HYDROTEC GmbH

TURBO **MAG**® - Scale Protection

WRAS APPROVED PRODUCT

Water, our most valuable resource

Optimised Systems and Solutions for Water Quality Management

HYDROTEC GmbH

TURBO **MAG**® in the field: a story of success

London's new Shopping C entre "One New Change"

From high-end to high street fashion, exciting new tastes and first-class office premises, One New Change opposite St Paul's Cathedral is the place to play in the City of London. The location combines modern architecture with an environmental friendly and energy-efficient building technology.

The situation:

Just after opening ceremonies of the new Shopping Centre in the heart of London, the hot water supply did fail due to scaling up. That stands for heavy damage to the image of such a prestigious building.

The solution:

After careful perusal of the total installation system, assessment of water chemistry and operation cost comparison towards traditional ion exchange process (water softener), a decision was made favouring the installation of a TURBO **MAG**® system.

The result:

The drinking water installation is free from scaling and the hot water supply keeps operating without interruption. The owners and persons running the restaurants, coffee shops, designer shops and office premises, and last but not least the visitors, benefit from and enjoy since then all advantages of water treated and conditioned by TURBO **MAG**®.

One New Change, Shopping Centre next to St Paul's.

Water quality: The One New Change

pH-value	7,9
Conductivity	785 µS/cm
Total hardness as CaCO3	286 ppm
Alcalinity as CaCO3	106.6 ppm
Calcium	106,6 ppm
Magnesium	31,2 ppm
Sodium	45 ppm
Potassium	2,8 ppm
Chloride	35 ppm
Sulphate	48,2 ppm
Nitrate	26,3 ppm
Scale precipitation potential at 60 °C	69,9 ppm

Cost saving compared with traditional water softening (ion exchange) more than 3.000 €/year.

Installation TURBO **MAG**®, One New Change

TURBO **MAG**® scale protection family without the use of chemicals and offering the performance of water softening

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TURBO **MAG**® in the field: a story of success

Private residential building in Berlin (Germany)

The focus for the new residential building in Berlin was on modern architecture with the inclusion of an efficient domestic engineering. Hot water preparation is with modern instantaneous water heaters and additionally by using solar power.

The situation:

The home-builder knew about high amount of hardness builders in the drinking water and intended to avoid damage caused by scale by the installation of a water treatment system.

The solution:

After careful perusal of the total installation system, assessment of water chemistry and operation cost comparison towards traditional ion exchange process (water softener), a decision was made favouring the installation of a TURBO **MAG**® system.

The result:

The water and installation system works for years already without any problems with scale on fittings, in the hot water preparation or in the washing machine. The residents benefit from and enjoy since then all advantages of water treated and conditioned by TURBO **MAG**® – gentle care in bath and shower.

Water quality: Single-family home in Berlin	
pH-value	7,41
Conductivity	864 µS/cm
Total hardness as CaCO3	446 ppm
Alcalinity as CaCO3	196 ppm
Calcium	152,0 ppm
Magnesium	19,8 ppm
Sodium	26,3 ppm
Potassium	3,9 ppm
Chloride	72,1 ppm
Sulphate	198,5 ppm
Nitrate	3,7 ppm
Scale precipitation potential at 60°C	53,1 ppm

Cost saving compared with traditional water softening (ion exchange) 196 €/year.

Installation TURBO **MAG**®, Berlin

TURBO **MAG**® scale protection family without the use of chemicals and offering the performance of water softening

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TURBO **MAG**® in the field: a story of success

Exclusive hotel nearby the coast in England

A hotel with a long tradition and directly situated at the coast of the North Sea. The guests are offered vacation in wonderful nature combined with utmost comfort and the outstanding atmosphere of the domicile.

The situation:

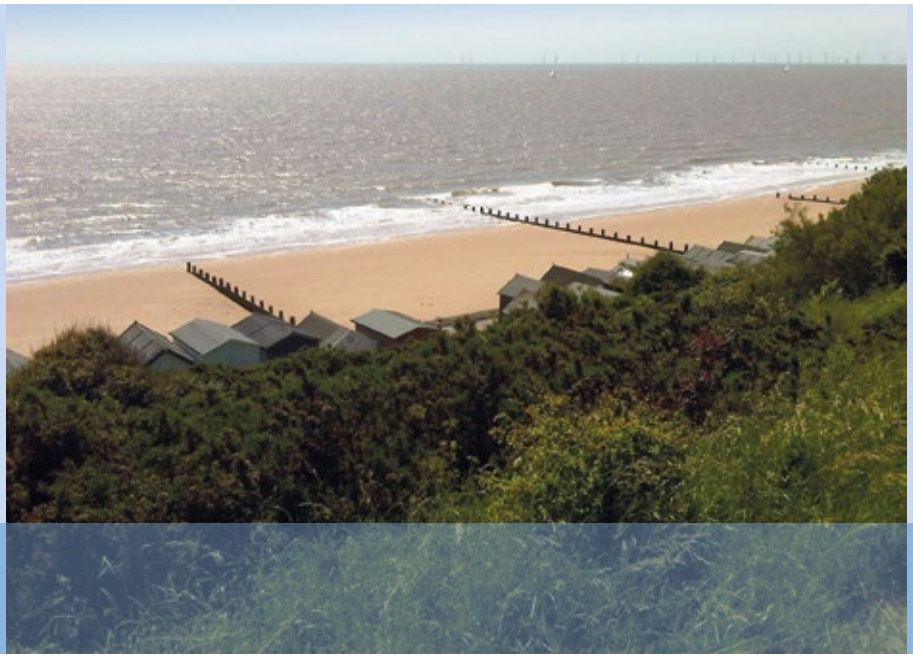
One year after system upgrade, the hot water supply did fail due to scaling up. Lots of massive complaints from guests showered on the persons running the hotel with the consequence of regular guests staying away and negative promotion.

The solution:

After careful perusal of the total installation system, assessment of water chemistry and operation cost comparison towards traditional ion exchange process (water softener), a decision was made favouring the installation of a TURBO **MAG**® system.

The result:

The water installation is free from scaling. The hotel guests benefit from and enjoy since then all advantages of water treated and conditioned by TURBO **MAG**®. The persons running the hotel are delighted in satisfied customers.



Water quality: Hotel nearby English Coast

pH-value	7,2
Conductivity	866 µS/cm
Total hardness as CaCO3	357 ppm
Alcalinity as CaCO3	250 ppm
Calcium	138,6 ppm
Magnesium	5,9 ppm
Sodium	28,1 ppm
Potassium	3,6 ppm
Chloride	61,2 ppm
Sulphate	56,6 ppm
Nitrate	38,5 ppm
Scale precipitation potential at 60°C	68,1 ppm

Cost saving compared with traditional water softening (ion exchange) more than 6.500 €/year.

Scale deposits in hot water accumulator prior installation of TURBO **MAG**®

TURBO **MAG**® scale protection family without the use of chemicals and offering the performance of water softening

The problem: **SCALE**

Quite lot faults and malfunction in hot water treatment, with washing and dishwasher systems, at fittings and pipe work are caused by scale deposits.

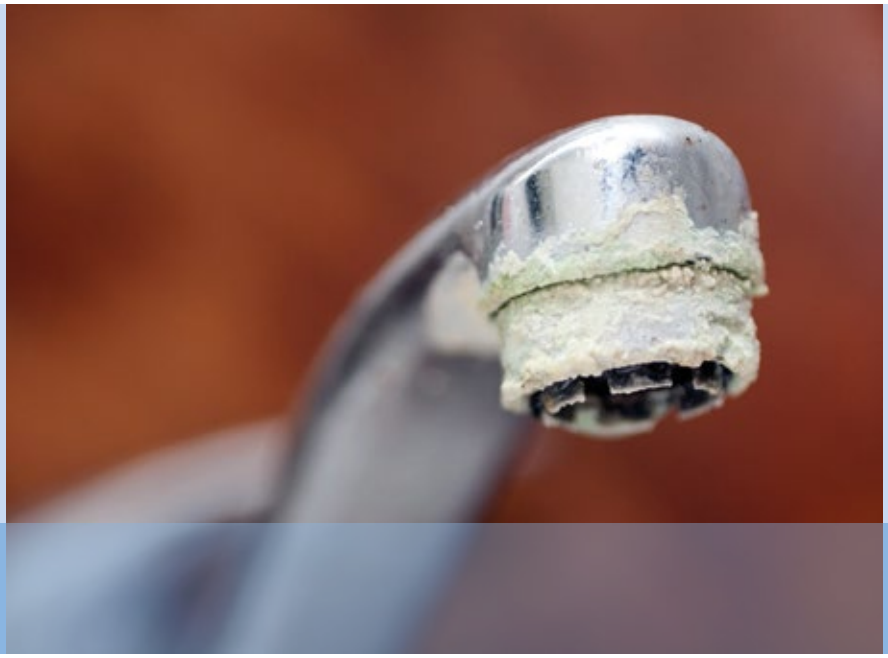
Drinking water comprise natural mineral substances such as calcium and magnesium that show up in form of scale deposits, especially in case of temperature rise.

The consequence:

- **Risk of rapid mechanical failure**
- **Destruction of pipe work, fittings, water heaters**
- **Increased maintenance and operational costs**
- **Poor energy efficiency**
- **Increased CO2 emission**
- **Habitat for dangerous bacteria**
- **Damage to washing and dishwasher machines**

Scale deposit in hot water tank

Heavy scale build up in hot water pipes in cross section



The solution: The TURBO **MAG**®

A physical water conditioning system with unique features and unequalled performance

Advantages:

- Fabrication includes high-tech, high performance materials such as textile carbons
- Intelligent control technology, for process flow control
- Failure record by SMS message (option)
- Efficiency and function proven by field trials

WRAS APPROVED PRODUCT

TÜV NORD DIN EN ISO 9001

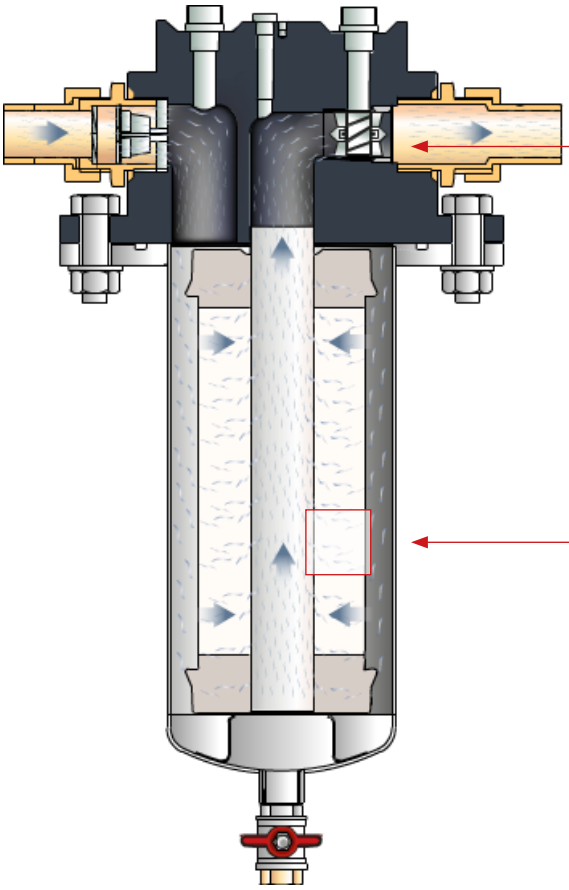
Environmental friendly scale protection
Efficiency test in accordance with DVGW worksheet W-512

The water is a friendly element for those who are familiar with it and know how to treat it.

(Johann Wolfgang von Goethe)

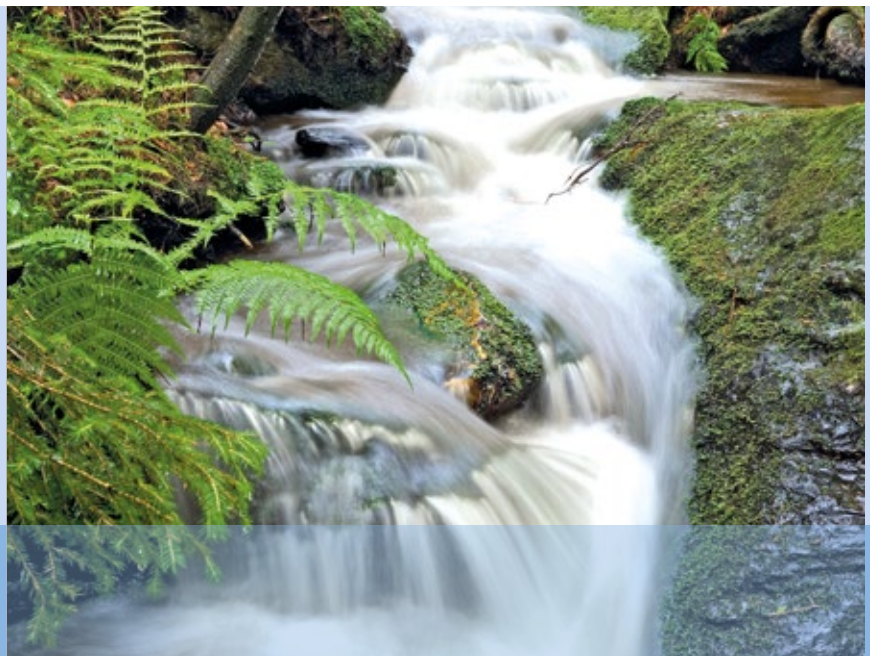
Optimised Systems and Solutions for Water Quality Management

System Schematics



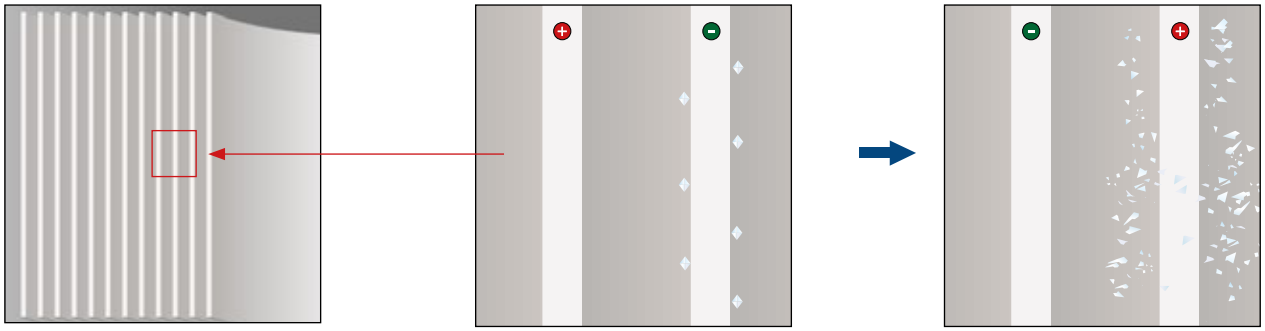
water meter (controlled)

Treatment module supported and separated by water permeable membranes



The operating principle

Water treatment is achieved in two steps



Treatment module

Step 1: Controlled formation of micro-crystals of scale in the treatment module

Step 2: Micro-crystals are released into the water system (for the prevention of scale) by a process of polarity reversal

Heating element conditioned in accordance with efficiency test W512
Left one with water treated by TURBO **MAG**®
Right one without water treatment

Hot water should be free from scale; that can only be achieved by suitable scale protection systems.
Our TURBO MAG® ensures effective scale protection – less maintenance, chemical-free and environmental friendly.

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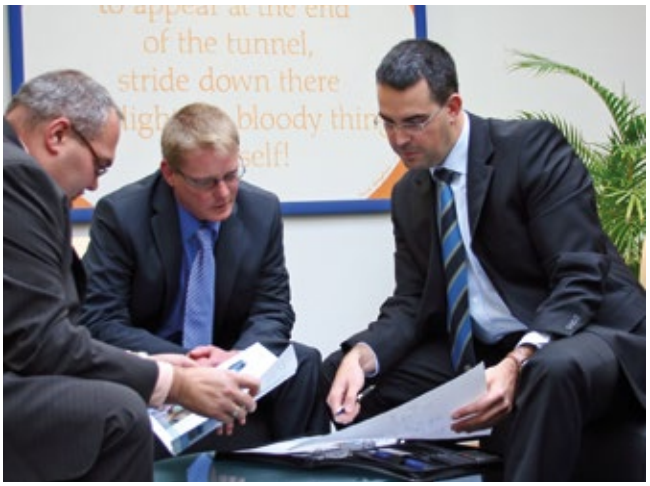
Steps to scale protection

Analytics / laboratory

Detailed analytics are carried out in our own laboratory so that a scaling risk for each individual property. Most modern research methods give information about scale precipitation potential and a subsequent optimum chemical-free water treatment.



Advice

Water treatment systems represent a long-lasting investment. Many factors have to be observed prior planning in order to ensure an original conception that is optimized to meet the customer's requirement. Operation costs compared with different technologies are calculated and presented. You will benefit from the experience and the know how of our experts to achieve the best possible result.

Service

Our worldwide assured services assist at every stage, from project conception, detailed design, technology applications, in-house equipment manufacture, commissioning and our after sales service. We aim to satisfy all our customer's needs.

Our TURBO**MAG**® delivers:

- Scale control throughout the system
- Reduced maintenance and repair costs caused by scaling
- Optimum energy efficiency
- Reduced CO2 emission
- No habitat for dangerous bacteria
- Reduced scale deposits in bath and kitchen
- Protection for cost expensive fittings
- Reduced consumption of cleaning agent
- Water treatment without the uses of chemicals
- No costs for regeneration salt and waste water

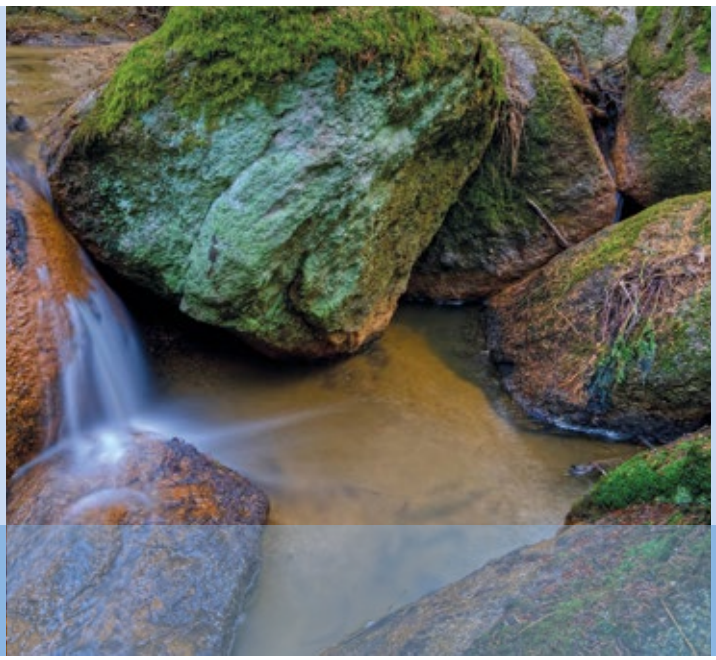
Optimised Systems and Solutions for Water Quality Management

TURBO**MAG**® flexible systems for every plant size

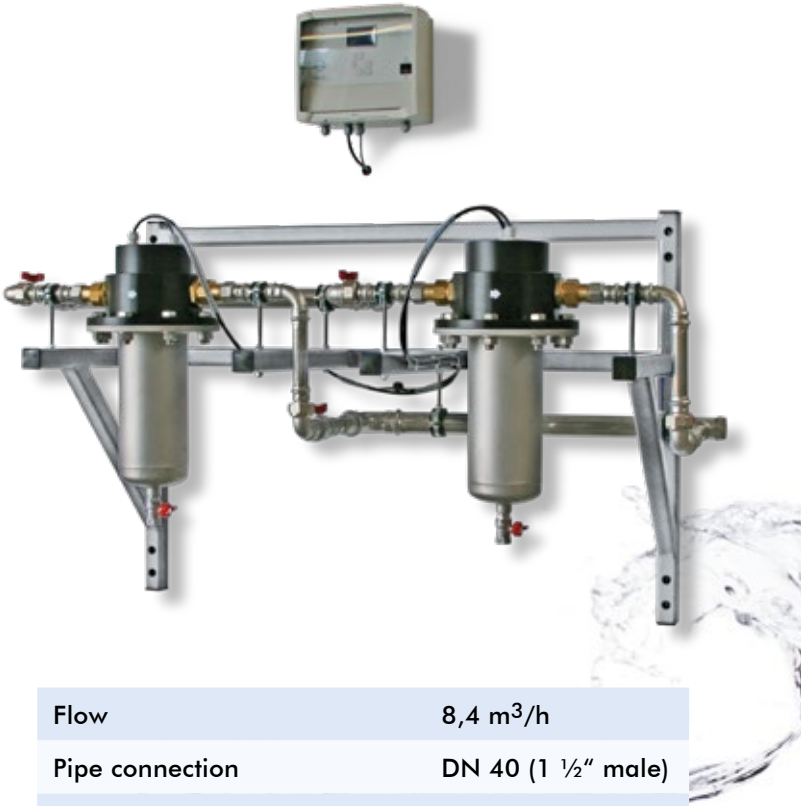
TURBO**MAG**® Simplex

Controller

Flow	4,2 m^3/h
Pipe connection	DN 25 (1″ male)
Water temperature min. / max.	5 / 30 °C
Operating pressure min./max.	10 bar
Electrical connection	230 V / 50 – 60 Hz
Power input - whilst water treatment - in stand-by	 25 Watt 7,5 Watt
Article number	500.000



TURBO**MAG**® Duplex Skid and Wall



Flow	8,4 m^3/h
Pipe connection	DN 40 (1 ½“ male)
Water temperature min. / max.	5 / 30 °C
Operating pressure min./max.	10 bar
Electrical connection	230 V / 50 – 60 Hz
Power input - whilst water treatment - in stand-by	 25 Watt 7,5 Watt
Article number skid system	500.093
Article number wall system	500.091

Optimised Systems and Solutions for Water Quality Management

HYDROTEC GmbH

TURBO**MAG**® flexible systems for every plant size

TURBO**MAG**® Quadplex Skid

Project and customer specific solutions - that is our strength. We develop and realise bespoke solutions for most diverse industrial sectors and branches.

TURBO**MAG**® Quadplex Vessel

Flow		16,8 m³/h
Pipe connection	DN 50 (flange) DN 50 (2"male)	- vessel unit - skid unit
Water temperature min. / max		5 / 30 °C
Operating pressure min./max		10 bar
Electrical connection		230 V / 50 – 60 Hz
Power input - whilst water treatment - in stand-by		 50 Watt 15 Watt
Article number vessel system		500.158
Article number skid unit		500.095

Optimised Systems and Solutions for Water Quality Management

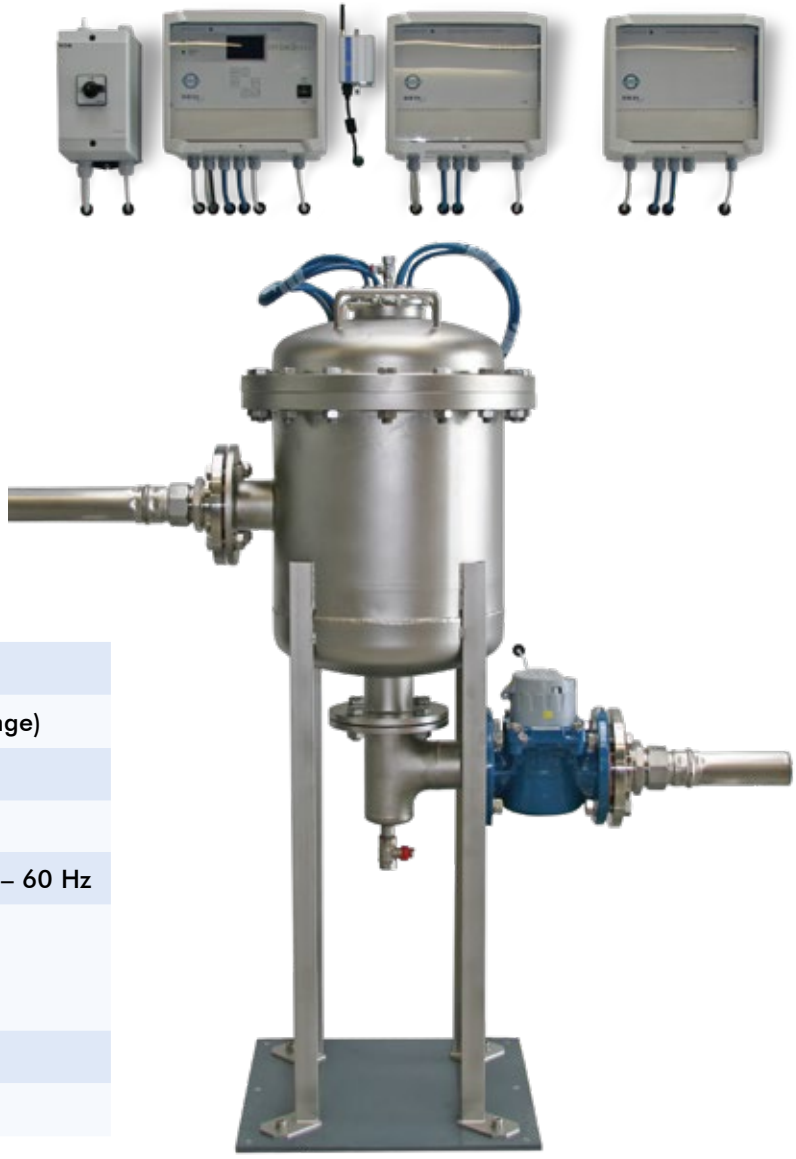
HYDROTEC GmbH

TURBO**MAG**® flexible systems for every plant size

TURBO**MAG**® Hexplex Skid

Our economic and cost effective systems that are easy to handle ensure a correct alignment of hot water, whereby operation costs are reduced and the plant life extended.

TURBO **MAG**® Hexplex Vessel



Flow	25,2 m³/h
Pipe connection	DN 65 (flange)
Water temperature min. / max.	5 / 30 °C
Operating pressure min. / max.	10 bar
Electrical connection	230 V / 50 – 60 Hz
Power input - whilst water treatment - in stand-by	 75 Watt 22,5 Watt
Article number vessel system	500.159
Article number skid unit	500.097

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