deposits, corrosion or even legionella. Because of the design, they consequently spread quickly.

Operators of evaporative cooling systems must therefore still act promptly to avoid mineral-based, corrosive and biological accumulations (such as legionella and pseudomonads).

The legislator has therefore issued a new hygiene directive, VDI 2047 Sheet 2 “Recooling plants - Ensuring the hygiene-compliant operation of evaporative cooling plants”. This directive is also referred to as the VDI cooling tower rule.

The duties of the operating company for the prevention of legionella are specifically regulated by this directive.
All plant operators are advised familiarise themselves with the new VDI 2047-2 directive and take the required measures – disregarding the operator‘s duties may be punishable by law.

To be able to continually ensure the economic, troublefree and – according to the new VDI 2047-2 directive – hygiene-compliant operation of a cooling tower, system conditioning and continuous monitoring of the water are absolutely essential.

What are the main focuses of monitoring?

Part of the cooling water regularly evaporates in open, semi-open and also closed cooling systems. As a result, the salt concentration in the circulating water rises constantly.

However, the increased salt and mineral content in the circulating water causes limescale buildup, corrosion and mineral deposits in the cooling tower and circulating water system. Drip collectors, trickling filters and distribution channels as well as the heat exchangers in the system are especially affected by this.

This is compounded by biological problems, such as from the formation of algae and biofilms introduced from the supply water and the ambient air.

VDI 3803 stipulates in section 3.4 for evaporative recooling plants that the water condition of the circulating water must be adapted to the building materials of the cooling circuit.

This means that the cooling water should be conditioned without fail to prevent corrosion, inorganic deposits (calcium and magnesium carbonates) as well as organic deposits (algae and bacteria strains) – also calld biofilms – from causing major damage in the cooling circuits.

Biofilms, however, can not only cause blockages of fittings and pumps but also constitute the germ cell for legionella or pseudomonas bacteria, which

are very dangerous for humans.

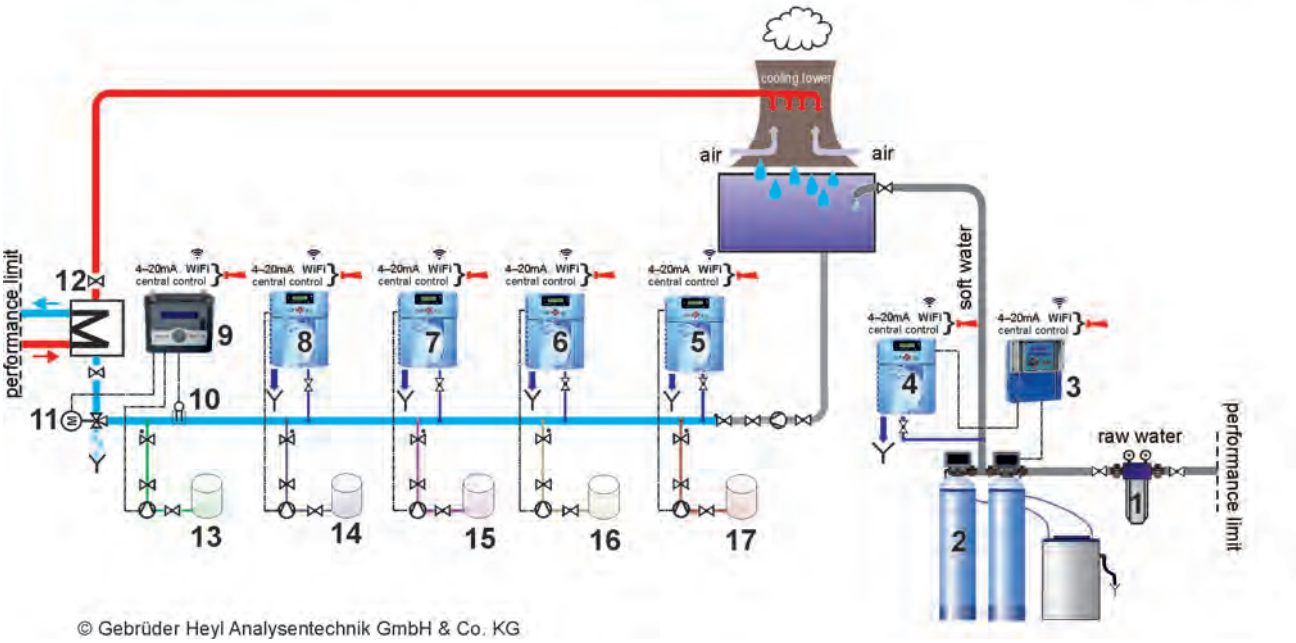
Biofilms are also energetically equivalent to mineral deposits such as calcium or silicate deposits. A layer of only 1 mm thickness can cause a loss of efficiency up to 30% with both types of deposits. This, in turn, results in additional energy costs of up to 12%.

Conclusion:
A controlled cooling tower system monitored online works in a hygienically compliant manner (according to VDI 2047-2), economically and without malfunctions (according to VDI 3803).

A cooling circuit concept, featuring Heyl analyzers and control devices

Many parameters can be measured in the cooling circuit. Our example shows some of them that you can measure with our measuring instruments. It depends on the application and the parameters to be monitored.
You can find an example for desalination in the cooling circuit on page 8.

1 pre-filter
2 softening system
3 control Softmaster® MMP1
4 hardness monitoring Testomat 2000®/ECO/EVO
5 chlorine monitoring Testomat 2000® CLT/F
6 bromine monitoring Testomat 2000® Br
7 phosphate monitoring Testomat 2000® PO4
8 polymer monitoring Testomat 2000® Polymer
9 control of biocide dosing MultiControl CT
10 conductivity probe
11 motor valve
12 plate heat exchanger
13 biocide
14 polymer
15 phosphate
16 bromine
17 chlorine



Desalination with the automatic desalination device MultiControl CT

Using untreated or partially softened water as the feed water for cooling water circuits or air washers usually causes problems such as:

- Limescale,
- Biological deposits by myxobacteria and algae (bacterial contamination)
- Corrosion of metallic materials.

Automatic monitoring and conditioning of the circulating water is important to prevent this from happening. We have developed the automatic desalination device **MultiControl CT** according to VDI 2047 part 1 and 2 for this application.

- **Desalination** can be controlled either by conductance or by TDS. There is a locking mechanism to stop desalination after a biocide dosing. The duration of desalination can be monitored.
- The **biocide dosing** may either take place after a certain number of days or regularly on certain days of the week at a fixed time. Preliminary desalination is available as an option.
- For quantity-based **inhibitor dosing**, there are various adjustment options available for the dosing point and dosing period.
- **Circulation** may either take place after a certain number of days or regularly on certain days of the week at a fixed time.
- In addition, **limit values**, for example for temperature (min and max) or pH value (min and max) can be monitored.

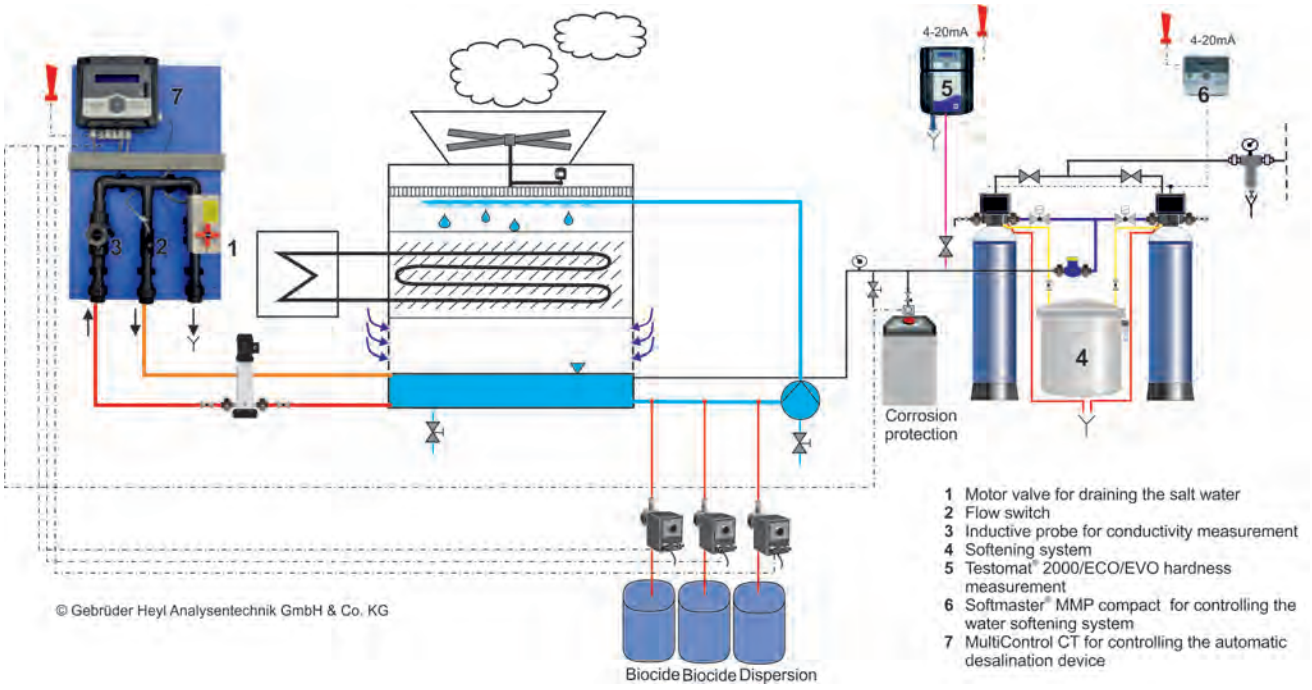
By using different plug-in cards on the two existing slots in the device, various sensors, a process controller with 0/4-20 mA input or a curve tracer can be connected.

The following plug-in cards are available in particular:

- Plug-in card for connecting a probe with two current outputs for measuring the inductive conductivity and temperature and for connecting a combination electrode for measuring the pH value.
- Plug-in card for connecting a probe with RS232 interface for measuring the inductive conductivity and temperature.
- Plug-in card for connecting a conductive conductivity probe, a PT100 or PT1000 temperature sensor with 2-, 3- or 4-wire technology and a combination electrode for measuring the pH value.
- Plug-in card with two 0/4-20 mA outputs for outputting the measured values and one RS232 interface for connecting an inductive conductivity probe.

A SD card is used to log measured values, messages, alarms and status changes. Even the firmware can be updated in this way.

Water treatment of feed water in cooling circuits with measuring instruments from Gebr. Heyl



The effect of a too low acid capacity on the water treatment facility and water quality is often underestimated.

Low acid capacity makes it difficult for the pH value in the swimming pool water to stabilize. The pH value in turn effects the filtration effect and therefore the disinfecting potential.

Acid capacity also strongly influences the occurrence of corrosion in parts of the facility that are in contact with water. The water is more aggressive the lower the acid capacity is.

This leads to corrosion on metal components such as pump drives and fiber backstops, untreated concrete water tanks and on gaps between tiles.

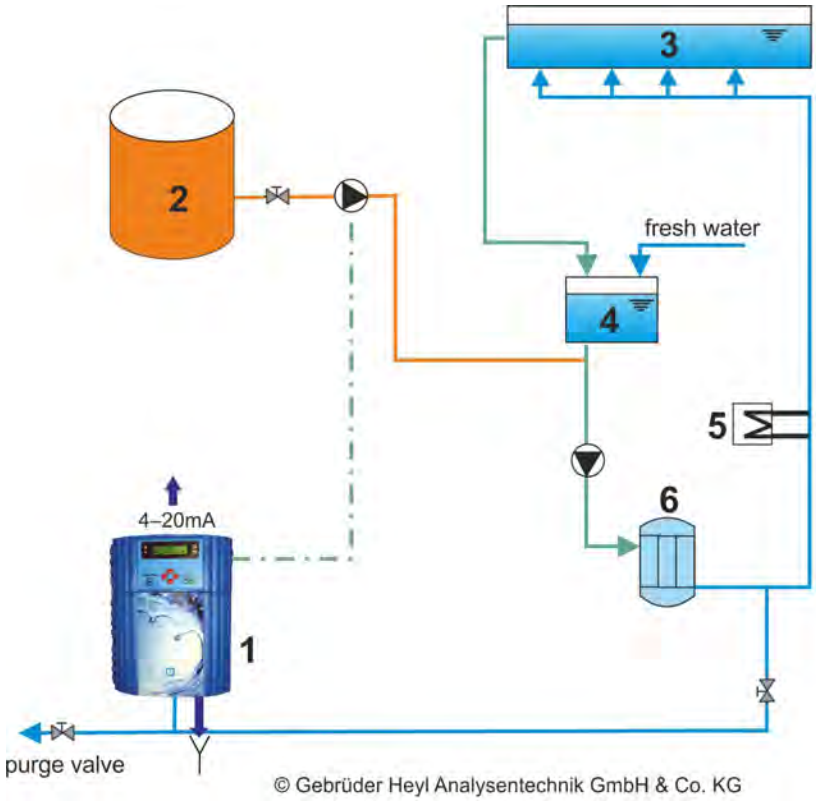
DIN 19643 recommends a weekly inspection of acid capacity in order to be able to permanently control the water quality and the state of the surfaces that are in contact with water.

It also recommends a maximum lower limit value of 0.3 mmol for the acid capacity in Jacuzzis and 0.7 mmol in swimmer‘s pools.

Through online analysis with the **Testomat ECO® C** the acid capacity can be stabilized automatically

Regular inspection also helps to reduce consumables such as disinfectants and stabilizers and thus helps to save costs.

Monitoring carbonate hardness in a swimming pool‘s water cycle with Gebr. Heyl measuring devices



1 Monitoring carbonate hardness Testomat ECO® C
2 Hardness increase sodium bicarbonate
3 Swimmer's pool
4 Gushing water container
5 Heat exchangers
6 Filters

When is it necessary to measure phosphate levels?

The measurement of the phosphate content in the wastewater of industrial processes becomes more and more important, because the phosphate values must be lower than the legally permitted values if the wastewater is discharged into the sewer system.

In accordance with § 11 of the German drinking water ordinance of 2001, the limits are 2,2 mg / l phosphorus (6.75 mg / l PO_4) for phosphates added to the drinking water.

Where do phosphates come from?

Phosphates are mainly found in fertilizers and detergents. They are released into the groundwater by agricultural fertilizers in the soil or by domestic wastewater with phosphate detergents. In industrial plants, orthophosphates (PO_4) are directly fed into the processing water to prevent corrosion in their piping systems.

Industrial and agricultural discharges in rivers and lakes lead to a nutrient surplus in the waters. This results in undesirable algae growth and a falling oxygen content in the water. The ecological balance suffers sustained damage.

Through the water cycle, high amounts of phosphates and nitrates also enter the ground water.

In order to prevent this environmental hazard, policies for the concentration of phosphates and nitrates in water have been established.

Phosphates in Sewage Treatment Plants

In waste water treatment plants, phosphate concentration must be measured in order to ensure effective wastewater treatment. Phosphates are removed either by chemical precipitation or biological elimination from wastewater.

By feeding in dissolved iron salts (ferrous chloride), most of the phosphorus from wastewater is precipitated and deposited along with the contaminants from the primary settlement tank to the bottom of the basin.

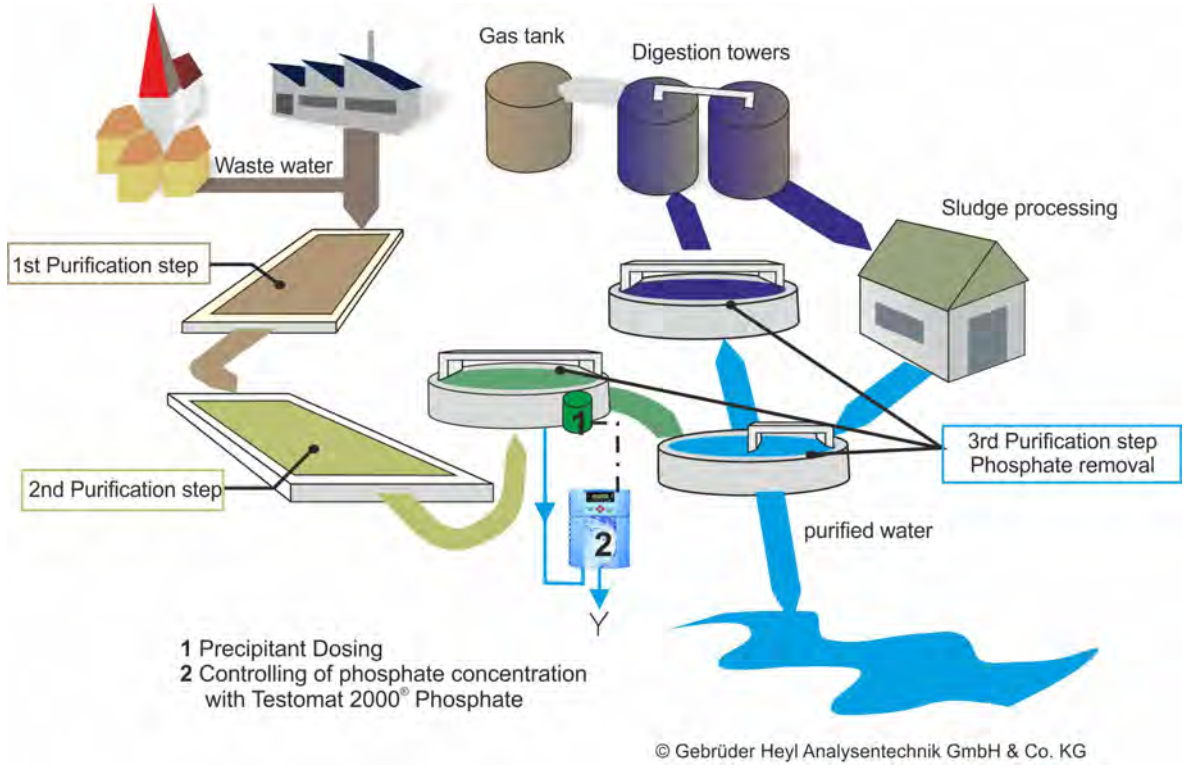
Increasingly important in wastewater treatment plants is the phosphate recovery from wastewater and sludge, since phosphorus is an important and finite raw material.

All these processes require an inspection of the phosphate content, which must be either conducted manually or continuously.

The **Testomat 2000® PO4** was developed for the online analysis of orthophosphate and operates within a measuring range of 0 - 10 mg/l PO_4.

Find the complete technical information on phosphate measurement with the **Testomat 2000® PO4** in the download section of our website www.heylanalysis.de.

Phosphate measurement at the water treatment plant with the Gebr. Heyl phosphate measuring instrument



During galvanic processes such as copper plating, chromium plating or nickel plating or during surface treatment before painting (phosphating), large amounts of rinsing water are required after each process step.

Since the disposal of these process waters is very expensive, it makes sense for a company to process and reuse the process waters. The amount of waste water and fresh water can thus be limited.

Heavy metals and toxic constituents are removed during the on-site treatment.

In many cases, a chemical-physical process is used, e.g. ion exchangers. Regeneration of ion exchangers produces solutions with a high concentration of heavy metal salts, from which the metals are either deposited electrolytically or, in some cases, recycled directly to the galvanising baths.

The process water is neutralised with the help of acid or lye. Auxiliary substances and additional reaction steps eliminate any existing critical constituents such as cyanides or chromic acid.

Afterwards, sludge is produced with a flocculant, which removes oils, fats and heavy metals from the water.

The resulting clear phase can then be discharged into the sewer in consideration of the legal limit values.

Limit values for chromium

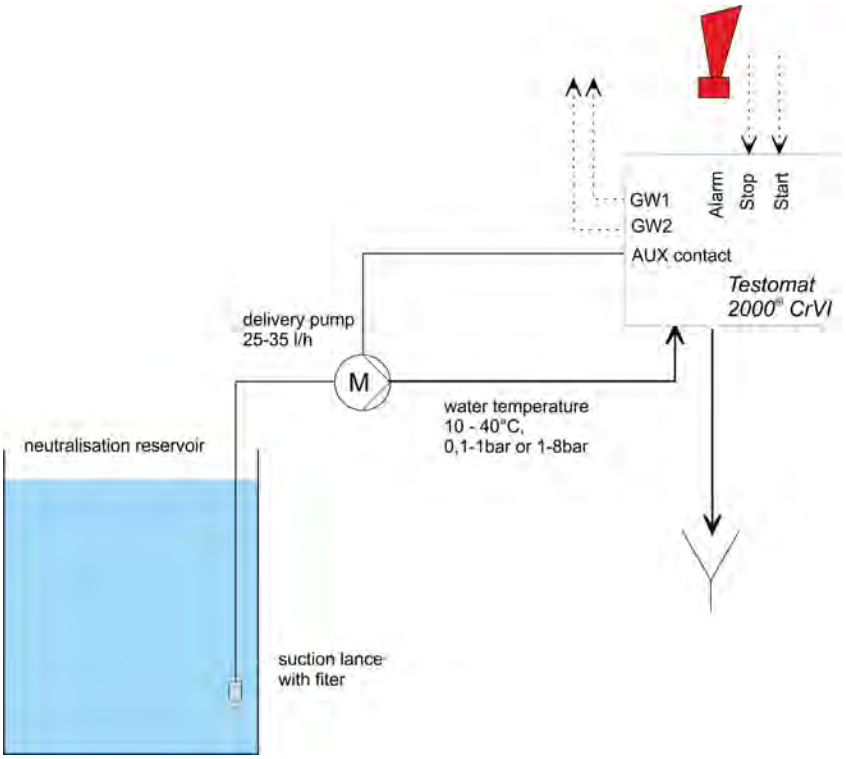
The Drinking Water Ordinance (TrinkwV 2001/amendment November 2011) prescribes a limit value of 0.05 mg/l chromium in drinking water.

The Waste Water Ordinance (AbwV) sets a limit of 0.05 mg/l chromium in the waste water of chemical industrial companies and a limit value of 0.25 g/t chromium for the iron, steel and malleable-iron foundry.

With a measuring range of 0.0-2.0 mg/l (chromate) and 0-1.0 mg/l (chromium VI), the **Testomat 2000® CrVI** is ideally suited for the required monitoring of these limit values.

Since the monitoring of limit values by the Testomat device takes place automatically online, the level of supervision required by personnel is low and the legal requirements are reliably and demonstrably adhered to and documented through data storage via SD card data loggers.

The analytical result is displayed after a reaction time of approx. 2 minutes. The **Testomat 2000® CrVI 0-5 ppm** can also be used for a broader monitoring range. The measuring range is 0.0-5.0 ppm (chromium VI) and 0.0-11.15 ppm (chromate).



Concept solution for central sterilization

The sterilisation of surgical instruments now plays a central role when it comes to quality assurance in hospitals.

The treatment process is subject to the requirements of the standard DIN EN 285 for steam sterilisation, among others. The steam or water used must not exceed the specified limit values, otherwise deposits and corrosion can occur on the metal surfaces of the instruments.

Demineralised water is therefore generally used for the sterilisation process. This process water (demineralised water) is produced in a water treatment system in the hospital.

DIN EN 285 stipulates the following limit values for the feed water quality to generate pure steam:

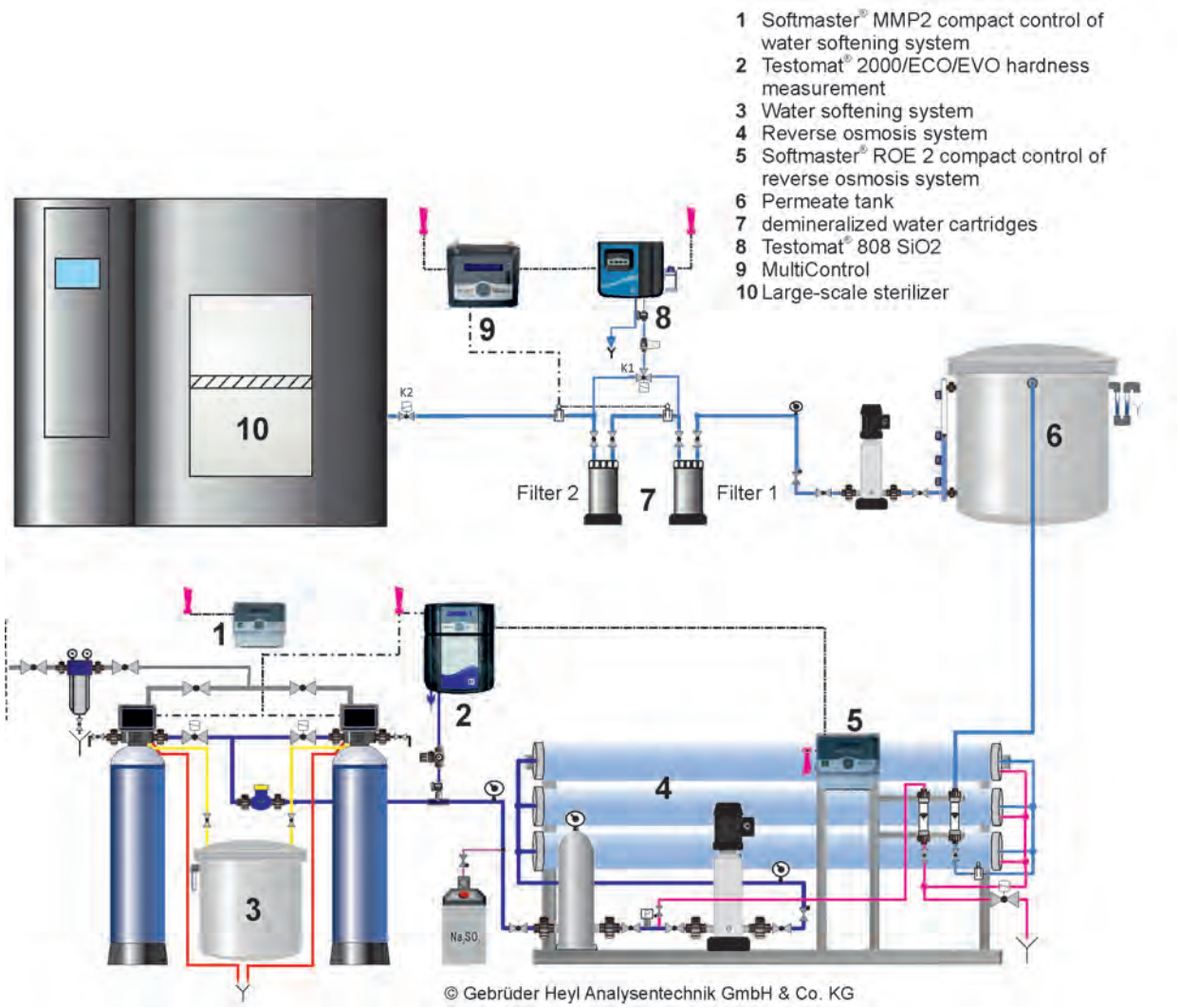
Conductivity:	< 15 µS/cm
pH-value:	5 – 7
Total hardness:	< 0,02 mmol/l
Salt content:	< 10 mg/l
Phosphate:	< 0,5 mg/l
Silicate (SiO_2):	< 1 mg/l
Chloride:	< 2 mg/l

To meet the need of hospitals for a simple, reliable silicate measuring device, Gebr. Heyl Analysentechnik has developed the **Testomat® 808 SiO2**.

This limit value measuring device can determine silicates in the measurement range from 0.3 to 1.2 ppm and thus corresponds to the specifications of the DIN standard EN 285 for a silicate monitoring device.

Find the complete technical information on **water treatment in hospitals** in the download section of our website www.heylanalysis.de.

Water treatment for the central sterilization with Gebr. Heyl measuring and control devices



Product	Testomat® 808 - 2019	Testomat® 808 SiO2 - 2019
		
Description	limit value monitoring instrument for water hardness	limit value monitoring instrument for silica
Parameters	water hardness	silica SiO_2
Monitoring range	0,02-5 °dH (0,4….89 ppm $CaCO_3$)	0,3-1,2 ppm
Indicators Limit values on page 49	Type 300, 300 S, 301, 302, 303, 305, 310, 320, 330, 350	Type A + B for Testomat® 808 SiO2
Performance profile	• low water consumption • state-of-the-art electronics • modern indicator pump system • error display • indicator quantity display • external rinsing valve control • limit value evaluation/external control • alarm processing • internal and external rinsing via manual control • 72 hours without supervision possible (in BOB mode) • selector switch for pause interval; selector switch for adjusting the behavior of the relay when the limit value is exceeded	• Offering all the benefits of the Testomat® 808 - 2019 in addition: • 2 selector switches for measuring intervals and evaluating limit values
Application	applications of continuous residual hardness monitoring, e.g.: • reverse osmosis plants • soft water for commercial purposes • pure water production plants • galvanization	• Water treatment of sterilizations in hospitals • Monitoring of silicate content in industrial waters Application example on page 12
Protection type/class	IP44 / I	IP44 / I
Supply voltage	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz
Power consumption	max. 16 VA	max. 16 VA
Dimensions	approx. 14.3” x 12.4” x 5.4” (W x H x D) 364 x 314 x 138 mm	approx. 14.3” x 12.4” x 5.4” (W x H x D) 364 x 314 x 138 mm with side pocket: 17.4” x 12.4” x 5.4” 442 x 314 x 138 mm
Weight	approx. 9.6 lbs (4.35 kg)	approx. 9.6 lbs (4.35 kg)
Operating pressure	14.5 to 58 psi (1 to 4 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)	14.5 to 58 psi (1 to 4 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)
Menu languages	—	—

Order numbers

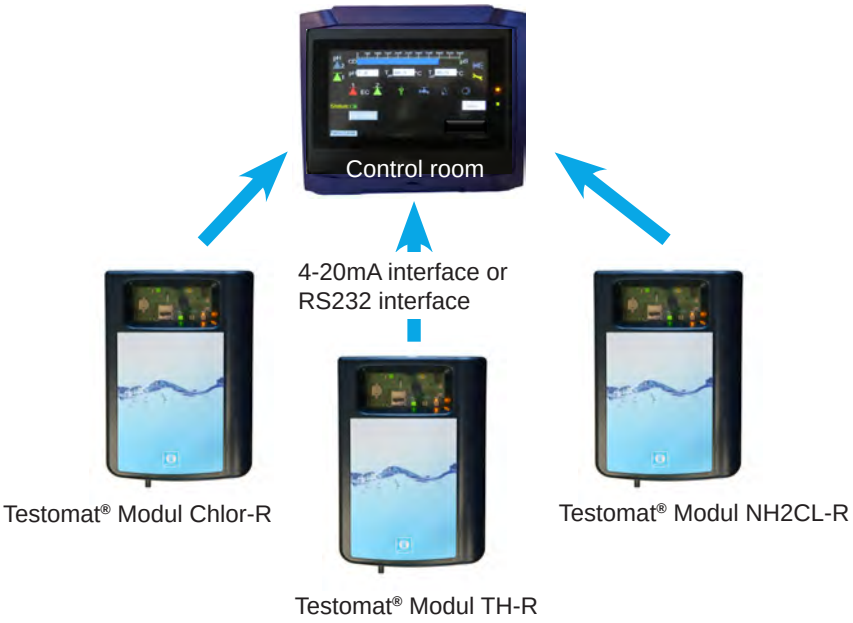
	24V	115 V	230 V	24V	115 V	230 V
1-4 bar	100652	100651	100650	100662	100661	100660
0,3-1 bar	100655	100654	100653	100665	100664	100663

Product	Testomat® Modul TH	Testomat® Modul TH-R
	 New	 New
Description	measuring converter for residual total hardness	measuring converter for residual total hardness
Parameters	water hardness	water hardness
Measuring range	0,05-25 °dH	0,05-25 °dH
Indicators Limit values on page 47	TH 2005, TH 2025, TH 2050, TH 2100, TH 2250	TH 2005, TH 2025, TH 2050, TH 2100, TH 2250
Performance profile	• device can be connected to an overriding control system • operation via function keys, which also serve as display elements • parameterisation with the Service Monitor program • output of measurement values via a 4-20 mA interface and a RS232 interface • 3 types of analysis triggers • shared output for the alarm • logging of error and maintenance messages with the SD card • firmware update with the SD card • USB connection for service purposes	• Offering all the benefits of the Testomat® Modul TH • The RS232 interface can also be used to set the parameters of the device. It receives defined commands from a higher-level control system for this purpose. Please note that it is not possible subsequently to change a Testomat® Modul TH into a Testomat® Modul TH-R.
Application	Monitoring and checking of water quality e.g.: • water treatment facilities • industrial boilers • process water monitoring	Monitoring and checking of water quality e.g.: • water treatment facilities • industrial boilers • process water monitoring
Protection type/class	IP43/40 (with/without cover) / I	IP43/40 (with/without cover) / I
Supply voltage	24 VDC	24 VDC
Power consumption	max. 1 A	max. 1 A
Dimensions	approx. 10.6” x 13.8” x 5.8” 270 x 350 x 147 mm W x H x D	approx. 10.6” x 13.8” x 5.8” 270 x 350 x 147 mm W x H x D
Weight	approx. 11.7 lbs (5.3 kg)	approx. 11.7 lbs (5.3 kg)
Operating pressure	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)
Relay contact load	max. 35 VAC / 60 VDC; max. 4 A	max. 35 VAC / 60 VDC; max. 4 A
Order numbers	**24 V**	**24 V**
with cover	116101	116111
without cover	116102	116112

Product	Testomat® Modul NH2CL	Testomat® Modul CL
	 New	 New
Description	measuring converter for monochloramine	measuring converter for total chlorine
Parameters	monochloramine	total chlorine or free chlorine
Measuring range	0 - 5 ppm (resolution 0,1)	0 - 5 ppm (resolution 0,1)
Indicators Limit values on page 48	Testomat Chlorine Reagent Kit M (Monochloramine)	Chlorine reagent set F (free) or Chlorine reagent set T (total)
Performance profile	• Offering all the benefits of the Testomat® Modul TH	• Offering all the benefits of the Testomat® Modul TH
Application	Monitoring the decay behaviour in cooling towers after shock chlorination	Monitoring the decay behaviour in cooling towers after shock chlorination
Protection type/class	IP43/40 (with/without cover) / I	IP43/40 (with/without cover) / I
Supply voltage	24 VDC	24 VDC
Power consumption	max. 1 A	max. 1 A
Dimensions	approx. 10.6” x 13.8” x 5.8” 270 x 350 x 147 mm W x H x D	approx. 10.6” x 13.8” x 5.8” 270 x 350 x 147 mm W x H x D
Weight	approx. 11.7 lbs (5.3 kg)	approx. 11.7 lbs (5.3 kg)
Operating pressure	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)
Relay contact load	max. 35 VAC / 60 VDC; max. 4 A	max. 35 VAC / 60 VDC; max. 4 A
Order numbers	**24 V**	**24 V**
with cover	116108	116105
without cover	116109	116106

Product	Testomat® Modul NH2CL-R	Testomat® Modul CL-R
	 New	 New
Description	measuring converter for monochloramine	measuring converter for total chlorine
Parameters	monochloramine	total chlorine or free chlorine
Measuring range	0 - 5 ppm (resolution 0,1)	0 - 5 ppm (resolution 0,1)
Indicators Limit values on page 48	Testomat Chlorine Reagent Kit M (Monochloramine)	Chlorine reagent set F (free) or Chlorine reagent set T (total)
Performance profile	• Offering all the benefits of the Testomat® Modul NH2CL • The RS232 interface can also be used to set the parameters of the device. It receives defined commands from a higher-level control system for this purpose. Please note that it is not possible subsequently to change a Testomat® Modul NH2CL into a Testomat® Modul NH2CL-R.	• Offering all the benefits of the Testomat® Modul CL • The RS232 interface can also be used to set the parameters of the device. It receives defined commands from a higher-level control system for this purpose. Please note that it is not possible subsequently to change a Testomat® Modul CL into a Testomat® Modul CL-R.
Application	Monitoring the decay behaviour in cooling towers after shock chlorination	Monitoring the decay behaviour in cooling towers after shock chlorination
Protection type/class	IP43/40 (with/without cover) / I	IP43/40 (with/without cover) / I
Supply voltage	24 VDC	24 VDC
Power consumption	max. 1 A	max. 1 A
Dimensions	approx. 10.6” x 13.8” x 5.8” 270 x 350 x 147 mm W x H x D	approx. 10.6” x 13.8” x 5.8” 270 x 350 x 147 mm W x H x D
Weight	approx. 11.7 lbs (5.3 kg)	approx. 11.7 lbs (5.3 kg)
Operating pressure	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)
Relay contact load	max. 35 VAC / 60 VDC; max. 4 A	max. 35 VAC / 60 VDC; max. 4 A
Order numbers	**24 V**	**24 V**
with cover	116118	116115
without cover	116119	116116

The equipment of the Testomat® Modul series has been developed to jointly monitor various parameters such as chlorine, water hardness or monochloramine in a networked system and to forward the measurement results to a control room.

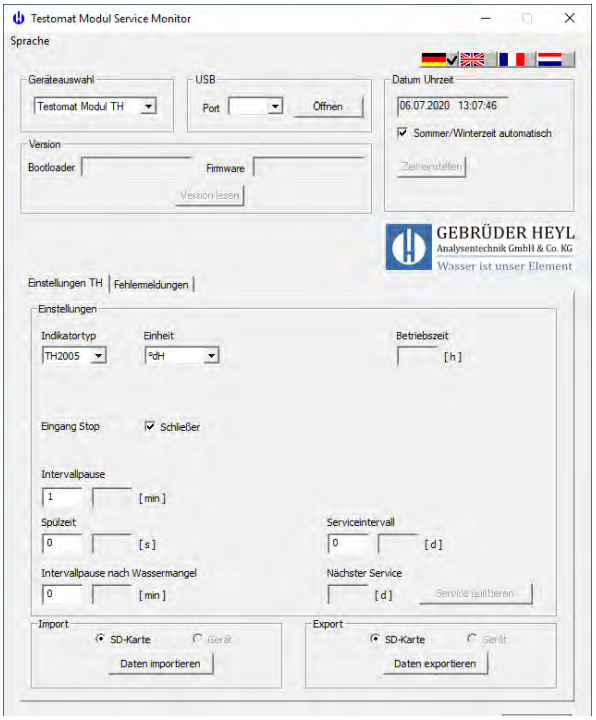


Operation via function keys

Using the function keys on the equipment, basic functions such as alarm acknowledgement, reset and standby operation can be carried out.

Parameterization via PC program

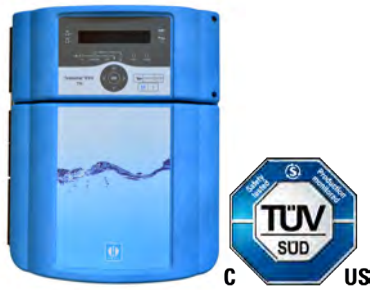
The transducer settings can be displayed and changed using the Service Monitor program (for operating systems starting with Windows 7).
The program is part of the scope of delivery.



Example of the Service Monitor software for the Testomat® Modul TH

Product	Testomat ECO®	Testomat ECO® C
		
Description	automatic online analysis units for water hardness	automatic online analysis units for carbonate hardness
Parameters	Water hardness	Carbonate hardness Acid capacity
Measuring range	0,05-25 °dH	0,18-3,58 mmol/l / 0,36-7,16 mmol/l 0,5-10,0 °dH / 1,0-20,0°dH
Indicators Limit values on page 47	TH 2005, TH 2025, TH 2100, TH 2250	TC 2050, TC 2100
Performance profile	• freely selectable hardness unit: °dH, °f, ppm $CaCO_3$ or mmol/l • high measurement accuracy thanks to precise piston dosing pump • two independent limit values (choice of 1, 2, or 3 bad analyses before the limit value relay switches) and adjustable switching functions • reliable, low-maintenance operation • very simple menu-driven operation and programming via plain-text display • two neutral changeover contacts • error message output (neutral changeover) • current output 0/4–20 mA • BOB function	• Offering all the benefits of the Testomat ECO® deviating from this: • determinable measuring of carbonate hardness/acid capacity in mmol/l via indicator selection • no BOB function
Application	monitoring and control of water quality, e.g.: • water treatment plants • drinking water plants	monitoring and control of water quality, e.g.: • water treatment plants • drinking water plants • Swimming pool water automatic hardness increase of swimming pool water via online analysis (application page 9)
Protection type/class	IP65 / I	IP65 / I
Supply voltage	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz
Power consumption	max. 30 VA	max. 30 VA
Dimensions	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)
Weight	approx. 19.8 lbs (9.0 kg)	approx. 20.9 lbs (9.5 kg)
Operating pressure	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)
Menu languages	German, English, French, Italian, Polish, Dutch, Spanish	German, English, French, Dutch

Order numbers	**24V**	**115 V**	**230 V**	**24V**	**115 V**	**230 V**
	100112	100117	100122	100115	100116	100121
without front sticker	100430	100431	100432			

	Testomat® EVO TH	Testomat® EVO TH CAL
		
Description	automatic online analysis units for water hardness	Online-Analysenautomat für Wasserhärte mit Kalibrierfunktion
Parameters	Water hardness	Water hardness
Measuring range	0,05-25 °dH	0,05-25 °dH
Indicators Limit values on page 47	TH 2005, TH 2025, TH 2100, TH 2250	TH 2005, TH 2025, TH 2100, TH 2250
Performance profile	• Offering all the benefits of the Testomat ECO® in addition: • built-in SD card for – recording data, alarm, errors – firmware updates – importing and exporting settings • transfer of measurement data and status via the RS232 port • there is also scope to connect a field bus converter or a converter for telecommunication networks • Operation <0.3 bar with MepuClip®	• Offering all the benefits of the Testomat® EVO TH in addition: • with calibation function
Application	Monitoring and checking of water quality e.g.: • water treatment facilities • industrial boilers • process water monitoring • drinking water systems	Monitoring and checking of water quality e.g.: • water treatment facilities • industrial boilers • process water monitoring • drinking water systems
Protection type/class	IP44 / I	IP44 / I
Supply voltage	100-240 VAC/ 100-353 VDC	100-240 VAC/ 100-353 VDC
Power consumption	max. 30 VA	max. 30 VA
Dimensions	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)
Weight	approx. 19.8 lbs (9,0 kg)	approx. 19.8 lbs (9,0 kg)
Operating pressure	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)
Menu languages	German, English, French, Dutch, Spanish (more upon request)	German, English, French, Dutch, Spanish (more upon request)

Order numbers

	24V	100-240 VAC	24V	100-240 VAC
housing black	upon request	100701	upon request	upon request
housing blue	upon request	100704	upon request	100712

Product	Testomat 2000®
	
Description	automatic online analysis units for water hardness
Parameters	water hardness, carbonate hardness, p-value, minus m-value
Measuring range	0,05-25 °dH water hardness 0,5-20 °dH carbonate hardness 0,1-15 mmol/l p-value 0,05-0,5 mmol/l minus m-value
Indicators Limit values on page 47	TH 2005, TH 2025, TH 2100, TH 2250 TC 2050, TC 2100, TM 2005, TP 2010, TP 2100
Performance profile	• freely selectable hardness unit: °dH, °f, ppm $CaCO_3$, or mmol/l • high measurement accuracy thanks to precise piston dosing pump • monitoring of two measuring points (switching via external magnet valves) • reliable, low-maintenance operation • very simple menu-driven operation and programming via plain-text display • BOB function • two independently programmable limit value contacts for monitoring and control tasks • recording of analysis results with optional plug-in card (SK910 current interface) for a point or line recorder (0/4–20 mA), SD card, or printer
Application	• water treatment plants • water blending plants • drinking water plants • water softening plants • decarbonization plants • desalination plants • boiler houses • cooling towers
Protection type/class	IP65 / I
Supply voltage	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz
Power consumption	max. 30 VA
Dimensions	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)
Weight	approx. 20.9 lbs (9.5 kg)
Operating pressure	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)
Menu languages	German, English, French, Italian, Polish, Dutch

Order numbers

	24V	115 V	230 V
German	100090	100100	100095
German without front sticker	100420	100421	100422
English	100091	100101	100096
French	100092	100102	100097
Italian	100093	100103	100098
Polish	100094	100104	100099
Dutch	100011	100012	100013
Spanish	100014	100015	100016

	Testomat 2000® Antox	Testomat 2000® CAL
		
Description	automatic online analysis units for hardness of water with elevated chlorine or H_2O_2 content	automatic online analysis unit for water hardness with additional calibration function
Parameters	water hardness, carbonate hardness, p-value, minus m-value	water hardness, carbonate hardness, p-value, minus m-value
Measuring range	0,05-25 °dH water hardness 0,5-20 °dH carbonate hardness 0,1-15 mmol/l p-value 0,05-0,5 mmol/l minus m-value	0,05-25 °dH water hardness 0,5-20 °dH carbonate hardness 0,1-15 mmol/l p-value 0,05-0,5 mmol/l minus m-value
Indicators Limit values on page 47	TH 2005, TH 2025, TH 2100, TH 2250, TC 2050, TC 2100, TM 2005, TP 2010, TP 2100	TH 2005, TH 2025, TH 2100, TH 2250, TC 2050, TC 2100, TM 2005, TP 2010, TP 2100
Performance profile	• Offering all the benefits of the Testomat 2000® in addition: • pump for dosing a reducing agent By adding the Antox solution before determining the hardness, the interference by oxidising agents (for example chlorine) is reliably eliminated up to a concentration of 10 mg/l (Antox solution, see page 45).	• Offering all the benefits of the Testomat 2000® in addition: • with calibration function
Application	• control of water quality in areas where measurement errors can arise due to oxidizing agents	control of water quality for which calibration of the measuring instrument is important, e.g.: • pharmaceutical industry
Protection type/class	IP65 / I	IP65 / I
Supply voltage	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz
Power consumption	max. 30 VA	max. 30 VA
Dimensions	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)
Weight	approx. 20.9 lbs (9.5 kg)	approx. 20.9 lbs (9.5 kg)
Operating pressure	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)
Menu languages	German, English	German, English, French, Italian, Dutch

Order numbers

	24V	115 V	230 V	24V	115 V	230 V
German	100440	100450	100460	100210	100215	100220
English	100441	100451	100461	100211	100216	100221
French				100212	100217	100222
Italian				100213	100218	100223
Dutch				100214	100219	100224

Product	Testomat 2000® self clean	Testomat 2000® V
		
Description	automatic online analysis units for water hardness with cleaning function for difficult water	automatic online analysis unit for water hardness for regulating blending water
Parameters	water hardness, carbonate hardness, p-value, minus m-value	Water hardness, Carbonate hardness
Measuring range	0,05-25 °dH water hardness 0,5-20 °dH carbonate hardness 0,1-15 mmol/l p-value 0,05-0,5 mmol/l minus m-value	1,0–25,0 °dH water hardness 1,0–20,0 °dH carbonate hardness
Indicators Limit values on page 47	TH 2005, TH 2025, TH 2100, TH 2250, TC 2050, TC 2100, TM 2005, TP 2010, TP 2100	TH 2005, TH 2025, TH 2100, TH 2250, TC 2050, TC 2100,
Performance profile	• Offering all the benefits of the Testomat 2000® in addition: • with dosing pump for dosing our cleaning agent for cleaning the measuring chamber after analysis For the cleaning solution see page 40	Offering all the benefits of the Testomat 2000® in addition: • suitable in connection with a 3/2-way motor valve with 0/4–20 mA interface as a control system for water hardness and carbonate hardness of blending water • the selection of the reagent determines the working range of the controller (= measuring range)
Application	• use for difficult water, e.g. calcium, biofims, various other deposits • extending service life • reducing contamination in the measuring chamber	• regulation of water blending systems (cooling circuits, process water)
Protection type/class	IP65 / I	IP65 / I
Supply voltage	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz
Power consumption	max. 30 VA	max. 30 VA
Dimensions	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)
Weight	approx. 20.9 lbs (9.5 kg)	approx. 20.9 lbs (9.5 kg)
Operating pressure	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)
Menu languages	German, English, French	German, English, French, Italian

Order numbers

	24V	115 V	230 V	24V	115 V	230 V
German	100380	100390	100370	100170	100175	100180
German without front sticker	—	—	100365	—	—	—
English	100381	100391	100371	100171	100176	100181
French	100382	100392	100372	100172	100177	100182
Italian				100173	100178	100183

Testomat 2000® DUO	Testomat 2000® DUO CN	Testomat 2000® CN
		
automatic online analysis units for water hardness for monitoring two measuring points	automatic online analysis units for water hardness for monitoring two measuring points for the Chinese market	automatic online analysis unit for water hardness for the Chinese market, with Chinese menu navigation
water hardness, carbonate hardness, p-value, minus m-value	water hardness, carbonate hardness, p-value, minus m-value	water hardness, carbonate hardness, p-value, minus m-value
0,05-25 °dH water hardness 0,5-20 °dH carbonate hardness 0,1-15 mmol/l p-value 0,05-0,5 mmol/l minus m-value	0,05-25 °dH water hardness 0,5-20 °dH carbonate hardness 0,1-15 mmol/l p-value 0,05-0,5 mmol/l minus m-value	0,05-25 °dH water hardness 0,5-20 °dH carbonate hardness 0,1-15 mmol/l p-value 0,05-0,5 mmol/l minus m-value
TH 2005, TH 2025, TH 2100, TH 2250, TC 2050, TC 2100, TM 2005, TP 2010, TP 2100	TH 2005, TH 2025, TH 2100, TH 2250, TC 2050, TC 2100, TM 2005, TP 2010, TP 2100	TH 2005, TH 2025, TH 2100, TH 2250, TC 2050, TC 2100, TM 2005, TP 2010, TP 2100
• Offering all the benefits of the Testomat 2000® in addition: • monitoring of two different measuring points with different indicator types, e.g. water hardness with different measurement ranges or water hardness and carbonate hardness • automatic switching between measuring points • one input available for limiting measuring point 1	• Offering all the benefits of the Testomat 2000® DUO in addition: • Chinese menu navigation for the Asian market	• Offering all the benefits of the Testomat 2000® in addition: • Chinese menu navigation for the Asian market
• use in two circuits with different hardnesses • measurement of inlet and outlet hardness	• use in two circuits with different hardnesses • measurement of inlet and outlet hardness	• the same areas of application such as Testomat 2000®
IP65 / I	IP65 / I	IP65 / I
230–240 VAC, 115 VAC, 24 VAC all 50–60Hz	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz
max. 30 VA	max. 30 VA	max. 30 VA
approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)
approx. 20.9 lbs (9.5 kg)	approx. 20.9 lbs (9.5 kg)	approx. 20.9 lbs (9.5 kg)
14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)
German, English, French, Italian, Polish	Mandarin and English	Mandarin and English

	24V	115 V	230 V
German	100290	100295	100300
English	100291	100296	100301
French	100292	100297	100302
Italian	100293	100298	100303
Polish	100294	100299	100304

	24V	115 V	230 V
Mandarin	110219	110220	110221

	230 V
Mandarin incl. SD card data logger	110212
Mandarin without SD card data logger	110215

Product	Testomat 2000® THCL	Testomat 2000® CLO2
		
Description	automatic online analysis unit for determining total chlorine and water hardness	automatic online analysis unit for determining chlorine dioxide content
Parameters	total chlorine water hardness	chlorine dioxide ClO_2
Measuring range (resolution)	0,00-0,99 mg/l (0,01) } total chlorine 1,0-2,5 mg/l (0,1) } 0,25-2,5°dH (0,05) water hardness	0,00-1,88 mg/l (0,02) 1,9-4,7 mg/l (0,2)
Indicators Limit values on page 48	TH 2025, CL 2250 A, CL 2250 B, CL 2250 C	CLO2 reagent set A and B
Performance profile	• Offering all the benefits of the Testomat 2000® in addition: • combination of total chlorine and hardness measuring instrument	• Offering all the benefits of the Testomat 2000® in addition: • the analysis result is displayed after a reaction time of approx. one minute
Application	• medical technology (dialysis) • corrosion protection • protection for reverse osmosis membranes • monitoring of softener and chlorination systems for drinking water or swimming pools	• disinfectant monitoring for drinking water and process water
Protection type/class	IP65 / I	IP65 / I
Supply voltage	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz
Power consumption	max. 30 VA	max. 30 VA
Dimensions	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)
Weight	approx. 20.9 lbs (9.5 kg)	approx. 20.9 lbs (9.5 kg)
Operating pressure	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)
Menu languages	German, English, French	German, English, French

Order numbers

	24V	115 V	230 V	24V	115 V	230 V
German	100270	100275	100280	100500	100505	100510
English	100271	100276	100281	100501	100506	100511
French	100272	100277	100282	100502	100507	100512

	Testomat 2000® CLF	Testomat 2000® CLT	Testomat 2000® CLT self clean
			
	automatic online analysis unit for determining chlorine content	automatic online analysis unit for determining chlorine content	automatic online analysis unit for determining chlorine content with cleaning function for difficult water
	free chlorine	total chlorine or free chlorine	total chlorine
	0,00-0,99 mg/l (0,01) 1,0-2,5 mg/l (0,1)	total chlorine or 0,00-0,99 mg/l 1,0-2,5 mg/l free chlorine 0,00-0,99 mg/l 1,0-2,5 mg/l	0,00-0,99 mg/l (0,01) 1,0-2,5 mg/l (0,1)
	CL 2250 A, CL 2250 B	CL 2250 A, CL 2250 B, CL 2250 C	CL 2250 A, CL 2250 B, CL 2250 C
	• Offering all the benefits of the Testomat 2000® in addition: • the analysis result is displayed after a reaction time of approx. one minute	• Offering all the benefits of the Testomat 2000® in addition: • the analysis result is displayed after a reaction time of approx. one minute • can be converted for CLF (free chlorine)	• Offering all the benefits of the Testomat 2000® in addition: • the analysis result is displayed after a reaction time of approx. one minute • with dosing pump for dosing our cleaning agent for cleaning the measuring chamber after analysis (see page 39)
	• monitoring of chlorination systems for drinking water/swimming pool water • protection for reverse osmosis membranes • monitoring of biocides and conditioning agents containing chlorine	• monitoring of chlorination systems for drinking water/swimming pool water • protection for reverse osmosis membranes • monitoring of biocides and conditioning agents containing chlorine	• disinfectant monitoring for drinking water and process water • medical technology (dialysis)
	IP65 / I	IP65 / I	IP65 / I
	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz
	max. 30 VA	max. 30 VA	max. 30 VA
	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)
	approx. 20.9 lbs (9.5 kg)	approx. 20.9 lbs (9.5 kg)	approx. 20.9 lbs (9.5 kg)
	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)
	German, English, French,	German, English, French,	German, English, French

	24V	115 V	230 V	24V	115 V	230 V	24V	115 V	230 V
German	100230	100235	100240	100130	100135	100140	upon request	upon request	100245
English	100231	100236	100241	100131	100136	100141	upon request	100256	100246
French	100232	100237	100242	100132	100137	100142	upon request	upon request	100247

Product	Testomat 2000® Br	Testomat 2000® CrVI Testomat 2000® CrVI 0-5ppm
		
Description	automatic online analysis unit for determining bromine content	automatic online analysis unit for determining chromate or chromium VI content
Parameters	bromine Br_2	chromate (CrO_4^{2-}) or chromium VI (CrVI)
Measuring range (resolution)	0,00-2.23 mg/l and 2.3-5.6 mg/l	Type: CrVI — Chromate: 0,00 - 0,99 / 1,0-2,0 — Chromium: 0,00 - 0,99 — resol.: 0,01 / 0,1 Type: CrVI 0-5ppm — Chromate: 0,0-4,0 / 4,00 - 5,00 — Chromium: 0,00 - 11,15 — resol.: 0,1 / 0,25
Indicators Limit values on page 48	bromine reagent set	CrVI 2100 A, CrVI 2100 B
Performance profile	• Offering all the benefits of the Testomat 2000® in addition: • the analysis result is displayed after a reaction time of approx. one minute	• Offering all the benefits of the Testomat 2000® in addition: • the analysis result is displayed after a reaction time of approx. 2 to 3 minutes
Application	• monitoring the dosing of disinfectant	• monitoring of chromate content waste water in galvanization plants • control of waste water in the metalworking industry Application example on page 11
Protection type/class	IP65 / I	IP65 / I
Supply voltage	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz
Power consumption	max. 30 VA	max. 30 VA
Dimensions	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)
Weight	approx. 20.9 lbs (9.5 kg)	approx. 20.9 lbs (9.5 kg)
Operating pressure	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)
Menu languages	German, English, French	German, English, French,

Order numbers

	24V	115 V	230 V
German	100520	100525	100530
English	100521	100526	100531
French	100522	100527	100532

Type		24V	115 V	230 V
CrVI	German	100310	100315	100320
	English	100311	100316	100321
	French	100312	100317	100322
CrVI 0-5ppm	German	request	request	100640
	English	request	request	100641
	French	request	request	request

	Testomat 2000® Fe	Testomat 2000® PO4	Testomat 2000® Polymer
		 enhanced	
	automatic online analysis unit for determining iron content	automatic online analysis unit for determining phosphate content	automatic online analysis unit for determining polyacrylate content
	iron (Fe (I I), Fe (I I I))	phosphate PO_4	anionic polyacrylates
	0,00-0,65 mg/l and 0,7-1,0 mg/l	0,0 - 7,0 mg/l (0,1) 7,0 - 10,0 mg/l (0,25)	customer-specific, e.g. 0,0-50,0 mg/l
	FE 2005 A, FE 2005 B	PO4 reagent set 2100	It is neccessary to customize the Testomat 2000® Polymer because of the large amount of polyacrylats, which can be measured with this unit. Either use your existing reagents or use our polymer reagents.
	• Offering all the benefits of the Testomat 2000® in addition: • the analysis result is displayed after a reaction time of approx. 7 minutes	• Offering all the benefits of the Testomat 2000® in addition: • the analysis result is displayed after a reaction time of approx. 10 minutes • choose between the 500 ml bottles or the large reagent containers (20 and 5 litre containers)	• Offering all the benefits of the Testomat 2000® in addition: • the analysis result is displayed after a reaction time of approx. 7 minutes • scaling factor adjustable from 0.01 to 99,99 to accommodate the reagents used
	• monitoring of systems for removing iron from well water • controlling industrial or drinking water	• monitoring of process water • conditioning of production water • treated wastewater (sewage treatment plants, biogas plants) • online – environmental analysis Application example on page 10	• monitoring of conditioning agents in cooling and heating circuits
	IP65 / I	IP65 / I	IP65 / I
	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz
	max. 30 VA	max. 30 VA	max. 30 VA
	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)
	approx. 20.9 lbs (9.5 kg)	approx. 20.9 lbs (9.5 kg)	approx. 20.9 lbs (9.5 kg)
	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)
	German, English, French. Dutch, Italian, Polish	German, English, French, Dutch, Spanish	German, English, French

	24V	115 V	230 V	24V	115 V	230 V	24V	115 V	230 V
German	100150	100155	100160	100560	100565	100570	upon request	upon request	100470
English	100151	100156	100161	100561	100566	100571	upon request	100472	100473
French	100152	100157	100162	100562	100567	100572	upon request	upon request	100471
Italian	100153	100158	100163	—	—	—			
Polish	100154	100159	100164	—	—	—			
Dutch.	100186	100187	100188	100563	upon request	100573			
Spanish	—	—	—	100564	100568	upon request			

Product	Testomat 2000® SO3
	
Description	automatic online analysis unit for determining sulfite content
Parameters	sulfite SO_3^{2-}
Measuring range (resolution)	0,0-5 mg/l (0,1) 5 - 10 mg/l (0,5) 10-50 mg/l (1)
Indicators Limit values on page 48	Sulfite reagent A Sulfite reagent B
Performance profile	• Offering all the benefits of the Testomat 2000® in addition: • the analysis result is displayed after a reaction time of approx. 3 minutes
Application	• monitoring of boiler feed water in steam boiler systems (sulfite for oxygen binding) Application example on page 4
Protection type/class	IP65 / I
Supply voltage	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz
Power consumption	max. 30 VA
Dimensions	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)
Weight	approx. 9,5 kg
Operating pressure	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)
Menu languages	German, English

Order numbers

	24V	115 V	230 V
German	100350	100355	100360
English	100351	100356	100361

Product	Titromat® TH	Titromat® KH
		
Description	automatic titration unit for determining water hardness	automatic titration unit for determining carbonate hardness
Parameters	water hardness	carbonate hardness
Measuring range (resolution)	2,5-50,0 °dH (2,5)	5-150 °KH (5) 2-60 °KH (2)
Indicators Limit values on page 47	TH 2500 reagent A, TH 2500 reagent B	TC 2150 reagent A, TC 2150 reagent B
Performance profile	• Offering all the benefits of the Testomat 2000®	• Offering all the benefits of the Testomat 2000® • special for high hardness measuring ranges
Application	• drinking water production and supply, • raw water monitoring	• alkalinity of open coolant circuits
Protection type/class	IP65 / I	IP65 / I
Supply voltage	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz
Power consumption	max. 30 VA	max. 30 VA
Dimensions	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)
Weight	approx. 9,5 kg	approx. 9,5 kg
Operating pressure	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)
Menu languages	German, English, French	German, English, French

Order numbers

	24V	115 V	230 V	24V	115 V	230 V
German	110110	110115	110120	110190	110195	110200
English	110111	110116	110121	110191	110196	110201
French	110112	110117	110122	110192	110197	110202

	Titromat® M1	Titromat® M2
		
Description	automatic titration unit for determining carbonate hardness	automatic titration unit for determining carbonate hardness
Parameters	carbonate hardness (m-value)	carbonate hardness (m-value)
Measuring range (resolution)	0,05-1,00 °dH (0,025) 0,09-1,80 °f (0,045)	0,05-2,00 °dH (0,05) 0,09-3,60 °f (0,09)
Indicators Limit values on page 47	TC 2010 reagent A, TC 2010 reagent B	TC 2020 reagent A, TC 2020 reagent B
Performance profile	• Offering all the benefits of the Testomat 2000® • special for low hardness measuring ranges	• Offering all the benefits of the Testomat 2000® • special for low hardness measuring ranges
Application	• corrosion monitoring in boiler feed water, • residual alkalinity after decarbonization (e.g., breweries)	• corrosion monitoring in boiler feed water, • residual alkalinity after decarbonization (e.g., breweries)
Protection type/class	IP65 / I	IP65 / I
Supply voltage	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz
Power consumption	max. 30 VA	max. 30 VA
Dimensions	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)	approx. 15” x 18.9” x 11” 380 x 480 x 280 mm (W x H x D)
Weight	approx. 9,5 kg	approx. 9,5 kg
Operating pressure	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)	14.5 to 116 psi (1 to 8 bar) or 4.4 to 14.5 psi (0.3 to 1 bar)
Menu languages	German, English, French	German, English, French

Order numbers

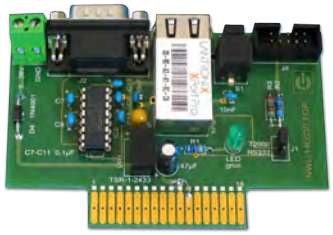
	24V	115 V	230 V	24V	115 V	230 V
German	110150	110155	110160	110130	110135	110140
English	110151	110156	110161	110131	110136	110141
French	110152	110157	110162	110132	110137	110142

Our Testomat devices have many uses in water analysis. This table will help you find the Testomat device suited to your needs.

	chlorination systems	decarbonization systems	iron removal systems	water softening systems	galvanization	boiler feed water	sewage treatment plants	cooling towers	medical technology	with dosing of antioxidants	with calibration function	with self-cleaning measuring chamber	osmosis systems	swimming pool	sterilisation/hospitals	drinking water supply	monitoring disinfectant dosing	monitoring chromate content	monitoring conditioning agents	monitoring two measuring points	water treatment	water blending
Testomat® 808	○	○	○	●	◐	◐	○	◐	○	○	○	○	●	◐	◐	◐	○	○	○	○	◐	◐
Testomat® 808 SiO2	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●	○	○	○	○	○	◐	○
Testomat ECO®	○	○	○	●	◐	◐	○	◐	○	○	○	○	◐	◐	◐	◐	○	○	○	○	◐	◐
Testomat® EVO TH	○	○	○	●	◐	◐	○	◐	○	○	○	○	◐	◐	◐	◐	○	○	○	○	◐	◐
Testomat® EVO TH CAL	○	○	○	●	◐	◐	○	◐	○	○	●	○	◐	◐	◐	◐	○	○	○	○	◐	◐
Testomat ECO® C	○	●	○	◐	◐	◐	○	◐	○	○	○	○	◐	●	○	◐	○	○	○	○	◐	◐
Testomat 2000®	○	◐	○	●	◐	●	○	◐	○	○	○	○	◐	◐	◐	◐	○	○	○	◐	◐	◐
Testomat 2000® Antox	○	◐	○	●	◐	◐	○	◐	○	●	○	○	◐	◐	○	◐	○	○	○	◐	◐	◐
Testomat 2000® BR	○	○	○	○	◐	○	○	○	○	○	○	○	○	○	○	◐	●	○	○	◐	◐	○
Testomat 2000® CAL	○	◐	○	●	◐	○	○	○	○	○	●	○	◐	○	◐	◐	○	○	○	◐	◐	◐
Testomat 2000® CLO2	●	○	○	○	○	○	○	◐	○	○	○	○	○	◐	○	●	●	○	○	◐	◐	○
Testomat 2000® CLF	●	○	○	○	○	○	○	○	○	○	○	○	○	◐	○	◐	●	○	○	◐	◐	○
Testomat 2000® CLT	●	○	○	○	○	○	○	◐	○	○	○	○	○	◐	○	◐	●	○	◐	◐	◐	○
Testomat 2000 CLT self clean®	●	○	○	○	○	○	○	◐	●	○	○	●	○	◐	○	◐	○	○	◐	◐	◐	○
Testomat 2000® CN	○	◐	○	●	◐	●	○	◐	○	○	○	○	◐	◐	◐	◐	○	○	○	◐	◐	◐
Testomat 2000® CrVI	○	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○	●	○	◐	◐	○
Testomat 2000® DUO	○	◐	○	●	◐	◐	○	◐	○	○	○	○	◐	◐	◐	◐	○	○	○	●	◐	◐
Testomat 2000® DUO CN	○	◐	○	●	◐	◐	○	◐	○	○	○	○	◐	◐	◐	◐	○	○	○	●	◐	◐
Testomat 2000® Fe	○	○	●	○	◐	◐	◐	○	○	○	○	○	◐	◐	○	●	○	○	○	◐	◐	○
Testomat 2000® PO4	○	○	○	○	○	◐	●	●	○	○	○	○	○	○	○	○	○	○	●	◐	◐	○
Testomat 2000® Polymer	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○	○	○	●	◐	◐	○
Testomat 2000® self clean	○	◐	○	●	◐	◐	○	◐	○	○	○	●	◐	◐	◐	◐	○	○	○	◐	◐	◐
Testomat 2000® SO3	○	○	○	○	◐	●	◐	◐	○	○	○	○	◐	○	○	○	○	○	○	◐	◐	○
Testomat 2000® THCL	◐	○	○	◐	○	○	○	○	○	○	○	○	●	◐	◐	●	◐	○	◐	●	◐	○
Testomat 2000® V	○	◐	○	●	◐	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◐	◐	●
Testomat® Modul TH	○	○	○	●	◐	◐	○	◐	○	○	○	○	◐	◐	◐	◐	○	○	○	○	◐	◐
Testomat® Modul CL/ NH2CL	●	○	○	○	○	○	○	◐	○	○	○	○	○	◐	○	◐	●	○	◐	◐	◐	○

● especially appropriate ◐ appropriate ○ not appropriate

Plug-in Cards	SK 910 current interface	RS 910 interface card	UK 910 voltage interface
			
Is used	for Testomat 2000® devices, Titromat	for Testomat 2000® devices, Titromat	for Testomat 2000® devices, Titromat
Order number	270305	270310	270315
Description	plug-in card current interface	RS232 plug-in card (serial interface)	plug-in card voltage interface
Technical data	• output current: 0–20mA or 4–20mA • maximum load: 500 Ohm • galvanic isolation	• for connecting a log printer or protocol converter (field bus, Ethernet, etc.)	• output voltage: 0/2–10V • galvanic isolation

	Network logger	Switching power supply board	SD card data logger
			
Is used	for Testomat 2000®	for Testomat® EVO	for Testomat 2000® devices, Titromat
Order number	100492	32394	100490
Description	Plug-in card with a 100 MBit network connection	Switching power supply unit for the power supply of Testomat® EVO devices	plug-in card for storing measurement results and error messages on an SD card
Technical data	• Web server, FTP server and built-in Flash storage • 8 MB Flash storage for 400,000 measurement values and notifications (around 5 years) • Generation of measurement and alarm data on a monthly basis • Files saved in “CSV” format and can be subsequently processed with Office packages.	• power supply 100-240 VAC / 100-350 VDC, 47-63 Hz	• now available for all Testomat 2000® and Titromat devices (after software update of older units) • including standard SD card up to 2GB • the data are available in CSV format and can be further processed or analyzed easily in a spreadsheet program

	USB data logger	OLED display module
		 New
Is used	for Testomat® 808	for Testomat® Moduls
Order number	100493	37764
Description	Data logger with USB connection	Plug-in card with OLED display for the measurement on Testomat modules
Technical data	• The data logger stores the measurement values via the 20mA port at regular intervals. Data can be accessed by the integrated USB port • sufficient storage capacity for 32,768 values. • comes complete with driver and applications • Cannot be used in the Testomat® 808 SIO2!	• Permanently plugged into the control board. • Measurement display only, no menu for programming. The unit is always programmed via the Service Monitor programme, which is stored on an SD card in the Testomat® module.

Accessories Testomat 2000® / 808	T2000 service case Variant 1
	
Is used	for Testomat® and Titromat® devices
Order number	270337
Description	Service case for regular maintenance of aTestomat 2000® device
Technical data	• 10 20x2 O-rings • 10 10.82x1.78 O-rings • 5 4.47x1.78 O-rings • 5 18x2 EPDM O-rings • 20 24x2 flat gaskets • 5 x filter screen for inlet, 19.5dx25 • 5 flow regulator cores • 2 springs for inlet • 10 stoppers for measuring chamber • 6 fuses, T 0.08A • 6 fuses, T 0.1 A • 6 fuses, T0.16 A • 6 fuses, T 0.2 A • 6 fuses, T 0.315 A • 6 fuses, T 1.0 A • 6 fuses, M4A • 20 30x3 sight glasses • 3 screw caps with T2000 insert • 4 M3x40 screws • 1 suction hose • 1 pressure hose • 6 different pipes • 1 cleaning brush set • 2 push-in angle joints • 2 magnetic stirring bars

	Repair and service case	
		
Is used for	Testomat® 808	Testomat® 808 SiO2
Order number	270342	270343
Description	Case for regular maintenance of a Testomat® 808 / 808 SiO2 and on-site service	
Technical data	• 8 3.68x1.78 O-rings • 8 1.78x1.78 O-rings • 8 4.5x1.5 O-rings • 8 24x2 flat gaskets • 1 pump head • 4 500ml inserts with screw cap • 1 100ml insert with screw cap • 1 cleaning brush set • 4 angle screw connectors • 6 fuses, T 0.1 A • 6 fuses, T 0.2 A • 6 fuses, T 1.0 A • 6 fuses, T4A • 6 30x3 sight glasses • 2 pipes, l = 53 mm • 2 pipes, l = 140 mm 1 SUB-D null modem cable • 1 USB serial adapter • 2 dosing needles • 4 hose adapters • 2 magnetic stirring bars • 8 M3x12 screws • 4 M3x40 screws • 1 magnetic valve • documentation/software (1) Testomat® 808 SiO2 differing: • 1 double pump head • 6 fuses T0.315A • 8 fuses T4A • 2 100ml insert with screw cap	

No longer included:
Optics board + LED holder
The optic set can be found on page 44.

	T2000 service case Variant 2
	
Is used	for Testomat® and Titromat® devices
Order number	270338
Description	Service case for regular maintenance of aTestomat 2000® device
Technical data	• 4 20x2 O-rings • 4 10.82x1.78 O-rings • 2 4.47x1.78 O-rings • 2 18x2 EPDM O-rings • 4 24x2 flat gaskets • 2 x filter screen for inlet, 19.5dx25 • 2 flow regulator cores • 2 springs for inlet • 6 stoppers for measuring chamber • 1x push-in connector for the drain hose • 2 fuses, T 0.08A • 2 fuses, T 0.1 A • 2 fuses, T0.16 A • 2 fuses, T 0.2 A • 2 fuses, T 0.315 A • 2 fuses, T 1.0 A • 2 fuses, M4A • 4 30x3 sight glasses • 3 screw caps with T2000 insert • 2 M3x40 screws • 2 suction hose • 2 pressure hose • 6 different pipes • 1 cleaning brush set • 2 push-in angle joints • 2 magnetic stirring bars • 2x valve set for dosing pump • 1x inlet connection • 1x screw-in connector G1/4“-6 • Angled plug-in connector G 1/8“

	Service set	Service set	1-Year service set
			
Is used	for Testomat® 808/808 SiO2	for Testomat 2000®, Testomat ECO®, EVO and Titromat®	for Testomat 2000®, Testomat ECO®, EVO, Modul TH and Titromat®
Order number	270351	270352	270360
Description	Set for regular maintenance	spare part kit for maintenance	small spare part kit for maintenance
Technical data	• 15 24x2 flat gaskets • 6 sight glasses • 6 3.68x1.78 O-rings • 6 4.5x1.5 O-rings • 6 1.78x1.78 O-rings • 1 pipe, l = 53 mm / 2“ • 1 pipe, l = 140 mm / 5.5“ • 1 cleaning brush set	• 1 T2000 gasket kit • 2 30x3 sight glass • 1 flow regulator cores • 3 stoppers for measuring chamber • 1 valve kit for injection pump • 1 filter screen for intake 19.5 d x 25 • 3 different pipes • 1 cleaning brush set	• 1 T2000 gasket kit 2 30x3 sight glass • 1 flow regulator cores • 3 stoppers for measuring chamber • 1 valve kit for injection pump • 1 filter screen for intake 19.5 d x 25

Accessories Testomat® / Titromat®	Service set Testomat® Modul TH	Service set Testomat 2000® Polymer	Service set Testomat 2000® PO4
	 New		
Is used	for Testomat® Modul TH/TH-R	for Testomat 2000® Polymer	for Testomat® PO4
Order number	270357	270353	270354
Description	spare part kit for maintenance of Testomat® Modul TH	spare part kit for maintenance of Polymer device and PeriClip pump	spare part kit for maintenance of PO4 device and PeriClip pump
Technical data	• 1 T2000 gasket kit • 2 30x3 sight glass • 1 flow regulator cores • 3 stoppers for measuring chamber • 2 x screw cap with insert for 500 ml bottle • 1 filter screen for intake 19.5 d x 25 • 5 different pipes • 1 cleaning brush set • 1 valve set for pump • 1 suction hose • 1 pressure hose	• 1 T2000 gasket kit • 2 30x3 sight glass • 1 flow regulator cores • 3 stoppers for m . chamber • 2 x pump head • 1 filter screen for intake • 3 different pipes • 1 cleaning brush set • 2 x tube connection • 2 x seal for tube connection • 2 x screw cap with insert	• 1 T2000 gasket kit • 2 30x3 sight glass • 1 flow regulator cores • 3 stoppers for m . chamber • 2 x pump head • 1 filter screen for intake • 3 different pipes • 1 cleaning brush set • 2 x tube connection • 2 x seal for tube connection • 2 x screw cap with insert

	Service set Testomat® Modul CL	Service set Testomat® EVO	
	 New	 New	
Is used	for Testomat® Modul CL and NH2CL	for Testomat® EVO TH and EVO TH CAL	
Order number	270356	270358	
Description	spare part kit for maintenance of Testomat® Modul CL and NH2CL	spare part kit for maintenance of Testomat® EVO TH and EVO TH CAL	
Technical data	• 1 T2000 gasket kit • 2 30x3 sight glass • 1 flow regulator cores • 3 stoppers for measuring chamber • 2 x screw cap with insert for 500 ml bottle • 1 filter screen for intake 19.5 d x 25 • 5 different pipes • 1 cleaning brush set • 1 pump head • 2 hose connection • 2 seal for hose adapter	• 1 T2000 gasket kit • 2 30x3 sight glass • 1 flow regulator cores • 3 stoppers for measuring chamber • 1 valve kit for injection pump • 1 filter screen for intake 19.5 d x 25 • 4 different pipes • 1 cleaning brush set	

Accessories Testomat 808/808 SiO2	Testomat 2000® connection kit	Connection set	Conversion kit for water connection
			
Is used	for Testomat 2000®, Testomat ECO®, EVO and Titromat®	for Testomat® 808	for Testomat® 808
Order number	040187	37610	37576
Description	connection kit with ball valve, pipes, and reducing pieces for the water connection	for the water connection	conversion kit for converting the water connection from Testomat® to BOB Testomat 808®
Technical data	• 5 m (16.4 ft) pipe, plastic PE 6/4x1, blue • 2 m (6.6 ft) drain hose, d=12 mm i • 1 ball valve, PPSV 011223W • 1 10-6 reducing connector • 1 3/8“-1/2“ reducing nipple	The kit consists of: • plastic hose, 6/4 x 1; length 5 m / 16.4 ft • 10 to 6 mm reducer • 3/8“a to 6 mm stopcock	The kit consists of: • plug connection G1/4“ DN6 • pipe, PE, D=6; length 5 m / 16.4 ft • screw-in connection G1/4“-6

	Conversion kit pump head	Conversion kit double pump head	SiO2 cartridge
			 New
Is used	for Testomat® 808 (up to device number 253060)	for Testomat® 808 SiO2	for Testomat® 808 SiO2
Order number	040363	040395	270344
Description	Conversion kit for replacing the old pump head (37578) in the new version (37562)	Conversion kit for replacing the old double pump head (37859) in the new version (37801)	Silicate filter for calibration after changing the double pump head
Technical data	• 1 x pump head Testomat 808 • 1 x shaft extension for pump head • 1 x spacer plate for pump head • 1 x screw M3x20 • 1 x screw M3x25 • 1 x threaded pin M3x3 • 1 x 1,5 mm hexagon socket wrench	• 1 x double pump head Testomat 808 SiO2 • 1 x shaft extension for pump head • 1 x spacer plate for pump head • 1 x screw M3x40 • 1 x screw M3x50 • 1 x threaded pin M3x3 • 1 x 1,5 mm hexagon socket wrench	• Filled with strongly alkaline anion exchanger • Following initial use it can be used for calibration 10 more times within one year • Rinse with 10 litres of demineralised water before each use • Store the cartridge in the dark at temperatures from 5 to 20°C

The current testomat® 808 2019 and Testomat® 808 SiO2 2019 devices do not require the conversion kit, as they are factory equipped with the new pump head.

Accessories Testomat® / Titromat®	Conversion kit for water inlet	Conversion kit for water connection USA	Conversion kit for 100ml-bottle
			
Is used	for Testomat 2000®, Testomat ECO®, EVO and Titromat®	for Testomat 2000®	for Testomat 2000®, Testomat ECO®, EVO and Titromat®
Order number	040123	40345	040143
Description	conversion kit for the water inlet for connecting a fabric hose	Conversion kit for converting water connections from 6 mm to 1/4”	for using 100 ml / 3.4 oz bottles instead of the 500 ml / 16.9 oz bottles included in the delivery
Technical data	• 1/4“ quick-connect plug • 1/4“ quick-connect coupling to hose with d = 6 mm i • lock on the hose side	• Reducing adaptor from 6 mm to 1/4”	• 100 ml / 3.4 oz bottle • used for screw cap with suction tube for 100 ml / 3.4 oz bottle • screw cap GL32 hole

	Tool kit	Pressure regulator	Suction lance PO4
			
Is used	for all Testomat and Titromat devices	for Testomat® 808	for Testomat 2000®
Order number	040138	37602	suction lance (20 l container) 40535 suction lance (5 l container) 40536
Description	tool kit for maintenance work on Testomat 2000®	the pressure regulator is used for pressures over 4 bar / 58 psi	long suction lances for large reagent containers
Technical data	• 1 Torx TX20 20x100 screwdriver • 1 Torx TX10 10x80 screwdriver • 1 Torx TX8 8x60 screwdriver	• max. inlet pressure 8 bar/116 psi • ambient temp. 0–50°C / 32-122°F • manometer connection, G1/8 on both sides • non-reversible • Particularly suitable for permeate and deionised water	• suction lances with different lenghts for 20-litre containers and 5-litre containers

Accessories Testomat 2000® / 808	small aerator R	Candle filter	
			
Is used	for Testomat 2000®/Testomat ECO®, EVO, 808	for Testomat® 808	
Order number	130010	candle filter 37583 filter insert 37584	
Description	small aerator to reduce CO_2 content	candle filter with filter insert for filtering sample water before analysis	
Technical data	• max. 12 l/h of water throughput when reducing the free carbon dioxide from max. 200 mg/l to under 20 mg/l • dimensions (W x H x D): 150 x 500 x 100 mm 5.9“ x 19.7“ x 3.9“ • line voltage:230 V/50 Hz • Installation 3 m above device	• max. pressure: 10 bar/145 psi • max. temperature: 50°C/122°F • filter fineness: 100 µm • 1/4“ inlet/outlet	

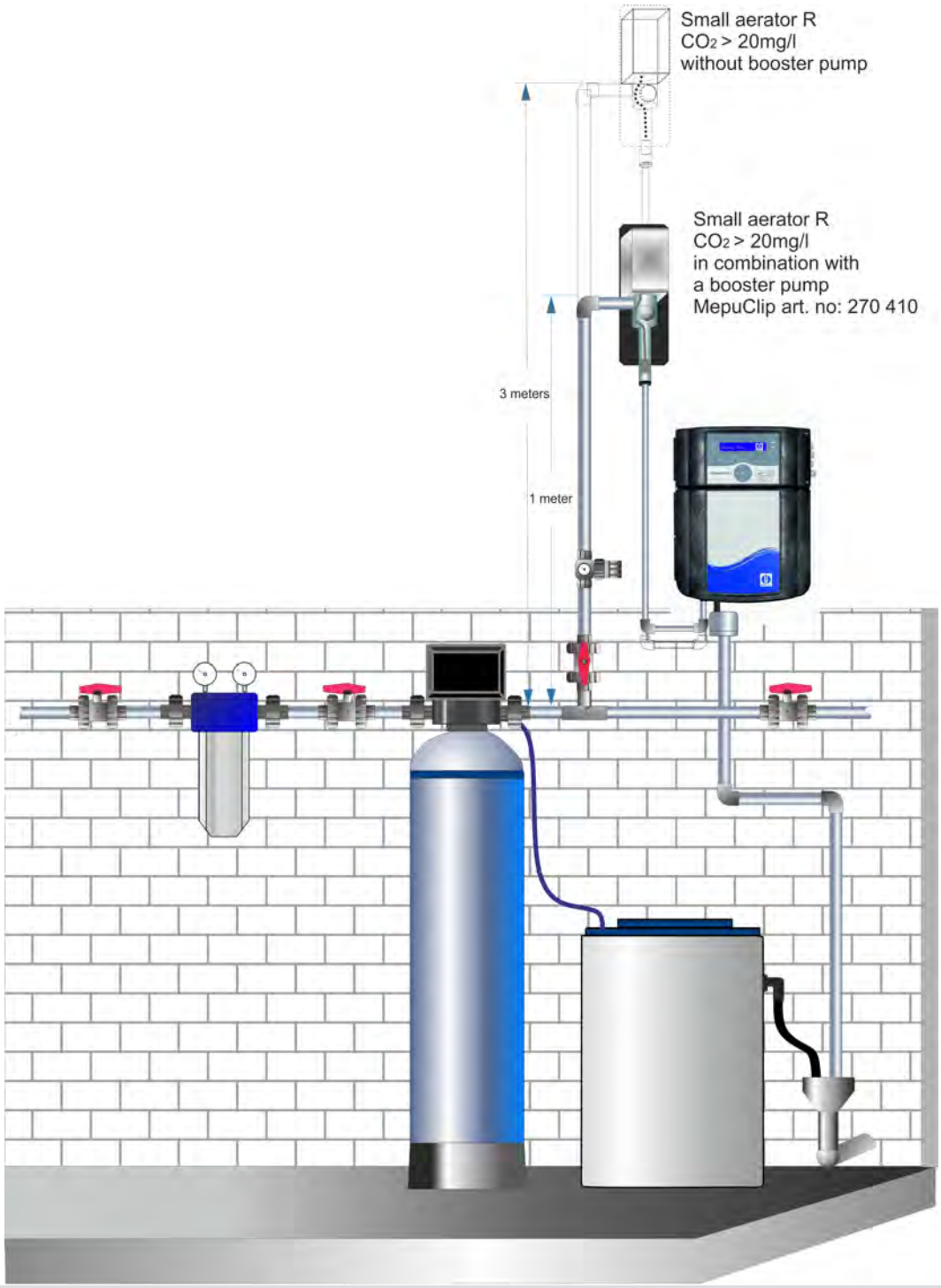
Example for assembly of aerator type R

The water intake connection of the small aerator can withstand a maximum of six bar. The water outlet from the small aerator is unpressurised. Therefore, the small aerator must be slotted in ahead of the Testomat device at least 3 m / 9,8 ft (0.3 bar / 4,35 psi) above the Testomat device.

During operation within a pressure range from 0.3 to 1 bar / 4,35 - 14,5 psi, or when supplied via a booster pump, please remove the valve body from the controller and filter housing of the Testomat device (see operating instructions for the Testomat device).

For installation heights lower than 3 m / 9,8 ft, use our booster pump MepuClip® in the Testomat 2000® or Testomat® EVO TH.

Testomat® ECO and Testomat® 808 cannot be fitted with the MepuClip® booster pump.



	Article no. of the measuring chamber holder							
	DUO 40370	DUO 40371	Trio 40372	Quad 40373	DUO 40375	DUO 40379	DUO 40382	DUO 37856
Testomat 2000® Antox	X							
Testomat 2000® Br		X						
Testomat 2000® CLF		X						
Testomat 2000® CLT			X					
Testomat 2000® CLT self clean				X				
Testomat 2000® CLO2		X						
Testomat 2000® CN DUO	X							
Testomat 2000® Cr VI		X						
Testomat 2000® Cr VI 0-5ppm						X		
Testomat 2000® DUO	X							
Testomat 2000® Fe		X						
Testomat 2000® Polymer		X						
Testomat 2000® PO4							X	
Testomat 2000® self clean	X							
Testomat 2000® SO3					X			
Testomat 2000 THCl®				X				
Testomat® Modul CL								X
Testomat® Modul NH2CL								X
Titromat M1	X							
Titromat M2	X							
Titromat KH	X							
Titromat TH	X							

Spare parts Testomat®	Bottle connection/ suction device	Device spare parts
		 
Is used	for Testomat 2000®, Testomat ECO®, EVO and Titromat®	for Testomat 2000® /Testomat ECO® and Titromat®
Order number	screw cap with T2000 insert for 500 ml bottle 040131 consists of: GL32 screw cap — hole 040130 insert for screw cap with suction pipe 040135	cable feedthrough, 5-7 040190 cable feedthrough, 7-10 040191 T2000 mains switch 040197 cover for mains switch 040198 ribbon cable, 10-pole, with ferrite 031713 ribbon cable, 26-pole, with ferrite 040096 loom 2V, complete (for valves) 040060 loom 2P, complete (for max two dosing pumps) 040062 loom for main switch complete 040200 fuse T 0.08 A 031596 fuse T 0.315 A 031585 fuse T 0.1 A 031595 fuse T 0.16 A 031622 fuse T 1.0 A 031592 fuse M4 A 031582 drain funnel T2000 040315

	PMMA sight glasses	Sight glasses for shortened measurement section
		 New
Is used	for Testomat® 808	for Testomat 2000® Cr VI 0-5ppm, Testomat 2000® PO4, Testomat® Modul CL/NH2CL
Order number	37653	40244
Description	PMMA sight glasses are used when the silicate content in the measuring water exceeds 15 mg/l and prevent silicates clogging up the sight glasses. The kit consists of: • 2 24x2 flat gaskets • 2 sight glasses	The sight glasses are designed for use in the measuring chamber with a shortened measurement section.

Spare parts Testomat® / Titromat®	Pressure regulator	Measuring chamber	Measuring chamber holder
			
Is used	for Testomat 2000®, Testomat ECO®, EVO, Modul, Titromat®	for Testomat 2000®, ECO®, EVO, Modul TH, Titromat®	for Testomat 2000®, Testomat ECO®, EVO, Modul TH, Titromat®
Order number	regulator/filter holder, complete 040125 consists of: regulator/filter holder 040120 regulator stopper T2000, complete 040129 flow regulator core (1–8 bar/14.5-87 psi) 011225 holding pin for regulator stopper 011230 filter screen for inlet 011217 spring for inlet 011218 inlet connector G ¼“ - 6 screw-in connector 040121 040153	measuring chamber, complete 040022 consists of: 30x3 sight glass pane with gasket 040173 30x3 sight glass pane 040170 sight glass holder 040176 M 3x40 screw 033253 TL 800-7-1 tenterhook 040032 plate stopper 24x2 011210 flat gasket 033777 sight glass holder set with 2 screws 040510 (2 sight glass holders and 2 M3x40 screws)	measuring chamber holder, complete (without valves) 040029 and accessories: magnetic rod 040050 plug connection for drain hose 040186 magnet valve, 2/2-ways 040018 pin for chamber holder, 5x60 mm 040181 *For further article numbers for DUO , TRIO, and QUAD measuring chamber holders, see pageSeite 41*

	Measuring chamber with double glazing	Measuring chamber with shortened measurement section	Gear motor
			
Is used	for Testomat 2000® and Testomat® 808	for Testomat 2000® Cr VI 0-5ppm, Testomat 2000® PO4, Testomat® Modul CL/NH2CL	for Testomat® 808 / 808 SiO2
Order number	Measuring chamber for Testomat 2000® 40559 Measuring chamber for Testomat® 808 37863 for both: sight-glass window 30x1,6 37833 sight-glass window holder 37806 seal 37808	40378	gear motor 12 V DC for the dosing pump of Testomat® 808 with installation guide 100494 for Testomat 2000® gear motor 12 V DC for the dosing pump PeriClip 39906
Description	The measuring chamber with double glazing can be used in the event of strong temperature differences between air and test water. Problems caused by steaming up in a humid environment are thus prevented in many applications.	Special measuring chamber for some Testomat devices. Cannot be used in all Testomat® devices	

Spare parts Testomat® 808/808 SIO2

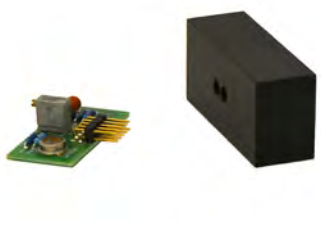
Is used for Testomat® 808 SiO2

Order number

magnet valve	37570
double pump head*	37859
fuse, T1,0A	31592
fuse, T0,315A	31585
fuse, T0,2A	31584
fuse, T0,1A	31595
fuse,GS-T, 5x20, T A4	31666
cable ducting M16 x 1,5	37734
Nut for cable ducting M16 x 1.5	37735
Blanking plug for cable ducting	37736

*New pump heads for the Testomat® 808-2019 and Testomat® 808 SiO2-2019 device generation. For older devices up to serial number 253060, the conversion kit on page 37 must also be used.

Devices spare parts Testomat® 808 SiO2



Is used for Testomat® 808 / 808 SiO2

Order number

Testomat® 808 - 2019: Full set with optics board and LED holder, 40393 synchronized by the factory	
Testomat® 808 SiO2 - 2019 Full set with optics board and LED holder, 40394 synchronized by the factory	
For older instruments: Testomat® 808: Full set with optics board and LED holder, 40364 synchronized by the factory	
Testomat® 808 SiO2 Full set with optics board and LED holder, 40365 synchronized by the factory	

Set optical board + LED socket

Is used for Testomat® 808 / 808 SiO2

Order number

24x2 flat gasket	33777
30x3 sight glass pane	40170
sight glass holde	40176
M3x40 screw, A2, DIN 965	33253
M3x12 screw	33246
T808 SiO2 measuring chamber, complete (1–4 bar/14.5-58 psi)	37784
T808 SiO2 measuring chamber, complete (0.3-1 bar/4.4-14.5 psi)	37785
magnetic rod	40050
G1/8“-6 screw-in angle joint	40157

Measuring chamber Testomat® 808 SiO2

Is used for Testomat® 808

Order number

magnet valve	37570
pump head*	37562
fuse, T1.0A	31592
fuse, T0.8A	31593
fuse, T0.2A	31594
fuse, T0.1A	31595
fuse, GS-T, 5x20, T A4	31666
cable ducting M16 x 1,5	37734
Nut for cable ducting M16 x 1.5	37735
Blanking plug for cable ducting	37736

Devices spare parts Testomat® 808

Is used for Testomat® 808

Order number

24x2 flat gasket	33777
30x3 sight glass pane	40170
sight glass holder	40176
M3x40 screw, A2, DIN 965	33253
T808 measuring chamber, complete (1-4 bar/14.5-58 psi)	37615
T808 measuring chamber, complete (0.3-1 bar/4.4-14.5 psi)	37616
magnetic rod, processed	40050
G1/8“-6 screw-in angle joint	40157

Measuring chamber

Is used for Testomat® 808 / 808 SiO2

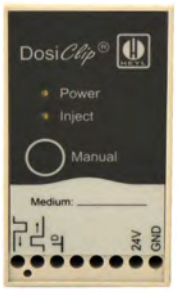
Order number

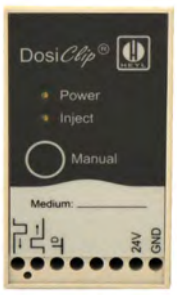
Testomat® 808: bottle insert with screw cap and suction tube, tube connection ø 2.4 mm	
500 ml bottle	37579
100 ml bottle	37580
hose adapter ø 2.4 mm	37538
Testomat® 808 SiO2: bottle insert with screw cap and suction tube, tube connection ø 3.5 mm	
500 ml bottle	37644
100 ml bottle	37645
hose adapter ø 3.5 mm	37643

Bottle connection/ suction device

Spare parts Testomat®	Device spare parts Testomat® EVO				Bottle connection/ suction device	
						
Is used	for Testomat® EVO TH				for Testomat 2000® Polymer/ Testomat 2000® PO4	
Order number	Cable ducting M16x1,5	37734	fuse GS-M 5x20E 4A MT	31582	screw cap with insert for 500 ml bottle	37644
	Nut for cable ducting M16x1,5	37735	fuse T0,315 A	31585	screw cap with insert for 100 ml bottle	37645
	Blanking plug for cable ducting	37736	fuse T0,16 A	31622		
	ribbon cable, 10-pole, with ferrite	31713	fuse T1,6 A	12140		
	loom 2V, complete (for valves)	40060	fuse T2,0 A	31655		
	loom 2P, complete (for max two dosing pumps)	40062	standard SD card 2 GB	37320		
			Lithium backup battery CR2032	31999		
			drain funnel	32187		

Device spare parts Testomat® Moduls					
					
			New		
Is used	for Testomat® Moduls TH/CL/NH2CL				
Order number	Cable ducting M16x1,5	37734	Pump head PeriClip SP	40362	Spare parts for the Testomat® BOB can only be supplied to a limited extent. Please contact your distributor if you need spare parts.
	Nut for cable ducting M16x1,5	37735	fuse GS-M 5x20E 2A MT	10843	
	Blanking plug for cable ducting	37736	standard SD card 2 GB	37320	
	Ribbon cable 2 x 7 pole	37832	Lithium backup battery CR2032	31999	
	loom 2V, complete (for valves)	40060	Cover	37798	
	loom 2P, complete (for max two dosing pumps)	40062			

Dosing pumps Testomat® / Titromat®	DOSIClip®	MEPUClip®	FLOWClip®
			
Is used as	dosing pump for Testomat devices	booster pump for Testomat 2000®/Titromat®	dosing pump for Testomat 2000® self clean
Order number	270470 as spare part 40001	270410	270440
Description	electromagnetically driven piston dosing pump for dosing aqueous media that are free of suspended matter	installation of the membrane pump is necessary for water inlet pressure under 0.3 bar	membrane pump for dosing cleaning agent into the measuring chamber also possible for other reagents
Technical data	• pump volume: 30 µl/stroke • max. suction height: approx. 0.5 m with water and 0.8 mm hose ID • max. pump pressure: approx. 1 bar /4.5 psi with water and 0.8 mm hose ID (max. 0.5 m length) • ambient temperature: 10–45°C / 50-113°F • mounting: on 35 mm / 1.4“ DIN top-hat rail	• Flow rate at atmospheric pressure : 0.6 l/min • Maximum suction head: 3m H_2O self-priming • ambient temperature: 10–45°C / 50-113°F • mounting: on 35 mm / 1.4“ DIN top-hat rail When a „Testomat® with pump“ is ordered, installation occurs at the factory.	• Flow rate at atmospheric pressure : 0.1 l/min • Maximum suction head: 3m H_2O self-priming • ambient temperature: 10–45°C / 50-113°F • mounting: on 35 mm / 1.4“ DIN top-hat rail

	PERIClip®	DOSIClip® Vi	
		 New	
	dosing pump for Testomat 2000® Polymer / PO4 / Modul CL/NH2CL	dosing pump for Titromat® and Testomat devices that measure carbonate hardness	
Order number	270430	270471	
Description	hose pump for aqueous media	electromagnetically driven piston dosing pump for dosing aqueous media that are free of suspended matter	
Technical data	• pump volume: 400–500 µl/min • ambient temperature: 10–45°C / 50-113°F • mounting: on 35 mm / 1.4“ DIN top-hat rail • dimensions: 75 x 45 x 110 mm (HxWxD) 3“ x 1,8“ x 4.3“	• as with DosiClip • for use with strongly acidic media	

Indicators/reagents
Together for the Heyl Well (Our second fundraising campaign with the Neven Subotic Foundation)

We at Gebrüder Heyl Analysentechnik GmbH & Co. KG take our social commitment very seriously, with a particular focus on supporting young people. But we want to do even more.

We firmly believe that our fundraising activities with the Neven Subotic Foundation make a positive contribution to people who, due to various factors, do not have it as easy as we do.

This is why we donate a small amount from every 500 ml bottle of Testomat® hardness indicator sold to provide people with clean drinking water. After all, water is our element and we want to contribute to ensuring that everybody has access to clean drinking water.

Our 2019 fundraising campaign for the Neven Subotic Foundation was successfully completed in early 2020. 10,086.60 euros were collected for the construction of the well.

Find out more about our fundraising campaign at: www.heylanalysis.de or scan the QR code.

Testomat 2000® indicators (500 ml bottle)

Indicator type	Unit °dH (resolution)	°f (resolution)	ppm $CaCO_3$ (resolution)	mmol/l (resolution)	Order number
TH 2005	0,05-0,50 (0,01)	0,09-0,89 (0,02)	0,89-8,93 (0,2)	0,01-0,09 (0,01)	152005
TH 2025	0,25-2,50 (0,05)	0,45-4,48 (0,10)	4,48-44,8 (0,9)	0,04-0,45 (0,01)	152025
TH 2050*	0,50-5,00 (0,10)	0,89-8,90 (0,10)	8,90-89,0 (0,1)	0,09-0,89 (0,10)	152050
TH 2100	1,00-10,00 (0,20)	1,79-17,9 (0,40)	17,9-179 (3,8)	0,18-1,79 (0,04)	152100
TH 2250	2,50-25,00 (0,50)	4,48-44,8 (1,00)	44,8-448 (10)	0,45-4,48 (0,10)	152250
TC 2050	0,50-5,00 (0,50)	0,90-8,96 (0,90)	8,9-89,5 (8,9)	0,18-1,79 (0,18)	153050
TC 2100	1,00-20,00 (1,00)	1,79-35,8 (1,79)	18-358 (18)	0,36-7,14 (0,36)	153100
TM 2005				0,05-0,50 (0,05)	154005
TP 2010				0,1-1,5 (0,10)	155010
TP 2100				1-15,0 (1,00)	155100

*Only for Testomat® EVO TH and Testomat® Modul TH/TH-R

Testomat 2000® indicators (100 ml bottle)

Indicator type	Unit °dH (resolution)	°f (resolution)	ppm $CaCO_3$ (resolution)	mmol/l (resolution)	Order number
TH 2005 (2 x 100 ml)	0,05-0,50 (0,01)	0,09-0,89 (0,02)	0,89-8,93 (0,2)	0,01-0,09 (0,01)	151005
TH 2025	0,25-2,50 (0,05)	0,45-4,48 (0,10)	4,48-44,8 (0,9)	0,04-0,45 (0,01)	151025
TH 2050*	0,50-5,00 (0,10)	0,89-8,90 (0,10)	8,90-89,0 (0,1)	0,09-0,89 (0,10)	152050
TH 2100	1,00-10,00 (0,20)	1,79-17,9 (0,40)	17,9-179 (3,8)	0,18-1,79 (0,04)	151100
TH 2250	2,50-25,00 (0,50)	4,48-44,8 (1,00)	44,8-448 (10)	0,45-4,48 (0,10)	152250

*Only for Testomat® EVO TH and Testomat® Modul TH/TH-R
Please note that a different bottle insert is required for the 100 ml from the insert included in the delivery. (T2000 conversion kit, art. no. 40143)

Testomat 2000® special solutions

Reagent type	Device	Order number
self clean cleaning solution (500 ml)	T 2000 self clean	151105
Antox solution (2 x 100 ml) for eliminating oxidant-related disruptions	T 2000 Antox	151107

Testomat 2000® reagents (500 ml bottle)

Reagent type	Parameters	for device	Measuring range [mg/l]	Order number	
CL 2250 A**	total chlorine + free chlorine	CL T + CL F	0-2,5	156230	
CL 2250 B**	total chlorine + free chlorine	CL T + CL F	0-2,5	156231	
CL 2250 C**	total chlorine	CL T	0-2,5	156232	
chlorine reagent set T*	total chlorine + free chlorine	CL T + CL F	0-2,5	156235	
chlorine reagent set T 50%*	total chlorine + free chlorine	CL T + CL F	0-2,5	156237	
chlorine reagent set F*	free chlorine	CL F	0-2,5	156233	
chlorine reagent set F 50%*	free chlorine	CL F	0-2,5	156236	new
Chlor reagent set T	total chlorine	Modul CL	0-5	156239	new
Chlor reagent set F	free chlorine	Modul CL	0-5	156234	
Chlor reagent set M	monochloramine	Modul NH2CL	0-5	156238	new
CLO2 reagent set A u. B*	chlorine dioxide	ClO_2	0-4,7	156265	
CrVI 2100 A	chromate CrO_4^{2-} or chromium VI	CrVI	0-5,0 0-1,0	156220	
CrVI 2100 B	chromate CrO_4^{2-} or chromium VI	CrVI	0-5,0 0-1,0	156221	
FE 2005 A	iron dissolved (I I) u. (I I I)	Fe	0-1,0	156250	
FE 2005 B	iron dissolved (I I) u. (I I I)	Fe	0-1,0	156251	
Sulfite reagent A	sulfite	SO_3^{2-}	0-50	156240	
Sulfite reagent B	sulfite	SO_3^{2-}	0-50	156241	
Brom reagent set*	bromine	Br	0-5,6	156295	
Polymer reagent A	polymer	Polymer	0-50	156271	
Polymer reagent B	polymer	Polymer	0-50	156272	
PO4 reagent set 2100	phosphate	PO_4	0-10	156264	
PO4 reagent 2100 A (20 litres)	phosphate	PO_4	0-10	156281	
PO4 reagent 2100 B (5 litres)	phosphate	PO_4	0-10	156282	

*The reagent sets are designed for the uniform consumption of reagents; the capacities of the individual reagent bottles are therefore not identical.
** Only reagents CL 2250 A and B are required for measuring free chlorine. All three reagents CL 2250 A, B and C are required for measuring total chlorine.

Titromat® reagents (500 ml bottle)

Reagent type	for	Parameters	Measuring range	Resolution	Order number
TH 2500 reagent A	TH	Water hardness	2,5-50 °dH	2,5 °dH	155160
TH 2500 reagent B	TH	Water hardness	2,5-50 °dH	2,5 °dH	155161
TC 2010 reagent A	M1	Carbonate hardness	0,05-1 °dH	0,025 °dH	155172
TC 2010 reagent B	M1	Carbonate hardness	0,05-1 °dH	0,025 °dH	155173
TC 2020 reagent A	M2	Carbonate hardness	0,05-2 °dH	0,05 °dH	155170
TC 2020 reagent B	M2	Carbonate hardness	0,05-2 °dH	0,05 °dH	155171
TC 2060 reagent A	KH	Carbonate hardness	2-60 °dH	2 °dH	155176
TC 2060 reagent B	KH	Carbonate hardness	2-60 °dH	2 °dH	155177
TC 2150 reagent A	KH	Carbonate hardness	5-150 °dH	5 °dH	155178
TC 2150 reagent B	KH	Carbonate hardness	5-150 °dH	5 °dH	155179

	Type	Limit value	Bottle	Order number	Packaging unit
808/F-BOB	300	0,02 °dH residual hardness	100 ml	140001	2 x 100 ml
	300S	0,05 °dH residual hardness	100 ml	140002	2 x 100 ml
	301	0,1 °dH residual hardness	100 ml	140003	2 x 100 ml
	302	0,2 °dH residual hardness	100 ml	140004	2 x 100 ml
	303	0,3 °dH residual hardness	100 ml	140005	2 x 100 ml
	305	0,5 °dH residual hardness	100 ml	140006	2 x 100 ml
	310	1 °dH residual hardness	100 ml	140007	2 x 100 ml
	320	2 °dH residual hardness	100 ml	140008	2 x 100 ml
	330	3 °dH residual hardness	100 ml	140009	2 x 100 ml
	350	5 °dH residual hardness	100 ml	140010	2 x 100 ml
C-BOB	C 5	0,5 °dH carbonate hardness	100 ml	140020	2 x 100 ml
	C 10	1 °dH carbonate hardness	100 ml	140021	2 x 100 ml
	C 15	1,5 °dH carbonate hardness	100 ml	140022	2 x 100 ml
	C 20	2 °dH carbonate hardness	100 ml	140023	2 x 100 ml
	C 30	3 °dH carbonate hardness	100 ml	140024	2 x 100 ml
	C 40	4 °dH carbonate hardness	100 ml	140025	2 x 100 ml
M-BOB	M 1	0,1 mmol/l minus m-value	100 ml	140040	2 x 100 ml
	M 3	0,3 mmol/l minus m-value	100 ml	140041	2 x 100 ml
	M 5	0,5 mmol/l minus m-value	100 ml	140042	2 x 100 ml
808/F-BOB	300	0,02 °dH residual hardness	500 ml	141001	500 ml
	300 S	0,05 °dH residual hardness	500 ml	141002	500 ml
	301	0,1 °dH residual hardness	500 ml	141003	500 ml
	302	0,2 °dH residual hardness	500 ml	141004	500 ml
	303	0,3 °dH residual hardness	500 ml	141005	500 ml
	305	0,5 °dH residual hardness	500 ml	141006	500 ml
	310	1 °dH residual hardness	500 ml	141007	500 ml
	320	2 °dH residual hardness	500 ml	141008	500 ml
	330	3 °dH residual hardness	500 ml	141009	500 ml
	350	5 °dH residual hardness	500 ml	141010	500 ml
C-BOB	C 5	0,5 °dH carbonate hardness	500 ml	141020	500 ml
	C 10	1 °dH carbonate hardness	500 ml	141021	500 ml
	C 15	1,5 °dH carbonate hardness	500 ml	141022	500 ml
	C 20	2 °dH carbonate hardness	500 ml	141023	500 ml
	C 30	3 °dH carbonate hardness	500 ml	141024	500 ml
	C 40	4 °dH carbonate hardness	500 ml	141025	500 ml
M-BOB	M 1	0,1 mmol/l minus m-value	500 ml	141040	500 ml
	M 3	0,3 mmol/l minus m-value	500 ml	141041	500 ml
	M 5	0,5 mmol/l minus m-value	500 ml	141042	500 ml
808 SiO2	A	0,3 - 1,2 ppm SiO2	500 ml	141808	500 ml
	B	0,3 - 1,2 ppm SiO2	500 ml	141809	500 ml
	reagent set A+B	0,3 - 1,2 ppm SiO2	100 ml	140808	100 ml

Product	Softmaster® ROE compact	Softmaster® ROE1
		
Description	Controller for reverse osmosis systems	Controller for reverse osmosis systems
Advantages	• multilingual menu navigation • large LCD with 2 lines x 16 characters and backlight • real-time clock • three potential-free relay outputs for pump, inlet valve and flushing valve • two potential-free relay outputs for measuring and error message output • 5 inputs: water deficiency message, concentrate monitoring, overpressure message, storage tank FULL / EMPTY, external motor protection switch, system stop	• variable multi-purpose body for control panel and wall installation • multilingual menu navigation • large blue LCD with 2 lines x 16 characters and backlight • error messages and operating mode displays are displayed alternately and stored in the error history • real-time clock • connection for conductivity probe with temperature sensor for permeate In addition, the following inputs and outputs: • 5 potential-free relay outputs: pump, inlet valve, flushing valve, dosing, and error message output • 5 inputs: water deficiency message, overpressure message motor protection, storage tank FULL /EMPTY, system stop • 12 V-power supply
Protection type/class	IP54 / I	IP65 / I
Mains connection	230–240V, 115V, 24V +/-10% 50–60Hz	230–240V, 115V, 24V +/-10% 50–60Hz
Power consumption	max. 9 VA	max. 9 VA
Dimensions	approx. 357 x 214 x 135 mm 14“ x 8.4“ x 5.3“ (W x H x D)	approx. 270 x 295 x 130 mm 10.6“ x 11.6“ x 5.1“(W x H x D) 262 x 146 mm / 10.3“ x 5.7“, +1 mm control panel cut-out approx. 90 mm / 3.5“ installation depth 270 x 155 mm / 10.6“ x 6.1“ front frame dimensions
Weight	approx. 1.6 kg / 3.5 lbs	approx. 2.3 kg / 5 lbs
Measuring range	0,1-50.000 µS/cm 0,01-5,0 cm^{-1} cell constant	0.1–50,000 µS/cm 0.01–5.0 cm^{-1} cell constant
Application	• reverse osmosis plants with 1 conductivity measurement	• reverse osmosis plants with 1 conductivity measurement Application example on page 5
Menu language	D, GB, F, I, NL, PL	D, GB, F, I, NL, PL

Order numbers

	24V	115 V	230 V	24V	115 V	230 V
attachable	601225	601226	601227	upon request	upon request	601102
with RS232				—	—	—
installable				upon request	upon request	601112
with RS232				—	—	—

Softmaster® ROE2	Softmaster® ROE2/S5	Softmaster® ROE3
		
Controller for reverse osmosis systems	Controller for reverse osmosis systems with programmable controller for water deficiency	Controller for reverse osmosis systems
like Softmaster® ROE1, but with the following inputs and outputs: • eight potential-free relay outputs for two pumps, programmable function output, inlet valve, outlet valve, flushing valve, by-pass valve, and error message output • output for metering pulse • eight inputs for concentrate monitoring, emergency operation (bypass) and external motor protection switch, water deficiency message, overpressure message, storage tank FULL /EMPTY, system stop • two inputs for water flow meter • 12 V power supply for water turbine • 4–20 mA input for a pressure transducer	like Softmaster® ROE2, but in addition: • programmable function for control for water deficiency. You determine how often and after how much time the system should be turned back on. • interval for restart after water deficiency message between 1 and 99 minutes can be selected	like Softmaster® ROE1, but with the following inputs and outputs: • eight potential-free relay outputs for two filters, service valves, two add-on programs, and error message, synchronizing contact • output for metering pulse • 12 V power supply for water turbine • inputs for 2 water flow meters • 8 inputs: water deficiency message, concentrate monitoring, overpressure message, storage tank FULL / EMPTY, external motor protection switch, system stop
IP65 / I	IP65 / I	IP65 / I
230–240V, 115V, 24V +/-10% 50–60Hz	230–240V, 115V, 24V +/-10% 50–60Hz	230–240V, 115V, 24V +/-10% 50–60Hz
max. 9 VA	max. 9 VA	max. 9 VA
approx. 270 x 295 x 130 mm 10.6“ x 11.6“ x 5.1“(W x H x D) 262 x 146 mm / 10.3“ x 5.7“, +1 mm control panel cut-out approx. 90 mm / 3.5“ installation depth 270 x 155 mm / 10.6“ x 6.1“ front frame dimensions	approx. 270 x 295 x 130 mm 10.6“ x 11.6“ x 5.1“(W x H x D) 262 x 146 mm / 10.3“ x 5.7“, +1 mm control panel cut-out approx. 90 mm / 3.5“ installation depth 270 x 155 mm / 10.6“ x 6.1“ front frame dimensions	approx. 270 x 295 x 130 mm 10.6“ x 11.6“ x 5.1“(W x H x D) 262 x 146 mm / 10.3“ x 5.7“, +1 mm control panel cut-out approx. 90 mm / 3.5“ installation depth 270 x 155 mm / 10.6“ x 6.1“ front frame dimensions
approx. 2.3 kg / 5 lbs	approx. 2.3 kg / 5 lbs	approx. 2.3 kg / 5 lbs
0,1-50.000 µS/cm 0,01-5,0 cm^{-1} cell constant	0,1-50.000 µS/cm 0,01-5,0 cm^{-1} cell constant	0,1-50.000 µS/cm 0,01-5,0 cm^{-1} cell constant
• reverse osmosis plants with 1 conductivity measurement	• reverse osmosis plants with 1 conductivity measurement	• reverse osmosis plants with second conductivity measurement for controlling an EDI module
D, GB, F, I, NL, PL	D, GB, F, I, NL, PL	D, GB, F, I, NL, PL

ROE2 24V	ROE2 115 V	ROE2 230 V	ROE2 230V/24 V	ROE2/S5 24V	ROE2/S5 115 V	ROE2/S5 230 V	ROE3 24V	ROE3 115 V	ROE3 230 V
request	request	request	request	—	—	upon request	upon request	upon request	upon request
request	request	request	request	—	—	—	upon request	upon request	603202
602010	request	602012	—	—	—	upon request	upon request	upon request	603012
602210	602211	602212	—	—	—	—	upon request	upon request	603212

Product	Softmaster® MMP1	Softmaster® MMP2
		
Description	Controller for water softening plants	Controller for water softening plants
Pluspunkte	• variable multi-purpose housing for control panel installation and wall installation • multilingual menu navigation • large blue LCD with 2 lines x 16 characters and backlight • error messages and operating mode displays are displayed alternately and stored in the error history • real-time clock • five potential-free relay outputs for two filters, service valves and error message, synchronizing contact • 12 V power supply for water turbine • 5 inputs: water flow meter, regeneration start/regeneration stop, salt and brine monitoring, and additional external program start • connection to various valves such as Autotrol, WWWS, Fleck, Siata	like Softmaster® MMP1, but with the following inputs and outputs: • eight potential-free relay outputs for two filters, service valves, two additional programs, and error message, synchronizing contact • output for metering pulse • 12 V power supply for water turbine • inputs for 2 water flow meters • 8 inputs: regenerationsstart/ regenerations-stop, brine level – empty/full, synchronous messages from valves, and error messages from Testomat instruments
Protection type/class	IP65 / I	IP65 / I
Mains connection	230–240V, 115V, 24V +/-10% 50–60Hz	230–240V, 115V, 24V +/-10% 50–60Hz
Power consumption	max. 9 VA	max. 9 VA
Dimensions	approx. 270 x 295 x 130 mm 10.6“ x 11.6“ x 5.1“ (W x H x D) 262 x 146 mm / 10.3“ x 5.7“, +1 mm control panel cut-out approx. 90 mm / 3.5“ installation depth 270 x 155 mm / 10.6“ x 6.1“ front frame dimensions	approx. 270 x 295 x 130 mm 10.6“ x 11.6“ x 5.1“ (W x H x D) 262 x 146 mm / 10.3“ x 5.7“, +1 mm control panel cut-out approx. 90 mm / 3.5“ installation depth 270 x 155 mm / 10.6“ x 6.1“ front frame dimensions
Weight	approx. 1.3 kg / 2.9 lbs	approx. 1.3 kg / 2.9 lbs
Measuring range	—	—
Application	• fully automatic regeneration of water softening systems • suitable for central control valves or pilot distributors, controlled via electrical toggle or pulse switch for single and double softening systems • quantity, time, or quality controlled activation of regeneration	• like Softmaster MMP1 in addition: • parallel and serial connection
Menu language	D, GB, F, I, NL, PL	D, GB, F, I, NL, PL

Order numbers

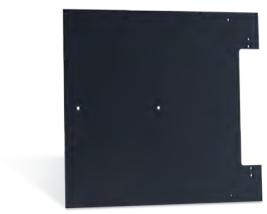
	24V	115 V	230 V	24V	115 V	230 V	230V/24V
attachable	610100	610101	610102	620000	620001	620002	620003
with RS232	—	—	—	620200	620201	620202	620203
installable	610110	610111	610112	620010	620011	620012	—
with RS232	—	—	—	620210	620211	620212	—

Product	Softmaster® MMP compact	MultiControl CT
		
Description	Controller for water softening systems	Controller for cooling systems
Advantages	• multilingual menu navigation • large LCD with 2 lines x 16 characters and backlight • error messages and operating mode displays are displayed alternately and stored in the error history • real-time clock • 4 non-potential-free relay outputs: 2 filters, service valves, and synchronous contact • one potential-free relay output for error message/additional program • 12 V power supply for water turbine • 5 inputs: water flow meter, regeneration start/regeneration stop, brine monitoring – empty and additional external program start • connection to various valves such as Autotrol, WWWS, Fleck, Siata	• LCD graphic display with background lighting • multi-language menu (DE, GB, FR, NL, PL, ES, TR) • relay outputs for attaching up to three pumps (dosing pump, circulation pump) • alarm output • inputs for external engine protection, water flow meter, biocide monitoring • two slots for conductivity probes and interface card • Error indicator on the display • error history for 20 notifications measurements and error notifications can be stored on SD card • ring buffer with 50 storage spaces • calibrating function for the conductivity probe • biocide metering dependent on time • 1 output for desalting valve (engine or magnet valve)
Protection type/class	IP65 / I	IP54 / I
Mains connection	230–240V, 115V, 24V +/-10% 50–60Hz	230VAC, 24VAC +/-10% 50–60Hz or 100-240VAC, 100-353 VDC (wide-range power supply)
Power consumption	max. 9 VA	max. 25 VA (without external load)
Dimensions	approx. 257 x 214 x 135 mm 10.1“ x 8.4“ x 5.3“ (W x H x D)	approx. 229 x 205 x 117 mm 8“ x 9“ x 4.6“ (W x H x D)
Weight	approx. 1.6 kg / 3.5 lbs	approx. 1,5 kg / 3.3 lbs
Measuring range	—	0-199,9 µS/cm bis 0-199,9 mS/cm (depending on cell constants)
Application	• fully automatic regeneration of water softening plants • suitable for central control valves or pilot distributors, controlled via electrical toggle or pulse switch for single and double softening systems • quantity, time, or quality controlled activation of regeneration	• Control of desalting and metering in cooling circuits Application example on page 7
Menu language	D, GB, F, I, NL, PL	D, GB, F, NL, PL, ES, TR

Order numbers

	24V	115 V	230 V
attachable	610225	610226	610227

	24 V	100-240V	230V
inductive/PH	341010	341020	341030
conductive/ PH	341070	341080	341090

Accessories Softmaster®	Adapter plate	RS232 interface	Current interface
			
Is used	for Softmaster® devices	for Softmaster® 2 devices	for Softmaster® 2 devices
Order number	130011	037259	037309
Description	With the help of the adapter plate, you can easily replace your old Heyl controller with a Softmaster® controller without drilling	plug-in card for one RS232 interface and one current interface	plug-in card for one current interface
Technical data	• The old holes can can be used for mounting the adapter plate. The Softmaster® device is then attached to the adapter plate. • dimensions (W x H x D): 264 x 280 x 8 mm 10.4“ x 11“ x 0.3“	• current output: 0–20mA • RS232 serial interface	• current output: • 0–20mA or 4–20mA • maximum load: 500 Ohm • galvanic isolation

Inductive conductivity probes	ADI plug-in card		
			
Is used	for MultiControl		
Order number	37342		
Technical data	Plug-in card Analog Digital Interface equipped with: • RS232 Interface • 2 x 20mA current output		

Accessories measuring instruments	pH combination electrodes	ESA screw-in fittings	pH-probe for measuring probe
			
Is used	for MultiControl, EcoControl pH to replace devices purchased prior to 05/2013.	for EMK 20 and EMK 50	for MultiControl, EcoControl pH
Order number	EMK 20 320301 EMK 50 320302	320310	310137
Technical data	• EMK 20: measuring range 1–12 pH temperature 0–80°C 32-176°F pressure 10 bar 145 psi • EMK 50 with PT 100: measuring range 0–14 pH temperature 0–135°C 32-275°F pressure 16 bar 232 psi	• stainless steel • max. medium temperature: 130°C / 266°F • connection: R ¾ external thread	• with PT 100 • measuring range 1–14 pH • temperature – 5 ...135°C (23 ... 275°F) • pressure 10 bar 145 psi

	Cable for combination electrode	Conductivity probe connection cables	pH probe connection cables
			
Is used	High-impedance coaxial cable, pre-made with screw and BNC connectors	Probe cable with STE5 cable socket	Probe cable with pH VarioPIN cable socket
Order number	KOAX 5 320320 KOAX 10 320321 KOAX/PT 5 320325 KOAX/PT 10 320326	310136	310138
Technical data	• KOAX 5: for EMF 20/RMK 20, length 5 m / 16.4 ft • KOAX 10: for EMK 20/RMK 20, length 10 m / 32.8 ft • KOAX/ PT 5: for EMF 50 with potential matching line, length 5 m / 16.4 ft • KOAX/ PT 10: for EMF 50 with potential matching line, length 10 m / 32.8 ft	• length 10 m / 32.8 ft • 4-lead for probes with PT 100 • with STE5 plug for conductivity probes	• length 10 m / 32.8 ft • 4-lead for probes with PT 100 • with VarioPin plug for pH probes

Conductive conductivity probes without temperature sensor

We also construct special versions of our probes for your specific application upon request.
All probes are suitable for applications up to 6 bar / 87 psi.

	Material	Cell constants [1/cm]	Maximum medium temp. [°C]	Connection design	Measuring range [µS/cm]	Order no.
Normal probes:						
SO 1	PVC-U	0,10	40	PVC union nut Rp 1¼	1-2000	310001
SO 5	PVC-U	0,50	40	PVC union nut Rp 1¼	5-10000	310003
SO 10	PVC-U	1,00	40	PVC union nut Rp 1¼	10-20000	310014
Screw-in probes:						
SOE 0	V4A steel	0,01	130	external thread R ¾	0,1-200	310005
SOE 1	V4A steel	0,10	130	external thread R ¾	1-2000	310002
SOE 5	V4A steel	0,50	130	external thread R ¾	5-10000	310004
Submersible probes:						
SEI 5	PVC-U	0,50	40	DN 20, connection cable 5 m	5-10000	310103

Conductive conductivity probes with temperature sensor

We also construct special versions of our probes for your specific application upon request.
All probes are suitable for applications up to 6 bar / 87 psi.

	Material	Cell constants [1/cm]	Maximum medium temp. [°C]	Connection design	Measuring range [µS/cm]	Order no.
Normal probes:						
ST 1 / PT 100	PVC-U	0,10	40	PVC union nut Rp 1¼	1-2000	310120
ST 5 / PT 100	PVC-U	0,50	40	PVC union nut Rp 1¼	5-10000	310121
Screw-in probes:						
STE 0 / PT 100	V4A steel	0,01	130	external thread R ¾	0,1-200	310110
STE 1 / PT 100	V4A steel	0,10	130	external thread R ¾	1-2000	310125
STE 5 / PT 100	V4A steel	0,50	130	external thread R ¾	5-10000	310126
STE 5 / PT 100 for measuring probe	V4A steel	0,50	130	Vario Pin	5-10000	310135
Submersible probes:						
SEI 5 / PT 100	PVC-U	0,50	40	DN 20, connection cable 5 m	5-10000	310131

PVP / PVH

Description	Pilot distributor with 4 switch settings • **PVH / PVH 4:** toggle switch for 8 bar (116 PSI) hydraulic pressure or 4.5 bar (65.3PSI) pneumatic pressure • **PVP / PVP 4:** toggle switch for 8 bar (116 PSI) pneumatic pressure • **PVH I / PVH I4:** pulse switch for 8 bar (116 PSI) hydraulic pressure or 4.5 bar (65.3 PSI) pneumatic pressure • **PVP I / PVP I4:** pulse switch for 8 bar (116 PSI) pneumatic pressure • without screw connections
Description	control of individual valves in automatic water treatment systems
Mains connection	230–240 V, 24 V +/-10% 50–60 Hz
Protection type/class	IP44 / I
Power consumption	max. 5 VA
Dimensions	approx. 125 x 120 x 210 mm 4.9“ x 4.7“ x 8.3“ (W x H x D)
Weight	approx 1.6 kg / 3.5 lbs
Ambient temperature	0–45 °C / 32-113 °F

Order numbers

Typ	**24V** valves, opened when depressu-rized	**24V** valves, closed when depressu-rized	**230V** valves, opened when depressu-rized	**230V** valves, closed when depressu-rized
PVH / PVH 4	250002	250004	250001	250003
PVP / PVP 4	250011	250013	250010	250012
PVH I / PVH I4	250006	250008	250005	250007
PVP I / PVP I4	250015	250017	250014	250016

	Program disc	**PVH/PVP screw connector**	**Seal for screw connector**
			
Is used	for pilot distributor	for pilot distributor	for pilot distributor
Order number	PV S1 250031 PV S2 250032 PV S8 250038 PV S9 250039	033900	033475
Description	PV S1 : additional disc and neutral contact for controlling a valve or a relay of a guard during the course of the program. PV S2 : like S1 but with two additional discs PV S3 : automatic return movement thanks to the upstream programming unit PV S9 : freely configurable program disc, e.g. for gravel filter systems	screw connector for pilot distributor (8 pieces required)	seal for screw connector (8 pieces required)

Limit value kits	DUROGNOST® I	DUROGNOST® SR 0	DUROGNOST® SR
			
Is used als	quick colorimetric determination of residual hardness	limit value test for quick determination of residual hardness	limit value test for quick determination of residual hardness
Order number	400050	400056	400055
Description	special indicator in powder form for quick colorimetric determination of minimum hardness traces in the range of 0–0.1°dH or 0–2 ppm $CaCO_3$ or 0,2 °f (French hardness) complete with measuring tube and spoon analyses: approx. 700 measuring time: approx. ½ minute	special liquid indicator in a dropper bottle for monitoring the residual hardness of softened water, adapted for limit values of 0.1 and 0.05 °dH. complete with measuring tube and stopper analyses: approx. 250 measuring time: approx. ½ minute	equipped like DUROGNOST® SR 0, but adapted for limit values of 0.5 and 0.25 °dH analyses: approx. 250 measuring time: approx. ½ minute

	DUROGNOST® SR 1	DUROGNOST® special buffer solution	
			A company logo on the supplement is free with purchase of more than 100 Duroval® or Durognost® articles.
Is used als	limit value test for quick determination of residual hardness	buffer solution for alkaline water samples	
Order number	400054	400016	
Description	equipped like DUROGNOST® SR0, but adapted to limit values of 1 and 0.5 °dH analyses: approx. 250 measuring time: approx. ½ minute	for buffering strongly alkaline water samples (pH over 10) for determining total and residual hardness with DUROGNOST® and DUROVAL® kits (8 ml dropper bottle) analyses: approx. 200	

Titration quick test kits	DUROVAL® 1 drop = 1 °dH	DUROVAL® 1 drop = 1 °f	DUROVAL® 1 Tr. = 10 ppm CaCO3
			
Is used as	titration kit for determining water hardness via complexometric titration	titration kit for determining water hardness via complexometric titration	titration kit for determining water hardness via complexometric titration
Order number	1 piece 400010 50 pieces 400110 neutral inlays without folding box 50 piece kit 400112 neutral inlays without folding box 50 pieces 400118 neutral inlays with folding box	1 piece 400011 50 pieces 400111 neutral inlays without folding box 50 piece kit 400113 neutral inlays without folding box 50 pieces 400119 neutral inlays with folding box	400012
Description	1 drop corresponds to 1 degree of German hardness analyses: approx. 30 (with an average hardness of 10 °dH).	1 drop corresponds to 1 degree of French hardness analyses: approx. 30 (with an average hardness of 10 °f)	1 drop corresponds to 10 ppm $CaCO_3$ analyses: approx. 30 (with an average hardness of 10 °f) approx. 30 (with an average hardness of 100 ppm $CaCO_3$)

	DUROVAL® 1 drop = 1 °KH	DUROVAL® 1 drop = 0,1 °dH	DUROVAL® AP
			
Is used as	titration kit for determining carbonate hardness via acidimetric titration	titration kit for determining water hardness via complexometric titration	titration kit for determining water hardness via complexometric titration
Order number	1 piece 400015 50 pieces 400120	400007	400021
Description	1 drop corresponds to 1 degree of carbonate hardness analyses: approx. 30 (with an average hardness of 10 °dH).	1 drop corresponds to 0.1 degree of German hardness analyses: approx. 30 (with an average hardness of 1 °dH).	• measuring tube • powder indicator • dosing pipette calibrated 0–30 °dH • 50 ml titration solution analyses: approx. 100 (with an average carbonate hardness of 15 °dH) measuring time: approx. 2 minutes measurement accuracy: 0.5 °dH

	DUROVAL® A	DUROVAL® A with pipette 0-60°f	DUROVAL AF
			
Is used as	titration kit for determining water hardness via complexometric titration	titration kit for determining water hardness via complexometric titration	titration kit for determining water hardness via complexometric titration
Order number	400020	400018	400022
Description	• measuring tube • liquid indicator • dosing pipette calibrated 0–30 °dH • 50 ml titration solution analyses: approx. 100 (with an average carbonate hardness of 15 °dH) measuring time: approx. 2 minutes measurement accuracy: 0.5 °dH	• measuring tube • powder indicator • dosing pipette calibrated 0–60 °f (French hardness) • 50 ml titration solution analyses: approx. 100 (with an average carbonate hardness of 26.7 °f) measuring time: approx. 2 minutes measurement accuracy: 1°f	• measuring tube • powder indicator • dosing pipette calibrated 0–30 °dH • 50 ml titration solution analyses: approx. 100 (with an average carbonate hardness of 15 °dH) measuring time: approx. 2 minutes measurement accuracy: 0.5 °dH

	DUROVAL® B	DUROVAL® BP	DUROVAL® BF
			
Is used as	titration kit for determining water hardness via complexometric titration	titration kit for determining water hardness via complexometric titration	titration kit for determining water hardness via complexometric titration
Order number	400030	400031	400032
Description	• measuring tube • liquid indicator • dosing pipette calibrated 0–2 °dH • 50 ml titration solution analyses: approx. 100 (with an average hardness of 1 °dH) measuring time: approx 2 minutes measurement accuracy: 0.05 °dH	• with measuring tube • powder indicator • dosing pipette calibrated 0–2 °dH • 50 ml titration solution analyses: approx. 100 (with an average hardness of 1 °dH) measuring time: approx 2 minutes measurement accuracy: 0.05 °dH	• with measuring tube • powder indicator • dosing pipette calibrated 0–60 °f (French hardness) • 50 ml titration solution analyses: approx. 100 (with an average hardness of 1.78 °f) measuring time: approx 2 minutes measurement accuracy: 0.1°f

Titration quick test kits	Water hardness DUO	DUROVAL® C	DUROVAL® CPM
			
Is used as	titration kit for determining water hardness	titration kit for determining carbonate hardness/m-value	kit for determining the carbonate hardness (m-value) and p-value
Order number	400005	400060	400065
Description	determining the hardness of raw water (0–30 °dH) and water after treatment (0–2 °dH) measuring range: 0 –30 °dH resolution: 0,5 °dH measuring range: 0–2 °dH resolution: 0,025 °dH complete with all reagents and accessories	acid capacity up to pH 4,3; $K_{S4,3}$ analyses: approx. 100 (with an average carbonate hardness of 10 °dH) measuring time: approx. 2 minutes measurement accuracy: 0.5 °dH/0.25 mmol/l complete with measuring tube, dosing pipette with calibration 0–20 °dH and 0–7 mmol/l, special connection stopper, indicator, and 50 ml titration solution	equipped like Duroval® C above, but with an additional p-value indicator m-value: acid capacity up to pH 4,3; $K_{S4,3}$ p-value: acid capacity up to pH 8,2; $K_{S8,2}$ measuring time: approx. 2 minutes measurement accuracy: 0.5 °dH/0.25 mmol/l

	DUROVAL® Chlorid	DUROVAL® CO2	DUROVAL® $K_{S\,4,3}$
			
Is used as	kit for determining the chloride content of water	test kit for the determination of free carbon dioxide in water via drop titration	titration kit for determining acid capacity up to pH 4.3
Order number	400090	400070	400067
Description	complete with all reagents and accessories analyses: approx 200 measuring time: approx. 2 minutes titration pipette: calibrated 0–300 mg/l Cl^- measurement accuracy: 10 mg/l Cl^-	complete with measuring tube, stopper. and three reagents analyses: approx. 200 (with an average concentration of 100 mg/l CO_2)	Acid capacity up to pH 4,3; $K_{S4,3}$ analyses: approx. 100 (with an average acid capacity of 1 mmol/l) measuring time: approx. 2 minutes resolution : 0.05 mmol/l complete with measuring tube, dosing pipette with calibration 0–2 mmol/l, special connection stopper, indicator, and 50 ml titration solution

	DUROVAL® $K_{B\ 8,2}$	DUROVAL® Sulfate	DUROVAL® TF
			
Is used as	titration kit for determining base capacity up to pH 8.2	kit for determining the sulfate content of water	industrial kit for water treatment plants
Order number	400077	400080	400042
Description	base capacity up to pH 8,2; $K_{B8,2}$ analyses: approx. 100 (with an average base capacity of 1 mmol/l) measuring time: approx. 2 minutes resolution : 0.05 mmol/l complete with measuring tube, dosing pipette with calibration 0–2 mmol/l, special connecti-on stopper, indicator, and 50 ml titration solution	complete with all reagents and accessories analyses: approx 30 titration pipette: calibrated 0–300 mg/l SO_4^{2-} measurement accuracy: 10 mg/l SO_4^{2-}	• measuring tube • powder indicator • dosing pipette calibrated 0–60 °f (French hardness) • 30 ml titration solution analyses: approx. 60 (with an average carbonate hardness of 26.7 °f)

	DUROVAL® TI	DUROVAL® TI with pipette 0-60 °f	DUROVAL® TP
			
Is used as	industrial kit for water treatment plants	industrial kit for water treatment plants	industrial kit for water treatment plants
Order number	400040	400038	400041
Description	• measuring tube • liquid indicator • dosing pipette calibrated 0–30 °dH • 30 ml titration solution analyses: approx. 60 (with an average carbonate hardness of 15 °dH)	• measuring tube • liquid indicator • dosing pipette calibrated 0–60 °f (French hardness) • 30 ml titration solution analyses: approx. 60 (with an average carbonate hardness of 26.7 °f)	• measuring tube • powder indicator • dosing pipette calibrated 0–30 °dH • 30 ml titration solution analyses: approx. 60 (with an average carbonate hardness of 15 °dH)

Titration quick test kits	KSS titration kit	Polyamine test kit	
			
Is used as	measuring kit for simple monitoring of cooling lubricant content	test kit for determining the polyamine concentration of circulating water	
Order number	400280	polyamine CCOH 400165 polyamine V 15/30 400166 polyamine K 26 400167 polyamine B42/C71 400168 polyamine A-853R 400169	
Description	complete with all reagents and accessories concentration range and accuracy are customerspecific	product-specific adaptation of the titration solution, complete with all reagents and accessories analyses: approx. 100 (with an average concentration of 30 mg/l) measuring time: approx. 3 minutes resolution: 1 mg/l	

	Polyamine reagents	Polyamine titration solution	Polyamine NI / NT refill pack
			
Is used as	reorder polyamine reagents	reorder polyamine titration liquid	polyamine NT refill package (reagents C and titration solution)
Order number	reagentien A 400185 (10 bottles with 8 ml) reagentien B 400186 (10 bottles with 8 ml) reagentien C 400187 (10 bottles with 50 ml)	Polyamine CCOH 400188 (10 bottles with 50 ml) Polyamine V 15/30 400189 (10 bottles with 50 ml) Polyamine K 26 400190 (10 bottles with 50 ml) Polyamine B42/C71 400191 (10 bottles with 50 ml) Polyamine A-853R 400192 (10 bottles with 50 ml)	Polyamine CCOH 400175 Polyamine V 15/30 400176 Polyamine K 26 400177 Polyamine B42/C71 400178 Polyamine A-853R 400179 polyamine NI refill pack reagents A+B 400170 can be used universally for all polyamine products

DUROVAL® refill pack

	Hardness grade	Quantity	Order number
DUROVAL® A titration solution	0–30 °dH (0–60 °f)	bottle with 50 ml 50 bottles with 50 ml	400023 400123
DUROVAL® B titration solution	0–2 °dH (0–4 °f)	bottle with 50 ml	400033
DUROVAL® TI titration solution	0–30 °dH (0–60 °f)	bottle with 25 ml	400043
DUROVAL® indicator fluid, 8 ml		liquid, 8 ml	400024
DUROVAL® indicator, 3 g (powder)		powder, 3 g	400025
DUROVAL® C titration solution		bottle with 50 ml	400061
DUROVAL® C indicator, 8 ml		bottle with 8 ml	400062
DUROVAL® P indicator, 8 ml		bottle with 8 ml	400066
DUROVAL® SO_4 ion exchanger			400081
DUROVAL® SO_4 reagent A		2 bottles with 50 ml each	400082
DUROVAL® SO_4 reagent B		bottle with 8 ml	400083
DUROVAL® SO_4 titration solution C		bottle with 50 ml	400084
DUROVAL® chloride reagent A + B		2 bottles with 17 ml each	400091
DUROVAL® chloride titration solution		2 bottles with 50 ml each	400092
DUROVAL® KS 4,3 indicator,		bottle with 8 ml	400068
DUROVAL® KS 4,3 titration solution		bottle with 50 ml	400069
DUROVAL® KB 8,2 indicator,		bottle with 8 ml	400078
DUROVAL® KB 8,2 titration solution		bottle with 50 ml	400079

Colorimetric test kits

	Testoval® ammonium	Testoval® aluminum	Testoval® chlorine DPD method 0,1-1 mg/l
			
Is used as	color comparison kit for the concentration range 0–10 mg/l NH_4^+	color comparison kit for the concentration range 0–1,5 mg/l Al	color comparison kit for concentration range 0.1–1 mg/l of free and total chlorine
Order number	410680	410650	410520
Description	individual values: 0.1–0.5–1–2.5–5–10 mg/l, complete with 3 reagents analyses: approx. 70 measuring time: approx. 4 minutes	individual values: 0–0,1–0,2–0,5–1–1,5 mg/l, by diluting the water sample 1:10 the measuring range can be extended to 10-times concentrations; complete with 2 reagents analyses: approx. 130 measuring time: approx. 6 minutes	individual values: 0,1–0,2–0,3–0,5–0,75–1 mg/l, complete with 3 reagents analyses: approx. 70 measuring time: approx. 1 minute

Colorimetric test kits	Testoval® chlorine DPD method 0,5-4 mg/l	Testoval® chloride	Testoval® chromate CrVI
			
Is used as	color comparison kit for concentration range 0.5–4 mg/l of free and total chlorine	color comparison kit for concentration range 0–100 mg/l Cl^-	color comparison kit for concentration range 0–5 mg/l Cr
Order number	411520	410526	410532
Description	individual values: 0,5–1–1,5–2–3–4 mg/l, complete with 3 reagents analyses: approx. 70 measuring time: approx. 1 minute	individual values: 1–5–10–25–50–100 mg/l, complete with 2 reagents analyses: approx. 40 measuring time: approx. 3 minutes	individual values: 0,1–0,25–0,5–1–2,5–5 mg/l, complete with 2 reagents analyses: approx. 180 measuring time: approx. 3 minutes

	Testoval® iron (II) + (III) dissolved, 0-1 mg/l	Testoval® iron (II) + (III) dissolved, 0-10 mg/l	Testoval® hydrazine
			
Is used as	color comparison kit for concentration range 0–1 mg/l of Fe	color comparison kit for concentration range 0–10 mg/l of Fe	color comparison kit for concentration range 0–1 mg/l N_2H_4
Order number	410547	410544	410556
Description	individual values: 0,05–0,1–0,25–0,5–0,75–1 mg/l, by diluting the water sample 1:10 the measuring range can be extended to 10-times concentrations; complete with 2 reagents analyses: approx. 100 measuring time: approx. 7 minutes	individual values: 0,25–0,5–1–2,5–5–10 mg/l, complete with 3 reagents analyses: approx. 60 measuring time: approx. 7 minutes	individual values: 0–0,05–0,1–0,25–0,5–1 mg/l, complete with reagent analyses: approx. 100 measuring time approx. 2 minutes

Colorimetric test kits	Testoval® copper	Testoval® manganese 0-0,5 mg/l	Testoval® manganese 0-20 mg/l
			
Is used as	color comparison kit for the concentration range 0–2 mg/l Cu	color comparison kit for the concentration range 0–0,5 mg/l Mn	color comparison kit for the concentration range 0–20 mg/l Mn
Order number	410562	410660	410568
Description	individual values: 0,1–0,25–0,5–1,0–1,5–2 mg/l, complete with reagent analyses: approx. 100 measuring time: approx. 2 minutes	individual values: 0,05–0,1–0,2–0,3–0,4–0,5 mg/l,complete with 3 reagents analyses: approx. 70 measuring time: approx. 17 minutes	individual values: 0,5–1–2,5–5–10–20 mg/l, complete with 2 reagents analyses: approx. 100 measuring time: approx. 1 minute

	Testoval® nitrite	Testoval® Phosphatest® (orthophosphate)	Testoval® pH chlorine DPD
			
Is used as	color comparison kit for the concentration range 0–1 mg/l NO_2^-	color comparison kit for the concentration range 0–10 mg/l P_2O_5	monitoring pH value and chlorine content in swimming pools
Order number	410690	410592	410601
Description	individual values: 0,05–0,1–0,2–0,3–0,5–1 mg/l, by diluting the water sample 1:10 the measuring range can be extended to 10-times concentrations; complete with reagent. analyses: approx. 100 measuring time: approx. 15 minutes	individual values: 0,25–0,5–1–2,5–5–10 mg/l, by diluting the water sample 1:10 the measuring range can be extended to 10-times concentrations; complete with 3 reagents. analyses: approx. 180 measuring time: approx. 5 minutes	individual values: pH 6,8–7, 4–8, Chlor 0,1–0,5–1 mg/l, complete with a set of reagents analyses: approx. 70 measuring time: approx. 3 minutes

	Testoval® pH value 5,5-8	Testoval® pH value 8-12	Testoval® dissolved silicate
			
Is used as	color comparison kit for pH range 5,5–8	color comparison kit for pH range 8–12	color comparison kit for the concentration range 0–10 mg/l SiO_2
Order number	410610	410616	410622
Description	individual values: 5,5–6–6,5–7–7,5–8, complete with reagent analyses: approx. 250 measuring time: approx. 1 minute	individual values: 8–8,5–9–10–11–12, complete with reagent analyses: approx. 250 measuring time: approx. 1 minute	individual values: 0.25–0.5–1.0–2.5–5–10 mg/l; by diluting the water sample 1:10 the measuring range can be extended to 10-times concentrations; complete with 4 reagents analyses: approx. 100 measuring time: approx. 19 minutes

	Testoval® sulfite		
			
Is used as	color comparison kit for the concentration range 0–20 mg/l SO_3^{2-}		
Order number	410634		
Description	individual values: 0,5–1–2,5–5–10–20 mg/l, complete with 2 reagents analyses: approx. 150 measuring time: approx. 3 minutes		

Testoval® refill pack



	Product	Order number
aluminum	1 set of reagents for approx. 130 analyses replacement color comparison device aluminum	410651 410652
ammonium	1 set of reagents for approx. 70 analyses replacement color comparison device ammonium	410681 410682
chlorine DPD method 0.1–1 mg/l	1 set of reagents for approx. 70 analyses replacement color comparison device chlorine DPD method 0.1–1 mg/l	410521 410522
chlorine DPD method 0,5-4 mg/l	1 set of reagents for approx. 70 analyses replacement color comparison device chlorine DPD method 0,5-4 mg/l	410521 410523
chloride	1 set of reagents for approx. 40 analyses replacement color comparison device chloride	410527 410528
chromate CrVI	1 set of reagents for approx. 70 analyses replacement color comparison device chromate CrVI	410533 410534
dissolved iron (II) + (III) 0-1 mg/l	1 set of reagents for approx. 100 analyses replacement color comparison device iron (II) + (III) 0-1 mg/l	410548 410549
dissolved iron (II) + (III) 0-10 mg/l	1 set of reagents for approx. 70 analyses replacement color comparison device, iron (II) + (III) 0-10 mg/l	410545 410546
hydrazine	1 set of reagents for approx. 100 analyses replacement color comparison device hydrazine	410557 410558
copper	1 set of reagents for approx. 100 analyses replacement color comparison device copper	410563 410564
manganese 0-0,5 mg/l	1 set of reagents for approx. 70 analyses replacement color comparison device manganese 0-0,5 mg/l	410661 410662
manganese 0-20 mg/l	1 set of reagents for approx. 100 analyses replacement color comparison device manganese 0-20 mg/l	410569 410570
nitrite	1 set of reagents for approx. 100 analyses replacement color comparison device nitrite	410691 410692
Phosphatest®	1 set of reagents for approx. 180 analyses replacement color comparison device Phosphatest®	410593 410594
pH-chlorine DPD	1 set of reagents for approx. 70 analyses replacement color comparison device pH-chlorine DPD	410602 410603
pH value 5,5-8	1 set of reagents for approx. 250 analyses replacement color comparison device pH value 5,5-8	410611 410612
pH value 8-12	1 set of reagents for approx. 250 analyses replacement color comparison device pH value 8-12	410617 410618
dissolved silicate	1 set of reagents for approx. 100 analyses replacement color comparison device silicate	410623 410624
sulfite	1 set of reagents for approx. 150 analyses replacement color comparison device sulfite	410635 410636
cuvettes	replacement cuvette for color comparison devices replacement cuvette for chloride color comparison device	410001 410529

Analysis kits	Standard analysis cabinet H	Standard analysis cabinet S	Analysis cabinet special version
			
Is used	for water analysis	for water analysis	for water analysis
Order number	410300	410305	410310
Description	• titration kits: 1 Duroval® A, 1 Duroval® B, 1 Duroval® CPM • Testoval® color comparison kits: 1 hydrazine, 1 phosphate, 1 pH value 8–12 • 1 aerometer, 1 100 ml measuring cylinder, 1 500 ml sampling container, 1 100 ml measuring cup, 1 funnel, 50 folding filters	• titration kits: 1 Duroval® A, 1 Duroval® B, 1 Duroval® CPM • Testoval® color comparison kits: 1 sulfite, 1 Phosphatest, 1 pH value 8–12 • 1 aerometer, 1 100 ml measuring cylinder, 1 500 ml sampling container, 1 100 ml measuring cup, 1 funnel, 50 folding filters	**Custom versions available upon request!** example: • titration kits: 1 Duroval® A, 1 Duroval® B, 1 Duroval® CPM • Testoval® color comparison kits: 1 sulfite, 1 Phosphatest • 1 Durognost® special buffer solution • 1 DIST 4 conductivity tester • 1 pHep+ pH tester • 1 100 ml measuring cylinder, 1 500 ml sampling container, 1 100 ml measuring cup, 1 funnel, 50 folding filters

	Boiler house analysis case	Analysis case special version	
			Other combinations of analysis cases and cabinets are possible upon request.
Is used	for water analysis in boiler houses	for water analysis in boiler houses	
Order number	410320	410360	
Description	• titration kits: 1 Duroval® A, 1 Duroval® B, 1 Duroval® CPM • Testoval® color comparison kits: 1 sulfite, 1 Phosphatest • 1 pHep + pH tester, 1 pH 7,01 buffer solution in pouch, 1 pH 10,01 buffer solution in pouch • 1 DiST 4 conductivity tester, 1 5000 µS/cm conductivity solution	**Custom versions available upon request!** example: • titration kits: 1 Duroval® A, 1 Duroval® B, 1 Duroval® CPM • Testoval® color comparison kits: 1 sulfite, 1 Phosphatest	

Product	Bioresin® BW 05
	
Is used als	special resin for protection against microbial contamination in softening plants in idle state
Order number	1 l Bioresin® BW 05 500002 10 l Bioresin® BW 05 500001 100 l Bioresin® BW 05 500006
Description	The disinfection effect of Bioresin® BW 05 is based on metallic silver, which has been firmly attached to the exchanger resin balls in a special procedure. Metallic silver is practically non-watersoluble. The smell and taste of the water are not affected. • effective against microbial recontamination of the resin at low flow rate and in idle state • does not negatively impact the disinfecting effect through backflushing and salting during filter regeneration, thus effective for a long time • existing systems can be retrofitted for use • no need for expensive dosing equipment to disinfect the filter material • no premature regeneration of the softening system with sodium chloride necessary for disinfection, thus environmentally friendly and economical • maintenance-free

Accessories Chemie

Product	Order number
measuring tube 1+ 5 + 10 ml	051010
connecting plug, white	051013
pipette, 0-60 polyamine	051101
pipette, 0-4,0 °f	051106
pipette, 0-30 Duroval chloride and sulphate	051109
pipette, 0-30 °dH	051110
pipette, 0-2 °dH	051112
pipette, 0-20 °dH 0-7 mmol/l	051114
pipette, 0-60 °f	051116
replacement cuvette for color comparison devices	410001
analysis cabinet, empty	410301
aerometer	410302
folding filters (pack of 50)	410303
100 ml measuring cylinder	410304
500 ml sampling container	410306
funnel	410307
100 ml measuring cup	410308

We handle the development, production, bottling and shipment of our reagents and analysis kits in house.

All our newly developed devices undergo thorough testing in the climatic chamber and test space. Upon customers request, we can also produce OEM devices featuring individual front foils.

Water is our element

Our environmental policy specifies the principles of conduct for environmental protection that we follow at Gebr. Heyl Analysentechnik GmbH & Co. KG. It is determined by the management and generally applicable.

As a commercial enterprise, we are part of a society and also part of the environment and the ecosystem. Consciousness of our responsibility to society, the environment, and the ecosystem is necessary for our children to be able to experience a happy, prosperous future.

As a commercial enterprise, we accept our special responsibility to preserve our natural world. We're convinced that it is necessary to ensure that the free resources of water, air, and earth, as well as flora and fauna, be handled sparingly.

Contract Development

We develop innovative, customized designs ourselves. But that's not all: We provide an appropriate housing design, prepare technical documentation, and obtain the necessary sales permissions and certificates. And if you would like, we also handle series production.

You choose between our two options:

1. From a „flash of inspiration" to the prototype – we develop the product you want according to your specifications

- We plan your product together and look for the best solution for you
- We develop the product according to your specifications
- We create prototypes
- We organize certificates (CE-marking, TÜV inspection, etc.)

2. Whether Softmaster®, MultiControl, or Testomat 2000® – we're happy to adapt our designs to your needs!

- We select the basic instrument corresponding to your needs together with you
- We design additional modules corresponding to your needs
- We develop software according to your specifications
- We create prototypes
- We organize certificates (CE-marking, TÜV inspection, etc.)

Brief overview of our contract development services

- Hardware and software development (analysis instruments, control and measuring devices, dosing pumps)
- Indicator and reagent development (e.g. water analysis)
- Test kit development
- Mechanics construction
- Material logistics
- Layout design
- Prototype fabrication
- Model series production
- Preparing operating instructions, instruction manuals, and safety data sheets
- Organizing desired or required certificates (e.g., CE-marking, TÜV inspection, etc.)
- Product maintenance
- Training

Development of new indicators in our chemical laboratory

We implement your idea!
We produce your product!

High quality, quick delivery times, customer orientation, and cooperative partnership are the foundations of our company, which operates in many countries. These maxims result in the continuous enhancement of our products and services and the continuous skill enhancement of our employees.

We attach great value to the reliability and durability of our products and have adapted the supply of spare parts to the long service lives of our instruments. In addition, we attach great value to multi-level 100% testing, only possible on the basis of small batch production. We test all assemblies separately before they are installed in our instruments and then subjected to a multi-day quality check in the instrument. Last but not least, we

develop and produce our own products in order to satisfy our own extremely high quality demands. Our mission includes consistently catering to our customers' needs and developing the best solution together with them!

Brief overview of our contract manufacturing services

We produce your product – in small batches too!

- Producing chemical formulations
- Filling into containers of any size
- Packaging
- Circuit board assembly
- Soldering
- Assembly
- Testing

We implement your idea!
You receive a final product from a single source:

- We optimize your product together and look for the best solution for you
- We look for the lowest-priced supplier
- We take care of purchasing all individual parts needed
- We coordinate cooperation with your partners
- We manufacture your product
- We subject the final product to extensive final checks
- We ship your finished product to the desired address in your name

All our newly developed devices undergo thorough testing in the climatic chamber and test space.
Upon customers request, we can also produce OEM devices featuring individual front foils.

Terms and Conditions of Gebrüder Heyl Analysentechnik GmbH & Co. KG

§ 1 Validity of the conditions

Our deliveries and services shall occur exclusively under these terms and conditions. At the same time, they are valid for all future business relations, even if they are not agreed expressly again. Customer‘s terms and conditions differing from them are not valid.

§ 2 Conclusion of a contract

(1) Our offers are non-binding. Technical changes as well as changes in shape, color, and/or weight within the scope of what is reasonable are reserved.

(2) Orders placed with us are binding offers which we can choose to accept within two weeks. Acceptance is declared either in writing or by delivery of goods to our customers.

(3) If customers place an order electronically, we shall immediately confirm receipt of the order. Receipt confirmation does not constitute a binding acceptance of the order, but can be combined with the declaration of acceptance. We shall store the contractual text and send it to the customer via e-mail together with these terms and conditions if requested.

(4) Conclusion of a contract occurs under reserve of the correct and timely delivery through our supplier, unless we are liable in the case of non-delivery, e.g. if a congruent hedging transaction has not been agreed with our supplier. We shall immediately inform the customer of any possible unavailability of the service and refund any service in return already received.

§ 3 Prices

(1) Our quotation prices are valid for 30 days after the quotation date, unless otherwise stated. In case of doubt, the prices specified in our confirmation of order are decisive.

(2) Our prices are valid, unless otherwise agreed, as net prices without cash discounts or any other allowances ex stock in Hildesheim, Germany, excluding packaging and shipping costs and plus the respective statutory VAT.

(3) If there is any change in labor costs, material costs, purchase conditions, etc. between the date of contract conclusion and the agreed and/or actual delivery date, we shall be entitled to adjust our prices accordingly and, if an agreement cannot be reached, to withdraw from the contract. This only applies for non-trade operators if the time between the date of contract conclusion and the delivery is more than four months.

(4) Our invoices are payable within 30 days of the delivery date with no deductions. In the event of default on payment, we are entitled, irrespective of the proof of greater damage caused by delay, to charge a higher default penalty interest at 8% points above the respective base rate.

(5) The off-setting of any counter-claims by the purchaser is permissible only if such counterclaims are undisputed or established in law. Purchasers can only exercise their right of retention if it is based on claims contained in this contract.

§ 4 Delivery

(1) Delivery and service delays due to instances of force majeure or circumstances which make delivery difficult or impossible – e.g. strike, lock-out, administrative regulations, natural disasters, business disruptions, power failure, etc. irrespective of whether we or our suppliers are affected by such circumstances – will exempt us from our contractual deadlines and obligations. We then have the right to postpone the delivery or the service for the period of the hindrance. If the delivery or service becomes impossible or unreasonable and this is not due to our fault, we shall be entitled to terminate the contract. In this case the customer has no right to make claims for damages.

(2) We shall be entitled to carry out partial deliveries and partial services.

§ 5 Transfer of risk

(1) The risk of accidental loss and accidental deterioration of the goods passes to the customer as soon as the consignment has been transferred to the freight carrier in the case of mail order purchase or other parties designated by the customer to carry out delivery. This applies irrespective of which party bears the transport costs.

(2) Goods will still be delivered even if the customer is delayed in accepting the delivery.

(3) We shall only take out transport insurance at the customer‘s request and expense.

§ 6 Warranty against defect

(1) We provide warranty for two years at our own discretion via fault rectification or replacement delivery. If the fault cannot be eliminated within an acceptable time period or if rectification or replacement delivery is to be considered as failed due to other reasons, customers can, according to their choice, demand a reduction or terminate the contract. Failure can only be assumed if sufficient opportunity has been provided to us to rectify the fault or to deliver a replacement without the desired aim being achieved, if fault rectification or replacement delivery is impossible, if we refuse to rectify the fault of deliver a replacement or unacceptably delay fault rectification or replacement delivery, if there is justified doubt regarding the prospect of success, or if they are considered unacceptable due to other reasons. Cancellation is impermissible on the grounds of minor faults. Wear parts (e.g. seals, moving parts, etc.) are only guaranteed for one year. For such parts, deterioration due to proper use does not constitute a fault, We assume no liability for faults that arise due to improper use, nor for faults arising because the original HEYL Testomat® indicator is not used exclusively.

(2) For a commercial transaction our customer must check that the goods conform to the contract immediately upon their receipt, immediately notify us in writing of any visible damages upon receipt of the goods, and notify us of any other defects immediately after their identification (§ 377 HGB); otherwise the goods are considered as accepted. Other business requires written notification of visible damage within two weeks upon receipt of the goods. The burden of proof of the fault, the time of its identification, and the timely receipt of the complaint rests with the customer.

(3) Contrary to the aforesaid rules of warranty, we only sell used items, except in the case of fraudulent intent, with the exclusion of any form of warranty. This does not affect warranty commitments.

(4) If customers decide to terminate the contract due to a fault after an unsuccessful rectification of faults, they are not entitled to an additional claim for damages due to this fault; the customer is obliged to return the goods. If customers make a claim for damages after an unsuccessful rectification of faults, the goods remain with the customers if this is reasonable for them. The claim for damages is then limited to the difference between the purchase price and the value of the faulty item. This is not valid if we have fraudulently attempted to violate the contract.

§ 7 Liability

(1) Our liability and the liability of our vicarious agents are hereby excluded for slight negligent breach of duty, provided that no contractual duties, damages to life, limb, or health, or agreed guarantees or claims in accordance with the German Product Liability Act are affected. In the case of violation of contractual duties our liability shall be limited to typical contractual losses which could have been reasonably foreseen.

(2) The period of limitation of one year applies for claims for damages against us which are not based on willful conduct attributable to us. This does not include suppliers‘ claims for recourse in accordance with section 478 of the BGB.

§ 8 Retention of title

(1) We retain the title to the goods until complete settlement of all claims against the customer that we are entitled to now or in the future.

(2) Our customers shall be entitled to process and resell the conditional goods in the ordinary course of business, provided that they are not in default. The pledging of goods or security transfers of ownership is not permissible. Claims resulting with respect to the conditional goods (including all balance claims from the current account) resulting from the resale or any other cause in law (insurance, unlawful act) shall now be assigned by the customer to us as security up to the amount of our claim. We hereby accept the transfer and authorize the customers to collect the claims assigned to us for their account in their own name. This authorization can only be revoked if our customers do not fulfill their payment oblig tions.

(3) Any adaptation and processing of the conditional goods by the customers shall always be carried out in our name and on our behalf. If processing occurs with goods which do not belong to us, we shall acquire co-ownership of the new goods in proportion to the value of the goods supplied by us to other processed goods. The same shall apply if the conditional goods are intermingled with other goods which do not belong to us.

(4) The customers shall keep our retention of title free of charge. They are obliged to take out insurance in a reasonable and usual scope. In the case of an intervention or seizure of the conditional goods by a third party – in particular by a marshal – our customers are obliged to indicate our ownership and to notify us without delay.

§ 9 Installation and maintenance

(1) If our customer asks us to carry out installation and maintenance work, which we do not carry out within the framework of our liability for defects, a separate contract for work and services comes into being. If not stated otherwise hereinafter these terms and conditions also apply for this contract for work and services. Payment takes place according to the respective valid prices for maintenance rates.

(2) A written estimate is required if our customer desires a binding quote. We are bound to this estimate for one complete month after submission.

(3) Customer rights due to defects of installation and maintenance work expire one year from acceptance of the repair item of work. This time limit does not apply if we acted with intent or gross negligence or if we are responsible for damages to life, limb, or health or for claims in accordance with the German Product Liability Act. In the case of contractors, we do not accept liability even for slight negligent breach of marginal contractual obligations.

§ 10 Miscellaneous

(1) The exclusive place of jurisdiction for all disputes is Hildesheim, Germany, if our customer is a trader, a legal person governed by public law, or special public law funds. This shall also apply if our customers do not have a general place of jurisdiction in the Federal Republic of Germany or if their normal place or residence when legal action is brought is unknown.

(2) Changes or additions to this contract have to be in writing. This also applies to the written form clause.

(3) Our customers consent to storage of their personal data for the purpose of contract conclusion.

(4) In the event that a provision of this contract or these terms and conditions is or becomes invalid or unenforceable, this shall not affect the validity of the remaining provisions.

(5) Only the relevant laws of the Federal Republic of Germany shall apply; the UN Convention on the International Sale of Goods is hereby excluded, even if our customer‘s registered seat is abroad.

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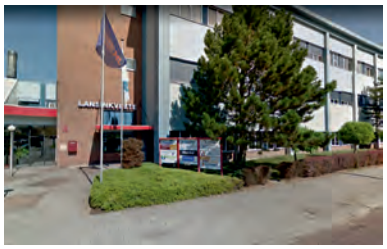

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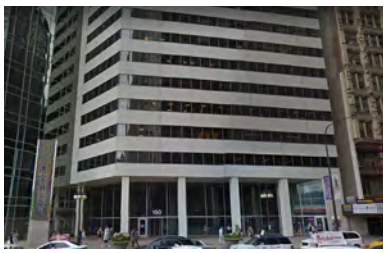

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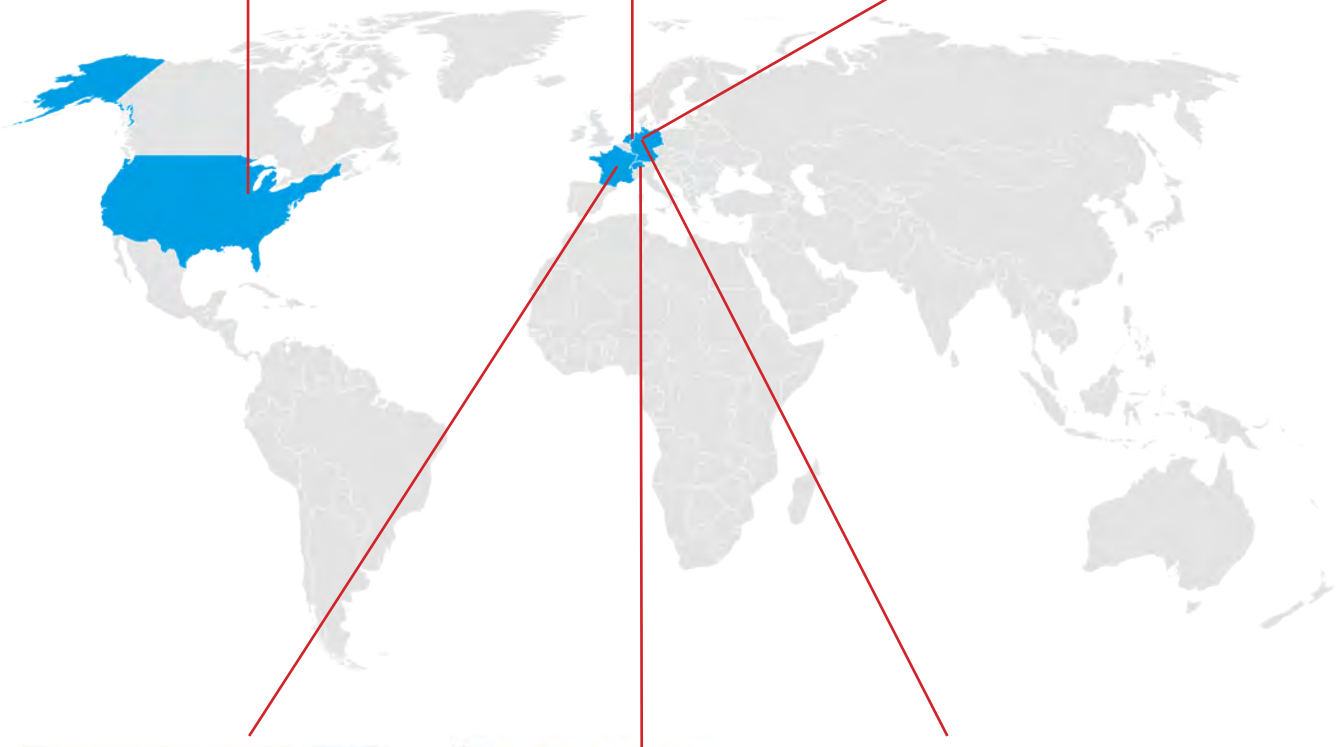

HEYL ANALYSIS TECHNOLOGIES
L'eau est notre élément / Water is our element

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