Operating Instruction

HY-MAG

Competition

Serial number: _______________
General

Our control box type HY-MAG Competition is a high-quality menu and micro-processor controlled control box providing maximum efficiency for the HY-MAG Water Conditioning Units sizes DN20 to DN65. The control box is set ex works to the individual water conditioning units.

The instruction render a survey on the menu guide and the individual programming possibilities for the operator.

The control box shall only be started if the Harting plug connection between control box itself and water conditioning unit is closed! Insert Harting connection of the control box into the corresponding bushing at the water conditioning unit and close safety bracket.

NOTE: The HY-MAG Competition control box is provided with a transparent plastic glass. To be able to change or set control operations, the plastic cover must be opened with the right-hand closure. Once setting has been finished, the glass must be closed again with an audible noise.

Initiating phase

Once the control box was connected to the mains power and switched on, the initiating phase and an initial system check is started automatically. Every individual and actually running operating sequence is shown in the LCD – display.

Standard display :

Control box test :

Short-circuit test :

Operation - test: Technical operation check of complete HY-MAG system (control box and water conditioning unit). The below individual sequences are shown

Test current to water conditioning unit See list of individual current rates for units (nom. width)

Pre-set water conditioning unit – example HY-MAG DN20/25

Check remanence clearance
Normal operation

The control box automatically switches to normal operation once the initiating phase has elapsed, whereby the individual actual operation sequences are shown in the display and by the LED lights.

The individual operation phases are shown optically. The below display monitoring is shown during continuous operation.

**LED – light sequence**

- All 8 LED’s light successively (GREEN phase), positive d.c. (approx. 100 V) is released to the water part
  - Duration about 8 s

- REFIT® – Phase
  - Duration about 2 s (magnetic remanence clearing, LED extinguishes successively to the left within 2 seconds – GREEN LED)

- All 8 LED’s light successively (RED), negative d.c. (approx. 100 V) is released to the water part
  - Duration about 8 s

- REFIT® – Phase
  - Duration about 2 s (magnetic remanence clearing, LED extinguishes successively to the left within 2 seconds – RED LED)

**Display monitor**

- Monitoring of day, date and time
- Operation state
- Monitoring current
- The current ratings for the corresponding HY-MAG types are shown in the below list

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>State</th>
<th>Current (mA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thu 11.10.2001</td>
<td>10:30</td>
<td>Cont. operation</td>
<td>+ xxx mA</td>
</tr>
<tr>
<td>Thu 11.10.2001</td>
<td>10:30</td>
<td>Cont. operation</td>
<td>+ 0mA</td>
</tr>
<tr>
<td>Thu 11.10.2001</td>
<td>10:30</td>
<td>Cont. operation</td>
<td>- xxx mA</td>
</tr>
<tr>
<td>Thu 11.10.2001</td>
<td>10:30</td>
<td>Cont. operation</td>
<td>- 0mA</td>
</tr>
</tbody>
</table>

The shown current rating is dependent on the type of water conditioning unit.

- **HY-MAG DN20 / DN25** 235 mA ± 10%
- **HY-MAG DN32 / DN40** 345 mA ± 10%
- **HY-MAG DN50 / DN65** 465 mA ± 10%
**Menu sequences**

Input and programming of HY-MAG Competition control box by pressing the front foil buttons (behind transparent cover) as below:

- **Menu**
  - Call up menu.
  - Return from the individual menu levels.

- **Löschen**
  - Clear parameters.

- **↑**
  - Selection of individual menu sequences in menu levels, modification and setting of parameters.

- **↓**
  - Selection of individual menu sequences in menu levels, modification and setting of parameters.

- **←**
  - Retrieval of individual menu sequences, confirmation/acknowledgement of settings

**NOTE:** The monitoring returns to Standard Mode if input is delayed for more than 30 seconds and standard operation is shown in the display.

**Main programme menu**

The individual sub-menus are selected in the main menu. The main menu is reached by pressing the button **Menu** once.

The below menu sequences can be retrieved by the buttons **↑** **↓**

<table>
<thead>
<tr>
<th>Menu Sequence</th>
<th>Main Menu Sub-Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation mode</td>
<td>Main menu Operation mode</td>
</tr>
<tr>
<td>Operation hours</td>
<td>Main menu Operation hours</td>
</tr>
<tr>
<td>Day / Time</td>
<td>Main menu Day / Time</td>
</tr>
<tr>
<td>Time zones</td>
<td>Main menu Time zones</td>
</tr>
<tr>
<td>Language</td>
<td>Main menu Language</td>
</tr>
<tr>
<td>Service</td>
<td>Main menu Service</td>
</tr>
</tbody>
</table>

- 4 -
The corresponding menu sequence is retrieved with the button \( \rightleftarrows \) and the respective sub-menu shown.

**Mode of operation**

The operator can select between 3 different operation modes for the HY-MAG water conditioning units.

**Continuous operation**

HY-MAG operates on a continuous 24 hour/day basis

**Timer control**

The control box is in standby mode (LED standby). Switch-on and –off times are controlled by the internal timers. One switch-on and –off time per day can be programmed.

**Operation off**

No operation of HY-MAG - no water treatment/conditioning. Such operation mode shall **not** be selected and set for normal operation but exclusively for test mode!

The above operation modes can be selected by pressing the buttons \( \uparrow \) \( \downarrow \) and the correct mode then be confirmed and acknowledged by pressing the button \( \rightleftarrows \) once.

The control box and/or monitoring returns automatically to main menu after the setting has been confirmed.

**Operating hours**

The operating hours of the HY-MAG unit are registered by 2 separate counters.

- **Absol. value:** Total operation time of HY-MAG unit in the actual installation. (Operation hours since start-up). Standby-times are not registered and thus, not shown.

- **Relative value** Operating hours of unit counted from a certain period of time. The counter can be reset by the operator. (Operating hours since last reset).

The below display is shown after the main menu sequence ‘operating hours’ is retrieved:

\[
\begin{array}{|c|c|}
\hline
\text{Oper. hours abs} & 000250 \\
\text{Oper. hours rel} & 000015 \\
\hline
\end{array}
\]
The operator is in a position to reset the relative operating hours by pressing the button once and the relative operating hours counting from the last reset are shown in the display.

The operating hours can be cleared by pressing the button once or the buttons also is used to reach and return to the previous display.

Clearing the relative operating hours results in an automatic store and monitoring in line 2 of the actual time of clearing.

Date / Time

The operator can alter the internal timer and the date as described below. The main menu Date / Time must initially be retrieved, whereby the display shows the actual setting.

If the setting is to be altered, press the button and should no modification be requested, the sub-menu can be left by pressing the button.

The active field that can be altered is marked with a line underneath. Alter the setting by pressing the buttons or until the desired figure is visible. The setting is finished once the Cursor is not flashing anymore. The mode is achieved by pressing the corresponding button. The menu can be left by pressing the button once.

NOTE: If the button is pressed during the modification phase, the input is interrupted and the changed figures not be registered.
**Time zones**

The switch-on and –off times of the unit can be programmed in the menu ‘Time zones’ after the operation mode ‘Timer control’ was retrieved. One such setting is possible per day.

A group of several days or also individual days can be programmed by the operator. Switch-on and switch-off times are controlled and initiated by the internal timer.

**Groups:**

(Several days)

<table>
<thead>
<tr>
<th>Time zone:</th>
<th>Mo .. Su:</th>
<th><strong>:</strong>: - <strong>:</strong>:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Time zone:</th>
<th>Mo .. Fr:</th>
<th><strong>:</strong>: - <strong>:</strong>:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Time zone:</th>
<th>Sa .. Su:</th>
<th><strong>:</strong>: - <strong>:</strong>:</th>
</tr>
</thead>
</table>

**Individual days:**

<table>
<thead>
<tr>
<th>Time zone:</th>
<th>Mo, Tue, Wed, Thu, Fr, Sa, Su:</th>
<th><strong>:</strong>: - <strong>:</strong>:</th>
</tr>
</thead>
</table>

and so on – for every day in the week.

An initial selection of the desired menu is possible with the Cursor buttons, the menu is then retrieved by pressing the button once and the switching times can then be altered with the Cursor buttons. The figure that can actually be altered is marked with a line underneath.

Once the correct setting is achieved, the button must be pressed until the line underneath is no longer visible. If the total switch settings for the selected and retrieved group of days/individual day are to be cleared, press the button once.

The times for switch-on and switch-off can be selected right on the dot. Below is an example for setting switch time - group of days Mo-Su, switch-on 6.00 a.m., switch-off 10.00 p.m.

<table>
<thead>
<tr>
<th>Alter time zone:</th>
<th>Mo .. Su:</th>
<th>06:00 - 22:00</th>
</tr>
</thead>
</table>

**NOTE:**

If times different to the individual days than provided in the corresponding group of days are set, the display for the group of days show **:**: - **:**: and the actual switch time is set in the day monitoring.

If the switch-off time is set earlier than the switch-on time or if the times were reset (00:00-00:00), the water conditioning unit is not activated that day(s).
Language

The service menu of the HY-MAG Competition control box provides 2 languages. Operation and setting possible in both languages.

The menu language is initially be selected by means of the button \( \leftarrow \). The corresponding language is then selected and confirmed by the buttons \( \uparrow \) or \( \downarrow \). Once the correct language is shown, confirm by pressing the button \( \leftarrow \) and the setting is finished.

<table>
<thead>
<tr>
<th>Language:</th>
</tr>
</thead>
<tbody>
<tr>
<td>German</td>
</tr>
<tr>
<td>English</td>
</tr>
</tbody>
</table>

Service

The service menu is code protected and can be retrieved from authorised service personnel only.

NOTE: If the customer or plant operator retrieves the service menu by mistake, no buttons shall be pressed for 30 seconds and after such time period the HY-MAG Competition control box returns automatically to standard mode.

<table>
<thead>
<tr>
<th>Password:</th>
</tr>
</thead>
<tbody>
<tr>
<td>. . . . .</td>
</tr>
</tbody>
</table>
Failure Indication

The Competition control box is provided with an automatic failure recognition. The failure type is shown.

In case of failure, the total LED-scale flashes red and the display shows the type of failure.

Moreover, it is possible to signal a failure via a potential-free contact. The correct connection is shown in the terminal plan and such relay-contact can be load as below:-

Rated current: 6A
Rated voltage: 250V AC
max. breaking capacity: 1500W (class AC1 – Ohm load)
max. breaking capacity: 300W (class AC15 – electro-magnetic load)
min. breaking capacity: 500mW / 12V / 10mA

Failure 1: Undercurrent
Coil not closed, faulty connection control box ↔ water unit

Failure 2: Overload
Short cut of coil, faulty coil

Failure 3: Short cut
Short cut in coil connection (visible during initialisation)

Failure 4: Control box failure
failure in any electrical component of the control box, e.g. faulty components
Failure – remedial action

General:

If there is no display or should no sign for any operation be visible, initially check the following:

Check whether or not the unit is switched on and mains voltage 230V/50 cps available. If that is all correct, check the fuse as per the below instruction:

The fuse is provided in the terminal unit on the ledge for the water part connections and mains supply. Please take care that the mains plug is removed prior to opening the unit! Open the lower front cover and replace fine fuse (3.15 AT).

If there is still no LED scale visible, inform the technical department of Hydrotec.

Failure 1: Undercurrent
Check connection and correct fit of Harting coupling.

Failure 2: Overload
Failure at magnet coil in water unit. Inform Hydrotec immediately in that case since there are no further local steps possible.
The first time the failure had been recognised must be noted.
Disconnect unit from mains voltage

Failure 3: Short cut
Short cut (external) of coil circuit
Disconnect unit from mains supply. Check for foreign particles in connection (spiral cable of control box and connection socket of water unit).
Restart unit. Hydrotec have to be informed immediately if the failure arises again. There are no further local measures necessary. Disconnect the unit from mains supply.

Failure 4: Control box
Faulty control box. Return box for inspection to Hydrotec along with corresponding failure report or other information.