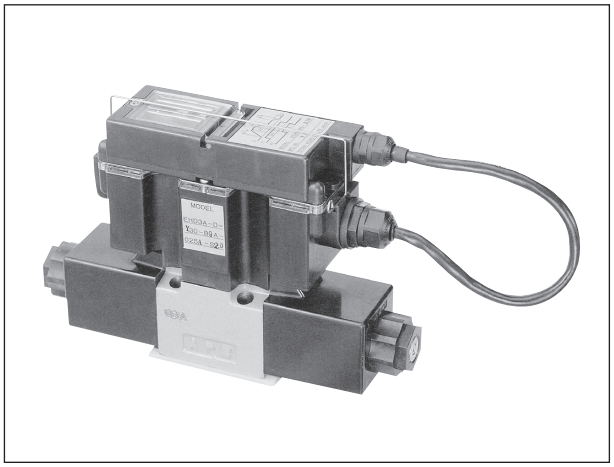


■Features

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

⚠ Caution

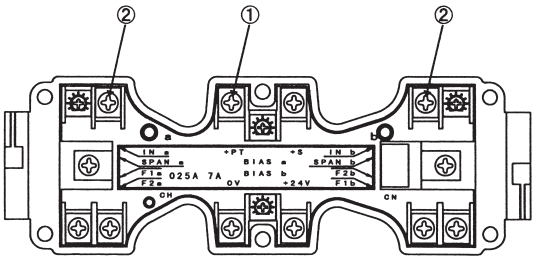
● Since the valve incorporates precision electronic parts, pay attention to the following points when handing the valve.

1. Do not stand on the valve.
2. Do not drop or apply shock to the valve or setting device.
3. Do not lift up the valve by the cable of the setting device.
4. Be sure to tighten the screws of the lid of the amplifier and the setting device.

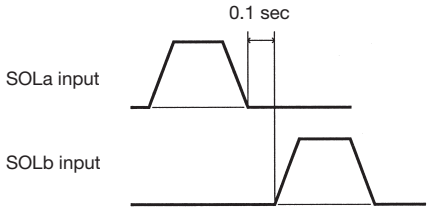
1. Do not directly spray organic solvent (ether solution, thinner, etc.) onto the amplifier or the setting device of the valve. When coating the valve with paint, be sure to mask these parts.
2. The applicable fluid is equivalent to hydraulic oil ISO VG32 to VG56. The permissible dynamic viscosity is 15 to 300 ㎟/s.
3. To achieve stable characteristics, keep the solenoid immersed in the oil. For this purpose, sink the R port pipe into the fluid completely or install the check valve at the R port to prevent entry of air into the R port.

■Cautions on wiring

1. The power cable must be larger than 0.75 ㎟.
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. ① +PT terminal
   The +PT terminal is the voltage output terminal for an external setting device. Therefore, do not apply voltage to this terminal.
   ② Terminal INa/INb
   When the valve is used with the setting device mounted, the output of the setting device is connected to terminals INa and INb. Therefore, do not apply voltage to these terminals.



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 valve is designed to have adequate environmental resistance against vibration, electric noise, water, etc. However, it is advisable to consult us if the valve is installed in especially harsh conditions such as in a vehicle.

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.

Voltage: DC21 to 28 V
Current: 1.3 A or larger

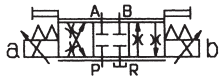
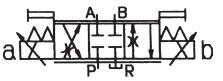
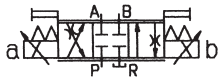
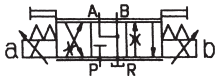
6. Do not leave metallic objects in the amplifier.

■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
- Nominal size 025A: Size 025
  03A: Size 03
- Type D: Contact input type A: Analog input type
- Cable length 1: 0.3 m 2: 1 m
- Setting device No code: Without setting device S: With setting device

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

V**-BCA	Y**-BCA
	
F**-BCA	Y**-BGA
	

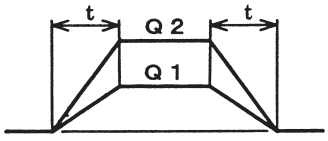
■General specifications

Nominal size				Size 025	Size 03
Max. Operating pressure			MPa	25	
Flow adjustment range			L/min	0.5 to 30	1 to 60
Permissible back pressure			MPa	7	16
Amplifier	Power supply (for control)	Voltage	V	DC24 (DC21 to 28)	
		Current	A	1.3 (at DC24 V)	
	Analog input (without setting device)	Voltage	V	DC0 to 5	
		Input resistance	kΩ	10	
	Power supply for external setting unit	Voltage	V	DC5.6	
		Load current	mA	15	
Setting device	Flow setting resolution (F1, F2)			1/100	
	Switching time adjustment range (t1 to t3)		sec.	0 to 10 (NOTE 1)	
	Switching time adjustment resolution		sec.	0.05	
	Switching time control mode			Time constant control, Constant slope control (selectable) (NOTE 2)	
	Switching signal	ON voltage	V	DC12 to 32	
		OFF voltage	V	DC0 to 8	
		Current	mA	10/1 contact point	
		Input interface		Bi-directional photocoupler, sink/source common use	
	Analog input (analog input type)	Voltage	V	DC0 to 5	
		Input resistance	kΩ	20	
	Cable length		m	0.3, 1	
Operating temperature range			℃	0 to 60	
Accessories (4 bolts)				JIS B 1176M5×45	JIS B 1176M8×60
Mass			kg	2.7	6.5
Solenoid model				LHS-M46T0	SDM3-03-D

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

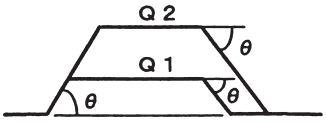
NOTE 2: Acceleration time constant control and acceleration slope constant control are performed in the manner shown below.

Acceleration time constant control



Acceleration time t does not change even when flow Q is changed.

Acceleration slope constant control



Acceleration slope θ does not change even when flow Q is changed.

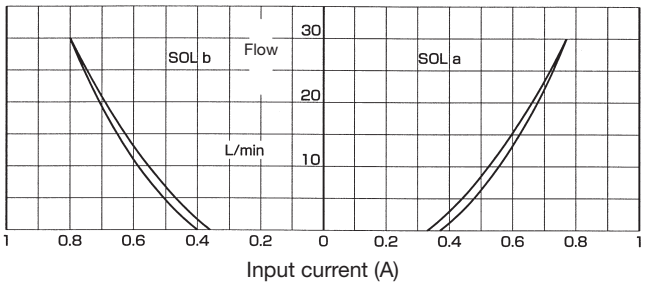
■Environmental resistance specifications

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

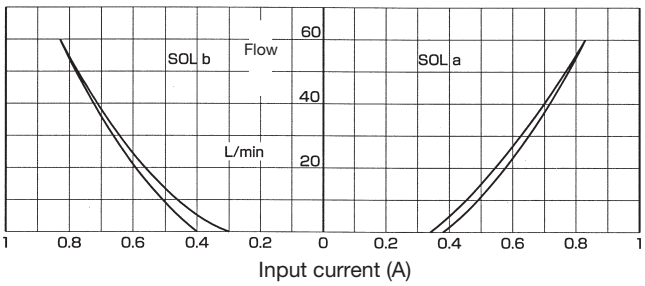
■Performance curve

Current - Flow characteristics

Size 025

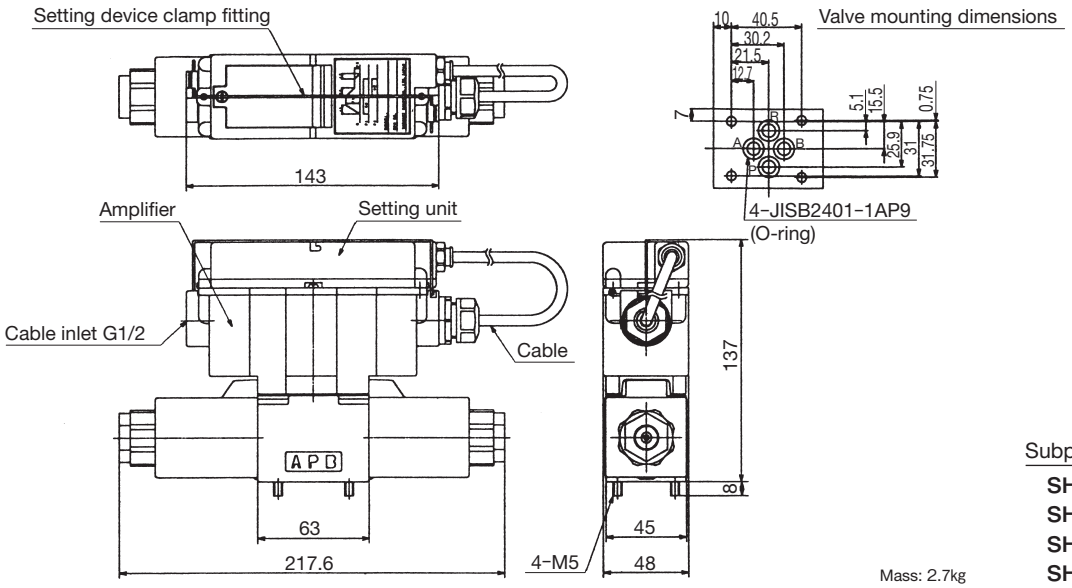


Size 03



■Outside dimensions

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

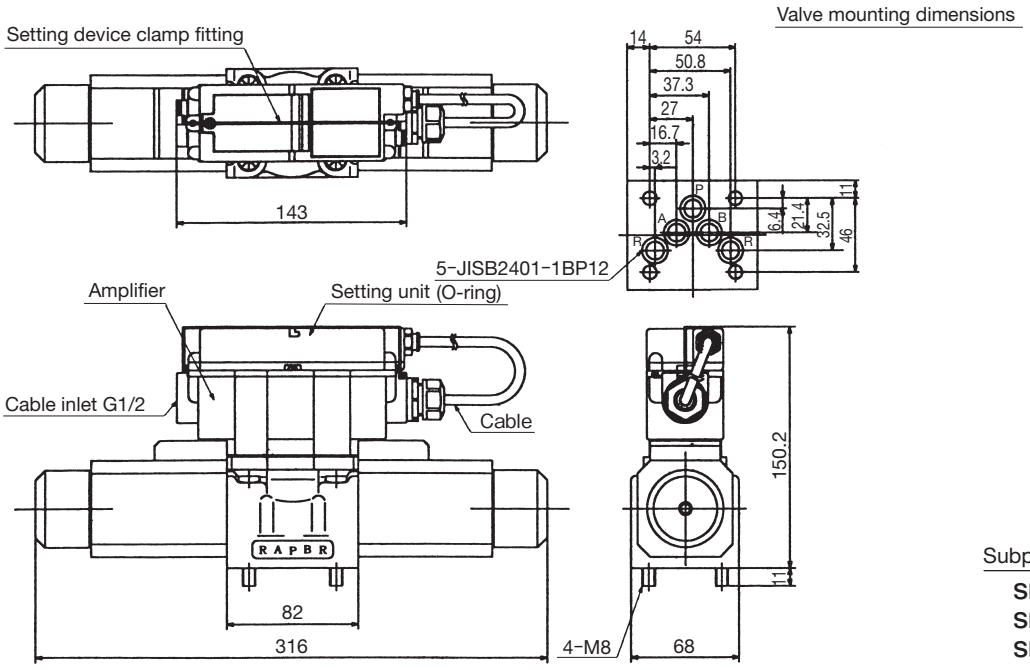


Mass: 2.7kg

Subplates to be used

SHD025-02T1A
SHD025-03T1A
SHD025-02T3A
SHD025-03T3A

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



Mass: 6.5kg

Subplates to be used

SHD03-04T1A
SHD03-06T1A
SHD03-04T3
SHD03-06T3

■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.

Parameter indicator

Indicates successive parameter names in the order F1 → F2 → t1 → t2 → t3 when the parameter key is pressed repeatedly.

Parameter key

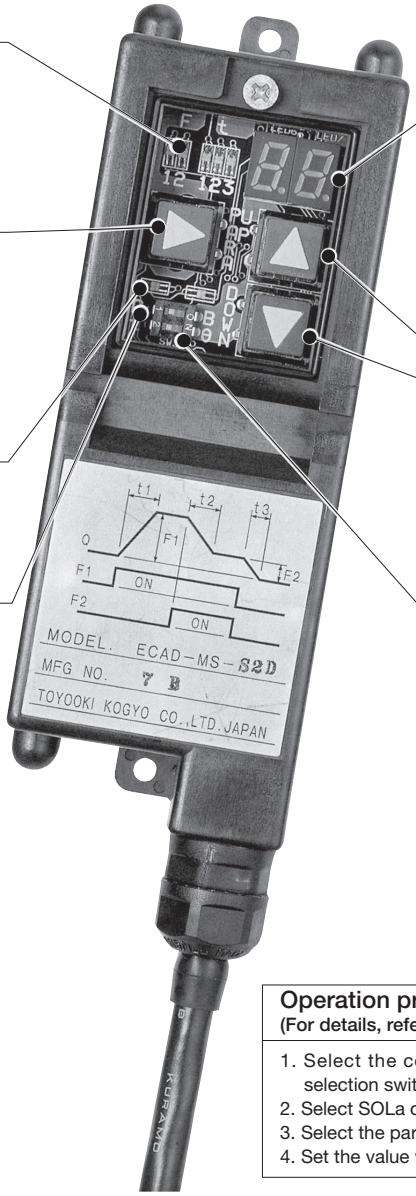
Once this key has been pressed the mode changes to the program mode. After that, pressing the parameter key selects the parameter in the order F1 → F2 → t1 → t2 → t3. The mode changes to the operation mode automatically if the key is not operated.

Solenoid selection indicator

Indicates the selected solenoid when inputting a parameter.

Solenoid selection switch

Allows selection of SOLa and SOLb when inputting a parameter.



Set value indicator

Displays the set value in the program mode and the active solenoid in the run mode. When the UP and DOWN keys are pressed simultaneously, this unit displays the output data.

Up / Down keys

Increases / decreases the parameter setting value in the program mode.

Time control mode selection switch

Allows the selection of the time constant control mode or the slope constant control mode.

Operation procedure

(For details, refer to the Instruction Manual.)

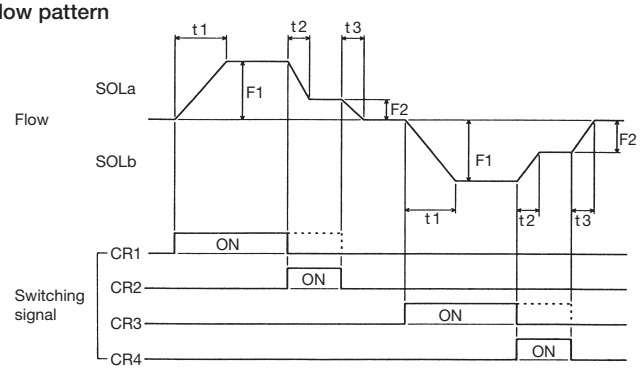
1. Select the control mode with the time control mode selection switch
2. Select SOLa or SOLb with the solenoid selection switch
3. Select the parameter with the parameter key
4. Set the value with the UP and DOWN keys.

■Setting examples

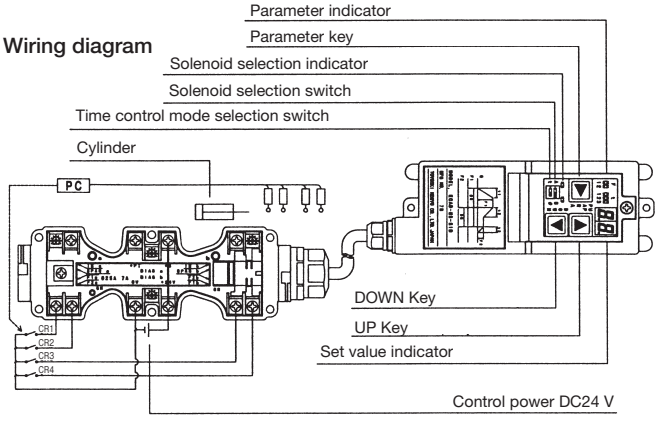
Contact Input type

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

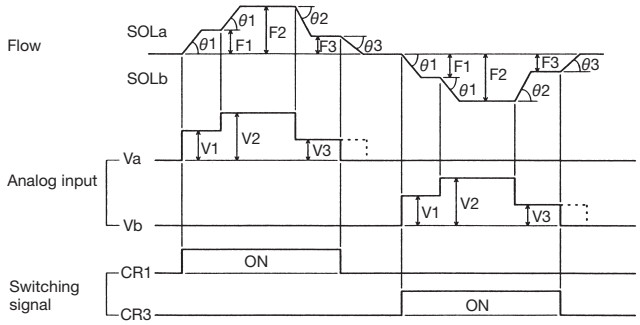


Wiring diagram

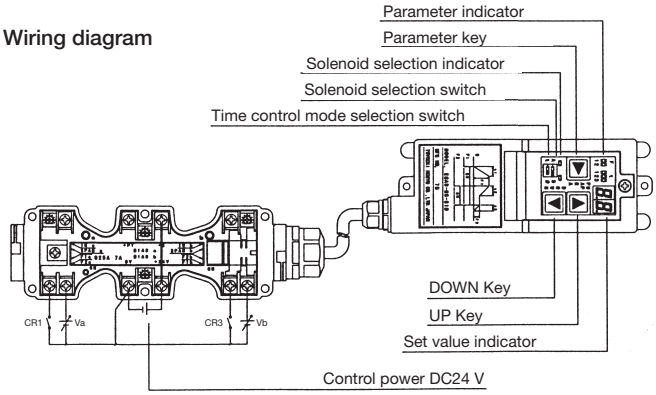


Analog Input Type
1. Acceleration slope constant control is possible.
2. Flow can be controlled in proportion to analog voltage with acceleration/ deceleration.
3. Multi-step control is possible using a joy stick or external trimmers.

Flow pattern



Wiring diagram

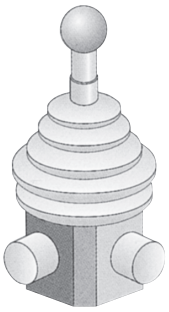


■Control without digital setting device

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.

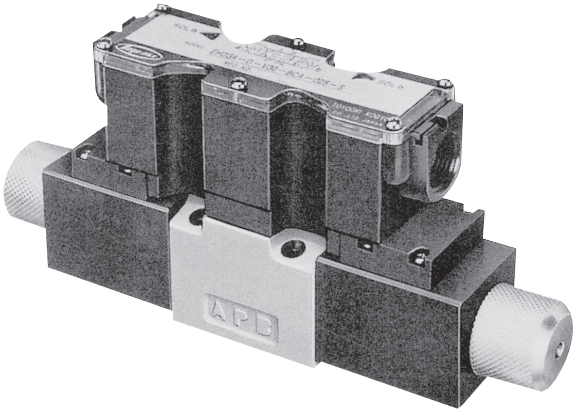
Computer

Joy stick



Program setting device

Command voltage



■Wiring diagram

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