

pH/t CONTROLLER model DTPH-1

- * Input - electrode for pH measurement
- * Pt100 for compensation
- * Automatic temperature compensation
- * Impulse input (NPN, OC) for flow measurement
- * Offset of the measured value
- * Current output 4 - 20 mA - passive
- * Galvanic isolated voltage output 24 V DC



GENERAL DESCRIPTION

The controller model DTPH-1 is designed for electrolyte pH measurement and control.

When in normal working mode on the "pH" display is visualized the measured electrolyte pH and on the "°C" display is visualized the measured or manually set electrolyte temperature.

If there is an error in the input circuit prompt "Err" is visualized on the display and LED L4 is activated.

The temperature compensation of the pH electrode is performed automatically. The electrolyte temperature is measured with Pt100 sensor or is set manually. The selection of the temperature compensation mode could be performed after correct identification of a corresponding password.

LED L2 indicates the temperature compensation mode. If LED L2 is not activated the compensation is performed according to the measured by the Pt100 sensor electrolyte temperature. If LED L2 is activated the compensation is performed according the manually set electrolyte temperature. This temperature is visualized on the display in °C.

The correction flow "q" [mg/min] is calculated as follows:

$$q = Q * (SP - PV) * K$$

where:

- Q - calculated flow [m³/min];
- SP - set pH;
- PV - measured pH;
- K - pump constant [mg/m³/1pH].

KEY OPERATIONS

1. When in normal working mode on the "pH" display is visualized the measured electrolyte pH and on the "°C" display is visualized the measured or manually set electrolyte temperature.
2. Press MODE to visualize the calculated flow [m³/min] on the "pH" display and prompt "Flou" on the "°C" display.
3. Press MODE again to visualize the correction flow [mg/min] on the "pH" display and prompt "q" on the "°C" display.
4. Press MODE and the calculated control action [0 - 100%] is visualized on the "pH" display and prompt "Out" on the "°C" display.

5. Press MODE to visualize the value set for pH. Prompt "SP" is visualized on the "°C" display. Use the <, >, v, ^ buttons to change the value of the set point.
6. Press MODE again to enter instrument's normal working mode.

MANUAL / AUTOMATIC MODE

When switched on the controller works in automatic mode. Press buttons < and > to switch to manual working mode. LED L1 is activated when manual mode is activated. In this mode the current output is increased/decreased with 1% by pressing buttons ^ and v. Press and hold the corresponding button to change the output faster. Press buttons < and > again to switch back to normal working mode.

PARAMETERS SETUP

All parameters could be set after correct identification of a corresponding password. To enter a password press buttons ENT and MODE simultaneously. On the upper display of the controller is visualized prompt 0000. Using the <, >, v, ^ buttons enter the password. Press ENT. After the correct identification of the password prompt PASS is visualized on the display. Press MODE to proceed with the parameter setup.

New parameter value could be set using the <, >, v, ^ buttons. Press ENT to store the value. Press MODE to switch to the next parameter. If you press MODE instead of ENT after setting the value of the parameter the device will switch to the next parameter without saving the value of the current one.

- pipe constant - "A-Factor" and pump constant setup:

Press simultaneously ENT and MODE and enter the 1111 password. Set the following parameters:

Prompt	Description	Dimensions	Size
A- F	A-Factor – pipe constant	l / min / Hz	xxx.x
P- C	Pump constant	mg/m ³ /1pH	xx.xx

- current output scaling:

Press simultaneously ENT and MODE and enter the 2222 password. Set the following parameters:

Prompt	Description	Dimensions	Size
I 04	Pump capacity for output current 4 mA	mg/min	xxxx
I 20	Pump capacity for output current 20 mA	mg/min	xxxx

- pH and temperature offset setup:

Press simultaneously ENT and MODE and enter the 3333 password. Set the following parameters:

Prompt	Description	Dimensions	Size
CrPH	pH offset – value with a sign	-	xx.xx
Cr t	Temperature offset – value with a sign	°C	xxx.x
Fund	Flow value. If the measured value is bellow this value control action is not performed (the control action is set to 0%).	m ³ /min	xx.xx

- temperature correction mode:

Press simultaneously ENT and MODE and enter the 4444 password. Set the following parameters:

Prompt	Description	Dimensions	Size
USEt	Temperature compensation type (change it using button ^): " no" – based on the measured temperature ; "YES" – based on the set temperature .	-	-
t °C	Set temperature – when correction based on the set temperature is chosen	°C	xxx.x

- measuring channel calibration:

Press simultaneously ENT and MODE and enter the 5555 password.

The calibration of the measuring channel is performed using standard electrolytes with known pH. One, two or three standard electrolytes have to be used. The calibration is performed with the electrolyte with the smallest value of pH first and is ended with the electrolyte with the biggest pH.

If the calibration is performed with only one standard electrolyte the pH value of this electrolyte has to be very small or very big - depending on the range in which the controller will be used (calibration with pH close to 7.0 will lead to bad results).

When the calibration is performed with 2 or 3 standard electrolytes is recommended the pH of the electrolytes to cover the real working range of the controller.

1. Number of electrolytes with which the calibration will be performed:

Prompt "Pnts" is visualized on the "°C" display. Using <, >, v, ^ buttons set the number on the "pH" display (1-3);

2. Calibration with the first electrolyte:

a. Prompt "PH 1" is visualized on the "°C" display. Using <, >, v, ^ buttons set the pH value of the electrolyte on the "pH" display. Press ENT to save the value. Press MODE to proceed to the next step.

b. Prompt "CAL1" is visualized on the "°C" display. Numerical code (200-4000) is visualized on the "pH" display. Press ENT to calibrate the controller in this point. Press MODE to proceed to the next point.

c. Prompt "t 1" is visualized on the "°C" display. On the "pH" display is visualized the measured electrolyte temperature. Use <, >, v, ^ buttons to change the value of the temperature (if necessary). Press ENT to save it. Press MODE to proceed to the next step.

3. Calibration with the second electrolyte:

(only if calibration with more than 1 electrolyte is chosen).

a. Prompt "PH 2" is visualized on the "°C" display. Using <, >, v, ^ buttons set the pH value of the electrolyte on the "pH" display. Press ENT to save the value. Press MODE to proceed to the next step.

b. Prompt "CAL2" is visualized on the "°C" display. Numerical code (200-4000) is visualized on the "pH" display. Press ENT to calibrate the controller in this point. Press MODE to proceed to the next point.

c. Prompt "t 2" is visualized on the "°C" display. On the "pH" display is visualized the measured electrolyte temperature. Use <, >, v, ^ buttons to change the value of the temperature (if necessary). Press ENT to save it. Press MODE to proceed to the next step.

4. Calibration with the third electrolyte:

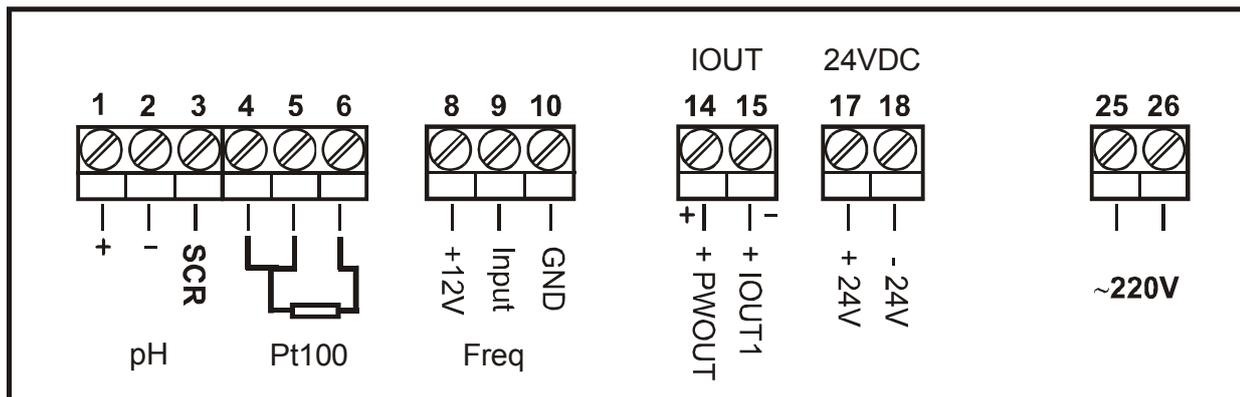
(only if calibration with 3 electrolytes is chosen).

a. Prompt "PH 3" is visualized on the "°C" display. Using <, >, v, ^ buttons set the pH value of the electrolyte on the "pH" display. Press ENT to save the value. Press MODE to proceed to the next step.

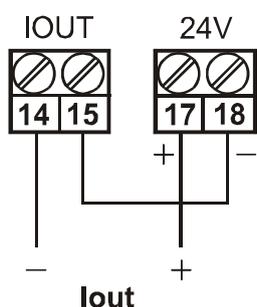
b. Prompt "CAL3" is visualized on the "°C" display. Numerical code (200-4000) is visualized on the "pH" display. Press ENT to calibrate the controller in this point. Press MODE to proceed to the next point.

c. Prompt "t 3" is visualized on the "°C" display. On the "pH" display is visualized the measured electrolyte temperature. Use <, >, v, ^ buttons to change the value of the temperature (if necessary). Press ENT to save it. Press MODE to enter proceed to the next step.

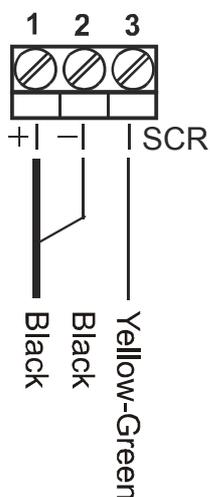
CONNECTION DIAGRAM



Connection of current output with external power supply:



Electrode APS-X5K and ARS-X5K connection:



Terminal No	Description
1, 2, 3	Electrode type APS-X5K or ARS-X5K input
4, 5, 6	Temperature compensation input - Pt100 3-wire connection
8, 9, 10	Impulse input - NPN OC, 0-600 Hz
14, 15	Current output 4-20 mA
17, 18	Output 24 VDC
25, 26	Power supply 220 VAC