R990525

This manual contains important safety informations about installation and use of this equipment. Ignoring this informations could result in injuries or damages.

It is strictly forbidden to use this equipment with radioactive chemicals!

# OPERATING MANUAL FOR "DIN DIGITAL PH" CONTROLLER

Read carefully!

ENGLISH Version

R1-11-03

| | |
|---|---|
| Descrizione Prodotto<br>*Product Description* | Sistema regolazione singola per barra DIN, serie DIN DIGITAL<br>*Single adjustment system for DIN bar Control system, DIN DIGITAL series* |
| Codici Identificativi Prodotto<br>(i simboli "_" completano il codice del prodotto in base alla configurazione delle varianti)<br>*Product Identification Codes*<br>*(the "_" symbols complete the product code based on the configuration of the variants)* | PHDIN _____<br>RHDIN _____<br>CLDIN _____<br>CDDIN _____<br>O3DIN _____<br>CLO2DIN _____<br><br>O3DIN _____<br>CLO2DIN _____<br>TEMPDIN _____ |

# GENERAL SAFETY GUIDELINES

**Danger!**

In emergencies the instrument should be switched off immediately! Disconnect the power cable from the power supply!

When installing always observe local regulations!

Manufacturer is not liable for any unauthorized use or misuse of this product that may cause injury, damage to persons and / or materials.

**Caution!**

Instrument must be accessible at all times for both operating and servicing. Access must not be obstructed in any way!

Feeder should be interlocked with a no-flow protection device to automatically shut-off the pumps when there is no flow!

Pumps and accessories must be serviced and repaired by qualified and authorized personnel only!

Always discharge the liquid end before servicing the instrument!

Empty and rinse the liquid end before work on a pump which has been used with hazardous or unknown chemicals!

Always read chemical safety datasheet!

Always wear protective clothing when handling hazardous or unknown chemicals!

Instrument must be operated / serviced by trained technicians only!

All connection operations must be performed while the instrument is not connected to main supply!

Missed activation for Min/Max alarm and Maximum Dosing Alarm may cause hazardous overdosing!

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Warning: proportional mode operates on 100 or 150 seconds basis

## GENERAL DESCRIPTION

"DIN Digital pH" measures and controls pH in industrial process. It is possible to set two ON/OFF setpoints and a current signal for connecting a chart recorder or a metering pump. It is possible to set the current output on 0÷20 or 4÷20 mA. LCD backlight display facilitates reading in high luminosity conditions. The instrument is cased into a plastic box for DIN mounting.

## CONTROL PANEL

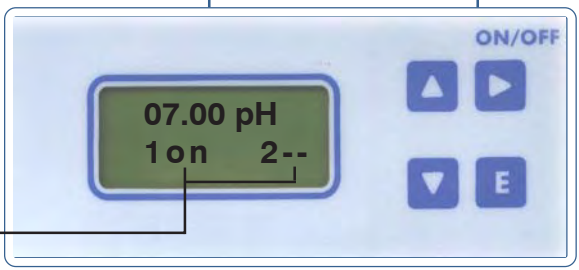
**Display**

*LCD backlight display facilitates reading in high luminosity conditions. It provides constant indications regarding operating conditions and equipment status.*

*Setpoint Activity Status. Example: "1ON" means that setpoint 1 is active. "2--" means that setpoint 2 is active.*

**Keyboard**

*A convenient keypad allows easy and quick access to the menu for easy programming and calibrating operations.*




▲ **"UP" key**

▼ **"DOWN" key**

▶ **"RIGHT" (ON/OFF - ESC) key**

E **"ENTER" key**

Into normal operating mode press "UP" or "DOWN" key for instrument's details.

Use keyboard (up, down, left and right) to make a selection or change set values. Press the "RIGHT" key to go back in previous menu or cancel entered data.

The "Enter" key confirms the selection.

Press "RIGHT" key for about 4 seconds to switch off the instrument (the display shows OFF). Repeat the sequence to return to the normal operating mode.

To reset the instrument (restore default settings) unplug power supply and keeping pressed "UP" and "DOWN" keys, plug in power supply. The instrument will show "Checksum Error- Press any key". Press any key to continue.

**ELECTRICAL WIRINGS:**

**1-2:** Power Supply (24VAC* or 115VAC* or 230VAC*). * See instrument's label

**3-4:** Setpoint 1 output - free contact.
**5-6:** Setpoint 2 output - free contact.

**7-8:** n/a
**9-10:** Temperature compensation probe. 9 (GND) ; 10 (NTC).

**11-12:** Current output (0÷20mA o 4÷20mA) proportional to read value. 11(-) ; 12 (+).

**13-14-15-16:** See the following paragraph.

**"SEPR" CONFIGURATION.**

The instrument is set to work without a proximity sensor. If needed, proximity sensor turns the instrument into stand-by mode if there isn't flow. Instrument's display shows "NO FLOW".

Connect "SEPR" to blocks 13(blue), 15(black), 16(brown). Connect together block 14 with block 13.

To work without a "SEPR" and with the same functionality use blocks 15 and 16 as a free contact. Connect together block 14 with block 13.

Using "SEPR" or the free contact, two instruments can be controlled. Connect block 14 and 15 from master instrument to another instrument "DinDigital" (slave). Finally follows the previous described connections for the master instrument.

**POWER SUPPLY FUSE PROTECTED (0,5A)**

### VIEW ON MENU

Make connections and plug the instrument. Instrument's version message on display confirms that the instrument is on. The display shows also the probe reading status and if setpoints are active. Press "E" for about 4 seconds to enter into setup menu.

*Note: During setup the instrument is in "Stand-by" mode. If user doesn't press any key for one minute the instrument will return to normal working mode.*

To enter into setup menu, a password is needed. If this the first time that user enters into this menu or if the password is not changed, simply press "E". Use "UP" and "DOWN" keys to scroll.

"MAIN" menu is configured as follows:

**1)Setup**: This menu is divided into **1)Setpn** ; **2)Calib** ; **3)Delay**.

**2)Param**: This menu is divided into **1)New Pw**

**3)Serv.**: service mode.

### SETTING SETPOINTS: 1)SETPN

"Out 1" and "Out 2" are relay's driven outputs. The instrument can be programmed to operate in "On/Off" mode or "Proportional" mode.

"Proportional" mode can be selected in % between 10 and 100.

Select "SETUP" from "MAIN" menu. Select "SETPN" and press "E". The display shows:

Setpoint
1) Out 1

Pressing "UP" or "DOWN" key the display will show in succession:

Setpoint
1) Out 1

Setpoint
2) Out 2

Setpoint
3) Out mA

Select the setpoint to set (Out 1 or Out 2) using "UP" and "DOWN" keys, press "E" to confirm. "Out mA" allows to set the current output based on two pH values. In the next example setpoint 1 (Out 1) has been set.

The instrument shows:

1a) ->OFF
7.00pH

Pressing twice “RIGHT” key the display will show:

1b) ->ON
7.40pH

“1a)” and “1b)” are working range values. Every range is set by a value that operates relay output. Using default values, the setpoint 1 will drive a pump for acid feeding. The pump will switch on when pH value wil be over than 7.40pH and it will switch off when pH value will be 7.00pH: **this is the “ON/OFF” working mode.** The difference between the two pH values (7.40 and 7.00) is called “HYSTERESIS”.

To avoid damaging the relay do not set Hysteresis under 0.1pH value.

**PROPORTIONAL mode**. The output relay is modulated (ON/OFF) depending on pH values set in 1a) and 1b). Example: Proportional mode between 7pH(0%) and 8pH (100%). In this mode the relay will be on for values greater than 8pH. The relay will be off for values lower than 7pH. For values between 7pH and 8pH the relay will be on or off depending on calculated percentage. The calculation is based on a 100 seconds time. If the pH reaches 7.30 value, the relay will be on for 30 seconds and off for 70 seconds: this is the 30% of the total time (100 seconds). To set the PROPORTIONAL functioning mode substitute percentual value to “ON” and “OFF”.

**It is not possible to enter mixed values (ex.: 100% for SP1and ON for SP2). In this case it will not possible save them.**

**In proportional mode the instrument doesn’t show % values for setpoints status but only if they are on or off.**

It is possible modify setpoint status (on,off, %) and setpoint values with RIGHT key on the function to modify and using “UP” and “DOWN” key to change the value. Enter the value and save by pressing “E” to save.

Repeat sequence for setpoint 2 (OUT2).

**Press “E” key to exit from setpoint setting. The display will show “SetPoint Saved” and it return to the previous menu.**

**Out mA**

This function allows to program the current output for driving a metering pump or a chart recorder.
It is possible to program in 0÷20mA mode or 4÷20mA mode in the working range between 0pH and 14pH. The current output and the working range may be modified.
Example: it is possible to set 4mA at 7pH and 20mA at 10pH. In this case, if you connect a metering pump it will dose at the maximum flow at 10pH. The pump will reduce the flow when pH decreases and it will stop at 7pH. If you connect a chart recorder, a graphic curve will be printed. Use “UP” and “DOWN” keys to change these settings. Press “RIGHT” key to scroll through the options. Press “E” to confirm.

**CALIBRATION: 2)CALIB**

For calibration procedure use two buffer solution: 4pH and 7pH.
Select “CALIB” option from “Setup” menu. The instrument shows:

Temp Cal
25°C

This is the buffer solution temperature. Measure the temperature of the first buffer solution and enter the value using “UP” and “DOWN”keys. Press “E” to confirm and proced to pH calibration.

The instrument shows:

Ra 8.68pH
Ca 4.00pH

Pressing again “E” the instrument shows:

Rb 8.69pH
Cb 7.00pH

To calibrate the instrument two buffer solutions are necessary: a 4pH value and a 7pH value. if the buffer solutions values are different from instrument default values, modify instrument default values (“Ca” and / or “Cb” field) using “UP” and “DOWN” keys.

*Instrument calibration using a 4pH (A) and 7pH(B) buffer solutions.*

Select “CALIB” from “SETUP” menu. The instrument shows the buffer solution temperature. Measure the temperature of the first buffer solution. If the value is different from instrument default value, use “UP” and “DOWN” keys and press “E” to confirm. If the value is right, press “E” key. The instrument shows:

Ra 8.68pH
Ca 4.00pH

If you are using a 4pH buffer solution press “E” otherwise enter the buffer solution value used by “UP” and “DOWN” keys and press “E”.

Remove the cap from the probe, wash the tip probe and dry it without wipe. Connect the probe to the instrument through the BNC. Insert the probe tip into the 4pH buffer solution and wait until “Ra” value (read value) is stabilized then press “E” to confirm the calibration. ATTENTION: IT IS NOT NECESSARY THAT “R” VALUE WILL BE THE SAME OF “C” VALUE. The instrument will show:

Rb 8.55pH
Cb 7.00pH

If you are using a 7pH buffer solution press “E” otherwise enter the buffer solution value used by “UP” and “DOWN” keys and press “E”.
Remove the cap from the probe, wash the tip probe and dry it without wipe.Connect the probe to the instrument through the BNC. Insert the probe tip into the 7pH buffer solution and wait until “Rb” value (read value) is stabilized then press “E” to confirm the calibration. ATTENTION: IT IS NOT NECESSARY THAT “R” VALUE WILL BE THE SAME OF “C” VALUE. If the procedure is correct the instrument will show a confirmation message otherwise a numbered error message will be displayed (see table on page 11). If an error occurred, repeat the procedure.

**DELAY: 3) Delay**

It's possible to set an activation delay for each output when the instrument reaches the setpoint values. Default value is set to 0. Select "DELAY" from "SETUP" menu. The instrument will show:

OUT1
10 Sec.

Press "RIGHT" key. The instrument will show:

OUT2
5 Sec.

Delay time can be set from 0 (no delay) to 60 seconds. Press "E" to confirm. The display will show the confirmation message "DELAYS SAVED".

**PASSWORD SETUP: 1) New Pw**

To avoid undesired access to the instrument a 4 number password may be set. Using “UP” or “DOWN” keys, from “Param” menu  choose “1) New Pw”, press “E” to confirm. The display shows:

NEW PW
-> 0 0 0 0

Use “UP” and “DOWN” keys to modify th first digit. Use “RIGHT” key to go on the next digit. Press “E” to confirm. The instrument will show the new password for 2 seconds and then will return to the main menu.

**MANUAL WORKING MODE: 3) Serv.**

This function allows to manual control the external relays contact (SP1 / SP2).
The display will show 1 or 2 to show the selected setpoint/output. The output status can be set “ON” or “OFF” using “UP” key for SP1 and “DOWN” key for SP2. “ON” is the status of N.O contact closed and N.C. contact open. “OFF” is the status of N.O. contact open and N.C. contact closed.

**ERROR MESSAGES**

If the display shows an error message, use the following table:

| | |
|---|---|
| *ERROR 1:* | *Buffer solution error during calibration. Try again using a different buffer solution.* |
| *ERROR 2:* | *Buffer solution read error during calibration. Try again using a different buffer solution.* |
| *ERROR 3:* | *N/A* |
| *ERROR 4:* | *Offset error. Verify sample and repeat procedure.* |

## PRECAUTIONS RELATING TO DIRECTIVES, REGULATIONS AND STANDARDS

### § CE/EU and UKCA marking

We guarantee that this product meets the essential requirements of the applicable Directives and Regulations based on the following specifications. Please carefully consider the following specifications for use of the product in European Union member countries and the United Kingdom.

**• CE/EU harmonized directives and standards**

**Directives**

DIRECTIVE 2014/35/EU
DIRECTIVE 2014/30/EU
DIRECTIVE 2011/65/EU
DELEGATED DIRECTIVE (EU) 2015/863

**Harmonized standards**

EN ISO 12100
EN IEC 61326-1
CEI EN 61010-1
EN IEC 63000

**• UKCA harmonized regulations and standards**

**Regulations**

2008 2016 No. 1091
2016 No. 1101
2012 No. 3032

**Harmonized standards**

BS EN ISO 12100
BS EN IEC 61326-1
BS EN 61010-1
BS EN IEC 63000

**Disposal of end-of-life equipment by users**

This symbol warns you not to dispose of the product with normal waste. Respect human health and the environment by giving the discarded equipment to a designated collection center for the recycling of electronic and electrical equipment. For more information visit the online site.

When dismantling a pump please separate material types and send them according to local recycling disposal requirements. We appreciate your efforts in supporting your local Recycle Environmental Program. Working together we'll form an active union to assure the world's invaluable resources are conserved.