IWAKI ELECTROMAGNETIC METERING PUMPS

EHN

Solutions for chemical handling applications
The latest electromagnetic metering pump equipped with digital controller & multi-voltage

EHN Series is the latest electromagnet drive & diaphragm type metering pump. Pump head and driving mechanism employ those of experienced EH-R Series pumps while control unit is newly developed. Multi-voltage from 100 to 240V and digitized EHN Series pump is easy to operate in a variety of chemical feeding application.

Pump head variation
Wide variety of standard pump head (VC/VH/PC/PH/PP/FC/SH), automatic air vent type (NAE) and high compression type (55 model).
• Refer to page 5 for details of NAE and 55.

High resolution
Thanks to digitized controller, stroke speed can be adjusted by 1 spm step from 1 to 360 spm. Combined with stroke length adjustment, you can do the fine adjustment from very small flow to maximum flow rate.
Multi-voltage power source

Multi-voltage power source from AC100 to 240V for all models. You are now free from worrying about power voltage.

Control unit

The highly-functional EHN-YN which is equipped with digital and analogue inputs are added to the standard production line as well as EHN-R.

Air vent valve

Standard pump head models (VC/VH/PC/PH/PP) equip air vent valve. Air in the pump chamber can be easily released by turning knob.

Water/dust-proof

Each unit such as driving unit and control unit is sealed to make the pump IP66 equivalent water/dust-proof.

• Do not install pump outdoor.

Multi hose connection

The use of a new hose stopper eliminates a twist in tube connection.

• Except for the following
  Wet-end material: FC type, SH type
  Controller: EHN-R/YN Flow Checker corresponding type
  Accessories: Check valve CS type, Backflow prevention valve, Back pressure valve, Flow checker, T-joint
The basic model of the EHN series. Key lock function prevents erroneous operation after controller programming. The mounted controller provides EXT and STOP functions. Multiply and dividing operations becomes newly available by EXT functions and allows you to delicate pump control.

**Controller function**

**Manual operation**
Pump run/stop and stroke rate setting (1 to 360 spm) can be done by keys. Stroke rate can be set either when pump is running or stopped.

**EXT operation**

### Multiply \( (1 : n) \)
Pump makes multiply operation by external pulse signal. Pump makes “n” times shots against one pulse signal input. “n” can be set from 1 to 999. Pulses which came while operation are put in memory up to 255 pulses.

### Dividing \( (n : 1) \)
Pump makes dividing operation by external pulse signal. Pump makes one shot against “n” times pulse input. “n” can be set from 1 to 999.

- If “n” is set at 1, pump makes synchronous operation. If pump is connected to optionally available EH controller, please use this function.

**Memory**

- **Input pulse**
- **Pump operation**
- **Input pulse**
- **Pump operation**

**STOP function**
Pump stops by external contact signal. Pump operates when stop signal input is released. This function enables pump ON/OFF control. This is convenient function when used in combination with level sensor.

- It is possible to operate pump while STOP signal comes in (Change over with keys). In this case, when pump is operated in EXT mode, pump operates synchronous with EXT signal input while STOP signal is coming in.

Level sensor watches water level in tank, and stops pump when water level comes to lower limit.

Various combinations of the controller and the pump head meet a wide range of application requirement.
Electromagnetic metering pump for sodium hypochlorite

**EHN-YN series**

- The features of both the EHN-Y and the FCM flow checker are integrated into the EHN-YN.
- Auxiliary functions including keypad lock and priming operation (max operation with the up and down keys depressed) are provided to support users.
- The FCM flow checker is optionally available.
- The pump gives an alarm and starts running at full speed (360spm), removing entrained air or clogging, when the FCM does not detect a suction line flow. Operation at a set speed or programmed behaviour will be restored after the problems are removed.
- The following three behavioural patterns are available:
  - PA mode/PA+AL mode/PA+AL+RE mode
  - Monitoring/alarming a suction-line flow ensures safer pump operation.

### Controller function

#### Manual operation
Pump run/stop and stroke rate setting (1 to 360 spm) can be done by keys. Stroke rate can be set either when pump is running or stopped.

#### Analogue input operation
Proportional control of spm by programming 2 points between 0-20mA.

#### EXT operation
**Multiply (1 : n)**
Pump makes multiply operation by external pulse signal. Pump makes “n” times shots against one pulse signal input. “n” can be set from 1 to 999. Pulses which came while operation are put in memory up to 255 pulses.

**Dividing (n : 1)**
Pump makes dividing operation by external pulse signal. Pump makes one shot against “n” times pulse input. “n” can be set from 1 to 999.

- If “n” is set at 1, pump makes synchronous operation. If pump is connected to optionally available EH controller, please use this function.

#### STOP function
Pump stops by external contact signal. Pump operates when stop signal input is released. This function enables pump ON/OFF control. This is convenient function when used in combination with level sensor.

- It is possible to operate pump while STOP signal comes in (Change over with keys). In this case, when pump is operated in EXT mode, pump operates synchronous with EXT signal input while STOP signal is coming in.

### Auto restoration

#### PA mode
When the FCM does not detect a suction-line flow for the PA time, the pump starts to run at full speed (360spm).

#### PA+AL mode
When the FCM does not detect a suction-line flow for the PA time, the pump starts to run at full speed (360spm) for the AL time and stops afterward.

#### PA+AL+RE mode
When the pump starts to run at full speed (360spm) for the AL time and the FCM keeps detecting a suction-line flow over the RE time, operation at a set speed or programmed behaviour will be restored.
The pump can be specialized for the need of a special chemical transfer.

The optimum for gaseous liquid feeding

**Automatic air vent type**

**EHN-NAE**

This type equips automatic air vent mechanism. An air vent valve built-in pump chamber enables reliable air venting. Also equipped manual air vent valve enables easy pressure release in discharge piping. Gaseous liquid such as sodium hypochlorite can be injected without gas locking.

**Wet-end material**

<table>
<thead>
<tr>
<th>Material code</th>
<th>VC</th>
<th>VC-S6</th>
<th>VC-HC</th>
<th>VH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump head</td>
<td>PVC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connection adaptor</td>
<td>PVC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separate pin</td>
<td>Titanium</td>
<td>SUS316</td>
<td>Hastelloy</td>
<td>C276</td>
</tr>
<tr>
<td>Valve</td>
<td>Alumina ceramic</td>
<td></td>
<td>Hastelloy</td>
<td>C276</td>
</tr>
<tr>
<td>Valve seat</td>
<td>FKM</td>
<td>EPDM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O-ring</td>
<td>FKM</td>
<td>EPDM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diaphragm</td>
<td>PTFE coated</td>
<td>EPDM</td>
<td>EPDM</td>
<td></td>
</tr>
</tbody>
</table>

Note: Automatic air vent valve is zirconia ceramic. 
• VH type is a C16 type only.

**Specification**

- **Model**: EHN-B11-NAE
  - Max. discharge capacity mL/min: 30
  - Discharge capacity per shot mL/shot: 0.04 - 0.08
  - Stroke rate spm: 1 - 360
  - Pressure max. MPa: 1.0
  - Stroke length adjustable range %: 50 - 100
  - Connection ( Hose dia. ): Ø4xØ9, Ø4xØ6

- **Model**: EHN-B16-NAE
  - Max. discharge capacity mL/min: 55
  - Discharge capacity per shot mL/shot: 0.08 - 0.15
  - Stroke rate spm: 1 - 360
  - Pressure max. MPa: 0.7
  - Stroke length adjustable range %: 40 - 100

- **Model**: EHN-C16-NAE
  - Max. discharge capacity mL/min: 65
  - Discharge capacity per shot mL/shot: 0.07 - 0.18
  - Stroke rate spm: 1 - 360
  - Pressure max. MPa: 1.0
  - Stroke length adjustable range %: 40 - 100

- **Model**: EHN-C21-NAE
  - Max. discharge capacity mL/min: 110
  - Discharge capacity per shot mL/shot: 0.12 - 0.31
  - Stroke rate spm: 1 - 360
  - Pressure max. MPa: 0.7
  - Stroke length adjustable range %: 40 - 100

**Operating condition**: Liquid temperature 0 - 40°C. Ambient temperature 0 to 40°C

**Construction (55 type)**

- Air which comes from suction port goes to the connection adapter through pump head. Because pump discharge side is pressurized, air goes to the automatic air vent valve which the pressure load is lower than pump discharge side, and goes out little by little together with liquid.
- Once the pump gets out of locked air condition, it returns to normal operation to discharge the liquid. Little bit of liquid is discharged from automatic air vent valve, too.

**The optimum for sodium hypochlorite feeding**

**High compression head type**

**EHN-55**

Increased compression ratio due to minimized dead volume in pump chamber.

**Wet-end material**

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<thead>
<tr>
<th>Material code</th>
<th>VC</th>
<th>VC-S6</th>
<th>VC-HC</th>
<th>VH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump head</td>
<td>PVC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve</td>
<td>Alumina ceramic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve seat</td>
<td>FKM</td>
<td>EPDM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gasket</td>
<td>PTFE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O-ring</td>
<td>FKM</td>
<td>EPDM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diaphragm</td>
<td>PTFE coated</td>
<td>EPDM</td>
<td>EPDM</td>
<td></td>
</tr>
</tbody>
</table>

Note: Automatic air vent valve is zirconia ceramic. 
• VH type is a C16 type only.

**Specification**

- **Model**: EHN-B11VC-55
  - Max. discharge capacity mL/min: 38
  - Discharge capacity per shot mL/shot: 0.05 - 0.11
  - Stroke rate spm: 1 - 360
  - Pressure max. MPa: 1.0
  - Stroke length adjustable range %: 50 - 100
  - Connection ( Hose dia. ): Ø4xØ9, Ø4xØ6

- **Model**: EHN-B21VC-55
  - Max. discharge capacity mL/min: 100
  - Discharge capacity per shot mL/shot: 0.14 - 0.28
  - Stroke rate spm: 1 - 360
  - Pressure max. MPa: 0.4
  - Stroke length adjustable range %: 50 - 100

**Operating condition**: Liquid temperature 0 - 40°C. Ambient temperature 0 to 40°C

**Principle of operation (NAE type)**

- Air which comes from suction port goes to the connection adapter through pump head. Because pump discharge side is pressurized, air goes to the automatic air vent valve which the pressure load is lower than pump discharge side, and goes out little by little together with liquid.
- Once the pump gets out of locked air condition, it returns to normal operation to discharge the liquid. Little bit of liquid is discharged from automatic air vent valve, too.

**Wet-end material**

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<td></td>
</tr>
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<td>SUS316</td>
<td>Hastelloy</td>
<td>C276</td>
</tr>
<tr>
<td>Valve</td>
<td>Alumina ceramic</td>
<td></td>
<td>Hastelloy</td>
<td>C276</td>
</tr>
<tr>
<td>Valve seat</td>
<td>FKM</td>
<td>EPDM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O-ring</td>
<td>FKM</td>
<td>EPDM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diaphragm</td>
<td>PTFE coated</td>
<td>EPDM</td>
<td>EPDM</td>
<td></td>
</tr>
</tbody>
</table>

**Operating condition**: Liquid temperature 0 - 40°C, Ambient temperature 0 to 40°C

- Max. discharge capacity represents the figure when pumping clear water at ambient temperature at max. discharge pressure. Pump discharges more liquid than shown above if it runs at lower discharge pressure. If discharge pressure is 0.12MPa or lower, be sure to use check valve to avoid over-feeding.
The EHN series meets the needs of various chemical feeding in water treatment fields.

**Injection of boiler compound into through flow boiler**
Because the pump can inject very small capacity, pure boiler compound can be injected without diluting.

**Sterilizing of swimming pool water (Residual chlorine concentration control)**
Continuous injection of sodium hypochlorite. Combined with Chlorine sterilizer, residual chlorine concentration can be controlled precisely.

**Sterilizing of distilled water (Proportional mixing of cleaning water and sterilizing agent)**
Pump injects sterilizing agent in proportion to the flow rate of cleaning water by the signal from pulse oscillating flow meter. Same mixing concentration can be kept regardless of the change of cleaning water flow rate.

**Metering dose**
Pump operates at pre-set number of shots by receiving signal from proximity switch. Number of shot can be set from 1 - 999.

**Electroless plating system (Planting solution supply/Conductivity control of cleaning water)**
Continuous injection of sodium hypochlorite. Combined with Chlorine sterilizer, residual chlorine concentration can be controlled precisely.
Check valve
Mount the check valve at the end of discharge hose for the prevention of over feeding, backflow, and siphon action.
Note: CBN type is an option.

**CS type:** Standard accessory
Install it between hoses.

**CBN type:** In-line type check valve.

**Optional accessories**

<table>
<thead>
<tr>
<th>Model</th>
<th>Connection</th>
<th>Set Press</th>
<th>Material</th>
<th>Body</th>
<th>O-ring</th>
<th>Wet and material code</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN-1V-M</td>
<td>Ød=Ø9</td>
<td>0.17</td>
<td>PVC</td>
<td>FKM</td>
<td>C16, 21</td>
<td>VC</td>
</tr>
<tr>
<td>CAN-1V-M</td>
<td>Ød=Ø9</td>
<td>0.17</td>
<td>EPDM</td>
<td>FKM</td>
<td>C16, 21</td>
<td>YH</td>
</tr>
<tr>
<td>CAN-1V-M</td>
<td>Ød=Ø9</td>
<td>0.17</td>
<td>C31</td>
<td>FKM</td>
<td>C16, 21</td>
<td>YH</td>
</tr>
<tr>
<td>CAN-1V-M</td>
<td>Ød=Ø9</td>
<td>0.17</td>
<td>PVC</td>
<td>FKM</td>
<td>C31</td>
<td>YH</td>
</tr>
<tr>
<td>CAN-1V-M</td>
<td>Ød=Ø9</td>
<td>0.17</td>
<td>EPDM</td>
<td>FKM</td>
<td>C31</td>
<td>YH</td>
</tr>
<tr>
<td>CAN-1VC-M</td>
<td>Ød=Ø9</td>
<td>0.17</td>
<td>PVC</td>
<td>FKM</td>
<td>C16, 21</td>
<td>VC</td>
</tr>
<tr>
<td>CAN-1VC-M</td>
<td>Ød=Ø9</td>
<td>0.17</td>
<td>EPDM</td>
<td>FKM</td>
<td>C16, 21</td>
<td>YH</td>
</tr>
<tr>
<td>CAN-1VC-M</td>
<td>Ød=Ø9</td>
<td>0.17</td>
<td>C31</td>
<td>FKM</td>
<td>C16, 21</td>
<td>YH</td>
</tr>
<tr>
<td>CAN-1VC-M</td>
<td>Ød=Ø9</td>
<td>0.17</td>
<td>PVC</td>
<td>FKM</td>
<td>C31</td>
<td>YH</td>
</tr>
<tr>
<td>CAN-1VC-M</td>
<td>Ød=Ø9</td>
<td>0.17</td>
<td>EPDM</td>
<td>FKM</td>
<td>C31</td>
<td>YH</td>
</tr>
</tbody>
</table>

**Dampner**
Mount the accumulator on discharge side hose to reduce vibration comes from pulsation.

**Hose flange**
The hose flange is the adapter for connecting hose to flange. Hose flange with the check valve is also available.

**Hose joint**
The hose joint offers a secure connection between hose and pipe.

**VP plumbing connection**
Back pressure valve

The back pressure valve enhances the dosing accuracy and prevents backflow. Set pressure is adjustable.

<table>
<thead>
<tr>
<th>Model</th>
<th>Connection</th>
<th>Material</th>
<th>Wet end material code</th>
</tr>
</thead>
<tbody>
<tr>
<td>BVC-1TV-4H</td>
<td>Ø4×Ø6 Hose</td>
<td>PVC</td>
<td>B11, C31, C36</td>
</tr>
<tr>
<td>BVC-1TV-10H</td>
<td>Ø8×Ø12 Hose</td>
<td>FKM</td>
<td>B11, C31, C36</td>
</tr>
</tbody>
</table>

Mount the foot valve at the end of suction hose. The foot valve with a strainer prevents backflow and foreign matter interfusion.

<table>
<thead>
<tr>
<th>Model</th>
<th>Connection</th>
<th>Material</th>
<th>Wet end material code</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSCN-1</td>
<td>Ø4×Ø9</td>
<td>PVC</td>
<td>B11, C31, C36</td>
</tr>
<tr>
<td>FSCN-2</td>
<td>Ø4×Ø6</td>
<td>PVC</td>
<td>B11, C31, C36</td>
</tr>
</tbody>
</table>

Strainer with a foot valve

Mount the strainer at the end of suction hose. The strainer with a foot valve prevents backflow and foreign matter interfusion. Inlet bore can be selected according to hose bore.

<table>
<thead>
<tr>
<th>Model</th>
<th>Connection</th>
<th>Material</th>
<th>Wet end material code</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSVN-1</td>
<td>Ø4×Ø9</td>
<td>PVC</td>
<td>B11, C31, C36</td>
</tr>
<tr>
<td>FSVN-2</td>
<td>Ø4×Ø6</td>
<td>PVC</td>
<td>B11, C31, C36</td>
</tr>
</tbody>
</table>

Foot valve with a strainer

Mount the foot valve at the end of suction hose. The foot valve with a strainer and a ceramic weight ball prevents backflow and foreign matter interfusion. Inlet bore can be selected according to hose bore.

<table>
<thead>
<tr>
<th>Model</th>
<th>Connection</th>
<th>Material</th>
<th>Wet end material code</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSN-1</td>
<td>Ø4×Ø9</td>
<td>PVC</td>
<td>B11, C31, C36</td>
</tr>
</tbody>
</table>

Flow counter/Controller

The pressure sensor detects pulsation to monitor the flow. Air lock and hose disconnection are also can be detected.

<table>
<thead>
<tr>
<th>Model</th>
<th>Connection</th>
<th>Material</th>
<th>Wet end material code</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCM-VC-1</td>
<td>Ø4×Ø9</td>
<td>PVC</td>
<td>B11, C31, C36</td>
</tr>
</tbody>
</table>

Flow checker

The FCM flow checker monitors the suction-line flow and sends a signal to the pump at each shot. Its mounting position is beneath the pump inlet, so the FCM can detect a system upset under any piping or operating condition.

<table>
<thead>
<tr>
<th>Model</th>
<th>Connection</th>
<th>Material</th>
<th>Wet end material code</th>
</tr>
</thead>
<tbody>
<tr>
<td>EHN-B-M</td>
<td>Ø4×Ø9</td>
<td>PVC</td>
<td>B11, C31, C36</td>
</tr>
</tbody>
</table>

A mount dedicated for the EHN Series

This dedicated mount elevates the pump to connect to the suction piping, when said piping is too high.

<table>
<thead>
<tr>
<th>Model</th>
<th>Material</th>
<th>Application</th>
<th>Height</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>EHN-B-M</td>
<td>PVC</td>
<td>sprouting</td>
<td>12mm</td>
<td></td>
</tr>
</tbody>
</table>

Model Connection Material Application pump Wet end material code
---|----------|-------------|--------|------|
FSCN-1 | Ø4×Ø9 | PVC | FKM | B11, C31, C36 |
FSCN-2 | Ø4×Ø6 | PVC | FKM | B11, C31, C36 |
FSCN-3 | Ø6×Ø8 | PVC | FKM | B11, C31, C36 |
FSCN-4 | Ø6×Ø13 | PVC | FKM | B11, C31, C36 |
FSCN-5 | Ø6×Ø12 | PVC | FKM | B11, C31, C36 |
Technical data

Construction and materials (VC/VH/PC/PH/PP)

<table>
<thead>
<tr>
<th>Material symbol</th>
<th>VC</th>
<th>VH</th>
<th>PC</th>
<th>PH</th>
<th>PP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump head</td>
<td>PVC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve</td>
<td>Alumina ceramic</td>
<td>Hastelloy C276</td>
<td>Alumina ceramic</td>
<td>Hastelloy C276</td>
<td>Alumina ceramic</td>
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<tr>
<td>Valve seat</td>
<td>FKM</td>
<td>EPDM</td>
<td>FKM</td>
<td>EPDM</td>
<td>PCTFE</td>
</tr>
<tr>
<td>Valve guide</td>
<td>PVC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O-ring</td>
<td>FKM</td>
<td>EPDM</td>
<td>FKM</td>
<td>EPDM</td>
<td>FKM</td>
</tr>
<tr>
<td>Diaphragm</td>
<td>PTFE</td>
<td>EPDM</td>
<td>(EPDM of diaphragm is not wet-end.)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PVC: Transparent polyvinyl chloride
FKM: Fluor rubber
EPDM: Ethylene-propylene-diene-methylene
PCTFE: Polychlorotrifluoroethylene
PTFE: Polytetrafluoroethylene

Construction and materials (FC/SH)

<table>
<thead>
<tr>
<th>Material symbol</th>
<th>FC</th>
<th>SH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump head</td>
<td>PVDF</td>
<td>SUS316</td>
</tr>
<tr>
<td>Valve</td>
<td>Alumina ceramic</td>
<td>Hastelloy C276</td>
</tr>
<tr>
<td>Valve seat</td>
<td>PCTFE</td>
<td>SUS316</td>
</tr>
<tr>
<td>Valve guide</td>
<td>PVDF</td>
<td>SUS316</td>
</tr>
<tr>
<td>Gasket</td>
<td>PTFE</td>
<td></td>
</tr>
<tr>
<td>O-ring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diaphragm</td>
<td>PTFE+EPDM</td>
<td>(EPDM of diaphragm is not wet-end.)</td>
</tr>
</tbody>
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PVC: Transparent polyvinyl chloride
FKM: Fluor rubber
EPDM: Ethylene-propylene-diene-methylene
PCTFE: Polychlorotrifluoroethylene
PTFE: Polytetrafluoroethylene

Pump identification (VC/VH/PC/PH/PP)

- **Drive unit code** (Average power consumption)
  - B: 20W
  - C: 24W
- **Diaphragm effective diameter**
  - 11: 10mm
  - 16: 15mm
  - 21: 20mm
  - 31: 30mm
  - 36: 35mm
- **Wet-end material code**
  - VC, VH, PC, PH, PP
- **Connection**
  - M: Multi tube connection
- **Connection hose dia. (in mm)**
  - Ø4 x Ø9, Ø4 x Ø6 (11/16/21)
  - Ø8 x Ø13, Ø9 x Ø12 (31/36)
  - PVC braided hose (Standard)
  - Teflon or polyethylene hose (Special specification)
- **Special configuration**
  - NAE: Automatic air vent
  - S5: High compression pump head, etc.
  - Controller
    - R: Standard
    - YN: Digital/Analogue correspondence
- **Air vent**
  - Blank: Provided
  - K: Not provided
  - • 31/36 (VC/VH)R only

Pump identification (FC/SH)

- **Drive unit code** (Average power consumption)
  - B: 20W
  - C: 24W
- **Diaphragm effective diameter**
  - 11: 10mm
  - 21: 20mm
  - 31: 30mm
  - 36: 35mm
- **Wet-end material code**
  - FC, SH
- **Connection hose dia. (in mm)**
  - Pump type
    - FC: Ø4 x Ø6, Ø10 x Ø12
    - SH: 9: Rc 1/4
- **Controller**
  - R: Standard
  - YN: Digital/Analogue correspondence
<table>
<thead>
<tr>
<th>Specifications of pump</th>
<th>Model</th>
<th>EHN-B11</th>
<th>EHN-B16</th>
<th>EHN-B21</th>
<th>EHN-B31</th>
<th>EHN-C16</th>
<th>EHN-C21</th>
<th>EHN-C31</th>
<th>EHN-C36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. discharge capacity</td>
<td>mL/min</td>
<td>38</td>
<td>65</td>
<td>100</td>
<td>230</td>
<td>80</td>
<td>130</td>
<td>270</td>
<td>450</td>
</tr>
<tr>
<td>Max. discharge capacity</td>
<td>mL/shot</td>
<td>0.05 - 0.11</td>
<td>0.09 - 0.18</td>
<td>0.14 - 0.28</td>
<td>0.32 - 0.64</td>
<td>0.09 - 0.22</td>
<td>0.14 - 0.36</td>
<td>0.30 - 0.75</td>
<td>0.50 - 1.25</td>
</tr>
<tr>
<td>Max. discharge pressure</td>
<td>MPa</td>
<td>1.0</td>
<td>0.70</td>
<td>0.40</td>
<td>0.20</td>
<td>1.0</td>
<td>0.70</td>
<td>0.35</td>
<td>0.20</td>
</tr>
<tr>
<td>Stroke rate</td>
<td>spm</td>
<td>1 - 360</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stroke length</td>
<td></td>
<td>50 - 100% (0.5 - 1.0mm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connection (Hose dia.)</td>
<td>mm</td>
<td>Ø4xØ9, Ø4xØ6</td>
<td>Ø8xØ13, Ø9xØ12</td>
<td>Ø4xØ9, Ø4xØ6</td>
<td>Ø8xØ13, Ø9xØ12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power voltage</td>
<td></td>
<td>AC100 - 240V 50/60Hz single phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air vent valve</td>
<td></td>
<td>Provided</td>
<td>Provided/Not Provided</td>
<td>Provided</td>
<td>Provided/Not Provided</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accessory</td>
<td>Check valve</td>
<td>CAN-1</td>
<td>CAN-2-L</td>
<td>CAN-1</td>
<td>CAN-2-L</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• The maximum discharge capacity of each model represents the figure when the pump is pumping clean water at maximum discharge pressure, rated voltage, ambient temperature, and 360 spm with stroke length 100%. If the discharge pressure is at or below the required MPa, install a check valve or back pressure valve.

Operating condition: Liquid temperature range is 0 to 60 ºC (0 to 40 ºC for VC/VH)
Ambient temperature range is 0 to 40 ºC

<table>
<thead>
<tr>
<th>Specifications of controller</th>
<th>Model</th>
<th>YN**(*1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational/control function</td>
<td>Manual, EXT (DIV/MULT/ANA), STOP, FCM, Priming</td>
<td></td>
</tr>
<tr>
<td>Operation</td>
<td>1 - 360spm</td>
<td></td>
</tr>
<tr>
<td>Alarm setting</td>
<td>PA time OFF 1 - 60 min, AL time OFF 1 - 60 min, RE time OFF 1 - 60 min, 1 - 60 sec</td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td>After PA time (during 360spm operation)/ After AL time (during operation stop)/ After PA time (through AL time and operation stop)/ At each pump shot</td>
<td></td>
</tr>
<tr>
<td>Input</td>
<td>Pulse (FCM flow checker), Open collector</td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td>Pulse (MULTI/DIV), No voltage contact, Open collector</td>
<td></td>
</tr>
<tr>
<td>Keypad lock</td>
<td>Available</td>
<td></td>
</tr>
<tr>
<td>Power voltage</td>
<td>AC100 - 240V 50/60Hz single phase</td>
<td></td>
</tr>
</tbody>
</table>

Note: The FCM flow checker is available with B11/16/21 and C16/21 types.