

## Operating and Maintenance Manual

# TurboMAG<sup>®</sup> Simplex



**Serial number:** .....

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## Preface

The system is constructed and manufactured in accordance with all current standards and technical specifications. The system provides the latest state-of-the-art technology, allowing for maximum safety under all operating conditions.

Safety of the system in operation can only be assured if all necessary measures are taken beforehand. It is part of the operator's responsibility to plan and monitor such measures and implement them appropriately.

This operating and maintenance manual includes important information for the safe installation, operation and commissioning of the system. Please make yourself familiar with all details prior to the commencement of works.

For any additional information or problems encountered in operation, please contact our Customer Service Department at the following address:

**Hydrotec (UK) Ltd  
Hydrotec House  
5 Manor Courtyard, Hughenden Avenue  
High Wycombe, Bucks HP13 5RE  
Tel: 01494 796040  
Email: [services@hydrotec.co.uk](mailto:services@hydrotec.co.uk)**

## Chapter I - General Information

### 1. Documentation

The following information is included in the operation and maintenance manual:

- Safety information
- Information and instructions for
  - Assembly
  - Start-up
  - Operation
  - Maintenance
  - Troubleshooting
- Technical Data

The operation and maintenance manual and all other technical information and documents must always be kept readily accessible.

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Tel: 01494 796 040  
Email: [services@hydrotec.co.uk](mailto:services@hydrotec.co.uk)

### 2. Safety Information

#### 2.1 Operator's Awareness

The system is constructed and manufactured in accordance with all current standards as well as further technical specifications. The system provides the latest state-of-the-art technology, allowing for maximum safety under all operating conditions.

Safety of the system in operation can only be assured if all necessary measures are taken beforehand. It is part of the operator's responsibility to plan and monitor such measures and implement them appropriately.

The operator must ensure that:

- The system is used in accordance with the specified purpose
- The system is maintained in a serviceable condition, with the safety facilities being monitored for correct function at regular intervals
- The operation and maintenance manual is always in a legible condition and available next to the unit
- The operation, maintenance and repair work is carried out by qualified and authorised personnel only

**All safety and warning information attached to the system must not be removed and must be kept in a legible condition**

## 2.2 Appropriate Use

The system is manufactured to the latest German technical safety standards employing the latest state-of-the-art technology.

If incorrectly treated, not maintained properly at regular intervals or not used for the correct purpose according to the specifications, the conditioner may incur risks and/or damage.

Operation of the system must be within the technical parameters and limit values in chapter II. The system is to be operated and maintained in good working order and according to the specification it was designed for only.

**Caution! Any use of the system other than described, is deemed to be not in accordance with the specification.**

**The manufacturer / supplier does not accept any liability resulting from the improper use of the system. Such risks are borne by the operator alone.**

**All regulations and instructions in the operating and maintenance manual and regulations applicable locally must be strictly adhered to.**

**Any malfunctions must be corrected immediately.**

## 2.3 Basic Safety Measures

Prior to starting the system it must be ensured that:

- No-one can suffer injury due to the system operation
- All safety facilities are in a perfectly serviceable condition

The system must be operated in perfect condition only. All faults must be notified to the person responsible immediately after being noticed.

In order to avoid any potential flooding of the installation site, there should be a drainage and / or leak control system with alarm provided locally by the site.

## Maintenance, Repair and Electrical Work

- All inspection and maintenance intervals specified in the operation and maintenance manual must be adhered to
- Prior to any repair work, the system must be disconnected from mains
- The system should be de-pressurised and must be protected from accidental re-start
- Only suitable and correctly functioning load-supporting devices shall be used when replacing heavy components or system elements
- Hose lines shall be replaced regularly (preventative maintenance) even if no damage is visible
- Prior to any work on electric components the system must be disconnected from the mains
- Electric equipment must be checked at regular intervals
- Any possible loose connections must be re-secured and damaged electric cabling replaced immediately
- Casings of electric equipment and system components must **never** be cleaned with a water hose (spray)
- Electric components must never be touched with wet hands
- When working on the plant, suitable protective clothing shall be worn (e.g. when handling with liquids such as acids and bases/alkalis)

## Start-up after Maintenance and Repair Work

- Check screw connections for tight fit
- Ensure that any components removed beforehand are installed and restored to their correct operational position
- It must be ensured that all material, tools and other appliances which were necessary for maintenance and repair work are removed from the working area of the system
- Any liquid which has emerged is to be removed
- Ensure that all safety equipment is in a perfectly serviceable condition

## Environmental Protection Regulations

When working on and with the system, all legal regulations in respect of waste minimisation and proper disposal (if appropriate) must be observed.

The elements listed below in particular must not be allowed to contaminate the soil or enter the drainage system during installation, maintenance and repair work:

- Grease and lubrication oils
- Hydraulic oils
- Acids and alkalis (bases)
- Cleaning materials containing solvents
- Cooling agents

**Such substances must be stored, transported and collected in suitable tanks and disposed of in accordance with the applicable regulations.**

## 2.4 Risks in the Event of Safety Instructions Being Disregarded

The consequences of disregarding safety instructions can be dangerous to the system, material and personnel, and may lead to the loss of any warranty claims.

**We shall accept no liability for possible water damage caused due to disregard of the safety instructions.**

## 3. Warranty

The warranty period for the system is either 12 months calculated from the date of commissioning by Hydrotec (UK) Ltd, or 15 months from the date of supply in the event that commissioning is not included with the supply agreement, whichever is the shorter. The plant must be operated and maintained in accordance with Hydrotec (UK) Ltd's requirements. It is recommended that a service contract is taken out for the unit.

Claims under warranty will only be accepted when subject to the following conditions:

- The system is used and operated in accordance with information and instructions in the operation and maintenance manual
- The system is used and operated in accordance with information and instructions provided by Hydrotec (UK) technical department
- The system is treated properly
- Repair work is to be carried out exclusively by authorised specialists
- Original spare parts or parts recommended by Hydrotec (UK) Ltd shall be used exclusively
- No modifications are carried out on the system by users themselves
- The stipulated operation parameters (pressures, flow volume) are maintained and a water temperature of 30°C is not exceeded
- Start-up of the system has been carried out by our service personnel
- After installation and longer standstill periods a chemical disinfection has been performed
- Routine maintenance is carried out by our service personnel.

Excluded from warranty claim are all parts subject to wear and tear such as:

- All moving parts, motors, seals, membranes, filters etc.

Warranty claims cannot be accepted in cases of:

- Operation and installation errors
- Faulty maintenance
- Deliberate damage or negligent handling

Any unauthorised modifications are not permitted for safety reasons. Original spare parts and accessories are especially designed for the system as described

**Original spare parts must be used exclusively!**

## Chapter II - System Description / Technical Data

### 1.1 System Description

TurboMAG® is an environmentally friendly physical scale conditioning system, operating without the use of salt or chemical products and without any water wastage. The unit promotes optimised heat transfer within water heaters and thus contributes positively to the continued reduction in the production of greenhouse gases. It is suitable for the reliable prevention of scale deposits in all drinking and process water installations and for the treatment of scale forming waters.

The scientifically verified operating principle is based on a cathodic induced inoculation crystal formation utilising an electrolytic electrochemical hybrid technology. In order to achieve a maximum efficiency and a long lifetime of the conditioning module, the system controller is programmed with the incoming water, water quality parameters and automatically adjusts its output to suit the water consumption rate. The system is WRAS approved and has also passed the performance efficiency test DVGW W-512.

### 1.2 Construction

The TurboMAG® **Simplex** water treatment system is designed and constructed as single vessel that should be installed in the supply to be treated.

The compact construction consists of a stainless steel module casing with integral treatment module and a detachable plastic top. A non-return valve is provided in the system to prevent the return of water.

The micro-processor control is designed with graphic display and optical and acoustic failure alarms (programmable), showing all relevant data and operating states such as operation, malfunction, residual capacity, module replacement, water flow and treatment intensity.

Measuring / control of: Flow

The optimisation of treatment intensity is achieved by the use of an integral water meter; thus the degree of conditioning the water receives is dependent on actual flow rate of the water and the operating parameters. Furthermore, a connection to BMS via potential free contact is possible.

### 1.3 Water Pressure

The inlet water pressure must be between 2.5 and 8 bar in order to ensure optimum and economic operation system.

Regular maintenance prevents increased pressure loss and ensures correct operation.

It is recommended to install a pressure reducing valve before the water treatment system if the water pressure could exceed 10 bar (static pressure) as this can result in a malfunction of the unit.

## 2. Technical Data

Pipe connection: 1" outer thread  
 Max. operating pressure: 10 bar

Nom. flow: 4.2m<sup>3</sup>/h  
 Pressure loss at nom. flow: 1.0 bar

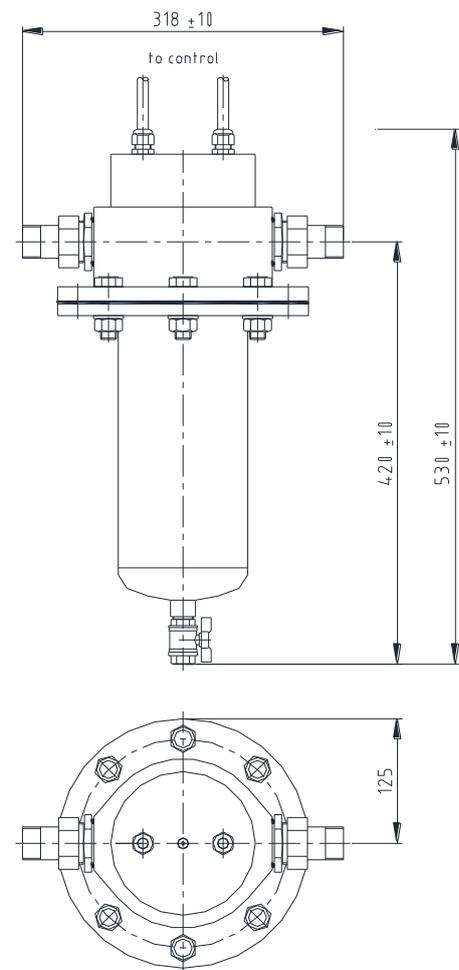
Min./max. water temperature: 5 / 30°C  
 Min./max. ambient temperature: 5 / 40°C

Electrical connection: 230V, 50Hz  
 Type of protection: IP 65  
 Power input  
 - whilst water treatment: 25 – 70 Watts  
 - in stand-by: 7.5 Watts

Water part/filter:  
 Height: 540 mm  
 Width: 329 mm  
 Depth: 250 mm

Micro processor casing  
 (wall-mounted casing)

Height: 240 mm  
 Width: 265 mm  
 Depth: 145 mm



**Important: The space required below the unit for module replacement is 400 mm!**

## Chapter III – Assembly / Installation

### 1. General Information

The TurboMAG® water treatment system is designed and constructed as a single vessel unit consisting of a conditioning vessel housing the conditioning module and a single control box. All operating states are controlled by a micro-processor control system.

- The necessary water connections are provided at the conditioning vessel.
- Conditioning of the water is flow dependent, which is monitored by a vane-type water meter integrated in to the conditioning vessel.
- Setting of the system control is done via the micro processor control.

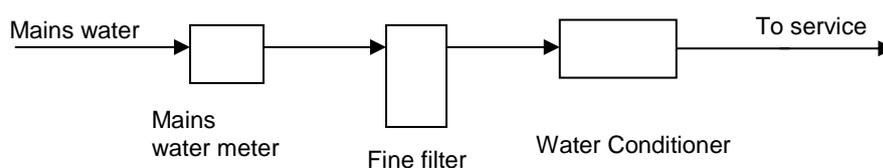
### Conditioning of Wholesome Water

According to standards EN1717 (DIN 1988), the unit installation should be protected by a particulate filter.

#### - Protective filter

A suitable filter should be fitted to protect the pipe work system and the water conditioning unit from malfunction, deposition and corrosion damage caused by foreign particles such as rust, sand, etc.

According to DIN 13443-1 the filter is to be installed in the pipe system directly after the mains water meter in the case of metal pipe installations.



**All technical data and local technical regulations as well as local installation rules must be observed.**

**The installation of the system is to be carried out by suitably qualified persons only. Relevant standards to be observed during installation.**

## 2. Installation Location

The following conditions must be met for the installation of the water conditioning system:

- The water treatment system TurboMAG® is to be installed in a frost-protected area
- The ambient temperature must not drop below 5°C and not exceed 40°C.
- The minimum installation dimensions are shown in the dimensional sketch and in the table.
- An electrical connection of 230V, 50Hz, 3A fused spur is to be provided locally for the operation of the micro processor control.
- In order to avoid flooding by leakage, it is recommended that the installation location is provided with ground drainage discharge or leakage monitor with corresponding alarm.

## 3. Work Prior to Assembly

### Delivery check

Prior to starting assembly, the equipment must be checked for completeness and possible transport damage.  
Any deviation must be notified immediately.

### Mains/incoming and waste water connection

The mains and waste water connections must be designed locally in the necessary positions in relation to the system.

## 4. Hydraulic Connections - Water Conditioning Vessel



TurboMAG® water conditioning vessel connection 1”

1 = mains water inlet

2 = conditioned water outlet

3 = drain cock for wash water / waste water (module replacement only)

All pipe connections must be done without any tension applied. If necessary, the subsequent pipes must be provided with corresponding mounts or support.

**The flow direction must be according to the arrow marking!**

**Important: The space required below the unit for module replacement is 400 mm!**

## 5. Electrical Connections

### Mains connection

The control box wall-mount casing must be installed at eye level and easily accessible.

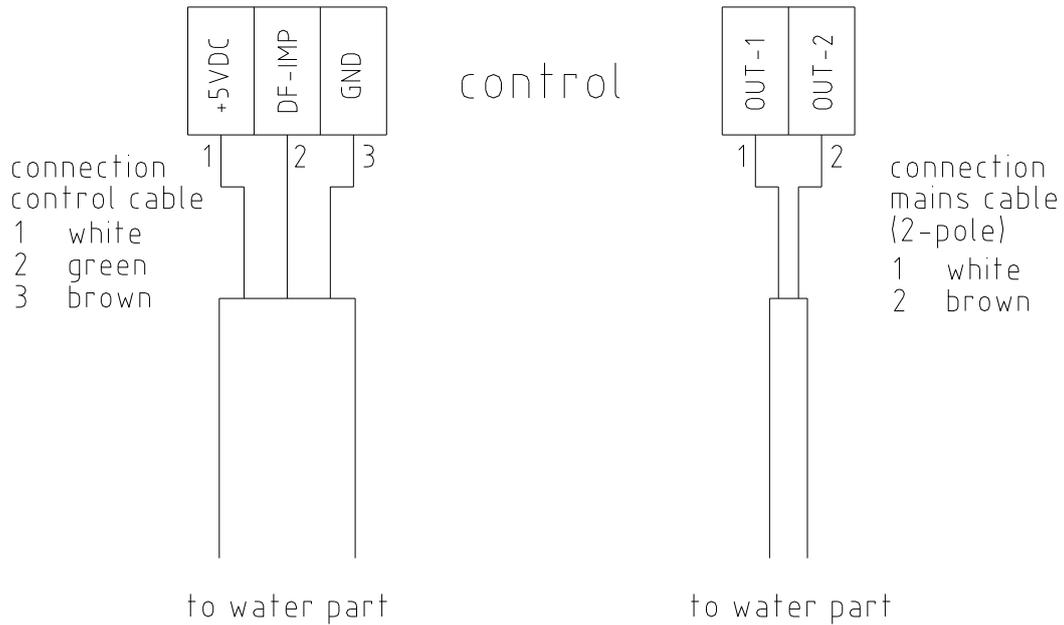
A fused spur must be provided locally to the mains cable of the micro processor controller.

Permanent voltage must be provided (230V, 50Hz).

**Do not use the lighting circuit!**



Cables between control unit and the water conditioning vessel to be installed as per the below terminal plan:



Sheath is not required and can be cut away.

**All work on electrical equipment of the system shall be carried out by authorized and competent persons only!**

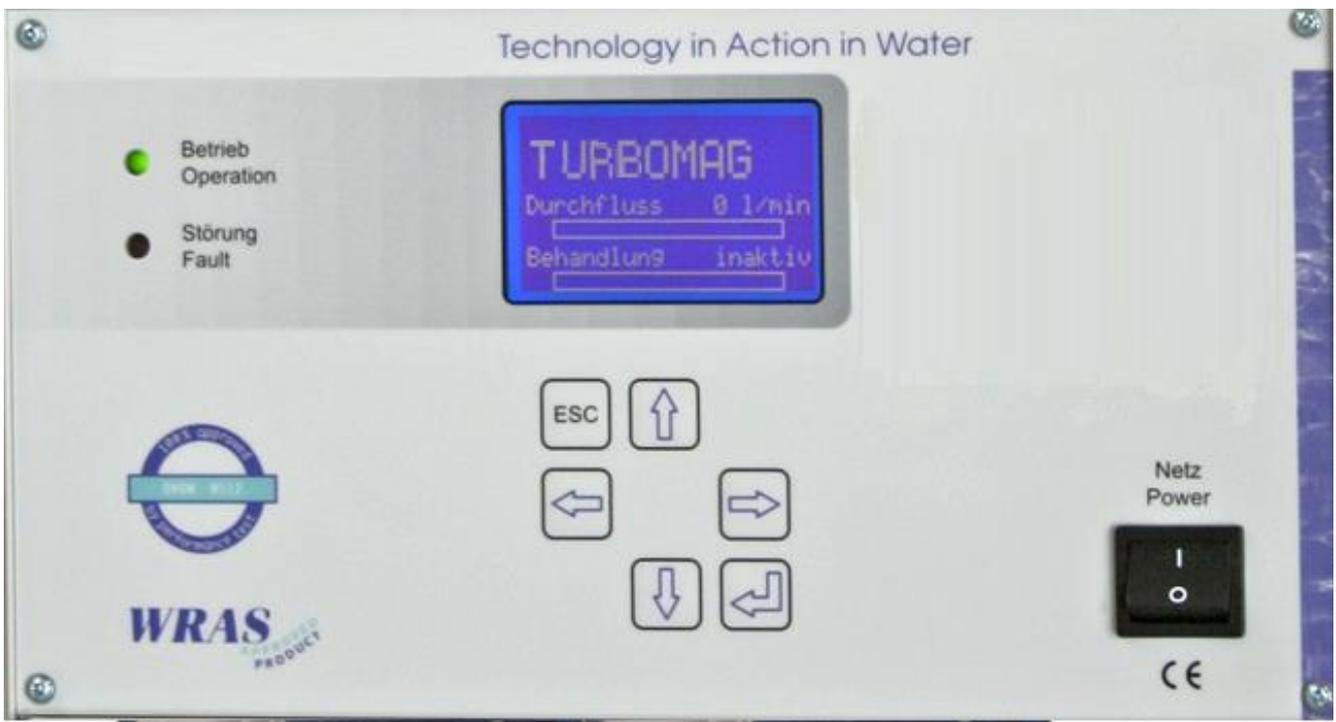
## Chapter IV – Micro-processor Control

### Control and Display Elements

The control unit of the TurboMAG® system has the following control and display elements:

- Mains switch                    ON/OFF
- LED green                    The system is ready for operation, mains voltage present
- LED red                      Malfunction
- Buzzer                        Alarm signal; function can be modified via parameter settings
- Keys/buttons                Input / setting
- LC-Display                  Information and status display

### Control Unit



The control unit is provided with two LEDs to monitor the operation state:

- Mains switch                    ON/OFF
- LED green                    The system is ready for operation, mains voltage present
- LED red                      Malfunction

## Control Menu

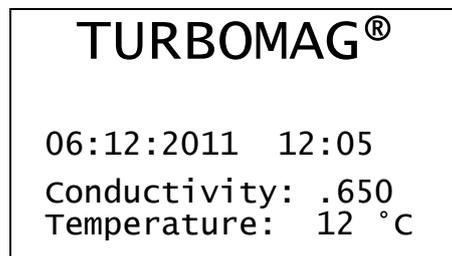
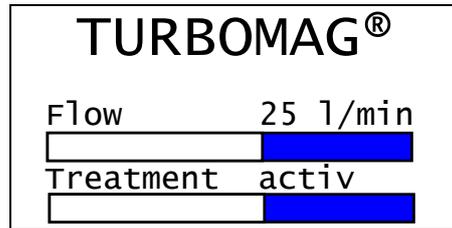
The TurboMAG® control unit is operated via six buttons having the below function dependent on the operation state:

Button	Function
 <Escape>	<ul style="list-style-type: none"> <li>• Termination of input</li> <li>• Return to previous menu level</li> <li>• End of menu</li> </ul>
 <Enter>	<ul style="list-style-type: none"> <li>• Activation of menu in normal operation and afterwards main menu</li> <li>• Confirmation/end of input</li> <li>• Selection of menu point</li> </ul>
 <up>	<ul style="list-style-type: none"> <li>• Navigation in menu (UP)</li> <li>• Increase the value of parameters</li> </ul>
 <down>	<ul style="list-style-type: none"> <li>• Navigation in menu (DOWN)</li> <li>• Reduce the value of parameters</li> </ul>
 <left>	<ul style="list-style-type: none"> <li>• Navigation between input fields should more than two fields exist</li> </ul>
 <right>	<ul style="list-style-type: none"> <li>• Navigation between input fields should more than two fields exist</li> </ul>

If during menu service no input occurs for more than 30 seconds, the input is interrupted automatically and the control device returns to normal operation.

## Normal Operation

In normal operation, the actual flow is shown on the display in l/min.

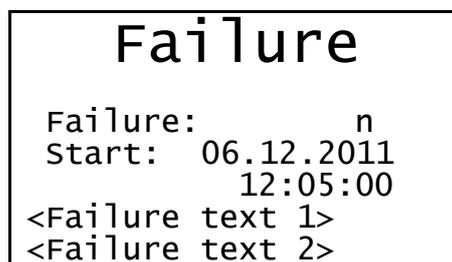


Monitoring (10 sec - active) of conductivity and temperature is shown only if an optional sensor is installed.

Return to normal operation by button <ESC>

## Malfunction

A failure or malfunction is shown by a red LED. The display in such case shows:

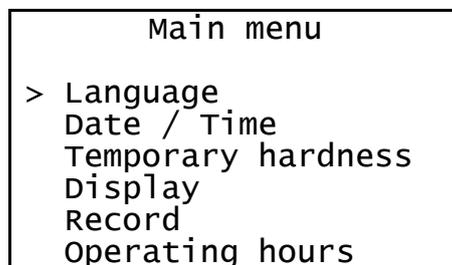
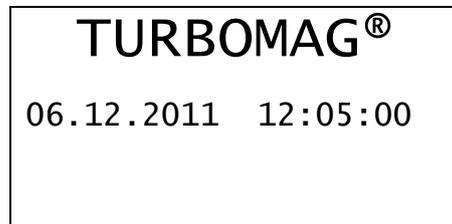
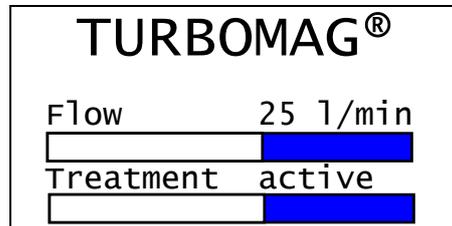


The display of the failure text fades the normal display and is removed only once the failure has been eliminated. The service menu can be called up when a failure record is active.

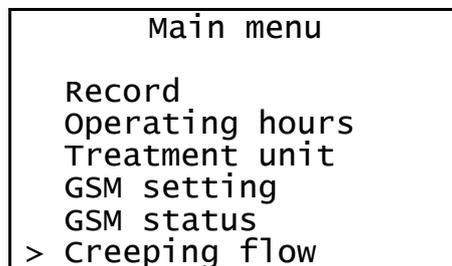
A description and explanation for the failure numbers and possible reasons are shown in chapter "Troubleshooting".

## Activation of Menu Control

If the control unit TurboMAG® is in normal operation without failure or malfunction, the control menu can be activated by pressing the button **<Enter>** twice. The existing control points are shown in a table:



Page 1



Page 2

The activated setting is shown and marked by the cursor. Navigation between the inputs is possible by the buttons **<up>** and **<down>**. The last two menu points are shown below the lower edge when scrolling. The input marked by the cursor is activated by pressing **<Enter>**. The menu setting is finished by **<ESC>**.

## Language Setting

The control unit TurboMAG® supports the languages English and German. The change-over of language is carried out by using the buttons **<up>** or **<down>** in the language menu.

<p>Language</p> <p>&gt;English&lt;</p>
--

The change-over is effective immediately and the dialogue is shown in the selected language. The name of the selected language is shown in the second line. The change-over is confirmed with the **<Enter>** button.

## Setting of Date and Time

Setting of date and time is done in the menu Date / Time.

<p>Date/Time</p> <p><u>06</u>.12.2011</p> <p>12:05:00</p>
---

The actual date and time is shown. The underlined values can be modified using the buttons **<up>** / **<down>**. Movement of the underlined parameter is done using the buttons **<left>** / **<right>**. The input is accepted by **<Enter>**.

## Total Hardness

The total water hardness can be set with the buttons **<up>** / **<down>**. Determination of total hardness is done by means of a measuring instrument or information obtained from the local water company or Hydrotec (UK); the UK models will indicate water hardness in ppm (CaCO<sub>3</sub>).

<p>Total hardness</p> <p>°dH</p> <p>&gt;17&lt;</p>
--

## Display

It is possible to adjust the background lighting to adapt the display to the different lighting conditions and to balance any variations in display parameters. The contrast is set ex works.

```

Display
-----
Brightness    >70<
  
```

Whilst setting (with buttons **<up>** / **<down>**), the display is re-adjusted immediately. If the display reaches a state that does not allow further recognition then a stop after 30 seconds is activated and the previous setting is restored.

## Configuration of Signal Contacts and Signal Sound

```

Record
-----
Signal noise    >ON<
Alarm contact   OFF
Warning contact OFF
Optional contact OFF
  
```

The internal signal sender and the relay contacts are activated or deactivated via the settings “ON” or “OFF”. The underlined parameter can be changed using the buttons **<up>** / **<down>**. The underlined parameter is changed using the buttons **<left>** / **<right>**. The setting is confirmed by **<Enter>**.

Signal sound	is activated once the red LED signals a failure
Alarm contact	is switched at the same time the red LED is activated
Warning contact	not available
Optional contact	not available

## Monitoring of Operation Hour Counter

The TurboMAG® control unit and the respective power units are equipped with several operational hour counters. The actual status of the counters is shown as follows.

Operation hours Control unit	
Mains On	25

The operational hours for the power units are shown by scrolling the buttons **<up>** and **<down>**.

Operation hours Power unit 1	
Mains On	25
Active	2

## Monitoring of Conditioning Module

The remaining capacity of the module is shown via the parameter 'Treatment unit Rem. capacity' in the TurboMAG® control unit. When the remaining capacity is less than 10%, then "service required" is shown in the display.

Treatment unit	
Rem. capacity	10%
	
Service required	

### Setting of GSM-Modem

GSM-modem settings must be done exclusively by the service technicians. A faulty input such as e.g. SIM-PIN results in a lock of the SIM-card.

```
GSM setting
Type          > 0<
SIM PIN      9999
```

### Status Monitoring GSM-Modem

```
GSM Status
State          1000
last rx      +CREG: 0,1
```

The status monitoring shows the actual state of the modem. The last reply of the modem is shown in the second line. The above example confirms that mains power is available and that the modem is recognised. Any details regarding the meaning of the reply string of the modem can be taken from the description.

### Setting of Creeping Flow

```
Creeping flow
>0.0< l/min
```

The setting of the creeping flow defines the flow required to start treatment. There is no treatment at all if the flow values are below the creeping flow. Setting ex works is 0.0 l/min – a modification is necessary in exceptional cases only and shall not be done without prior consultation of the service technician.

## Chapter V – Start-up / Taking Out of Service

### 1. Check Prior to Commissioning

<b>Hydraulic connections</b>	<p>Is the vessel installed according to the arrow marking?</p> <p>Are the following pipelines connected and tight?</p> <ul style="list-style-type: none"> <li>- mains water in</li> <li>- conditioned water out</li> </ul>
<b>Electrical connections</b>	<p>Is the fused spur installed next to the mains cable and is permanent voltage available?</p> <p>Is the following equipment connected to the micro processor control?</p> <ul style="list-style-type: none"> <li>- treatment module</li> <li>- vane-type water meter</li> </ul> <p>Is the micro processor control connected to mains?</p>
<b>Mains water pressure</b>	<p>The mains water pressure may not exceed the following parameters:</p> <p>Min. pressure:        2.5 bar (flow pressure)</p> <p>Max. pressure:        10.0 bar (static pressure)</p>

### 2. Start up of System

**Commissioning and start-up may be carried out by trained personnel only. We recommend that such work is done by our service personnel.**

<b>Preparation</b>	<p>Close isolation valves before and after the water treatment system.</p> <p>Measure the local hardness using the hardness measuring kit.</p>
<b>Start control</b>	<p>Start the control unit with the ON/OFF switch. An automatic test is started directly after switching on.</p>
<b>AUTOMATC TEST</b>	<p>The automatic test is finished automatically and must pass the total sequence without any failure.</p>
<b>Programming of control unit</b>	<p>The control unit is programmed ex works. The hardness is set to 300 ppm ex works. This figure must be adapted to the local permanent hardness.</p>

<p>Total hardness ppm</p> <p>&gt;17&lt;</p>
---

Setting of actual time and date

<p>Date/Time</p> <p>06.12.2011</p> <p>12:05:00</p>
--

**System flush**

Open isolation valve at mains water side slowly.

Open isolation valve at discharge water side slowly.

Let the system ventilate through pipeline and local discharge valve.

**Control water treatment**

All isolation fittings need to be open for the system to fully ventilate. Open a connected water consumer (e.g. a tap in kitchen). The control box must recognise the flow and start conditioning.

<b>TURBOMAG®</b>	
Flow	25 l/min
<input type="checkbox"/>	<input checked="" type="checkbox"/>
Treatment	active
<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Commissioning Record**

An acceptance certificate is attached to the operating manual (see appendices), which must be filled in by the service technician at time of commissioning.

**It is necessary to complete the Commissioning Settings in the manual as well as the Log Book so that warranty claims can be accepted.**

### 3. Taking Out of Operation

**Taking out of service** The isolation valves in the mains and waste water pipeline must be closed.

Mains power should be shut off at the spur.

Even when taken out of operation, the system should be protected against frost.

**Restoring operation** Put mains plug of the control unit in the fused socket.

Open isolation valve at mains water side slowly.

Open isolation valve at discharge water side slowly.

Let the system ventilate through pipeline and local discharge valve.

**An extended period of standstill may pose a risk of bacterial growth in the system; disinfection of the system is required.**

**Such disinfection shall be carried out by skilled persons only.**

**Please call our services team for further information.**

## Chapter VI – Troubleshooting / Fault Finding

### 1. No Water Supply

No.	Inspection	Result	Action
1.	Open sample cock before the TurboMAG® system	No water	Open isolation valves before the TurboMAG® system
		Water flows	Proceed with 2
2.	Open sample cock after the TurboMAG® system	Water flows	Open isolation valve to consumer
		No water	Proceed with 3
3.	Check pressure loss through TurboMAG®	<b>Too high a pressure loss</b>  Treatment module contaminated	<b>Call service!</b>

### 2. Malfunction of Micro-processor Control

Different states are controlled and monitored during operation. Any malfunction is shown in the LCD display and the failure record contact and failure record lamp are switched on.

#### Malfunction of automatic test

The automatic test is only carried out when the control unit is switched ON/OFF or when the control unit is run after a power failure. Please call the services team if a malfunction is evident during automatic test.

Step	Failure	Text
1	0x02	Real time display (EDP) faulty
2	0x11	Operation hour memory damaged
	0x12	Table measuring values damaged
	0x14	Parameter input 1 (ManParams) damaged
	0x18	Parameter input 2 (ApplParams) damaged
	The LOW-Nibble of failures is added if there are several failures evident, e.g. 0x1D means 0x11, 0x14 and 0x18 at the same time.	
3	0x02	PCB temperature control below 0°C
	0x03	Temperature sensor control faulty
	0x04	PCB temperature control exceeds 60°C
4	0x02	Water temperature below 5°C
	0x03	Water temperature sensor faulty
	0x04	Water temperature exceeds 30°C

## Malfunction Control / Power Unit

Number	Text	Action
0x35	Flow xx l/min / too high	Flow is outside the admissible limit The flow is to be reduced
<b>Water treatment module</b>		
0x2x/0x21	Power unit / short circuit	Replace water treatment module
0x2x/0x22	Power unit / disconnection	
0x2x/0x23	Power unit / faulty module	
0x91	Maintenance / replacement	
<b>Internal malfunction</b>		
0x1x	Power unit / communication error xx	Call service!
0x81	Control device / too high	
0x2x/0x80	Power unit / too hot, reduced	
0x2x/0x81	Power unit / too hot, off	
0x2x/0x82	Power unit / Uin < 22 Volt	
0x2x/0x83	Power unit / Uin > 29 Volt	
0x2x/0x85	Power unit / RUN_SS failure	
0x2x/0x8F	Power unit / CAN-Bus Time-out	

## Chapter VII – Monitoring and Maintenance

### 1. General Information

In order to ensure good operation of the TurboMAG® water conditioning system, it is necessary to keep a regular log of the system operation parameters and adhere to all local regulations.

The DIN 1988 part 8 / A 12 includes regulations relating to the inspection and maintenance of water treatment systems.

- A yearly maintenance of the system shall be carried out by the Hydrotec services team or an authorised expert, or earlier if the conditioning module becomes exhausted before then.

### 2. Routine Inspection by the Operator

A regular visual check of all system components (damage, leakage etc.) is necessary for the safe operation of the water treatment system.

The following parameters must be checked and recorded in an operational diary at the stated intervals as a minimum, in order to be in a position to deal with a problem immediately.

Inspection	Domestic / Trade
Mains water total hardness	1 x per month

Inspection	Weekly
Operational pressure mains water (flow pressure)	X
Temperature mains water	X
Value shown on water meter	X

### 3. Maintenance

A yearly maintenance is necessary as per DIN 1988 part 8.

This includes a visual system inspection as well as a check of technical function of individual plant components.

### Inspection Work Carried out During Maintenance:

- Functional check of control unit, recognition of water flow
- Check of control valves for tightness (the wear seals are to be replaced if required)
- Adjustment of time and program; settings on control box
- Check of total hardness in mains water
- Replacement of conditioning module as necessary.

### Note:

The following components in the mains water pipe should be checked and maintained at the shown intervals:

Filter, backwash	after 2 months at the latest
Filter, non backwash	after 6 months at the latest (inspection after 2 months)

## 4. Replacement of Treatment Module

A serviceable treatment module is necessary to ensure optimum water treatment and thus, optimum scale protection. The treatment module efficiency is constantly controlled and monitored by the control unit. The degree of wear is shown by a bar diagram (histogram).

The following situation requires a replacement of the treatment module:

- Information in display “module replacement necessary”
- Information in display – error “0x2x/0x21 or 0x2x/0x22 or 0x2x/0x23”
- After 5 years of operation at the latest.

**Important:**

In order to carry out cleaning and maintenance work at the system, it must be disconnected from the mains water and depressurised.

Once this has been done, the parts can be dismantled and cleaned with CA cleaner in order to remove lime scale deposits.

**Only use components which are approved for the TurboMAG® water treatment system.**

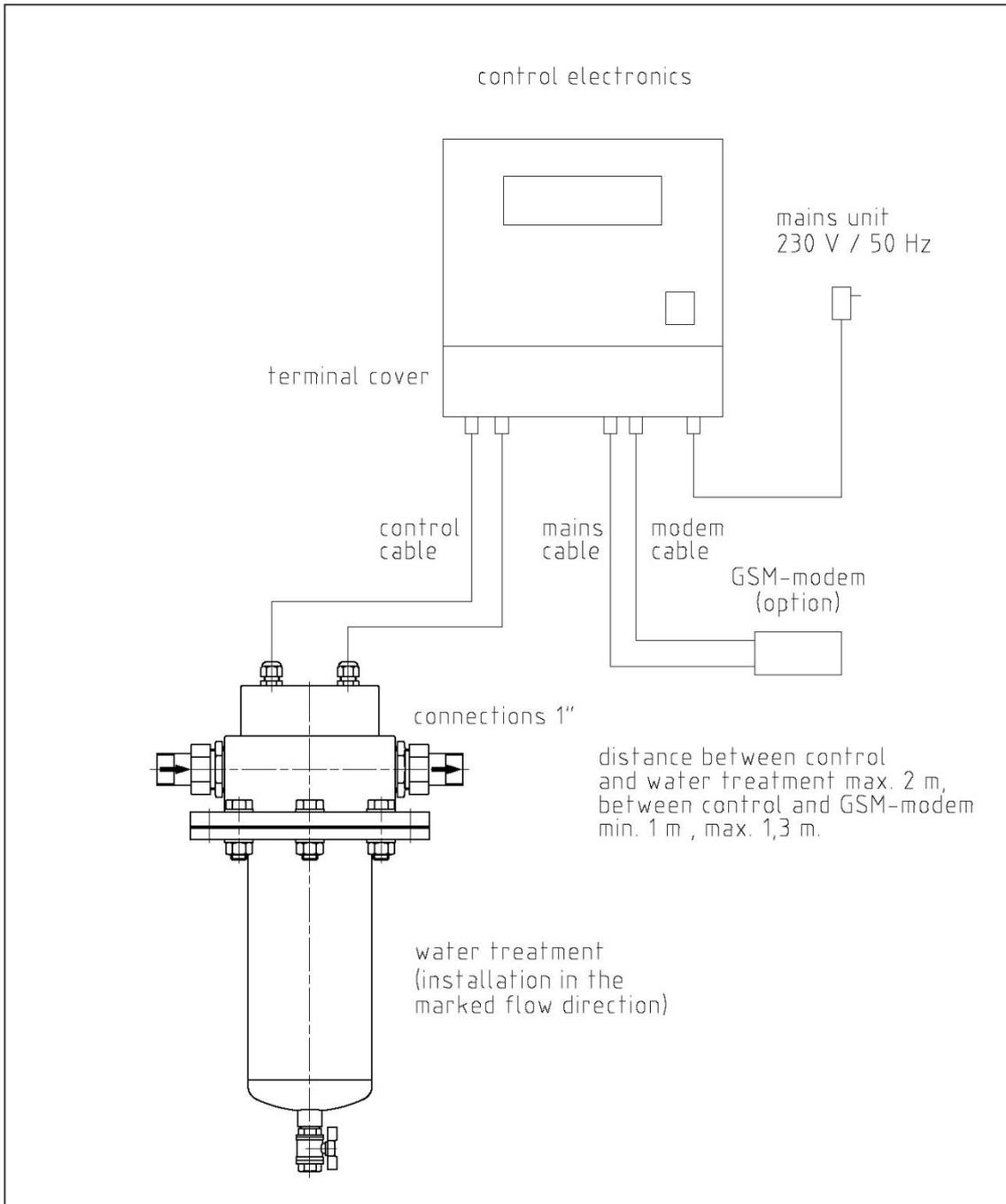
**All inspection, cleaning and maintenance work shall be carried out with care and disinfection measures should be taken if applicable.**

**Please note that the maintenance / treatment module replacement should either be carried out by Hydrotec (UK) Ltd\* or by an authorised specialist company, otherwise we cannot accept any warranty claim.**

**For queries regarding operation and handling of the system, please contact our services department:**

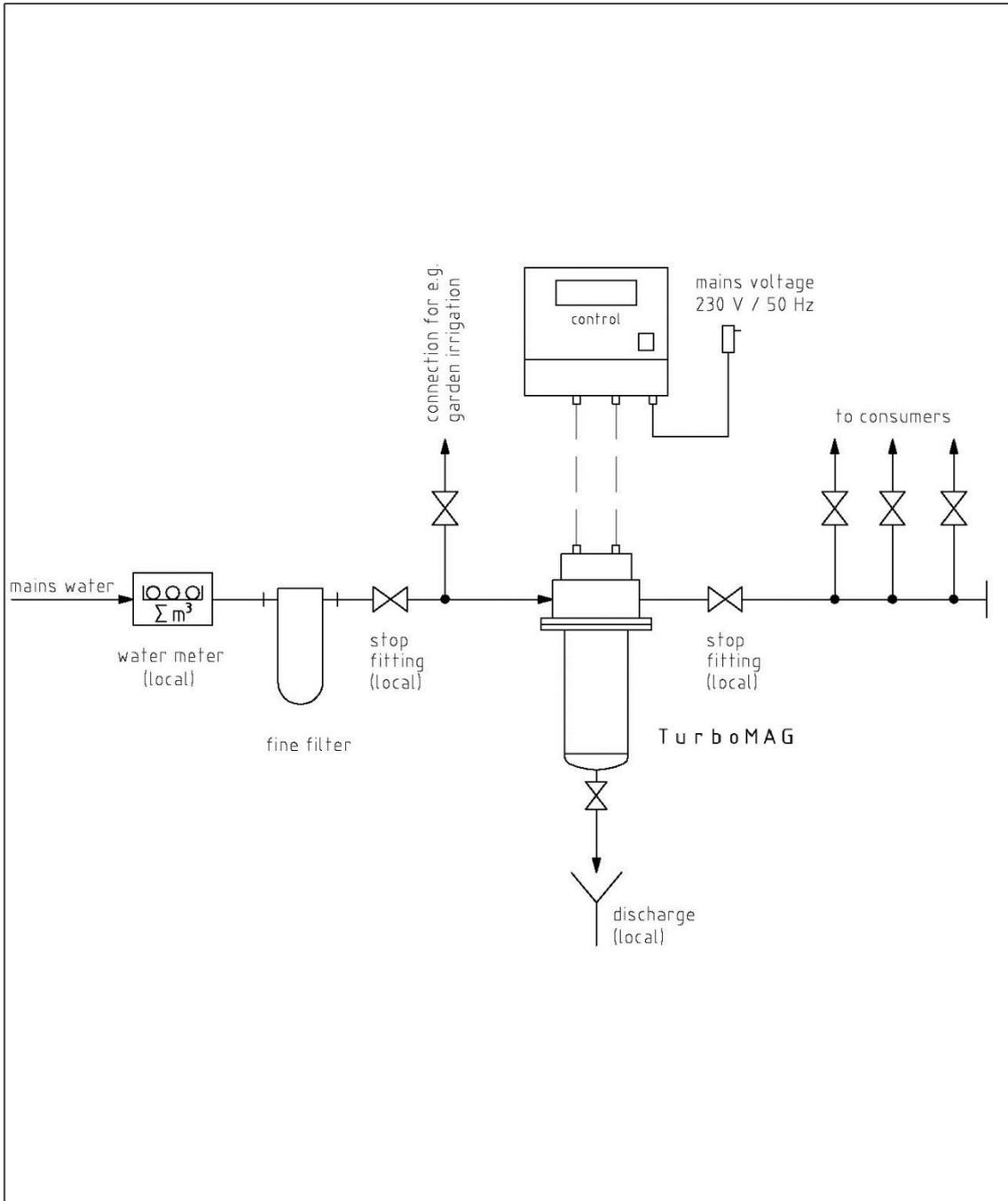
Hydrotec  
Hydrotec House  
5 Manor Courtyard, Hughenden Avenue  
High Wycombe, Bucks HP13 5RE  
Tel: 01494 796 040  
email: [services@hydrotec.co.uk](mailto:services@hydrotec.co.uk)

## Appendix 1: TurboMAG® Installation Schematics



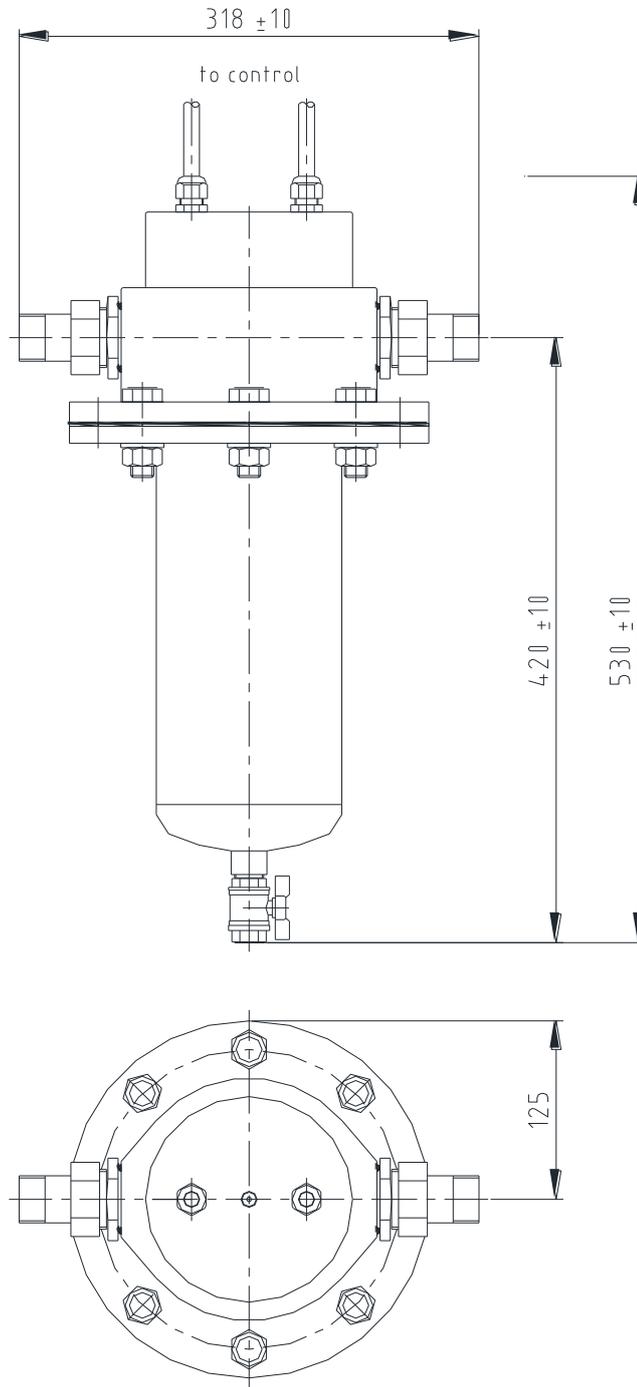
HYDROTEC GmbH Roland-Dorschner-Str. 5 95100 Selb Tel. 0 9287 - 800 64 -0 Fax 0 9287 - 800 64 -150			Surface	Scale	Position	Qty.	
			Date	Name	<h1>TurboMAG</h1> <p>schematic construction</p>		
			Iss.	13.04.2011			R. Wagner
			Check.	13.04.2011			A. Lammer
			Norm				
No.	Alteration	Date	Name	4 - 01 - 500.000 - 001 - E			Sheet
						BL	
Subject to technical modifications!							

## General Installation



HYDROTEC GmbH Roland-Dörschner-Str. 5 95100 Selb Tel. 0 9287 - 800 64 -0 Fax 0 9287 - 800 64 -150				Surface	Scale	Position	Qty.
				Date	Name	Scheme <b>T u r b o M A G</b>	
			Iss.	10.02.2012	R. Wagner		
			Check.	10.02.2012	A. Lammer		
			Norm				
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No.	Alteration	Date	Name	Subject to technical modifications!			

## Appendix 2: TurboMAG® Dimensional Schematic



### Appendix 3: Start up and Training Record

#### TurboMAG® Water Conditioning System

Plant size / Serial number: \_\_\_\_\_

Customer: \_\_\_\_\_

- Temperature mains water: \_\_\_\_\_ °C
- Total hardness drinking water: \_\_\_\_\_ ppm (CaCO<sub>3</sub>)
- Filter inlet pressure: \_\_\_\_\_ bar (flow pressure)
- Filter outlet pressure: \_\_\_\_\_ bar (flow pressure)
- TurboMAG® inlet pressure: \_\_\_\_\_ bar (flow pressure)
- TurboMAG® outlet pressure: \_\_\_\_\_ bar (flow pressure)
- TurboMAG® static pressure: \_\_\_\_\_ bar (static pressure)
- Volume flow: \_\_\_\_\_ l/min
- Active treatment (checked):                      yes                          no
- Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

An instruction for the operation of the system was given. The operation and maintenance manual was handed over. It was confirmed that despite careful planning and design of the good quality drinking water production, this will only be available at tap outlets if water is adequately turned over in all installation areas.

Place/Date: \_\_\_\_\_

Supplier: \_\_\_\_\_ Customer: \_\_\_\_\_





## Appendix 5: Commissioning Request Form

Please complete and sign this form and send to HYDROTEC to arrange commissioning of your TurboMAG® Simplex Water Conditioner on Fax: 01494 796 049 or Email: services@hydrotec.co.uk

Name		Site Contact	
Company		Company	
Address		Site Address	
Full Postcode		Full Postcode	
Tel		Site Tel	
Fax		Installation Area	

Tick to confirm:

- The TurboMAG® unit has been installed as per Hydrotec Installation Instructions.
- All parts are on site as per packing checklist.
- Particulate removal filter is fitted upstream of the TurboMAG® unit.
- The isolation valves are installed either side of the water unit.
- Water sample point if fitted prior to the water unit.

Is the bypass fitted?

- Yes       No

- The control box has been secured to the wall.
- Electrical supply (fused spur outlet 230V AC / 50Hz / 3AMP) within 1.5 metres of the control box has been provided and connected. **(DO NOT TURN THE POWER ON).**
- Treatment module and water meter cables are within reach of control box.**
- The TurboMAG® water unit is plumbed in (according to the flow direction arrow) and water to the inlet is provided.
- The mains water pressure is between 2.5 and 8 bar.
- 300mm free space below the water unit is available for module replacements.
- On-site parking will be available.
- We agree to the following: Should any of the above not have been carried out at the time of the agreed visit; a further inspection will be required prior to a Commissioning Certificate being issued. This will be carried out upon the issue of a Purchase Order for £500.00. Less than 48 hours cancellation notice will also incur a £350.00 charge.

Please do not hesitate to call us should you be having difficulties with the completion of this form.

**Required commissioning date \_\_\_ / \_\_\_ / \_\_\_\_\_. Commissioning is normally carried out within 15 working days.**

**Signed..... Print Name..... Date.....**

For Office Use Only:

Job No:		Model:	
Serial No:		No of Units:	
Ship Date:		Remarks:	
Hydrotec Engineers Comments:			

# Operation and Maintenance Manual

**System:** TurboMAG<sup>®</sup>

**Type:** Simplex

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Publisher: HYDROTEC

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Subject to technical modification.

All information, dimensions and sketches correspond to the latest state of technical development at the date of this document.

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