

# HY-MAG INTEGRAL

## DN100

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

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## Operating Instruction HY-MAG® INTEGRAL

### General

The HY-MAG Integral is a high-quality menu- and micro-processor driven control box providing maximum efficiency for the HY-MAG Water Conditioning Units sizes DN20 to DN100. The control box is pre-programmed ex works to the individual water conditioning units.

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

The specific technical data for the HY-MAG Water Conditioning Unit are shown on the type plate. Below some information:

Mains voltage:	230V, 50cps a.c.
Protection class:	IP 65
Ambient temperature	
Control box:	max. 40°C
Flow capacity water part:	dependent on nominal width
Max. operating temperature:	80°C
Nom. Pressure:	PN 16

**CAUTION:** The HY-MAG Integral control box is designed in protection class IP65. The feed line with power supply plug for mains supply does not meet the requirements. Mains supply line and plugs must rather be positioned outside the possible spray water range or be protected by appropriate means.

**NOTE:** The HY-MAG Integral 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 cover must be closed again with an audible sound.

**NOTE:** The water parts of the DN 100 have, contrary to the water parts series DN25-DN65, an additional thermal protection to avoid overheating. The units are supplied ex works with appropriate connections.

## Connection of Water Part

The HY-**MAG** Water Conditioning Units are supplied ex works in 2 components, that means water part and control box.

Connection between control box and water part must be provided by expert plumbers as follows:

### HY-**MAG** DN25 – DN65

The control box includes a mains connection cable and a load cable for the connection of the water part. Such load cable is provided with a Harting plug. To guarantee a correct connection of the water part, it is necessary to insert the Harting plug into the Harting bushing on the water part and to fix it by the safety bracket. A code bar on the plug / bushing guarantees a correct connection.

It is only possible and allowed to start or put the control box in operation if the Harting plug between control box and water part has been closed!

The connection cable between control box and water part is a spiral cable. Max. distance between both unit components shall not exceed 1.5 m!

### HY-**MAG** DN100

The control box for the HY-**MAG** DN100 does include a mains connection cable, a load cable and a cable to connect the thermal protection.

The connection box (terminal strip) provided on the water part is necessary to make the appropriate connection at plant installation:

Connection coil:	load cable
	Connection thermal
protection:	thermal protection cable

To guarantee a correct connection of the water part, it is necessary to fix the corresponding cable ends in the specific and marked terminals.

It is only possible and allowed to start or put the control box in operation if the connection is properly made correctly and the terminal or connection box closed!

The connection cable between control box and water part is a spiral cable. Max. distance between both unit components shall not exceed 1.5 m!

## Initiation Phase

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

Standard display:

**HYDROTEC**  
**Integral V. 1.00**

Control box test:

**Control box - test . . . .**  
**Control box OK**

Short-circuit test:

**Short-circuit - test**  
**Test OK**

Operation - test:

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

**Actor – test**  
**Temp. test: OK**

Test thermal protection

**Actor – test**  
**current: xxx mA**

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

**Actor – test**  
**Hydromag type: DN 100**

Pre-set water conditioning unit –  
example HY-MAG DN100

**Actor – test**  
**Time reman. clearance: OK**

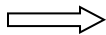
Check remanence clearance

## Normal Operation

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

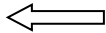
The individual operation phases are shown optically. The below display monitoring is shown during continuous operation.

### 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 26 s

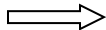
LED : GREEN



### REFIT® – Phase

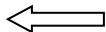
Duration about 4 s (magnetic remanence clearing, LED extinguishes successively to the left within 4 seconds – GREEN LED)

LED : GREEN  
LED REFIT Phase : YELLOW



All 8 LED's light successively (RED), negative d.c. (approx. 100 V) is released to the water part  
Duration about 26 s

LED : GREEN



### REFIT® – Phase

Duration about 4 s (magnetic remanence clearing, LED extinguishes successively to the left within 4 seconds – RED LED)

LED : GREEN  
LED REFIT PHASE : YELLOW

### Display Monitor

Thu 11.10.2003	10:30
Cont. operation	+ xxx mA

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

Thu 11.10.2003	10:30
Cont. operation	+ 0mA

Thu 11.10.2003	10:30
Cont. operation	- xxx mA






Thu 11.10.2003	10:30
Cont. operation	- 0mA

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

HY-MAG DN20 / 25	235 mA $\pm$ 10%
HY-MAG DN32 / 40	345 mA $\pm$ 10%
HY-MAG DN50 / 65	465 mA $\pm$ 10%
HY-MAG DN100	3.25 A $\pm$ 10%


### Menu Sequences

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

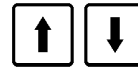
	Retrieval of menu. Return from the individual menu levels.
	Clear parameters.
	Selection of individual menu sequences in menu levels, modification and setting of parameters.
	Selection of individual menu sequences in menu levels, modification and setting of parameters.
	Retrieval of individual menu sequences, 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 again.


### Main Programme Menu

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

The below menu sequences can be retrieved by the buttons



Operation mode	<div style="border: 1px solid black; padding: 2px;">Main menu Operation mode</div>
Operation hours	<div style="border: 1px solid black; padding: 2px;">Main menu Operation hours</div>
Date / Time	<div style="border: 1px solid black; padding: 2px;">Main menu Date / Time</div>
Time zones	<div style="border: 1px solid black; padding: 2px;">Main menu Time zones</div>
Language	<div style="border: 1px solid black; padding: 2px;">Main menu Language</div>
Service	<div style="border: 1px solid black; padding: 2px;">Main menu Service</div>

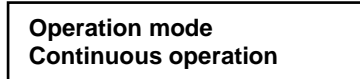
The corresponding menu sequence is retrieved via the button  and the respective sub-menu is shown.

### Mode of Operation

The operator can select between 2 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: YELLOW). Switch-on and –off times are controlled by the internal timers. One switch-on and –off time per day can be programmed.



The above operation modes can be selected by subsequent pressing the buttons



and the correct mode can then be confirmed and acknowledged by pressing the button



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.


Absolute 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:

Oper. hours abs	000250
Oper. hours rel	000015

The operator is in a position to reset the relative operating hours by pressing the button  once and the relative operating hours since the last reset are shown in the display.

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

000015 oper. hours since
08.10.2003 14:50



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

000000 oper. hours since
10.10.2003 09:40



## 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.

Date:	Wed	10.10.2003
Time:		09:45

If the setting is to be altered, press the button . 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. Change the setting by

pressing the buttons  or  until the desired figure is visible in the display. 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.

Date:	<u>Wed</u>	10.10.2003
Time:		09:45



NOTE: If the button  is pressed during the modification phase, the input is interrupted and the changed figures not 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)

Mo ... Su

Select time zone:  
Mo .. Su:    \*\*.:\*\* -    \*\*.:\*\*

Mo ... Fr

Select time zone:  
Mo .. Fr:    \*\*.:\*\* -    \*\*.:\*\*

Sa ... Su






Select time zone:  
Sa .. Su:    \*\*.:\*\* -    \*\*.:\*\*

Individual days:

Mo, Tue, Wed, Thu, Fr, Sa, Su

Select time zone:  
Mo:    \*\*.:\*\* -    \*\*.:\*\*

and so on – for every day in the week.

An initial selection of the desired menu is possible via the Cursor buttons   , the menu is then retrieved by pressing the button  once and the switching times can then be altered via 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.





Alter time zone:  
Mo .. Su:    06:00 -    22:00

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** Integral control box provides 2 languages. Operation and setting is possible in both languages.

The menu language is initially selected by means of the button . The corresponding language is then selected and confirmed by the buttons  or . Once the correct language is shown, confirm by pressing the button  and setting is finished.

Language:  
German

Language:  
English

## 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, and no buttons shall be pressed for 30 seconds, after such time period the HY-**MAG** Integral control box returns automatically to standard mode.

Code :  
.....

## Failure Indication

The Integral control box is provided with an automatic failure recognition, whereby 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 charged as below:

Rated (nom.) current: 6A  
Rated (nom.) voltage: 250V AC

max. switching capacity: 1500W (class AC1 – Ohm load)  
max. switching capacity: 300W (class AC15 – electro-magnetic load)  
min. switching capacity: 500mW / 12V / 10mA

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

<b>Failure: Undercurrent</b> <b>Thu 11.10.2003 16:17</b>
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Failure 2: Overload  
Short cut of coil, faulty coil

<b>Failure: Overload</b> <b>Thu 11.10.2003 16:17</b>
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Failure 3: Short cut  
Short cut in coil connection (visible during initiation)


<b>Failure: Short cut</b> <b>Thu 11.10.2003 16:17</b>
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Failure 4,5: Control box failure  
failure in any electrical component of the control box

<b>Failure: Control box</b> <b>Thu 11.10.2003 16:17</b>
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Failure 6: Thermal protection  
Thermal switch in the coil of the HY-MAG DN100 was released

<b>Failure: Overheating</b> <b>Do 11.10.2003 16:17</b>
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**ATTENTION:** If the button  is pressed during a failure record, the acoustic alarm is switched-off, the record contact shows failure and the display: "Conditioning off". A new start of the control box and initiation is released automatically about 60 seconds after a button has been pressed last.

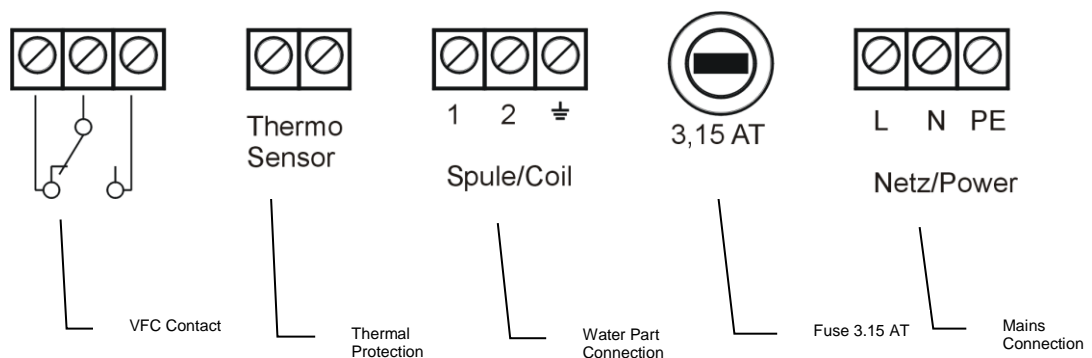
## Failure – Remedial Action

### 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.

### Fault Types:

#### Failure 1: Undercurrent

Check connection and correct fit between water part and control box, i.e. fit of Harting coupling.

#### Failure 2: Overload

Failure in magnet (solenoid) coil in water unit. Inform Hydrotec immediately in that case since no further local steps are possible.

It is necessary to note the time the failure had been recognised first.

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, 5: Control box

Faulty control box. Internal communication or between control box and water part may be faulty or disturbed. Switch-off plant and start again. Return box for inspection to Hydrotec along with corresponding failure report or other information should the fault happen again.

Failure 6: Overheating

- For HY-**MAG** DN100 only -

Temperature safety control was released, i.e. the solenoid coil in the water part is overheated. Check whether or not exterior influences or stagnation of water may be the reason.

If there is no exterior influence visible, control operation and check whether cooling takes place. The operation mode starts automatically again once the coil temperature is cooling down and the contact switching accordingly. Inform Hydrotec accordingly should that not be the case.