Features
1. The valve enables easy 2-speed control and shockless control.
2. A digital setting device is used for 2-speed and shockless control allowing excellent repeatability.
3. The digital setting device is detachable, making it possible to adjust the setting while observing the actuator closely.
4. The throttle can be selected from among the meter-in throttle, meter-out throttle, and meter-in/meter-out throttle.
5. The mounting dimensions have interchangeability with conventional size 025 and size 03 solenoid-operated directional valves.

Application examples
1. 2-speed and shockless control for a transfer unit
2. Shockless control in reversing the direction of operation of a cylinder
3. Shockless control for a single-acting cylinder
4. Remote / proportional control

Cautions on use
1. Do not directly spray organic solvent (ether solution, thinner, etc.) onto the amplifier or the setting device of the valve. When coating the valve with paint, be sure to mask these parts.
2. The applicable fluid is equivalent to hydraulic oil ISO VG32 to VG56. The permissible dynamic viscosity is 15 to 300 mm²/s.
3. Since internal control circuits may be damaged if power cables are connected incorrectly, check that the power cable connections are correct before turning on the power.
4. When using the valve as a current-controlled valve without mounting the setting device, avoid simultaneous input of the SOLa and SOLb signals. If either of the solenoids is to be turned ON immediately after turning OFF the other signal, allow an interval of at least 0.1 seconds between turning OFF and turning ON. When the setting device is mounted, smooth shockless control is possible without providing an interval between these events.
5. The amplifier is able to operate correctly under the voltage range indicated below. Confirm that the valve is connected to the correct power supply before turning on the power.

Cautions on wiring
1. The power cable must be larger than 0.75 mm².
2. The tightening torque of the screws on the terminal block should be 0.8 N·m or less. Screws on terminals where cables are not connected must also be tightened to prevent them falling.
3. Since internal control circuits may be damaged if power cables are connected incorrectly, check that the power cable connections are correct before turning on the power.
4. +PT terminal
   The +PT terminal is the voltage output terminal for an external setting device. Therefore, do not apply voltage to this terminal.
5. Terminal INa/INb
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### Description of the model designation

EHD3A-D-F30-BCA-025A-S1D

- **Current-controlled type directional and flow control valve**
- **Max. operating pressure**: 3: 25 MPa
- **Valve with amplifier**
- **Drive method**: D: Direct spool drive
- **Throttle method**: V: Meter-in/meter-out (NOTE 1)
- **F: Meter-out**
- **Y: Meter-in**
- **Control flow**: 30: 30 L/min
- **60: 60 L/min**
- **Spool type**: 025A: Size 025
- **Nominal size**: 03A: Size 03

**NOTE**: The opening area of meter-in/meter-out throttle is “P → A, P → B → R, B → A”, to give priority to the meter-in throttle.

### General specifications

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>Size 025</th>
<th>Size 03</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Operating pressure MPa</td>
<td>25</td>
<td>25</td>
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<tr>
<td>Flow adjustment range L/min</td>
<td>0.5 to 30</td>
<td>1 to 60</td>
</tr>
<tr>
<td>Permissible back pressure MPa</td>
<td>7</td>
<td>16</td>
</tr>
<tr>
<td>Amplifier</td>
<td></td>
<td></td>
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<tr>
<td>Power supply (for control)</td>
<td>Voltage V</td>
<td>DC24 (DC21 to 28)</td>
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<tr>
<td>Current A</td>
<td>1.3 (at DC24 V)</td>
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</tr>
<tr>
<td>Analog input (without setting device)</td>
<td>Voltage V</td>
<td>DC0 to 5</td>
</tr>
<tr>
<td>Input resistance kΩ</td>
<td>10</td>
<td></td>
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<tr>
<td>Power supply for external setting unit</td>
<td>Voltage V</td>
<td>DC5.6</td>
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<tr>
<td>Load current mA</td>
<td>15</td>
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<td>Setting device</td>
<td>Flow setting resolution (F1, F2)</td>
<td>1/100</td>
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<tr>
<td>Switching time adjustment range (t1 to t3) sec.</td>
<td>0 to 10 (NOTE 1)</td>
<td></td>
</tr>
<tr>
<td>Switching time adjustment resolution sec.</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>Switching time control mode</td>
<td>Time constant control, Constant slope control (selectable) (NOTE 2)</td>
<td></td>
</tr>
<tr>
<td>Switching signal</td>
<td>ON voltage V</td>
<td>DC12 to 32</td>
</tr>
<tr>
<td>OFF voltage V</td>
<td>DC0 to 8</td>
<td></td>
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<tr>
<td>Current mA</td>
<td>10/1 contact point</td>
<td></td>
</tr>
<tr>
<td>Analog input (analog input type)</td>
<td>Voltage V</td>
<td>DC0 to 5</td>
</tr>
<tr>
<td>Input resistance kΩ</td>
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<td>Cable length m</td>
<td>0.3, 1</td>
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<tr>
<td>Operating temperature range °C</td>
<td>0 to 60</td>
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<tr>
<td>Accessories (4 bolts)</td>
<td>JIS B 1176M5×45</td>
<td>JIS B 1176M8×60</td>
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<tr>
<td>Mass kg</td>
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<td>6.5</td>
</tr>
<tr>
<td>Solenoid model</td>
<td>LHS–M46T0</td>
<td>SDM3–03–D</td>
</tr>
</tbody>
</table>

**NOTE 1**: In acceleration slope constant control, the time to be set corresponds to 100% output.

**NOTE 2**: Acceleration time constant control and acceleration slope constant control are performed in the manner shown below.

### Environmental resistance specifications

- **Noise resistance**: 1000 Vp-p (pulse width: 1 μs)
- **Withstanding voltage**: AC1500 V, 1 min. (across input terminal and valve body)
- **Insulation resistance**: DC500 V, 10 MΩ or larger (across input terminal and valve body)
- **Protection** IP55
- **Vibration Resistance**
  - Constant vibration: Amplitude 4 mm, Frequency 30 Hz 69 m/s² (7G) JIS C0911
  - Sweep: Amplitude 1.5 mm, Frequency 10 to 55 Hz/Min 89 m/s² (9G) JIS C0911
- **Shock resistance**: 147m/s² (15G) 11 ms
■ Performance curve

Current - Flow characteristics

![Performance curve graph]

■ Outside dimensions

**EHD3A-D-***-025A-S**

![Outside dimensions diagram 1]

**EHD3A-D-***-03A-S**

![Outside dimensions diagram 2]
Control with digital setting device
1. The digital setting device is classified into two types according to the type of input, namely the contact input type and the analog input type.
2. Set values can be altered during operation.
3. The setting resolution is 1/100, facilitating fine adjustments.

Setting examples
Contact Input type
1. Acceleration time constant control and acceleration slope constant control can be selected.
2. Since SOLa and SOLb can be controlled independently using contact commands, cylinder operation can be set independently for advance and retraction (upward and downward movements). Flow for high-speed operation and low-speed operation, and acceleration / deceleration / halt time can be set.
3. Shockless positioning control is possible using contact commands of the programmable controller and relays.

Flow pattern

Wiring diagram

Operation procedure
(For details, refer to the Instruction Manual.)
1. Select the control mode with the time control mode selection switch
2. Select SOLa or SOLb with the solenoid selection switch
3. Select the parameter with the parameter key
4. Set the value with the UP and DOWN keys.
Analog Input Type
1. Acceleration slope constant control is possible.
2. Flow can be controlled in proportion to analog voltage with acceleration/deceleration.
3. Multi-step control is possible using a joy stick or external trimmers.

Flow pattern

Wiring diagram

Control without digital setting device
Control in various patterns is possible in the same manner as for the EHD 3 type current-controlled type directional / flow control valve by inputting a command voltage from an external device such as a computer, joy stick or program setting device.

Wiring diagram
The figure below shows the cable connection for controlling the operation with a command voltage.