

Vakioitu toimintaohje KeBPr-5142 Iwaki annostelupumppu

Dokumenttinro.: 1096
Versio: 1
pvm: 24.10.2018

Laatija: Tero Eerikäinen
Tarkastaja: _____
Tarkastaja: _____

1 Käyttötarkoitus

Iwaki EH-B10VH-20EPW2-PH2B on tarkoitettu annostelupumpuksi pH:n säätösovelluksiin.

2 Vastuhenkilö

Laitteen vastuhenkilö on Tero Eerikäinen.

3 Käyttöturvallisuus

pH:n säätöön käytettävät kemikaalit ovat usein syövyttäviä. Laitteen käytössä tulee huomioida syövyttävien kemikaalien työturvallisuusohjeet.

4 Käyttöohjeet

Laitetta voi käyttää joko pumppuna tai säätimenä. Pumppuna laite toimii MAN-moodissa, säätimenä AUT-moodissa. Kulloinkin päällä olevan moodin indikaattori näkyy laitteen näytössä.

Moodin vaihto:

1. paina ensin func ja sitten yhtä aikaa näppäintä ►
2. paina ►, kunnes haluamasi moodi vilkkuu näytössä
3. vahvasta valintasi painamalla func

Letkujen täyttö tai puhdistus:

1. aseta laite MAN-moodiin
2. aseta imuletku nesteastiaan

3. paina start/stop, niin laite käynnistyy
4. mikäli letkuissa on ilmaa, ilman saa poistettua avaamalla laitteen takaosassa, venttiilistön päällä olevaa ilmausruvia (\varnothing noin 2,5 cm)
5. pumppu pysähtyy, kun painat uudelleen start/stop

pH-anturin kalibrointi:

1. aseta laite AUT-moodiin
2. kiinnitä pH-anturin johto ja laita anturi pH 7 kalibroitiliuokseen
3. odota, kunnes näytön pH-lukema stabiloituu
4. paina ▲, jolloin näytön alareunan ZERO-merkinnän taakse tulee musta kursori ja näyttöön 07,00 tai se lukema, mitä edellisessä pH-anturin kalibroinnissa käytettiin nollana
5. paina ► (luvun mahdollinen muutos ▲-näppäimellä ja seuraavaan lukuun siirtyminen ►-näppäimellä)
6. tilasta pääsee pois painamalla func-näppäintä kerran (=accept), joka hyväksyy elektrodin pH:n asettamaksesi nolaksi (jos func-näppäintä painaa kauan se vastaa exit-komentoa)
7. kun olet hyväksynyt ZERO-pH:n, käytä ▲-näppäintä selatessasi valikon läpi takaisin pH:n näyttöruutuun (laitteen näytössä tummennettuina vain pH ja AUT)
8. vaihda kalibroitiliuokseksi pH 4 liuos ja odota kunnes lukema stabiloituu
9. paina ▲ kahdesti, jolloin näytön alareunan SPAN-merkinnän tausta tummentuu ja näyttöön tulee 04,01 tai se lukema, mitä edellisessä pH-anturin kalibroinnissa käytettiin kulmakertoimen määrittämiseen
10. paina taas ► riittävän monta kertaa, jolloin pääset muuttamaan numeroita (luvun muutos ▲-näppäimellä, seuraavaan lukuun siirtyminen ►-näppäimellä)
11. tilasta pääsee pois painamalla func-näppäintä kerran (=accept), joka hyväksyy elektrodin pH:n asettamaksesi SPAN-arvoksi.
12. pH-anturin kalibrointi on nyt valmis, voit jatkaa säätöasetusten syöttämisellä tai laitteen muulla käytöllä

pH:n säätö:

1. varmista, että laite on AUT-moodissa
2. tarkista säätöasetukset liikkumalla valikossa ▲-näppäimellä
3. älä paina ►-näppäintä, kun näytön ZERO tai SPAN on ruudussa, sillä silloin et pääse eteenpäin muuten kuin vahvistamalla kalibroinnin siinä tilassa, missä pH-anturisi sillä hetkellä on
4. SET ollessa valittuna saat ►- ja ▲-näppäinten avulla muutettua pH:n säätöarvon (vahvistus painamalla func)
5. PB ollessa valittuna saat ►- ja ▲-näppäinten avulla muutettua pH:n säädön suuntaa (emäksellä säädettäessä miinus, hapolla plus) ja tehokkuutta (kuinka kaukana säätöarvosta säätö on täysillä)
6. spm ollessa valittuna saat ►- ja ▲-näppäinten avulla muutettua pumpun maksimipumppaustehoa
7. laitteen maksimi- ja minimi-pH:ta pystyy säätämään anturin mukaan
8. säätö käynnistetään start/stop-näppäimellä, kun näytössä on tummennettuina vain pH ja AUT
9. kun säätö on päällä, AUT vilkkuu
10. säätö pysäytetään start/stop-näppäimellä

5 Ongelmatilanteet

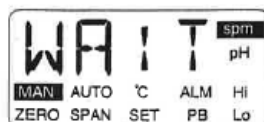
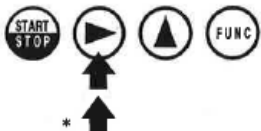
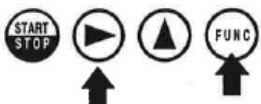
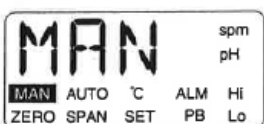
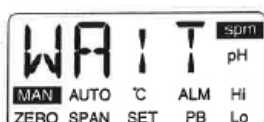
Mahdollisia ongelmia:

- letkut tukossa ⇒ puhdista tai vaihda letkut
- pumppu likainen ja kalvo jumissa ⇒ puhdista pumppu (sisältää purkutöitä)
- pH-anturi näyttää mitä sattuu ⇒ **ÄLÄ MISSÄÄN TAPAUKSESSA KOSKE LAITTEEN KALIBROINTIVALIKKOON KESKEN SÄÄDÖN!!!!**
- Katso räjäytyskuva viimeisellä sivulla

II. Setting and Changing of Modes

■ Setting and Changing of Modes

- 'MAN' and 'AUTO' modes are available for selection.
- MAN mode: Manual operation (for air elimination or test run)
- AUTO mode: pH control operation with PH model
ORP control operation with OR model
Conductivity control operation with CD model



1 Stop the pump through key operation and put it in standby condition (with 'WAIT' displayed).

2 While holding the **FUNC** key down, press the **▶** key. Then, the LCD display starts flashing, indicating that the mode can be changed.

3 If the **▶** key is pressed while 'AUTO' is flashing, 'MAN' is displayed in flashing mode.

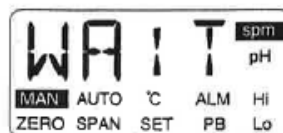
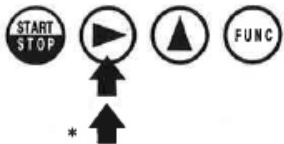
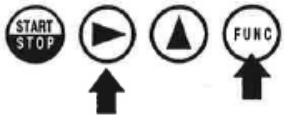
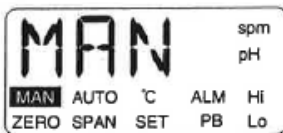
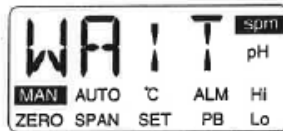
* Each time the **▶** key is pressed, 'AUTO' or 'MAN' is alternately displayed in flashing mode.

4 Select a display from the flashing display and press the **FUNC** key to enter the election. (now the mode changing process is completed.)

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III. Calling Up, Setting and Changing of Parameters




■ Parameters

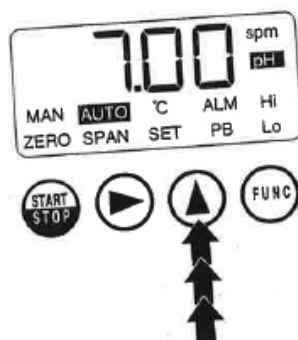
Parameters, data which determine the operation and control of pump, store respective set values specified previously. The applicable parameters available in each model and each mode are as shown below.

Mode	Parameter	PH model			OR model			CD model		
		Initial value	Setting range	Step	Initial value	Setting range	Step	Initial value	Setting range	Step
MAN	SET	360spm	0~360spm	1spm	360spm	0~360spm	1spm	360spm	0~360spm	1spm
	ZERO	7.00pH	0.00~14.00pH	0.01pH	0mV	0mV				
AUTO	SPAN	4.00pH	0.00~14.00pH	0.01pH				1.00	0.80~2.20	0.01
	CELL							2.00%	-9.99~9.99%	0.01%
	%							5.00mS/cm	0.00~9.99mS/cm	0.01mS/cm
	SET	7.00pH	0.00~14.00pH	0.01pH	0mV	-1999~1999mV	1mV	-2.5mS/cm	-9.99~9.99mS/cm	0.01mS/cm
	Pb	5.00pH	-14.00~14.00pH	0.01pH	1000mV	-1999~1999mV	1mV	360spm	0~360spm	1spm
	spm	360spm	0~360spm	1spm	360spm	0~360spm	1spm	0.00mS/cm	0.00~9.99mS/cm	0.01mS/cm
	Lo	2.00pH	0.00~14.00pH	0.01pH	-1500mV	-1999~1999mV	1mV	9.99mS/cm	0.00~9.99mS/cm	0.01mS/cm
	Hi	12.00pH	0.00~14.00pH	0.01pH	1500mV	-1999~1999mV	1mV			

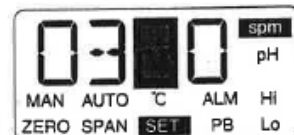
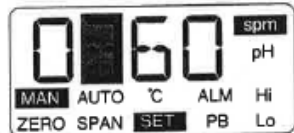
■ Calling up parameter

Parameters can be called up and displayed in the operation panel as necessary.

- Press the  key once to display the first parameter. Each time the  key is pressed, the following parameters are displayed one at a time in sequence. When all the parameters have been displayed in such a manner, the first parameter is displayed again. (Each time the  key is pressed, the parameters are displayed in sequence downward from the top as indicated in the above table for each mode.)



■ Changing parameter

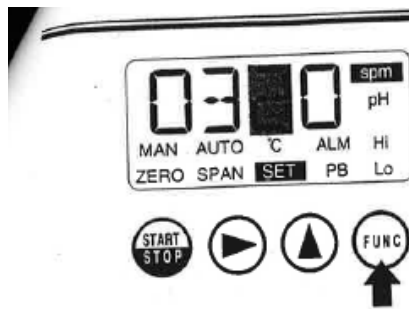


1 Call up a parameter to be changed. Press the key to display a parameter to be changed.

2 Press the key to start the set value display section flashing. indicates blinking of the display.

3 Press the key again, to move the position of the digit to flash. Each press of the said key moves the digit rightward one at a time.

4 Each press of the key, then, increase the value of the digit selected.
 (0→1→2→3.....→9→0)



5 With the desired value displayed, press the **FUNC** key to enter the value. (The set value display section stops flashing.)

6 When setting a parameter with a minus sign, call up the parameter and press the **▶** key first. Then, press the **▲** key once to flash a minus sign.

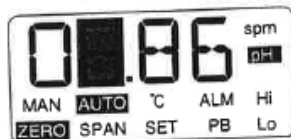
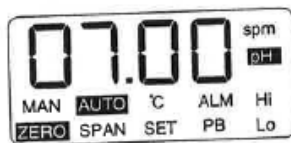
Warning

Press the **FUNC** key for the storage of a set value in the memory. Each time a set value is changed, check that no digit is flashing. Also, make sure to press the **FUNC** key.

IV. Calibration and Handling of Electrode

Warning

Calibration of electrode is an indispensable process in the use of the control unit. When using an electrode for the first time, washing it, replacing and recalibrating it, even if the ZERO or SPAN described in the following procedure has been set up, press the **▶** key to make the display flash and press the **FUNC** key to memorize the value newly.



Caution

In the step of calibration, make sure that the pH electrode is soaked in each pH standard liquid completely. Be careful not to expose the electrode to the air or use the same liquid for both ZERO and SPAN. Otherwise, incorrect values will be stored in the memory which will result in abnormal operation.

<Calibration for PH type>

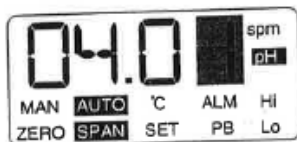
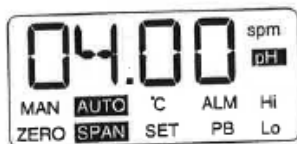
1 Change the mode, if MAN mode has been selected, into the AUTO mode.

2 Prepare two types of pH standard liquid. (pH7 liquid and pH4 liquid)

3 Press the **▲** key to call up parameter ZERO. Place the pH electrode in the pH7 standard liquid for 1 to 2 minutes. (**ZERO** lights up and all the digits are displayed.)

4 Set the value of the pH7 standard liquid. Press the **▶** key to make the highest digit flash. Pressing the **▲** key while the digit is flashing increases the value by 1. Pressing the **▶** key then moves the flash to the next digit. For the set value, take the value on the package of the standard liquid in accordance with the temperature of the liquid. (The value indicated for an electrode without a temperature compensating element is specified for a temperature of 25 °C.) **■** indicates blinking of the display.

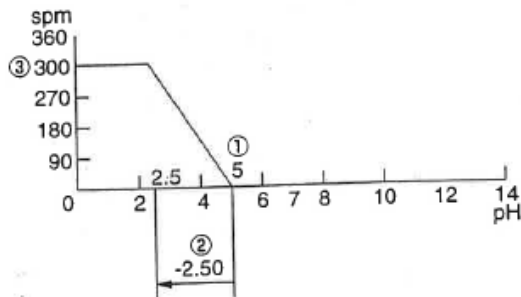
Even when setting the parameter to the same value as the current one, carry out steps 3 and 4 above.



- 5 Press the **FUNC** key to enter the value. The display stops flashing.
With the above step completed, the signal from the pH electrode and set value are memorized.
- 6 Press the **▲** key to call up parameter SPAN. Place the pH electrode in the pH4 standard liquid for 1 to 2 minutes. (**SPAN** lights up.)
- 7 Set the value of the pH4 standard liquid.
Press the **▶** key to make the highest digit flash. Pressing the **▲** key while the digit flashes increases the value by 1. Pressing the **▶** key then moves the flash to the next digit.
For the set value, take the value on the package of the standard liquid in accordance with the temperature of the liquid. (The value indicated for an electrode without a temperature compensating element is specified for a temperature of 25 °C.)
■ indicates blinking of the display.
Even when setting the parameter to the same value as the current one, carry out steps 6 and 7 above.
- 8 Press the **FUNC** key to enter the value. The display stops flashing.
With the above step completed, the signal from the pH electrode and the set value are memorized.
- 9 With all the above steps completed, the calibration of an electrode is completed.

V. Setting of parameters and operation mechanism

■ Setting of parameters and operation mechanism (PH model)

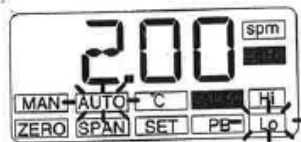


Parameter		
①	SET	5.00pH
②	PB	-2.50pH
③	spm	300spm
	Lo	2.00pH
	Hi	12.00pH

• Operation mechanism

- The stroke rate of the pump is represented by the real line in the figure above. The range of proportional control is called proportional band (PB). The spm value indicates the max. stroke rate of the pump. In the example above, the stroke rate is fixed at 300 spm for the pH values at or lower than 2.50. The PB value is assumed to be added to the SET value, which increases the stroke rate in the figure above as the pH measurement decreases. For example, the stroke rate for the measured value 4.00 pH stands at 120 spm.
- The parameters are set before shipment from the plant. Set them to the required values in accordance with the application purpose before use.
- If the measurements exceed the value set for Lo or Hi, the alarm function runs with display and/or alarm output (optional function). The values for Lo and Hi can be set as required upon the condition, however, a setting of $Lo > Hi$ should be avoided.

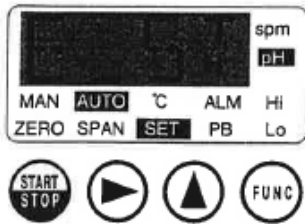
- When the measured value is at or lower than the Lo set value:



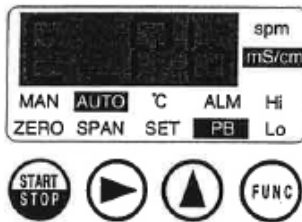
The display ALM is lit and Lo flashes.

VI. Other Display Messages and Special Procedure

■ Error messages



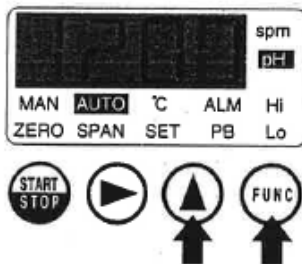
If any value out of the permissible set value range is entered by mistake, error indication ('E_ST') will be displayed for 5 seconds and the value valid before the setting change step will be resumed. Carry out value changing step for a correct value.



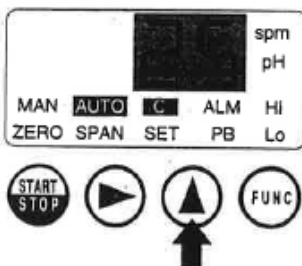
- If 0.00 or -0.00 is specified for the setting of parameter Pb, "E_Pb" will flash for 5 seconds. Then, the value registered in the previous setting will be displayed. Then, carry out the set value changing step for the correct value (only in the AUTO mode).

■ How to select the content of display

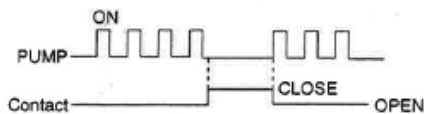
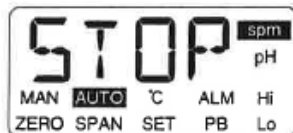
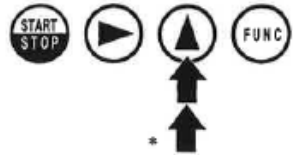
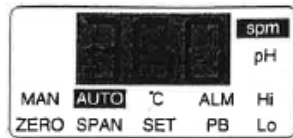
This control unit can display pH value, voltage (mV), conductivity (mS/cm), stroke rate (spm), and temperature (°C) (PH type and CD type only).



- 1 While holding **FUNC** key down, press the **▲** key. The correct measured value starts flashing.



- 2 Press the **▲** key next to make the temperature display "°C" flashing. (No temperature display is available with OR type.)
██████ indicates blinking of the display.



3 Press the key again to display stroke rate in flash mode.

The above display contents are shown alternately every time the key is pressed.

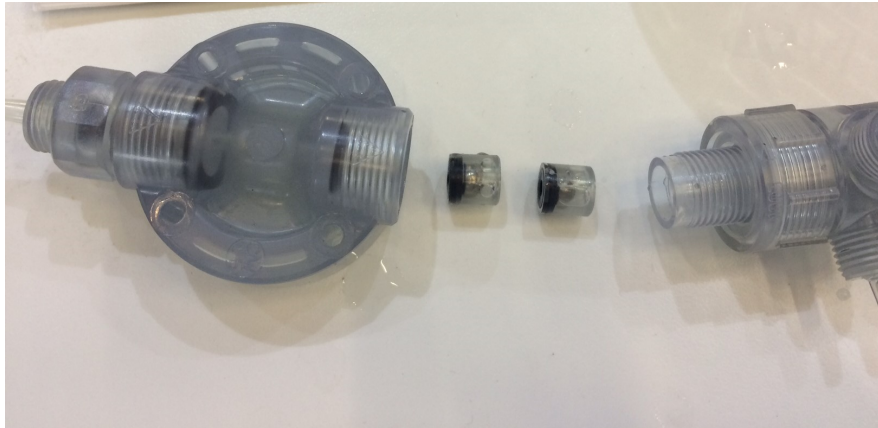
4 With the desired display presented, press the key to register it.

- When stroke rate is display in 'spm' The pump is equipped with stop function which temporarily stops the pump operation upon receiving contact signal from outside. When this function is activated and only if the stroke rate is displayed, the display as shown below is presented.

* Note that you cannot operate the key when the stop function is activated by the external contact signal.

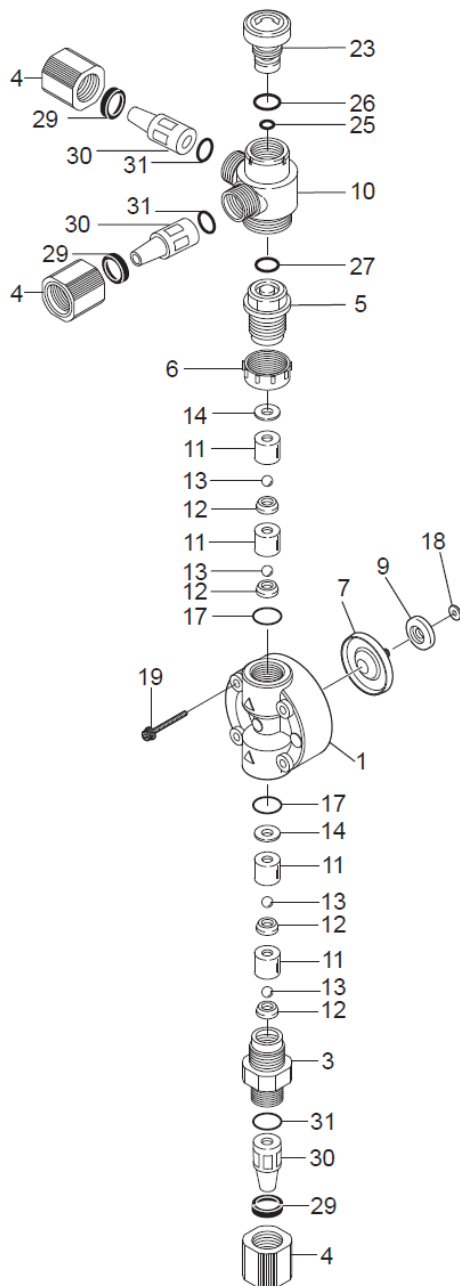
■ Special procedure

When the display is not in flash mode, pressing the key for more than one second will turn the parameter display back to the basic display (selected display content) in the current mode 'MAN' or 'AUTO'. This procedure is employed when the parameter should be reset or when only one parameter should be changed with call-up for all the other parameters canceled.



Liuta ko. kuulaventtiilit tarvittaessa, jumittuvat esim. jos suolaa kiteytyy sisään

■ EWN-[B09•B11•B16•B21•C16•C21][VC•VH•PC•PH•TC]



No.	Osan nimi	Osien lkm
1	Pumppupää	1
3	Liitin	1
4	Kiristysmutteri	3
5	Ilmausventt. runko	1
6	Lukkomutteri	1
7	Kalvo	1
9	Tukilevy	1
10	Ilmausventtiili A	1
11	Venttiiliohjain	4
12	Venttiili-istukka	4
13	Venttiilikuula	4
14	Venttiilitiiviste	2
17	O-rengas	2
18	Kalvon priikka	*
19	Kuusiokoloruuvi [PW•SW]	4
23	Säätönappula	1
25	O-rengas	1
26	O-rengas	1
27	O-rengas	1
29	Letkun kiristin	3
30	Letkun liitin	3
31	O-rengas	3

*Kalvon priikojen lukumäärä vaihtelee pumppukohtaisesti.

*Korkeapainemalleille on asennettava tukilevy osien 7 ja 9 väliin, jotta kalvo kestää korkean paineen