



The water quality
An essential parameter

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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 you our selection help table on page 27 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.

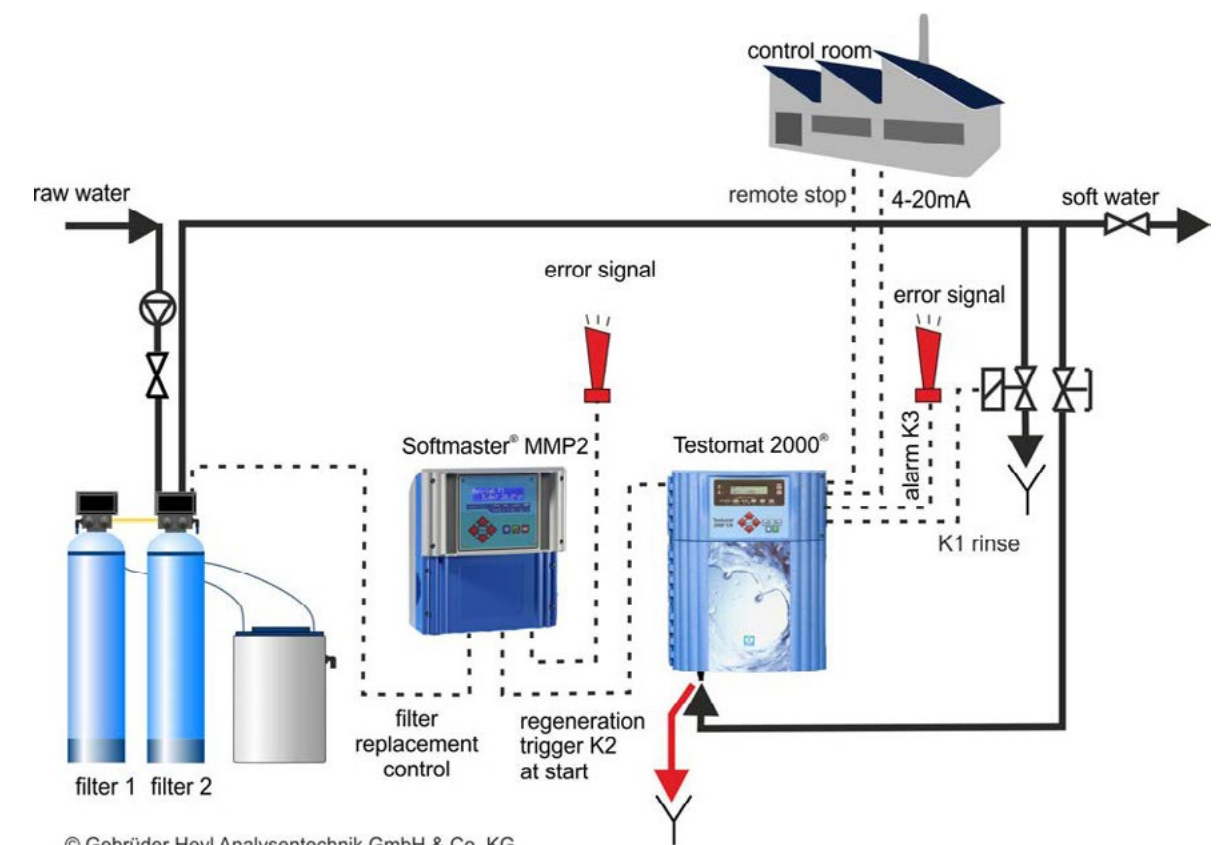
Technical information:

Energy cost reduction through on-line 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.hey1.de.

Online monitoring of water quality with Gebrüder Heyl instruments



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Boiler house conceptual solution

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.

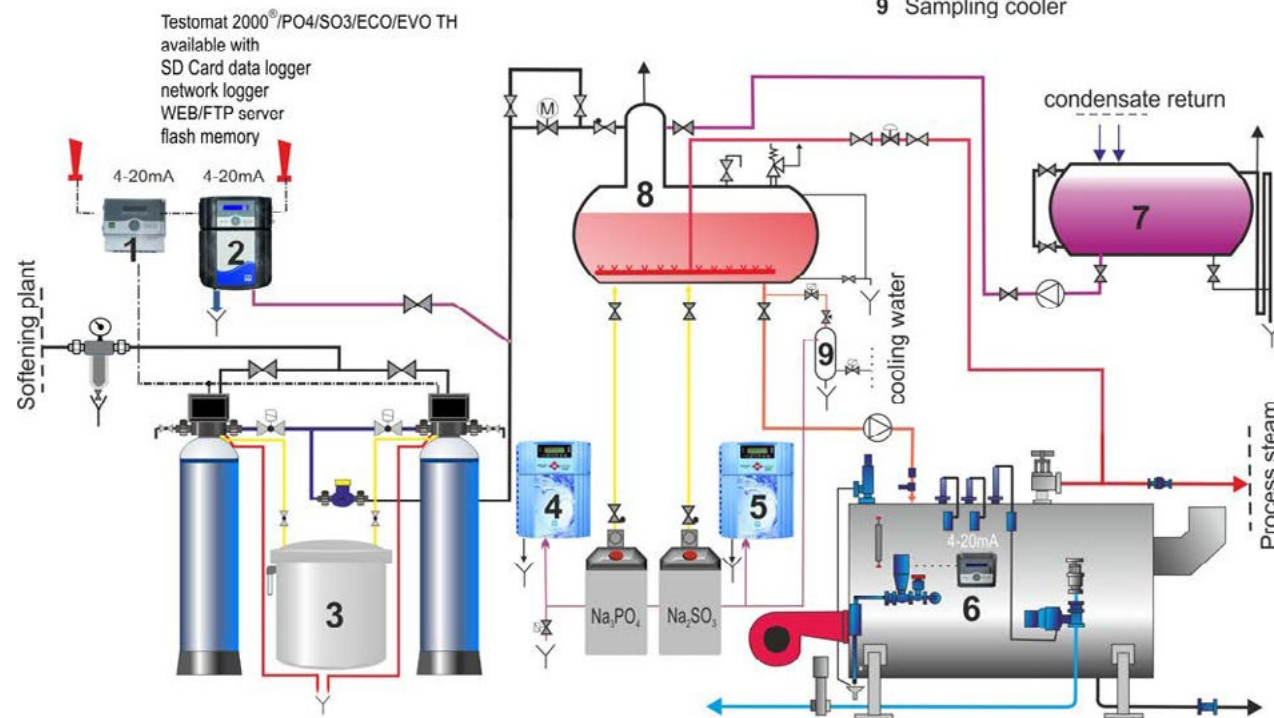
The desalination electrode is located in the upper region of the steam generator at the height of the lower water level.



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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Reverse osmosis plant conceptual solution

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 Parameters 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

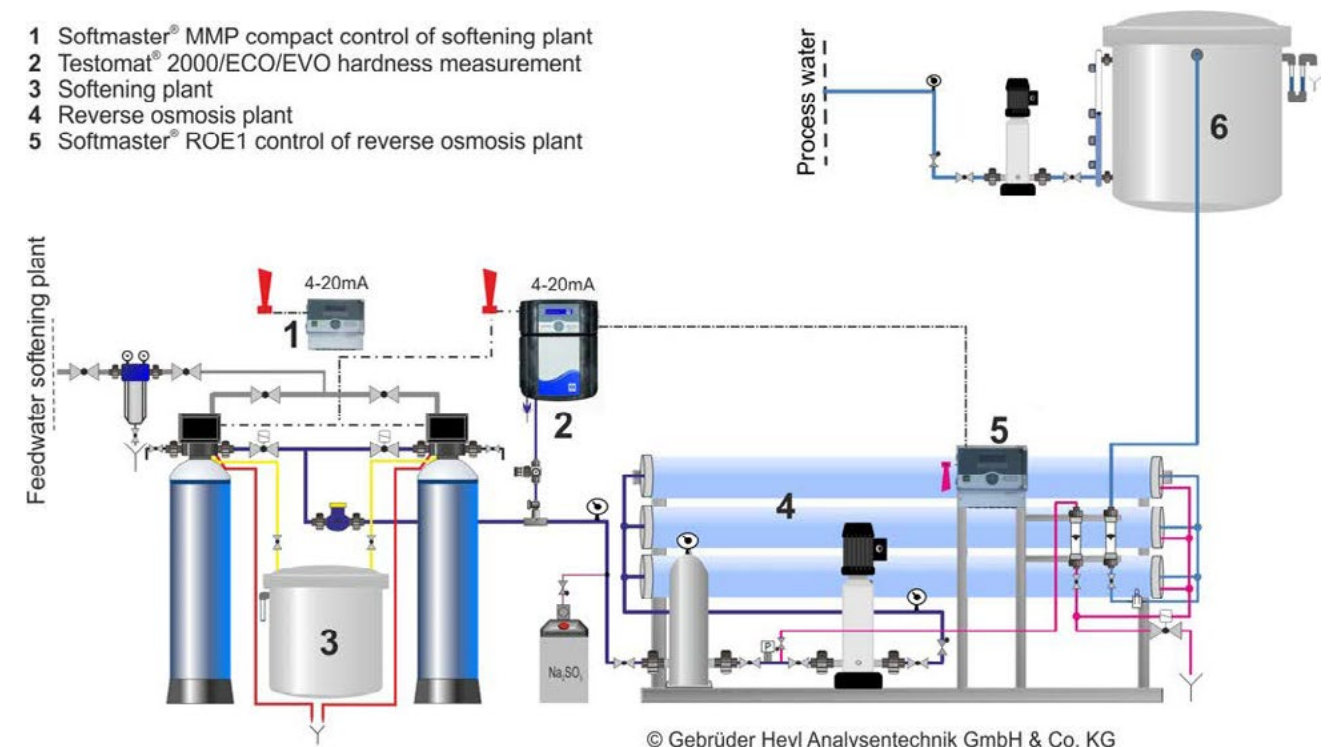
- Autotrol
- Fleck
- Siata

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



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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 installed 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 called 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%.

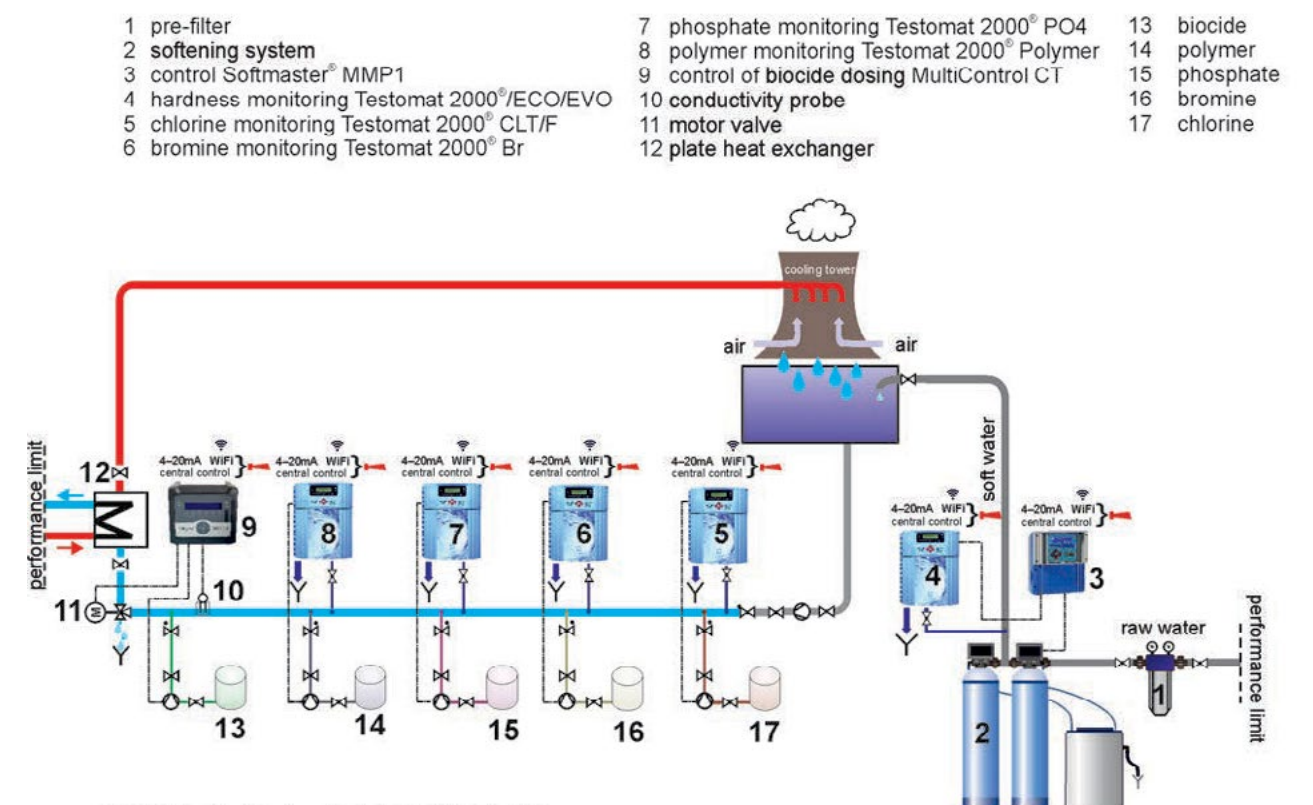
Conclusion:

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.



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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:

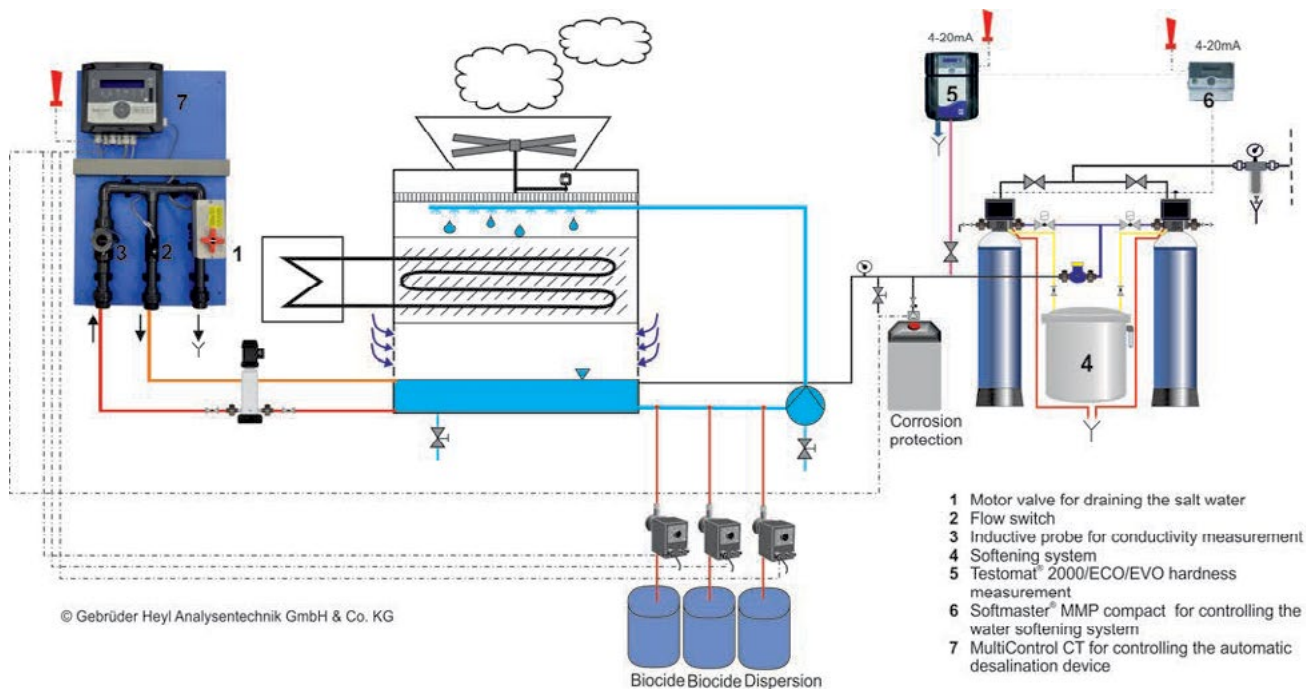
- Plug-in card for connecting a probe with two current outputs for measuring the inductive conductivity and temperature and for connecting a combination electrode for measuring the pH value.
- Plug-in card for connecting a probe with RS232 interface for measuring the inductive conductivity and temperature.
- 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.

There is also the option of a wireless measured value enquiry. To do this, simply replace the SD card used in the device with our WLAN SD card. The files can then be loaded via a browser and displayed graphically.

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 affects 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

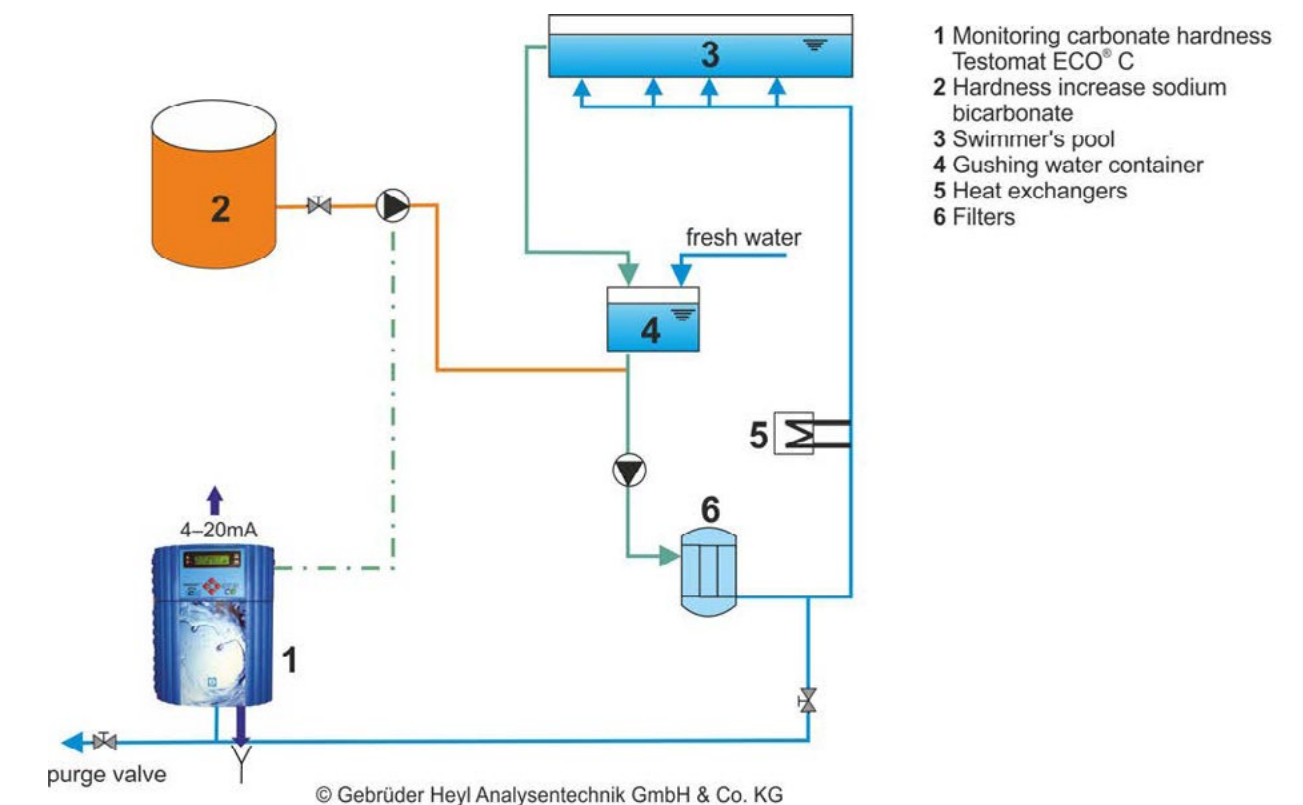


capacity in Jacuzzis and 0.7 mmol in swimmer's pools.

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



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.

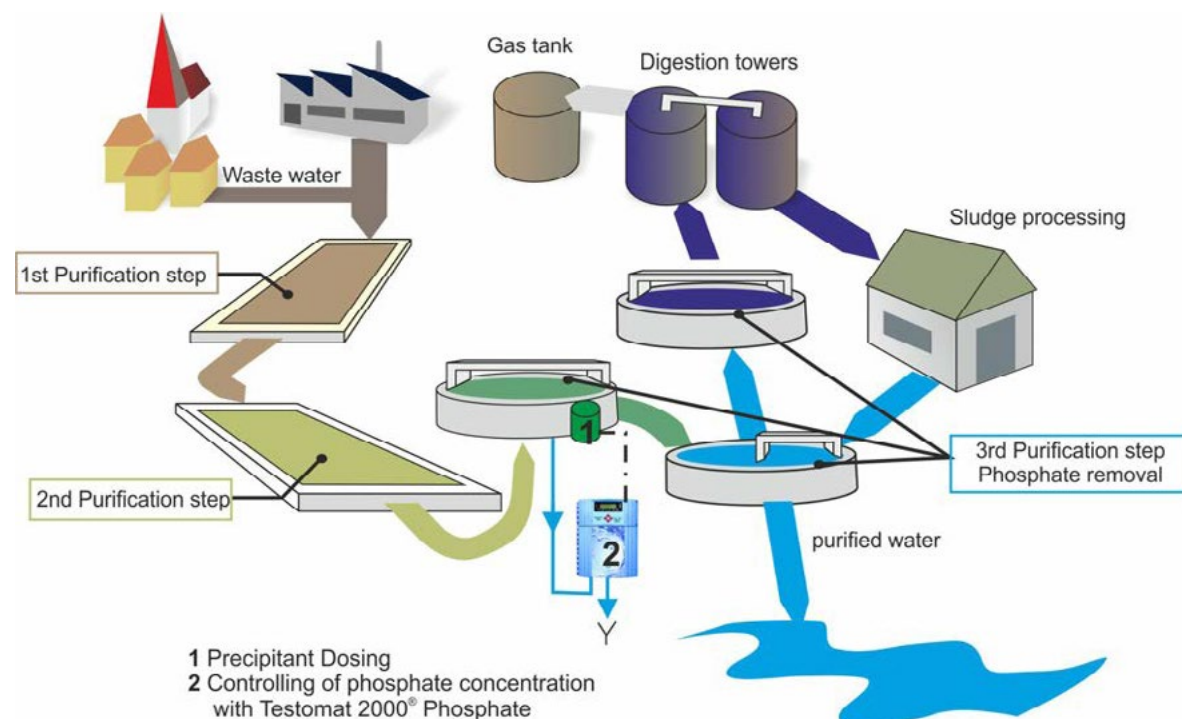
Increasingly important in wastewater treatment plants is the phosphate recovery from wastewater and sludge, since phosphorus is an important and finite raw material.

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

The Testomat 2000® PO_4 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® PO_4 in the download section of our website www.heyhl.de.

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



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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

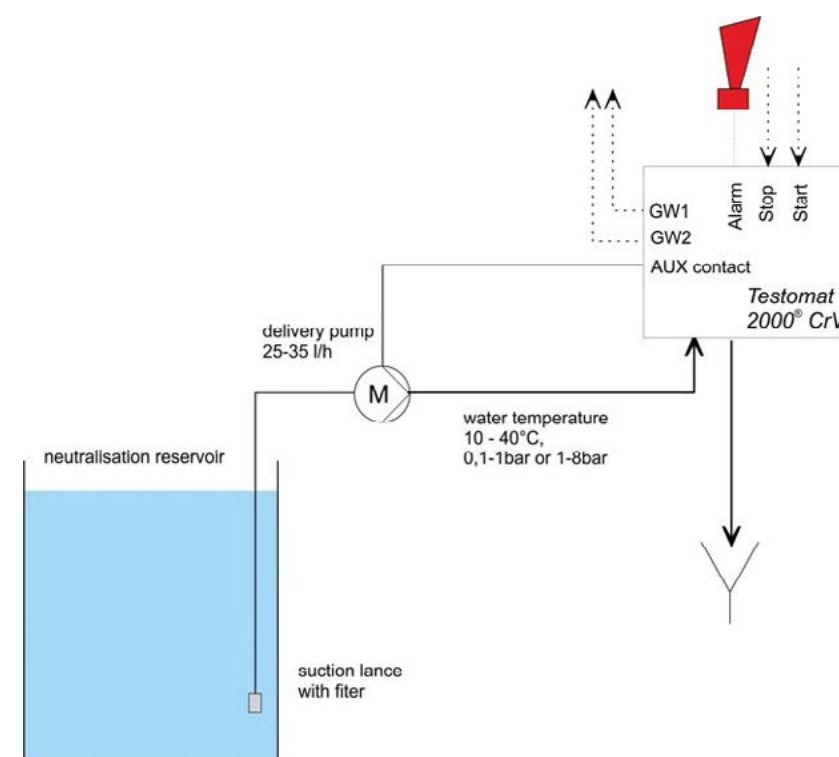
2011) prescribes a limit value of 0.05 mg/l chromium in drinking water.

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:

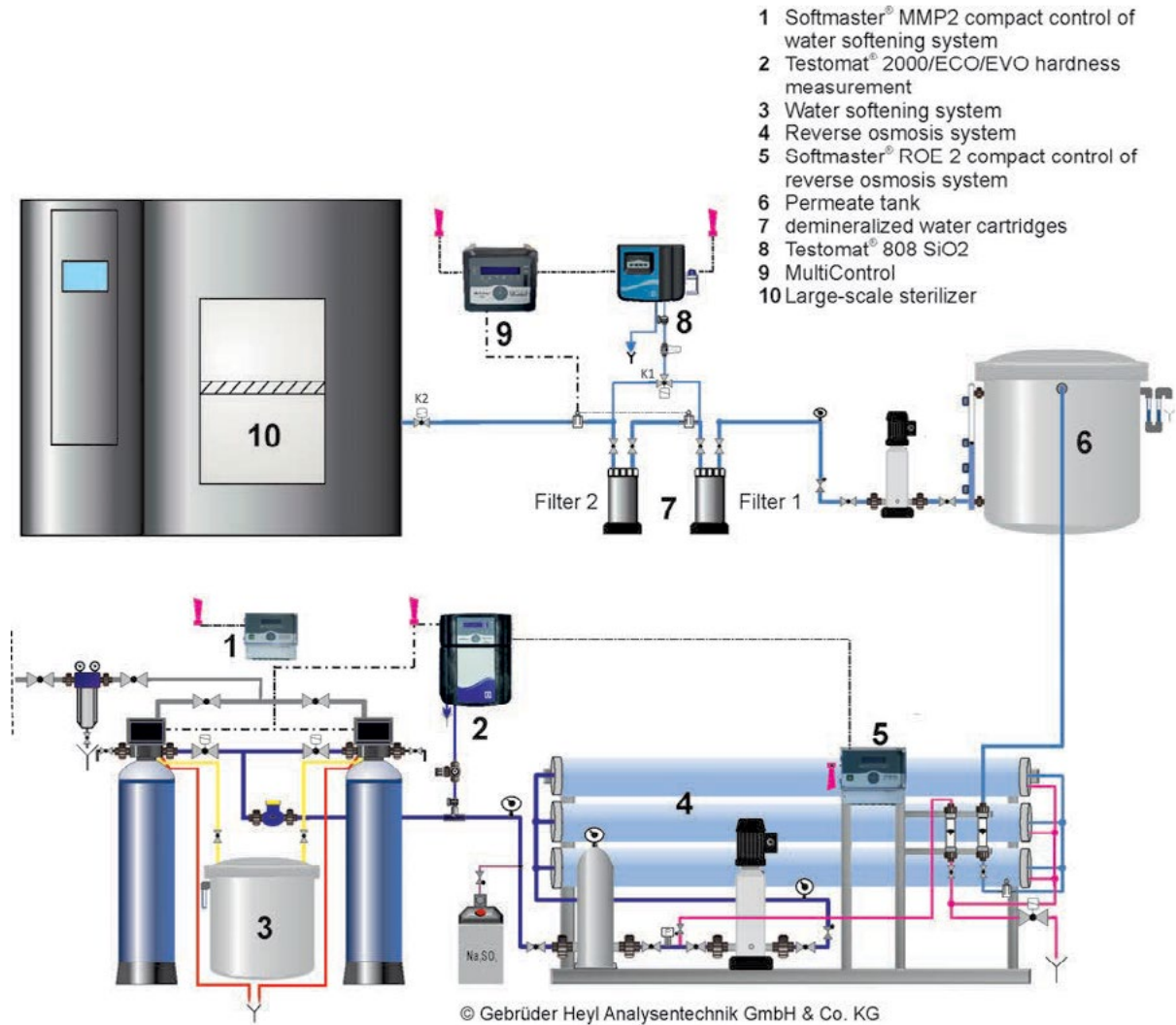
- Conductivity: < 15 µS/cm
- pH-value: 5 – 7
- Total hardness: < 0,02 mmol/l
- Salt content: < 10 mg/l
- Phosphate: < 0,5 mg/l
- Silicate (SiO₂): < 1 mg/l
- Chloride: < 2 mg/l

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.heyhl.de.

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



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Product




Testomat® 808 - 2019





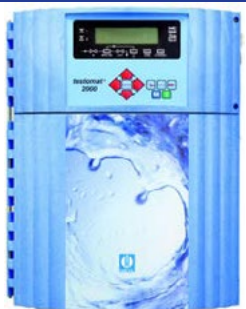
Testomat® 808 SiO₂ - 2019












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 pageSeite 42		Type 300, 300 S, 301, 302, 303, 305, 310, 320, 330, 350			Type A + B for Testomat® 808 SiO ₂		
Performance profile		<ul style="list-style-type: none">• 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			<ul style="list-style-type: none">• Offering all the benefits of the Testomat® 808 - 2019 in addition: <ul style="list-style-type: none">• 2 selector switches for measuring intervals and evaluating limit values		
Application		<p>applications of continuous residual hardness monitoring, e.g.:</p> <ul style="list-style-type: none">• reverse osmosis plants• soft water for commercial purposes• pure water production plants• galvanization			<ul style="list-style-type: none">• 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 CL	Testomat® EVO TH	Testomat® EVO TH CAL
	 New	 Preview	  C US	
Description	measuring converter for residual total hardness	measuring converter for total chlorine	Description	automatic online analysis units for water hardness
Parameters	water hardness	total chlorine	Parameters	Water hardness
Measuring range	0,05-25 °dH	0,00-0,99 mg/l 1,0-2,5 mg/l	Measuring range	0,05-25 °dH
Indicators Limit values on pSeite 4040	TH 2005, TH 2025, TH 2100, TH 2250	CL 2250 A, CL 2250 B, CL 2250 C	Indicators Limit values on pSeite 4040	TH 2005, TH 2025, TH 2100, TH 2250
Performance profile	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Offering all the benefits of the Testomat® Modul TH 	Performance profile <ul style="list-style-type: none"> • Offering all the benefits of the Testomat ECO® in addition: • built-in SD card for <ul style="list-style-type: none"> – recording data, alarm, errors – firmware updates – importing and exporting settings • optional: WLAN access for wireless read access to the SD card • 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® 	<ul style="list-style-type: none"> • Offering all the benefits of the Testomat® EVO TH in addition: • with calibration function
Application	Monitoring and checking of water quality e.g.: <ul style="list-style-type: none"> • water treatment facilities • industrial boilers • process water monitoring • drinking water systems 	<ul style="list-style-type: none"> • monitoring of chlorination systems for drinking water/swimming pool water • protection for reverse osmosis membranes • monitoring of biocides and conditioning agents containing chlorine 	Application	Monitoring and checking of water quality e.g.: <ul style="list-style-type: none"> • water treatment facilities • industrial boilers • process water monitoring • drinking water systems
Protection type/class	IP54 / I	IP54 / I	Protection type/class	IP44 / I
Supply voltage	24 VDC	24 VDC	Supply voltage	230 VAC ± 10%, ,50–60Hz or 100-240 VAC/ 100-353 VDC
Power consumption	max. 1 A	max. 1 A	Power consumption	max. 30 VA
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	Dimensions	approx. 15" x 18.9" x 11" 380 x 480 x 280 mm (W x H x D)
Weight	approx. 11.7 lbs (5.3 kg)	approx. 11.7 lbs (5.3 kg)	Weight	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)	Operating pressure	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	Menu languages	German, English, French, Dutch, Spanish (more upon request)
Order numbers	<div>24 V</div> <div>116101</div>		Order numbers	<div>24V 100-240 VAC 230 V</div> <div>upon request 100701 100700</div> <div>upon request 100704 100703</div>
			housing black housing blue	<div>24V 100-240 VAC 230 V</div> <div>upon request upon request 100710</div> <div>upon request 100712 100711</div>



Product	Testomat 2000®				Testomat 2000® Antox				Testomat 2000® CAL																																																																																																				
																																																																																																													
Description	automatic online analysis units for water hardness				Description	automatic online analysis units for hardness of water with elevated chlorine or H ₂ O ₂ content				automatic online analysis unit for water hardness with additional calibration function																																																																																																			
Parameters	water hardness, carbonate hardness, p-value, minus m-value				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				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 pSeite 4040	TH 2005, TH 2025, TH 2100, TH 2250 TC 2050, TC 2100, TM 2005, TP 2100				Indicators Limit values on pSeite 4040	TH 2005, TH 2025, TH 2100, TH 2250, TC 2050, TC 2100, TM 2005, TP 2100				TH 2005, TH 2025, TH 2100, TH 2250, TC 2050, TC 2100, TM 2005, TP 2100																																																																																																			
Performance profile	<ul style="list-style-type: none">freely selectable hardness unit: °dH, °f, ppm CaCO₃, or mmol/lhigh measurement accuracy thanks to precise piston dosing pumpmonitoring of two measuring points (switching via external magnet valves)reliable, low-maintenance operationvery simple menu-driven operation and programming via plain-text display <ul style="list-style-type: none">BOB functiontwo independently programmable limit value contacts for monitoring and control tasksrecording 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				Performance profile	<ul style="list-style-type: none">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 40).				<ul style="list-style-type: none">Offering all the benefits of the Testomat 2000® in addition:with calibration function																																																																																																			
Application	<ul style="list-style-type: none">water treatment plantswater blending plantsdrinking water plantswater softening plants <ul style="list-style-type: none">decarbonization plantsdesalination plantsboiler housescooling towers				Application	<ul style="list-style-type: none">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.: <ul style="list-style-type: none">pharmaceutical industry																																																																																																			
Protection type/class	IP65 / I				Protection type/class	IP65 / I				IP65 / I																																																																																																			
Supply voltage	230–240 VAC, 115 VAC, 24 VAC all 50–60Hz				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				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)				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)				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)				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				Menu languages	German, English				German, English, French, Italian																																																																																																			
Order numbers	<table><tr><td></td><td>24V</td><td>115 V</td><td>230 V</td></tr><tr><td>German</td><td>100090</td><td>100100</td><td>100095</td></tr><tr><td>German without front sticker</td><td>100420</td><td>100421</td><td>100422</td></tr><tr><td>English</td><td>100091</td><td>100101</td><td>100096</td></tr><tr><td>French</td><td>100092</td><td>100102</td><td>100097</td></tr><tr><td>Italian</td><td>100093</td><td>100103</td><td>100098</td></tr><tr><td>Polish</td><td>100094</td><td>100104</td><td>100099</td></tr><tr><td>Dutch</td><td>100011</td><td>100012</td><td>100013</td></tr><tr><td>Spanish</td><td>100014</td><td>100015</td><td>100016</td></tr></table>					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	Order numbers	<table><tr><td></td><td>24V</td><td>115 V</td><td>230 V</td></tr><tr><td>German</td><td>100440</td><td>100450</td><td>100460</td></tr><tr><td>English</td><td>100441</td><td>100451</td><td>100461</td></tr><tr><td>French</td><td colspan="3"></td><td></td><td>100212</td><td>100217</td><td>100222</td></tr><tr><td>Italian</td><td colspan="3"></td><td></td><td>100213</td><td>100218</td><td>100223</td></tr><tr><td>Dutch</td><td colspan="3"></td><td></td><td>100214</td><td>100219</td><td>100224</td></tr></table>					24V	115 V	230 V	German	100440	100450	100460	English	100441	100451	100461	French					100212	100217	100222	Italian					100213	100218	100223	Dutch					100214	100219	100224	<table><tr><td></td><td>24V</td><td>115 V</td><td>230 V</td></tr><tr><td></td><td>100210</td><td>100215</td><td>100220</td></tr><tr><td></td><td>100211</td><td>100216</td><td>100221</td></tr><tr><td></td><td>100212</td><td>100217</td><td>100222</td></tr><tr><td></td><td>100213</td><td>100218</td><td>100223</td></tr><tr><td></td><td>100214</td><td>100219</td><td>100224</td></tr></table>					24V	115 V	230 V		100210	100215	100220		100211	100216	100221		100212	100217	100222		100213	100218	100223		100214	100219	100224
	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																																																																																																										
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	24V	115 V	230 V																																																																																																										
German	100440	100450	100460																																																																																																										
English	100441	100451	100461																																																																																																										
French					100212	100217	100222																																																																																																						
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	100212	100217	100222																																																																																																										
	100213	100218	100223																																																																																																										
	100214	100219	100224																																																																																																										

Product	Testomat 2000® self clean			Testomat 2000® V			Testomat 2000® DUO			Testomat 2000® DUO CN			Testomat 2000® CN	
														
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			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	
Parameters	water hardness, carbonate hardness, p-value, minus m-value			Water hardness, Carbonate hardness			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	
Measuring range	0,05-25 °dH	water hardness		1,0-25,0 °dH	water hardness		0,05-25 °dH	water hardness		0,05-25 °dH	water hardness		0,05-25 °dH	water hardness
	0,5-20 °dH	carbonate hardness		1,0-20,0 °dH	carbonate hardness		0,5-20 °dH	carbonate hardness		0,5-20 °dH	carbonate hardness		0,5-20 °dH	carbonate hardness
	0,1-15 mmol/l	p-value					0,1-15 mmol/l	p-value		0,1-15 mmol/l	p-value		0,1-15 mmol/l	p-value
	0,05-0,5 mmol/l	minus m-value					0,05-0,5 mmol/l	minus m-value		0,05-0,5 mmol/l	minus m-value		0,05-0,5 mmol/l	minus m-value
Indicators Limit values on pSeite 4040	TH 2005, TH 2025, TH 2100, TH 2250, TC 2050, TC 2100, TM 2005, TP 2100			TH 2005, TH 2025, TH 2100, TH 2250, TC 2050, TC 2100,			TH 2005, TH 2025, TH 2100, TH 2250, TC 2050, TC 2100, TM 2005, TP 2100			TH 2005, TH 2025, TH 2100, TH 2250, TC 2050, TC 2100, TM 2005, TP 2100			TH 2005, TH 2025, TH 2100, TH 2250, TC 2050, TC 2100, TM 2005, TP 2100	
Performance profile	<ul style="list-style-type: none"> 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 			<ul style="list-style-type: none"> 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) 			<ul style="list-style-type: none"> 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 			<ul style="list-style-type: none"> Offering all the benefits of the Testomat 2000® DUO in addition: Chinese menu navigation for the Asian market 			<ul style="list-style-type: none"> Offering all the benefits of the Testomat 2000® in addition: Chinese menu navigation for the Asian market 	
Application	<ul style="list-style-type: none"> use for difficult water, e.g. calcium, biofilms, various other deposits extending service life reducing contamination in the measuring chamber 			<ul style="list-style-type: none"> regulation of water blending systems (cooling circuits, process water) 			<ul style="list-style-type: none"> use in two circuits with different hardnesses measurement of inlet and outlet hardness 			<ul style="list-style-type: none"> use in two circuits with different hardnesses measurement of inlet and outlet hardness 			<ul style="list-style-type: none"> the same areas of application such as Testomat 2000® 	
Protection type/class	IP65 / I			IP65 / I			IP65 / I			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			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	
Power consumption	max. 30 VA			max. 30 VA			max. 30 VA			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)			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)	
Weight	approx. 20.9 lbs (9.5 kg)			approx. 20.9 lbs (9.5 kg)			approx. 20.9 lbs (9.5 kg)			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)			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)	
Menu languages	German, English			German, English, French, Italian			German, English, French, Italian, Polish			Mandarin and English			Mandarin and English	
Order numbers	24V 115 V 230 V			24V 115 V 230 V			24V 115 V 230 V			24V 115 V 230 V			230 V	
	German	100380	100390	100370	100170	100175	100180	German	100290	100295	100300	Mandarin	110219	110212
	German without front sticker	—	—	100365	—	—	—	English	100291	100296	100301			
	English	100381	100391	100371	100171	100176	100181	French	100292	100297	100302			
	French	100382	100392	100372	100172	100177	100182	Italian	100293	100298	100303			
	Italian				100173	100178	100183	Polish	100294	100299	100304			110215

Product	Testomat 2000® THCL			Testomat 2000® CLO2			Testomat 2000® CLF			Testomat 2000® CLT			Testomat 2000® CLT self clean						
																			
Description	automatic online analysis unit for determining total chlorine and water hardness			automatic online analysis unit for determining chlorine dioxide content			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						
Parameters	total chlorine water hardness			chlorine dioxide ClO ₂			free chlorine			total chlorine or free chlorine			total chlorine						
Measuring range (resolution)	0,00-0,99 mg/l (0,01) 1,0-2,5 mg/l (0,1) 0,25-2,5°dH (0,05) } total chlorine water hardness			0,00-1,88 mg/l (0,02) 1,9-4,7 mg/l (0,2)			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)						
Indicators Limit values on pSeite 4041	TH 2025, CL 2250 A, CL 2250 B, CL 2250 C			CLO2 reagent set A and B			CL 2250 A, CL 2250 B			CL 2250 A, CL 2250 B, CL 2250 C			CL 2250 A, CL 2250 B, CL 2250 C						
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			• 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)						
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			• 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)						
Protection type/class	IP65 / I			IP65 / I			IP65 / I			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			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						
Power consumption	max. 30 VA			max. 30 VA			max. 30 VA			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)			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)						
Weight	approx. 20.9 lbs (9.5 kg)			approx. 20.9 lbs (9.5 kg)			approx. 20.9 lbs (9.5 kg)			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)			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)						
Menu languages	German, English, French, Italian			German, English, French			German, English, French, Italian			German, English, French, Italian			German, English, French						
Order numbers		24V	115 V	230 V		24V	115 V	230 V		24V	115 V	230 V		24V	115 V	230 V			
	German	100270	100275	100280		100500	100505	100510		German	100230	100235	100240	100130	100135	100140	upon request	upon request	100245
	English	100271	100276	100281		100501	100506	100511		English	100231	100236	100241	100131	100136	100141	upon request	100256	100246
	French	100272	100277	100282		100502	100507	100512		French	100232	100237	100242	100132	100137	100142	upon request	upon request	100247
	Italian	100273	100278	100283						Italian	100233	100238	100243	100133	100138	100143			


Product		Testomat 2000® Br				Testomat 2000® CrVI Testomat 2000® CrVI 0-5ppm				Testomat 2000® Fe				Testomat 2000® PO4				Testomat 2000® Polymer																																																																																																																											
																																																																																																																																													
Description		automatic online analysis unit for determining bromine content				automatic online analysis unit for determining chromate or chromium VI content				automatic online analysis unit for determining iron content				automatic online analysis unit for determining phosphate content				automatic online analysis unit for determining polyacrylate content																																																																																																																											
Parameters		bromine Br ₂				chromate (CrO ₄ ²⁻) or chromium VI (CrVI)				iron (Fe (II), Fe (I I I))				phosphate PO ₄				polyacrylates																																																																																																																											
Measuring range (resolution)		0,00-2.23 mg/l and 2.3-5.6 mg/l				<table><tr><td>Type</td><td>CrVI</td><td>CrVI 0-5ppm</td><td>resol.</td></tr><tr><td rowspan="3">Chromate</td><td>0,00 - 0,99</td><td>0,00 - 0,99</td><td>0,01</td></tr><tr><td>1,0-2,0</td><td>1,0-3,0</td><td>0,1</td></tr><tr><td>-</td><td>3,0 - 5,0</td><td>0,2</td></tr><tr><td>Chromium</td><td>0,00 - 0,99</td><td>0,00 - 11,15</td><td>0,01</td></tr></table>				Type	CrVI	CrVI 0-5ppm	resol.	Chromate	0,00 - 0,99	0,00 - 0,99	0,01	1,0-2,0	1,0-3,0	0,1	-	3,0 - 5,0	0,2	Chromium	0,00 - 0,99	0,00 - 11,15	0,01	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																																																																																																									
Type	CrVI	CrVI 0-5ppm	resol.																																																																																																																																										
Chromate	0,00 - 0,99	0,00 - 0,99	0,01																																																																																																																																										
	1,0-2,0	1,0-3,0	0,1																																																																																																																																										
	-	3,0 - 5,0	0,2																																																																																																																																										
Chromium	0,00 - 0,99	0,00 - 11,15	0,01																																																																																																																																										
Indicators Limit values on pageSeite 40		bromine reagent set				CrVI 2100 A, CrVI 2100 B				FE 2005 A, FE 2005 B				PO4 reagent set 2100				It is necessary 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.																																																																																																																											
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				• 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 re-agents used																																																																																																																											
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				• 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																																																																																																																											
Protection type/class		IP65 / I				IP65 / I				IP65 / I				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				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																																																																																																																											
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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)				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)																																																																																																																											
Weight		approx. 20.9 lbs (9.5 kg)				approx. 20.9 lbs (9.5 kg)				approx. 20.9 lbs (9.5 kg)				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)				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)																																																																																																																											
Menu languages		German, English, French				German, English, French,				German, English, French. Dutch, Italian, Polish				German, English, French, Dutch, Spanish				German, English, French																																																																																																																											
Order numbers		<table><tr><td></td><td>24V</td><td>115 V</td><td>230 V</td></tr><tr><td>German</td><td>100520</td><td>100525</td><td>100530</td></tr><tr><td>English</td><td>100521</td><td>100526</td><td>100531</td></tr><tr><td>French</td><td>100522</td><td>100527</td><td>100532</td></tr></table>					24V	115 V	230 V	German	100520	100525	100530	English	100521	100526	100531	French	100522	100527	100532	<table><tr><td>Type</td><td>24V</td><td>115 V</td><td>230 V</td></tr><tr><td rowspan="3">CrVI</td><td>100310</td><td>100315</td><td>100320</td></tr><tr><td>100311</td><td>100316</td><td>100321</td></tr><tr><td>100312</td><td>100317</td><td>100322</td></tr><tr><td rowspan="3">CrVI 0-5ppm</td><td>request</td><td>request</td><td>100640</td></tr><tr><td>request</td><td>request</td><td>100641</td></tr><tr><td>request</td><td>request</td><td>request</td></tr></table>				Type	24V	115 V	230 V	CrVI	100310	100315	100320	100311	100316	100321	100312	100317	100322	CrVI 0-5ppm	request	request	100640	request	request	100641	request	request	request	<table><tr><td></td><td>24V</td><td>115 V</td><td>230 V</td></tr><tr><td>German</td><td>100150</td><td>100155</td><td>100160</td></tr><tr><td>English</td><td>100151</td><td>100156</td><td>100161</td></tr><tr><td>French</td><td>100152</td><td>100157</td><td>100162</td></tr><tr><td>Italian</td><td>100153</td><td>100158</td><td>100163</td></tr><tr><td>Polish</td><td>100154</td><td>100159</td><td>100164</td></tr><tr><td>Dutch.</td><td>100186</td><td>100187</td><td>100188</td></tr><tr><td>Spanish</td><td>—</td><td>—</td><td>—</td></tr></table>					24V	115 V	230 V	German	100150	100155	100160	English	100151	100156	100161	French	100152	100157	100162	Italian	100153	100158	100163	Polish	100154	100159	100164	Dutch.	100186	100187	100188	Spanish	—	—	—	<table><tr><td></td><td>24V</td><td>115 V</td><td>230 V</td></tr><tr><td>German</td><td>100560</td><td>100565</td><td>100570</td></tr><tr><td>English</td><td>100561</td><td>100566</td><td>100571</td></tr><tr><td>French</td><td>100562</td><td>100567</td><td>100572</td></tr><tr><td>Italian</td><td>—</td><td>—</td><td>—</td></tr><tr><td>Polish</td><td>—</td><td>—</td><td>—</td></tr><tr><td>Dutch.</td><td>100563</td><td>upon request</td><td>100573</td></tr><tr><td>Spanish</td><td>100564</td><td>100568</td><td>upon request</td></tr></table>					24V	115 V	230 V	German	100560	100565	100570	English	100561	100566	100571	French	100562	100567	100572	Italian	—	—	—	Polish	—	—	—	Dutch.	100563	upon request	100573	Spanish	100564	100568	upon request	<table><tr><td></td><td>24V</td><td>115 V</td><td>230 V</td></tr><tr><td>German</td><td>upon request</td><td>upon request</td><td>100470</td></tr><tr><td>English</td><td>upon request</td><td>100472</td><td>100473</td></tr><tr><td>French</td><td>upon request</td><td>upon request</td><td>100471</td></tr></table>					24V	115 V	230 V	German	upon request	upon request	100470	English	upon request	100472	100473	French	upon request	upon request	100471
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Product		Testomat 2000® SO3			Titromat® TH			Titromat® KH			Titromat® M1			Titromat® M2				
																		
Description		automatic online analysis unit for determining sulfite content			automatic titration unit for determining water hardness			automatic titration unit for determining carbonate hardness			automatic titration unit for determining carbonate hardness			automatic titration unit for determining carbonate hardness				
Parameters		sulfite SO ₃ ²⁻			water hardness			carbonate hardness			carbonate hardness (m-value)			carbonate hardness (m-value)				
Measuring range (resolution)		0,0-5 mg/l (0,1) 5 - 10 mg/l (0,5) 10-50 mg/l (1)			2,5-50,0 °dH (2,5)			5-150 °KH (5) 2-60 °KH (2)			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 pageSeite 40		Sulfite reagent A Sulfite reagent B			TH 2500 reagent A, TH 2500 reagent B			TC 2150 reagent A, TC 2150 reagent B			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® in addition: • the analysis result is displayed after a reaction time of approx. 3 minutes			• Offering all the benefits of the Testomat 2000®			• Offering all the benefits of the Testomat 2000® • special for high hardness measuring ranges			• 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		• monitoring of boiler feed water in steam boiler systems (sulfite for oxygen binding) Application example on page 4			• drinking water production and supply, • raw water monitoring			• alkalinity of open coolant circuits			• 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			IP65 / I			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			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				
Power consumption		max. 30 VA			max. 30 VA			max. 30 VA			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)			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)				
Weight		approx. 9,5 kg			approx. 9,5 kg			approx. 9,5 kg			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)			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)				
Menu languages		German, English			German, English, French, Italian			German, English, French			German, English, French			German, English, French				
Order numbers		24V115 V230 V			24V115 V230 V			24V115 V230 V			24V115 V230 V			24V115 V230 V				
		German English French Italian	100350	100355	100360	110110	110115	110120	German English French	110190	110195	110200	110150	110155	110160	110130	110135	110140
			100351	100356	100361	110111	110116	110121		110191	110196	110201	110151	110156	110161	110131	110136	110141
						110112	110117	110122		110192	110197	110202	110152	110157	110162	110132	110137	110142
						110113	110118	110123										













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 pageSeite 40	TH 2005, TH 2025, TH 2100, TH 2250	TC 2050, TC 2100															
Performance profile	<ul style="list-style-type: none">freely selectable hardness unit: °dH, °f, ppm CaCO₃ or mmol/lhigh measurement accuracy thanks to precise piston dosing pumptwo independent limit values (choice of 1, 2, or 3 bad analyses before the limit value relay switches) and adjustable switching functionsreliable, low-maintenance operationvery simple menu-driven operation and programming via plain-text displaytwo neutral changeover contactserror message output (neutral changeover)current output 0/4–20 mABOB function	<ul style="list-style-type: none">Offering all the benefits of the Testomat ECO® deviating from this: <ul style="list-style-type: none">determinable measuring of carbonate hardness/acid capacity in mmol/l via indicator selectionno BOB function															
Application	monitoring and control of water quality, e.g.: <ul style="list-style-type: none">water treatment plantsdrinking water plants	monitoring and control of water quality, e.g.: <ul style="list-style-type: none">water treatment plantsdrinking water plantsSwimming 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	<table><tr><td>24V</td><td>115 V</td><td>230 V</td></tr><tr><td>100112</td><td>100117</td><td>100122</td></tr><tr><td>100430</td><td>100431</td><td>100432</td></tr></table>	24V	115 V	230 V	100112	100117	100122	100430	100431	100432	<table><tr><td>24V</td><td>115 V</td><td>230 V</td></tr><tr><td>100115</td><td>100116</td><td>100121</td></tr></table>	24V	115 V	230 V	100115	100116	100121
24V	115 V	230 V															
100112	100117	100122															
100430	100431	100432															
24V	115 V	230 V															
100115	100116	100121															
without front sticker																	

Selection help

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	⬇	⬇	⬇	⬇	⬇	⬇	⬇	⬇	⬇	⬇	⬇	⬇	⬇	⬇	⬇	⬇	⬇	⬇	⬇	⬇	⬇	⬇

⬇ especially appropriate ⬇ appropriate ⬇ not appropriate

Accessories Testomat® / Titromat®	Testomat 2000® connection kit	Connection set	Conversion kit for water connection		SK 910 current interface	RS 910 interface card	UK 910 voltage interface
							
Is used	for Testomat 2000®, Testomat ECO®, EVO and Titromat®	for Testomat® 808	for Testomat® 808	Is used	for Testomat 2000® devices, Titromat	for Testomat 2000® devices, Titromat	for Testomat 2000® devices, Titromat
Order number	040187	37610	37576	Order number	270305	270310	270315
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®	Description	plug-in card current interface	RS232 plug-in card (serial interface)	plug-in card voltage interface
Technical data	<ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • plug connection G1/4" DN6 • pipe, PE, D=6; length 5 m / 16.4 ft • screw-in connection G1/4"-6 	Technical data	<ul style="list-style-type: none"> • output current: 0–20mA or 4–20mA • maximum load: 500 Ohm • galvanic isolation 	<ul style="list-style-type: none"> • for connecting a log printer or protocol converter (field bus, Ethernet, etc.) 	<ul style="list-style-type: none"> • output voltage: 0/2–10V • galvanic isolation
					Network logger	Power supply boards	SD card data logger
Conversion kit for water inlet	USB data logger	WLAN SD card					
							
Is used	for Testomat 2000®, Testomat ECO®, EVO and Titromat®	for Testomat® 808	for Testomat® EVO	Is used	for Testomat 2000®	for Testomat® EVO	for Testomat 2000® devices, Titromat
Order number	040123	100493	100491	Order number	100492	standard 32381 wide-range 32391	100490
Description	conversion kit for the water inlet for connecting a fabric hose	Data logger with USB connection	For contacting the Testomat® EVO device in a WLAN (Wireless Local Area Network), e.g. for retrieving measurements	Description	Plug-in card with a 100 MBit network connection	Power supply boards for the power supply of Testomat® EVO devices	plug-in card for storing measurement results and error messages on an SD card
Technical data	<ul style="list-style-type: none"> • 1/4" quick-connect plug • 1/4" quick-connect coupling to hose with d = 6 mm i • lock on the hose side 	<ul style="list-style-type: none"> • 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! 	<ul style="list-style-type: none"> • 8 GB Flash storage for 40 million measurement values and notifications (around 20 years) • WLAN access point with secure WPA2 encryption • range approx. 20m • graphic online display of measurement • file download via browser 	Technical data	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • standard power supply unit for power supply of 230 VAC • wide-range power supply unit for power supply of 100-240 VAC / 100-353 VDC 	<ul style="list-style-type: none"> • 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

Accessories
Testomat 2000® / 808T2000 service case
Variant 1T2000 service case
Variant 2

Is used for Testomat® and Titromat® devices

Is used for Testomat® and Titromat® devices

Order number 270337

Order number 270338

Description Service case for regular maintenance of a Testomat 2000® device

Description Service case for regular maintenance of a Testomat 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

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"

Repair and service case

PMMA
sight glasses

Service set

Service set
Testomat 2000® Polymer

Is used for Testomat® 808

Testomat® 808 SiO2

Is used for Testomat® 808

for Testomat® 808/808 SiO2

for Testomat 2000® Polymer

Order number 270342

270343

Order number 37653

270351

270353

Description Case for regular maintenance of a Testomat® 808 / 808 SiO2 and on-site service

Description PMMA sight glasses Set for regular maintenance spare part kit for maintenance of Polymer device and PeriClip pump




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

Technical data

- 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
 - 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 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

No longer included:
Optics board + LED
holder
The optic set can be
found on page 38.

Accessories Testomat 2000® / 808	Service set	1-Year service set	Service set Testomat 2000® PO4
			
Is used	for Testomat 2000®, Testomat ECO®, EVO and Titromat®	for Testomat 2000®, Testomat ECO®, EVO and Titromat®	for Testomat® PO4
Order number	270352	270360	270354
Description	spare part kit for maintenance	small spare part kit for maintenance	spare part kit for main- tenance of PO4 device and PeriClip pump
Technical data	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• 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

Accessories Testomat® / Titromat®	small aerator R	Conversion kit for water connection USA	Conversion kit for 100ml-bottle
			
Is used	for Testomat 2000®/Testomat ECO®, EVO, 808	for Testomat 2000®	for Testomat 2000®, Testomat ECO®, EVO and Titromat®
Order number	130010	40345	040143
Description	small aerator to reduce CO ₂ content	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	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• Reducing adaptor from 6 mm to 1/4"	<ul style="list-style-type: none">• 100 ml / 3.4 oz bottle• used for screw cap with suction tube for 100 ml / 3.4 oz bottle• screw cap GL32 hole

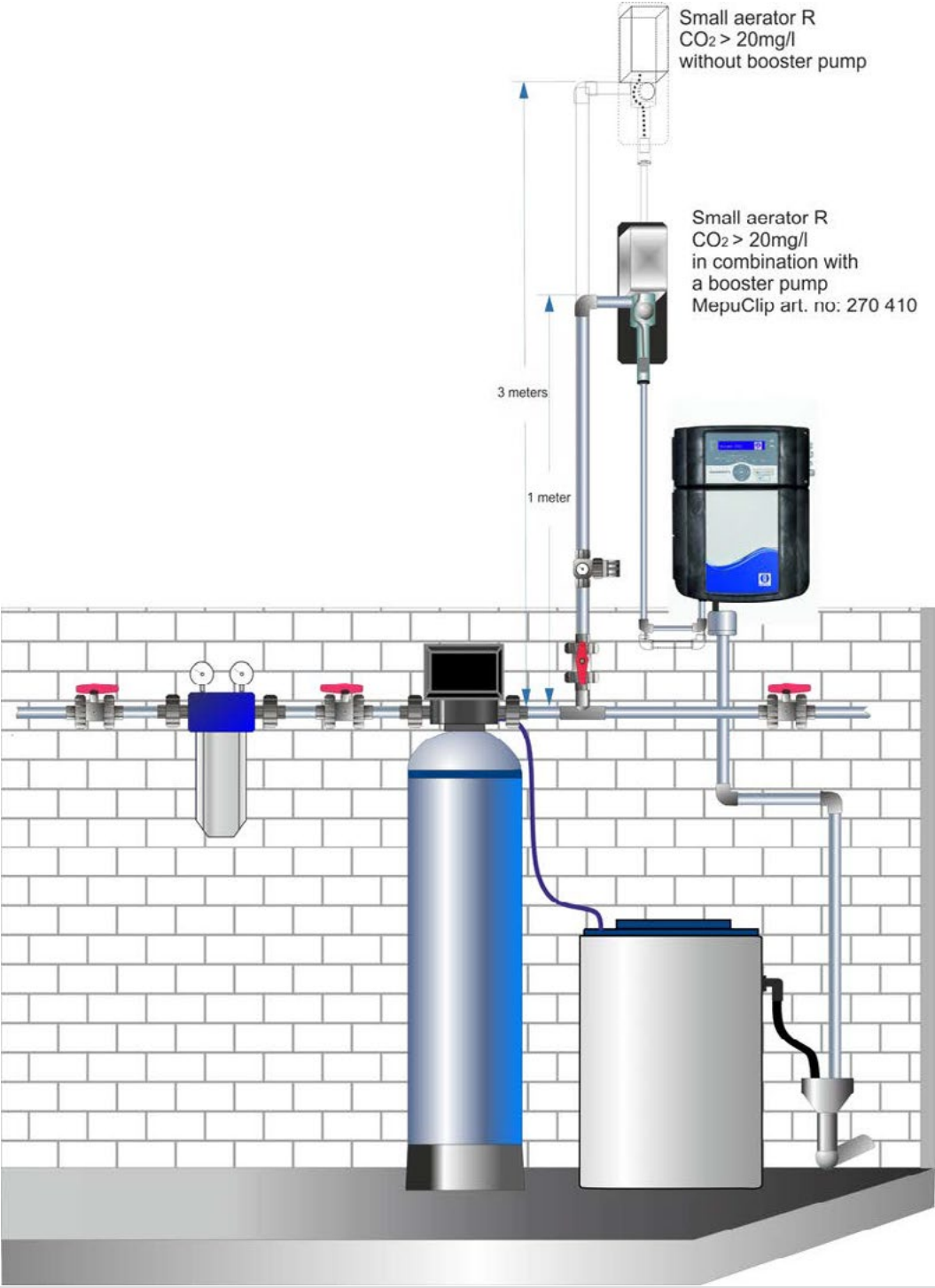
Example for assembly of aerator type R

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.



Accessories Testomat 2000® / 808	Tool kit	Pressure regulator	Candle filter	Spare parts Testomat® / Titromat®	Pressure regulator	Measuring chamber	Measuring chamber holder
Is used	for all Testomat and Titromat devices	for Testomat® 808	for Testomat 2000®	Is used	for Testomat 2000®, Testomat ECO®, EVO and Titromat®	for Testomat 2000®, Testomat ECO®, EVO and Titromat®	for Testomat 2000®, Testomat ECO®, EVO and Titromat®
Order number	040138	37602	suction lance (20 l container) 40535 suction lance (5 l container) 40536	Technical data	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 040121 G 1/4" - 6 screw-in connector 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 040032 tenterhook 011210 plate stopper 24x2 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 plug connection for drain hose 040050 magnet valve, 2/2-ways 040018 pin for chamber holder, 5x60 mm 040181
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	<ul style="list-style-type: none"> 1 Torx TX20 20x100 screwdriver 1 Torx TX10 10x80 screwdriver 1 Torx TX8 8x60 screwdriver 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> suction lances with different lengths for 20-litre containers and 5-litre containers 				<p>For further article numbers for DUO , TRIO, and QUAD measuring chamber holders, see pageSeite 36</p>
Accessories Testomat 808/808 SiO2	Conversion kit pump head	Conversion kit double pump head			Measuring chamber with double glazing	Measuring chamber T2000 with shortened measurement section	Gear motor
Is used	for Testomat® 808	for Testomat® 808 SiO2	for Testomat® 808	Is used	for Testomat 2000® and Testomat® 808	for Testomat 2000® Cr VI 0-5ppm, Testomat 2000® PO4	for Testomat® 808 / 808 SiO2
Order number	040363	040395	candle filter 37583 filter insert 37584	Technical data	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. 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	Special measuring chamber for Testomat 2000® CrVI 0-5ppm and Testomat 2000® PO4. Cannot be used in other Testomat® devices Order number 40378	gear motor 100494 12 V DC for the dosing pump of Testomat® 808 with installation guide for Testomat 2000® gear motor 39906 12 V DC for the dosing pump PeriClip
Description	Conversion kit for replacing the old pump head in the new version	Conversion kit for replacing the old double pump head in the new version	candle filter with filter insert for filtering sample water before analysis				
Technical data	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 1 x Doppel-Pumpenkopf 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 	<ul style="list-style-type: none"> max. pressure: 8 bar/116 psi max. temperature: 50°C/122°F filter fineness: 100 µm 1/4" inlet/outlet 				
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.							

Measuring chamber holder DUO / TRIO / QUAD Testomat® / Titromat®								Spare parts Testomat® / Titromat®	Bottle connection/ suction device		Device spare parts			
														
Article no. of the measuring chamber holder								Is used	for Testomat 2000®, Testomat ECO®, EVO TH and Titromat®		for Testomat 2000® /Testomat ECO® and Titromat®			
	DUO 40370	DUO 40371	Trio 40372	Quad 40373	DUO 40375	DUO 40379	DUO 40382	Order number	screw cap with T2000 insert for 500 ml bottle	040131	cable feedthrough, 5-7	040190	loom 2P, complete (for max two dosing pumps)	040062
Testomat 2000 Antox	X										cable feedthrough, 7-10	040191	loom for main switch	
Testomat 2000 Br		X							consists of: GL32 screw cap		T2000 mains switch cover for mains	040197	complete	040200
Testomat 2000 CLF		X							— hole	040130	switch	040198	fuse T 0.08 A	031596
Testomat 2000 CLT			X								ribbon cable, 10-pole, with ferrite	031713	fuse T 0.315 A	031585
Testomat 2000 CLT self clean				X					insert for screw cap with suction pipe	040135	ribbon cable, 26-pole, with ferrite	040096	fuse T 0.1 A	031595
Testomat 2000 CLO2		X									loom 2V, complete (for valves)	040060	fuse T 0.16 A	031622
Testomat 2000 CN DUO	X												fuse T 1.0 A	031592
Testomat 2000 Cr VI		X											fuse M4 A	031582
Testomat 2000 Cr VI 0-5ppm						X								
Testomat 2000 DUO	X								Bottle connection/ suction device		Device spare parts Testomat® EVO			
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										
								Is used	for Testomat 2000® Polymer/ Testomat 2000® PO4		for Testomat® EVO TH			
Titromat M1	X							Order number	screw cap with insert for 500 ml bottle	37644	Cable ducting M16x1,5	37734	fuse GS-M 5x20E 4A MT	31582
Titromat M2	X													
Titromat KH	X								screw cap with insert for 100 ml bottle	37645	Nut for cable ducting M16x1,5	37735	fuse T0,315 A	31585
Titromat TH	X										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

Spare parts Testomat® 808/808 SiO2		Devices spare parts Testomat® 808 SiO2		Set optical board + LED socket		Measuring chamber Testomat® 808 SiO2		Dosing pumps Testomat® / Titromat®		DosiClip®		MEPUClip®		FlowClip®	
															
Is used		for Testomat® 808 SiO2		for Testomat® 808 / 808 SiO2		for Testomat® 808 / 808 SiO2		Is used as		dosing pump for Testomat devices		booster pump for Testomat 2000®/Titromat®		dosing pump for Testomat 2000® self clean	
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		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 <u>For older instruments:</u> 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		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				Order number 270470		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		<ul style="list-style-type: none">• 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		<ul style="list-style-type: none">• Flow rate at atmospheric pressure : 0.6 l/min• Maximum suction head: 3m H₂O self-priming• ambient temperature: 10–45°C / 50-113°F• mounting: on 35 mm / 1.4“ DIN top-hat rail <p>When a „Testomat® with pump“ is ordered, installation occurs at the factory.</p>		<ul style="list-style-type: none">• Flow rate at atmospheric pressure : 0.1 l/min• Maximum suction head: 3m H₂O self-priming• ambient temperature: 10–45°C / 50-113°F• mounting: on 35 mm / 1.4“ DIN top-hat rail	
Devices spare parts Testomat® 808				Measuring chamber		Bottle connection/ suction device		PeriClip®							
															
Is used		for Testomat® 808		for Testomat® 808		for Testomat® 808 / 808 SiO2		Is used as		dosing pump for Testomat 2000® Polymer / PO4					
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		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		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				Order number 270430					
								Description		hose pump for aqueous media					
								Technical data		<ul style="list-style-type: none">• 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“					

Spare parts for the Testomat® BOB can only be supplied to a limited extent. Please contact your distributor if you need spare parts.

Indicators/reagents
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 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

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 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

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	T2000	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
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.

new

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



Description		Controller for water softening plants			Controller for water softening plants				
Pluspunkte		<ul style="list-style-type: none">• 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: <ul style="list-style-type: none">• 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		<ul style="list-style-type: none">• 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			<ul style="list-style-type: none">• like Softmaster MMP1 in addition: <ul style="list-style-type: none">• parallel and serial connection				
Menu language		D, GB, F, I, NL, PL			D, GB, F, I, NL, PL				
Order numbers		attachable with RS232	24V 115 V 230 V			24V 115 V 230 V 230V/24V			
			610100	610101	610102	620000	620001	620002	620003
			—	—	—	620200	620201	620202	620203
			610110	610111	610112	620010	620011	620012	—
			—	—	—	620210	620211	620212	—

Product	Softmaster® MMP compact			Softmaster® ROE1			Softmaster® ROE2				Softmaster® ROE2/S5			Softmaster® ROE3						
																				
Description	Controller for water softening systems			Controller for reverse osmosis systems			Controller for reverse osmosis systems				Controller for reverse osmosis systems with programmable controller for water deficiency			Controller for reverse osmosis systems						
Advantages	<ul style="list-style-type: none">• 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			<ul style="list-style-type: none">• 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: <ul style="list-style-type: none">• 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			like Softmaster® ROE1, but with the following inputs and outputs: <ul style="list-style-type: none">• 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: <ul style="list-style-type: none">• 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: <ul style="list-style-type: none">• 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						
Protection type/class	IP65 / I			IP65 / I			IP65 / I				IP65 / I			IP65 / I						
Mains connection	230–240V, 115V, 24V +/-10% 50–60Hz			230–240V, 115V, 24V +/-10% 50–60Hz			230–240V, 115V, 24V +/-10% 50–60Hz				230–240V, 115V, 24V +/-10% 50–60Hz			230–240V, 115V, 24V +/-10% 50–60Hz						
Power consumption	max. 9 VA			max. 9 VA			max. 9 VA				max. 9 VA			max. 9 VA						
Dimensions	approx. 257 x 214 x 135 mm 10.1" 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			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						
Weight	approx. 1.6 kg / 3.5 lbs			approx. 2.3 kg / 5 lbs			approx. 2.3 kg / 5 lbs				approx. 2.3 kg / 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				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	<ul style="list-style-type: none">• 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			<ul style="list-style-type: none">• reverse osmosis plants with 1 conductivity measurement Application example on page 5			<ul style="list-style-type: none">• reverse osmosis plants with 1 conductivity measurement				<ul style="list-style-type: none">• reverse osmosis plants with 1 conductivity measurement			<ul style="list-style-type: none">• reverse osmosis plants with second conductivity measurement for controlling an EDI module						
Menu language	D, GB, F, I, NL, PL			D, GB, F, I, NL, PL			D, GB, F, I, NL, PL				D, GB, F, I, NL, PL			D, GB, F, I, NL, PL						
Order numbers	attachable with RS232 installable with RS232	24V	115 V	230 V	24V	115 V	230 V	24V	115 V	230 V	230V/24 V	24V	115 V	230 V	24V	115 V	230 V			
		610225	610226	610227	upon request	upon request	601102	request	request	request	request	—	—	upon request	upon request	upon request	upon request			
					—	—	—	request	request	request	request	—	—	—	upon request	upon request	603202			
					upon request	upon request	601112	602010	request	602012	—	—	—	upon request	upon request	upon request	603012			
			—	—	—							602210	602211	602212	—	—	—	upon request	upon request	603212

Product	Softmaster® ROE compact	MultiControl CT	Desalination device	
				
Description	Controller for reverse osmosis systems	Controller for cooling systems	Is used	for process water circuits and cooling circuits
Advantages	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• 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)	Technical data	<div>Dimensions450 x 700 x 300 mm (W x H x D)</div> <div>Mounting dimensions629 x 407 mm</div> <div>Piping materialPVC-U</div> <div>InletDN 32; inner diameter approx. 25 mm</div> <div>OutletDN 32; inner diameter approx. 25 mm</div> <div>Outlet ductDN 32; inner diameter approx. 25 mm</div> <div>Max. water pressure4 bar</div> <div>Power supply230 VAC</div> <div>Power consumption6 VA</div> <div>Ambient temperature5 – 40°C</div> <div>Water temperature5 – 40°C</div> <div>Weight8.2 kg</div> <div>Protection typeIP54</div>
			Specific data	<div><div>Type I-S-P:Control systemMultiControl CT</div><div>Conductivity measurementInductive probe</div><div>Measurement range20 mS/cm</div><div>RS232 output</div><div>Power consumption20 V - 50 mA</div><div>Temperature sensor0 - 100°C</div><div>Flow monitorType VH3</div><div>Nominal pressurePN 25</div><div>Max. flow rate100 l/min</div><div>Switching range10.4...14.8 l/min</div><div>Motor valve230 VAC 50-60 Hz</div><div>Motor power4 W</div></div> <div><div>Type I-J-F:Control systemMultiControl CT</div><div>Conductivity measurementInductive probe</div><div>Measurement range5 mS/cm</div><div>Change in the measuring range possible</div><div>Current output2 x 0 - 20 mA</div><div>Power consumption<2,6 W</div><div>Flow monitorType VH3</div><div>Nominal pressurePN 25</div><div>Max. flow rate100 l/min</div><div>Switching range10.4...14.8 l/min</div><div>Motor valve230 V valve</div><div>Motor power10 W</div></div>
Protection type/class	IP54 / I	IP54 / I	Order number	Type I-J-F for process water circuits310140 Type I-S-P for cooling circuits310160
Mains connection	230–240V, 115V, 24V +/-10% 50–60Hz	230VAC, 24VAC +/-10% 50–60Hz or 100-240VAC, 100-353 VDC (wide-range power supply)		Application example on page 8
Power consumption	max. 9 VA	max. 25 VA (without external load)		
Dimensions	approx. 357 x 214 x 135 mm 14" 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	0,1-50.000 µS/cm 0,01-5,0 cm ⁻¹ cell constant	0-199,9 µS/cm bis 0-199,9 mS/cm (depending on cell constants)		
Application	• reverse osmosis plants with 1 conductivity measurement	• 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	<div>24V115 V230 V</div> <div>601225601226601227</div>	Order numbers for Multi-Control CT on page 52.		
attachable				



Order numbers MultiControl				
Device type	Voltage	plug-in card	Parameters	Order number
MultiControl CT	24 V	EC inductive/pH	Conductivity (inductive) pH value	341010
MultiControl CT	100-240VAC	EC inductive/pH	Conductivity (inductive) pH value	341020
MultiControl CT	230 V	EC inductive/pH	Conductivity (inductive) pH value	341030
MultiControl CT	24 V	BKEX probe*	Conductivity (inductive)	341040
MultiControl CT	100-240VAC	BKEX probe*	Conductivity (inductive)	341050
MultiControl CT	230 V	BKEX probe*	Conductivity (inductive)	341060
MultiControl CT	24 V	EC/pH (conductive)	Conductivity (conductive), pH value	341070
MultiControl CT	100-240VAC	EC/pH (conductive)	Conductivity (conductive), pH value	341080
MultiControl CT	230 V	EC/pH (conductive)	Conductivity (conductive), pH value	341090




* Please note that the plug-in card for the BKEX probe cannot be combined with other measuring cards.





We assembled and preconfigured the MultiControl device in the device variants listed above.
Your service partner will gladly advise you on the selection of the suitable variant for you.





The suitable probes and accessories for the MultiControl device can be found on the following pages.










Inductive probes	Page 49
pH probes	Page 50
Conductive probes	Page 51

Inductive conductivity probes		Inductive probe BKEX		Plug-in card for BKEX probe	
					
Is used		for MultiControl		for MultiControl	
Order number		37851		37347	
Technical data		<ul style="list-style-type: none"> Inductive probe for conductivity measurement 20 mS/cm A plug-in card (Item no. 37347) is required 		<ul style="list-style-type: none"> Plug-in card for the BKEX probe to measure the conductivity 	











Inductive probe CTI 500		PC interface for inductive probe CTI 500		WLAN SD card	
					
Is used		for MultiControl		for MultiControl	
Order number		310132		310133	
Technical data		<ul style="list-style-type: none"> Inductive probe for the conductivity measurement For all measuring converters with 20 mA output Fully programmable in the range from 500 µS/cm - 2000 mS/cm; the PC interface (Item no. 310133) is required 		<ul style="list-style-type: none"> to program the inductive probe CTI 500 	
					
				for MultiControl	
				100491	
				For contacting the Multi-Control device in a WLAN (Wireless Local Area Network), e.g. for retrieving measurements <ul style="list-style-type: none"> 8 GB Flash storage for 40 million measurement values and notifications (around 20 years) WLAN access point with secure WPA2 encryption range approx. 20 m graphic online display of measurement file download via browser 	

Accessories measuring instruments	pH combination electrodes	ESA screw-in fittings	pH-probe for measuring probe	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.					
Is used	for MultiControl, EcoControl pH to replace devices purchased prior to 05/2013.		for EMK 20 and EMK 50	for MultiControl, EcoControl pH	Material	Cell constants [1/cm]	Maximum medium temp. [°C]	Connection design	Measuring range [µS/cm]	Order no.
Order number	EMK 20 EMK 50	320301 320302	320310	310137	Normal probes:					
Technical data	<ul style="list-style-type: none"> 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 		<ul style="list-style-type: none"> stainless steel max. medium temperature: 130°C / 266°F connection: R ¾ external thread 		<ul style="list-style-type: none"> 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	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.					
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	Material	Cell constants [1/cm]	Maximum medium temp. [°C]	Connection design	Measuring range [µS/cm]	Order no.	
Order number	KOAX 5	310136	310138	Normal probes:						
	KOAX 10			ST 1 / PT 100	PVC-U	0,10	40	PVC union nut Rp 1¼	1-2000	310120
	KOAX/PT 5			ST 5 / PT 100	PVC-U	0,50	40	PVC union nut Rp 1¼	5-10000	310121
	KOAX/PT 10			Screw-in probes:						
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	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

Controllers	Accessories Softmaster®				Adapter plate		RS232 interface		Current interface		PVP / PVH				
															
	Is used		for Softmaster® devices		for Softmaster® 2 devices		for Softmaster® 2 devices		Description		Pilot distributor with 4 switch settings • PVH / PVH 4: toggle switch for 8 bar (116 PSI) hydraulic pressure or 4.5 bar (65.3 PSI) 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				
	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		Description		control of individual valves in automatic water treatment systems				
	Technical data		• The old holes 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		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				
			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					
Heyl Remote Control Softmaster®				Heyl Remote Control Softmaster® retrofit kit				Program disc				PVH/PVP screw connector		Seal for screw connector	
															
Is used		remote maintenance for Softmaster devices		retrofit kit for remote main- tenance of software devices				Is used		for pilot distributor		for pilot distributor		for pilot distributor	
Order number		790001		790003				Order number		PV S1 250031 PV S2 250032 PV S8 250038 PV S9 250039		033900		033475	
Scope of delivery		• Software • Softmaster® -modem cable connection • license key		• Software • Softmaster® modem cable connection • RS232 plug-in card • license key				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)	
Technical data		Using the remote mainten- ance software, software devices can be configured via com- puter. The settings no longer need to be entered directed on the device and can now be entered conveniently on a PC using a mouse and keyboard.		Using the remote mainten- ance software, software devices can be configured via com- puter. The settings no longer need to be entered directed on the device and can now be entered conveniently on a PC using a mouse and keyboard.											













Controllers






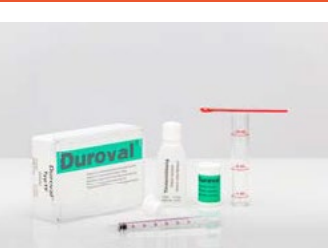






Analysis systems	Analysis kits		DIST 3 conductivity tester	DIST 4 conductivity tester	pHep+ pH tester	Limit value kits	DUROGNOST® I	DUROGNOST® SR 0	DUROGNOST® SR
									
	Is used als		electronic conductivity device for determining conductivity	electronic conductivity device for determining conductivity	electronic pH measuring device for determining pH value	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		330050	330060	330070	Order number	400050	400056	400055
	Description		<ul style="list-style-type: none">• measuring range of 0,00–2000 µS/cm• resolution of 1 µS/cm• automatic temperature compensation• automatic 1-point calibration• Automatic shutdown after 8 or 60 minutes of non-use	<ul style="list-style-type: none">• measuring range of 0,00–20,00 mS/cm• resolution of 0,01 mS/cm• automatic temperature compensation• automatic 1-point calibration• Automatic shutdown after 8 or 60 minutes of non-use	<ul style="list-style-type: none">• measuring range of 0,00–14,00• resolution of 0,01 pH• Automatic one-point or two-point calibration• automatic temperature compensation	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
Dimensions		40 x 160 x 17 mm 1.6“ x 6.3“ x 0.7“ (W x H x D)	40 x 160 x 17 mm 1.6“ x 6.3“ x 0.7“ (W x H x D)	40 x 160 x 17 mm 1.6“ x 6.3“ x 0.7“ (W x H x D)					
Buffer solution for analysis kits					DUROGNOST® SR 1 DUROGNOST® special buffer solution				
		Product description	Quantity	Order number					
buffer solution pH		buffer solution pH 4,0 buffer solution pH 7,0 buffer solution pH 9,0 buffer solution pH 10,0 storage solution for pH tester	100 ml 100 ml 100 ml 100 ml 230 ml	425304 425307 425309 425310 425370	Is used als		limit value test for quick determination of residual hardness	buffer solution for alkaline water samples	
conductivity solution		conductivity solution 1413 µS/cm conductivity solution 12,88 mS/cm	230 ml 230 ml	425404 425409	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	
<div><div><p>A company logo on the supplement is free with purchase of more than 100 Duroval® or Durognost® articles.</p><p>Other combinations of analysis cases and cabinets are possible upon request.</p></div></div> <p>We handle the development, production, bottling and shipment of our reagents and analysis kits in house.</p>									
Analysis systems									

















A company logo on the supplement is free with purchase of more than 100 Duroval® or Durognost® articles.
Other combinations of analysis cases and cabinets are possible upon request.






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




Analysis systems	Titration quick test kits																	
	DUROVAL® 1 drop = 1 °dH			DUROVAL® 1 drop = 1 °f			DUROVAL® 1 Tr. = 10 ppm CaCO ₃			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			Is used as			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 400112 50 piece kit neutral inlays without folding box 400118			1 piece 400011 50 pieces 400111 neutral inlays without folding box 400113 50 piece kit neutral inlays without folding box 400119			Order number			400020			400018		
	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)			Description			<ul style="list-style-type: none"> • 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			<ul style="list-style-type: none"> • 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		
							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)									<ul style="list-style-type: none"> • 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® 1 drop = 1 °KH			DUROVAL® 1 drop = 0,1 °dH			DUROVAL® AP			DUROVAL® B			DUROVAL® BP			DUROVAL® BF		
																		
	Is used as			titration kit for determining carbonate hardness via acidimetric titration			titration kit for determining water hardness via complexometric titration			Is used as			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			Order number			400030			400031		
	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).			Description			<ul style="list-style-type: none"> • 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			<ul style="list-style-type: none"> • 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		
							<ul style="list-style-type: none"> • 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									<ul style="list-style-type: none"> • 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		DUROVAL® K _{B 8,2}	DUROVAL® Sulfate	DUROVAL® TF
								
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	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		400005	400060	400065	Order number	400077	400080	400042
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. 200 (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	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 connection 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⁻	<ul style="list-style-type: none"> • 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® Chlorid	DUROVAL® CO ₂	DUROVAL® K _{S 4,3}		DUROVAL® TI	DUROVAL® TI with pipette 0-60 °f	DUROVAL® TP
								
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	Is used as	industrial kit for water treatment plants	industrial kit for water treatment plants	industrial kit for water treatment plants
Order number		400090	400070	400067	Order number	400040	400038	400041
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	Description	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • 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)

Analysis systems	Titration quick test kits		KSS titration kit		Polyamine test kit		DUROVAL®refill pack										Analysis systems																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								

Colorimetric test kits	Testoval® ammonium	Testoval® aluminum	Testoval® chlorine DPD method 0,1-1 mg/l		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 the concentration range 0–10 mg/l NH_4^+	color comparison kit for the concentration range 0–2 mg/l Al	color comparison kit for concentration range 0.1–1 mg/l of free and total chlorine	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	410680	410650	410520	Order number	410547	410544	410556
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: 0–0,1–0,2–0,5–1–2 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	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
Testoval® chlorine DPD method 0,5-4 mg/l		Testoval® chloride	Testoval® chromate CrVI		Testoval® copper	Testoval® manganese 0-0,5 mg/l	Testoval® manganese 0-20 mg/l
							
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	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	411520	410526	410532	Order number	410562	410660	410568
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	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

Colorimetric test kits	Testoval® nitrite	Testoval® Phosphate® (orthophosphate)	Testoval® pH chlorine DPD	Testoval® dissolved silicate	Testoval® sulfite	
						
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 ₂ O ₅	monitoring pH value and chlorine content in swimming pools	Is used as	color comparison kit for the concentration range 0–10 mg/l SiO ₂	color comparison kit for the concentration range 0–20 mg/l SO ₃ ²⁻
Order number	410690	410592	410601	Order number	410622	410634
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	Description	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	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® pH value 1-5,5	Testoval® pH value 5,5-8	Testoval® pH value 8-12
			
Is used as	color comparison kit for pH range 1-5,5	color comparison kit for pH range 5,5-8	color comparison kit for pH range 8-12
Order number	410604	410610	410616
Description	individual values: 1-2-3-4-5-5,5, complete with reagent analyses: approx. 250 measuring time: approx. 1 minute	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

Analysis systems	Testoval® refill pack		Analysis kits	Standard analysis cabinet H	Standard analysis cabinet S	Analysis cabinet special version		
		Product	Order number					
	aluminum	1 set of reagents for approx. 130 analyses replacement color comparison device, complete	410651 410652					
	ammonium	1 set of reagents for approx. 70 analyses replacement color comparison device, complete	410681 410682					
	chlorine DPD method 0.1–1 mg/l	1 set of reagents for approx. 70 analyses replacement color comparison device, complete	410521 410522					
	chlorine DPD method 0,5-4 mg/l	1 set of reagents for approx. 70 analyses replacement color comparison device, complete	410521 410523	Is used	for water analysis	for water analysis	for water analysis	
	chloride	1 set of reagents for approx. 40 analyses replacement color comparison device, complete	410527 410528	Order number	410300	410305	410310	
	chromate CrVI	1 set of reagents for approx. 70 analyses replacement color comparison device, complete	410533 410534	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	
	dissolved iron (II) + (III) 0-1 mg/l	1 set of reagents for approx. 100 analyses replacement color comparison device, complete	410548 410549					
	dissolved iron (II) + (III) 0-10 mg/l	1 set of reagents for approx. 70 analyses replacement color comparison device, complete	410545 410546					
	hydrazine	1 set of reagents for approx. 100 analyses replacement color comparison device, complete	410557 410558					
	copper	1 set of reagents for approx. 100 analyses replacement color comparison device, complete	410563 410564					
	manganese 0-0,5 mg/l	1 set of reagents for approx. 70 analyses replacement color comparison device, complete	410661 410662					
	manganese 0-20 mg/l	1 set of reagents for approx. 100 analyses replacement color comparison device, complete	410569 410570					
	nitrite	1 set of reagents for approx. 100 analyses replacement color comparison device, complete	410691 410692					
	Phosphatest®	1 set of reagents for approx. 180 analyses replacement color comparison device, complete	410593 410594					
	pH-chlorine DPD	1 set of reagents for approx. 70 analyses replacement color comparison device, complete	410602 410603	Boiler house analysis case				Analysis case special version
	pH value 1-5,5	1 set of reagents for approx. 250 analyses replacement color comparison device, complete	410605 410606					
	pH value 5,5-8	1 set of reagents for approx. 250 analyses replacement color comparison device, complete	410611 410612					
	pH value 8-12	1 set of reagents for approx. 250 analyses replacement color comparison device, complete	410617 410618					
	dissolved silicate	1 set of reagents for approx. 100 analyses replacement color comparison device, complete	410623 410624					
	sulfite	1 set of reagents for approx. 150 analyses replacement color comparison device, complete	410635 410636	Is used	for water analysis in boiler houses	for water analysis in boiler houses		
	cuvettes	replacement cuvette for color comparison devices replacement cuvette for chloride color comparison device	410001 410529	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		

Analysis systems



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	<p>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-water-soluble. The smell and taste of the water are not affected.</p>	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• 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
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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, normal	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



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.

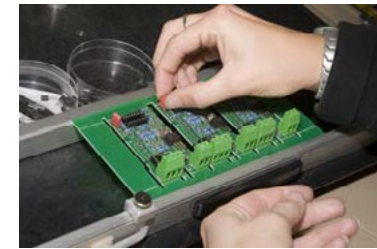


Contract Development



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



Contract Manufacturing



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.



§ 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 obligations.
- (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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