

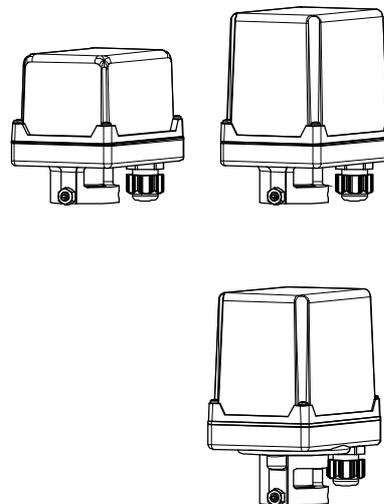


Please read this document before using these valves.

GENERAL

Compact and light weight economical actuator.

- AM1 : For AC power
- AM2 : For AC power
- AH1 : For AC power (High-speed)
- DM2 : For DC power
- DM0 : For DC power



PRODUCT CODE

AM type	A M 1 -	<input type="checkbox"/>	-	<input type="checkbox"/>	-	<input type="checkbox"/>
	A M 2 -	<input type="checkbox"/>	-	<input type="checkbox"/>	-	<input type="checkbox"/>
AH type	A H 1 -	<input type="checkbox"/>	-	<input type="checkbox"/>	-	<input type="checkbox"/>
DM type	D M 2 -	<input type="checkbox"/>	-	0	-	<input type="checkbox"/>
	D M 0 -	<input type="checkbox"/>	-	0	-	<input type="checkbox"/>
	(1)	(2)	(3)	(4)		
(1) Actuator	(2) Torque	(3) Voltage	(4) Option			
AM1 AM2	030	1 : 100 / 110 V AC	AK : Aluminum alloy motor cover			
AH1	070	2 : 200 / 220 V AC	M1 : Manual lever (for AH1, DM)			
DM2 DM0	180	0 : 24 V DC	C1 : Flexible cable			

ELECTRIC ACTUATOR SPECIFICATIONS

3 way valve: SHUT / Position①, OPEN / Position②

AM1 AM2 type

Actuator type (□:Voltage code)	AM1-030-□	AM1-070-□	AM1-180-□	AM2-030-□	AM2-070-□	AM2-180-□
Voltage	100 / 110 V AC ±10 % 50/60 Hz (Voltage code: 1) 200 / 220 V AC ±10 % 50/60 Hz (Voltage code: 2)					
Rated torque [N·m]	3	7	18	3	7	18
Operation time [s]	5.4 / 4.5 (50/60 Hz)	15.5 / 13 (50/60 Hz)	16 / 13.5 (50/60 Hz)	5.4 / 4.5 (50/60 Hz)	15.5 / 13 (50/60 Hz)	16 / 13.5 (50/60 Hz)
Power consumption [VA]	16		19	18		19
Motor	Synchronous motor					
Overload protection	Thermal protector					
Method of operation	Transfer input type			a-contactinput type, with built-in relay		
Operation	Power to S → SHUT (SHUT PL is lit.) Power to O → OPEN (OPEN PL is lit.)			SW is OFF → SHUT (SHUT signal is output.) SW is ON → OPEN (OPEN signal is output.)		
Input signal current	Nil			9 mA (O-terminal) Leakage current in SW: less than 1 mA		
Output signal rating	Resistance load 3 A 250 V AC (Minimum 0.1 A)			Resistance load 0.5 A 125 V AC 2 A 30 V DC Micro load 1 mA 5 V DC		
Duty cycle	20 % 15 min.					
Ambient temperature	-20 to 55 °C					
Space heater	1 W					
Manual operation	Direct operation of actuator by loosening lock screw					
Enclosure	Equivalent to IP65 (IEC 60529)					
Housing material	Aluminum alloy die cast + Polycarbonate resin cover					
Terminal block	For bare wire 0.14 to 1.5 mm ² (AWG 26 to 14) Ground terminal: M4					
Conduct port	G3/8 Cable gland (for Φ5 to 10.5 mm cable)					

WIRING

AM1

- Control switch should be prepared one by one for actuator. Do not operate two or more actuator from one switch. It might malfunction.

AM2

- Two or more actuators can be operated with one control switch.
- When using control switch with current leakage (more than 1 mA) such as TRIAC or relay with CR, it can cause malfunction.

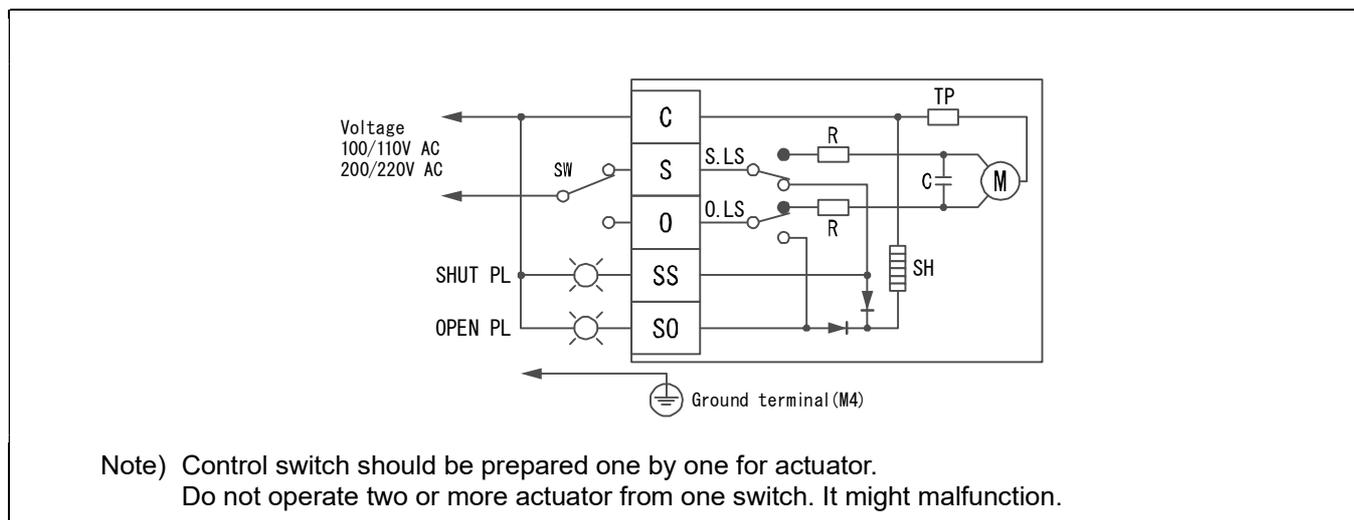
ELECTRIC ACTUATOR SPECIFICATIONS

3 way valve: SHUT / Position①, OPEN / Position②

AH1 type

Actuator type (□:Voltage code)	AH1-030-□	AH1-070-□	AH1-180-□
Voltage	100 / 110 V AC ±10 % 50/60 Hz (Code: 1) 200 / 220 V AC ±10 % 50/60 Hz (Code: 2)		
Rated torque [N·m]	3	7	18
Operation time [s]	3 / 2.5 (50/60 Hz)		6 / 5 (50/60 Hz)
Power consumption [VA]	19	50	
Motor	Synchronous motor	Reversible motor	
Overload protection	Thermal protector		
Method of operation	Transfer input type		
Operation	Power to S → SHUT (SHUT PL is lit.) Power to O → OPEN (OPEN PL is lit.)		
Output signal rating	Resistance load 3 A 250 V AC (Minimum 0.1 A)		
Duty cycle	20 % 15 min.		
Ambient temperature	-20 to 55 °C		
Space heater	0.5 W	1 W	
Manual operation	Direct operation of output shaft		
Enclosure	Equivalent to IP65 (IEC 60529)		
Housing material	Aluminum alloy die cast + Polycarbonate resin cover		
Terminal block	For bare wire 0.14 to 1.5 mm ² (AWG 26 to 14) Ground terminal: M4		
Conduct port	G3/8 Cable gland (for Φ5 to 10.5 mm cable)		

WIRING



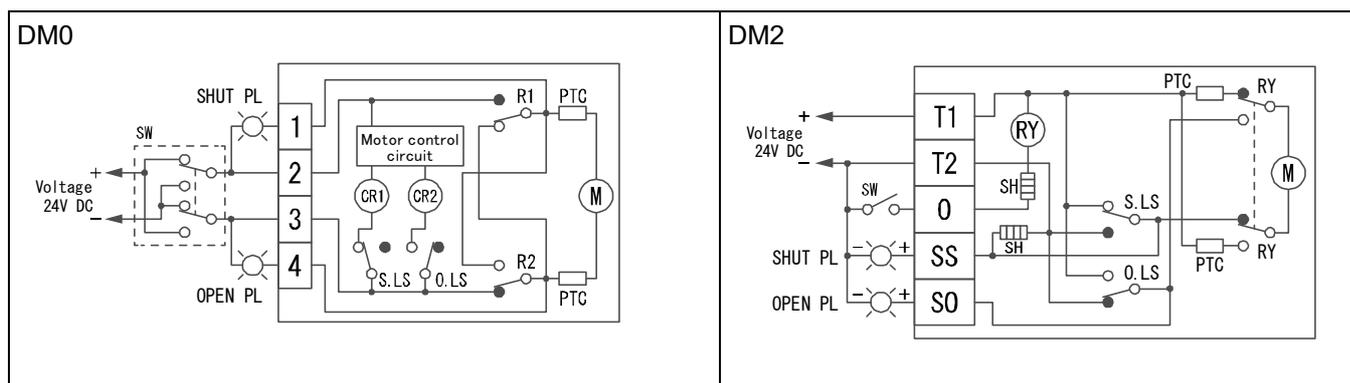
ELECTRIC ACTUATOR SPECIFICATIONS

3 way valve: SHUT / Position①, OPEN / Position②

DM0 DM2 type

Actuator type	DM0-030-0	DM0-070-0	DM0-180-0	DM2-030-0	DM2-070-0	DM2-180-0
Voltage	24 V DC					
Rated torque [N·m]	3	7	18	3	7	18
Operation time [s]	0.8 to 1.5	2 to 3	4 to 6	2 to 3.5	2 to 3	4 to 6
Power consumption (Max) [VA]	24			10	24	
Motor	DC motor					
Overload protection	Thermistor					
Method of operation	Switching polarity type			a-contact input type, with built-in relay		
Operation	② + ③ - → SHUT (SHUT PL is lit.) ③ + ② - → OPEN (OPEN PL is lit.)			SW is OFF → SHUT (SHUT PL is lit.) SW is ON → OPEN (OPEN PL is lit.)		
Input signal current	Nil			16.2 mA (O-terminal)		
Output signal rating	Resistance load 2 A 30 V DC Micro load 1 mA 5 V DC			Resistance load : Less than 1 A 24 V DC		
Duty cycle	20 % 15 min.					
Ambient temperature	-20 to 55 °C					
Space heater	1 W					
Manual operation	Direct operation of output shaft					
Enclosure	Equivalent to IP65 (IEC 60529)					
Housing material	Aluminum alloy die cast + Polycarbonate resin cover					
Terminal block	For bare wire 0.14 to 1.5 mm ² (AWG 26 to 16)					
Conduct port	G3/8 Cable gland (for Φ5 to 10.5 mm cable)					

WIRING



ELECTRIC ACTUATOR SPECIFICATIONS

3 way valve: SHUT / Position①, OPEN / Position②

OPTIONAL PARTS

Specifications	Code No.	AM	AH1	DM	Remarks
Aluminum alloy motor cover	AK	○	○	○	
Manual lever	M1		○	○	Detachable lever
Flexible cable (Approx. 300 mm long)	C1	○	○	○	

DIMENSIONS

AM (030 / 070) DM2 (030)

DM0 (030) DM (070) AH1 (030 / 070)

AM (180) DM (180) AH1 (180)

Parts name

1 Body	4 Control board	7 Drive gear
2 Motor cover	5 Terminal block	8 Drive shaft
3 Motor	6 Limit switch	9 Rubber packing

INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS**HANDLING & STORAGE****①HANDLING**

Proper care in handling the actuator should be taken to prevent damage. Do not drop or throw it.

②STORAGE

Store the actuator in the protected area from dust, moisture, and direct sunlight. If possible, actuator should be kept in the original packaging.

③CHECKING

Check the product code, power supply, and voltage before installation.

INSTALLATION**①ENVIRONMENT**

- Do not install in place where corrosive gas is present or where vibration is heavy (0.5 G or more).
- When radiant heat causes the surface temperature of the control unit to exceed 55 °C, provide an appropriate shielding plate.
- If there is a possibility that the fluid and drive part freeze, please take measures to prevent freezing.

②POSITIONING

Should be positioned through 90° upward from horizontal. Provide space around the product to allow manual operation, inspection and replacement work.

Maintenance space for upper part of actuator

AM (030 / 070)	DM2 (030)	More than 65 mm
AM (180) AH1	DM2 (070 / 180) DM0	More than 90 mm

③OTHER NOTES

Until the wiring is completed there must be no condensation or flooding in the interior of the actuator, after piping. Protective caps on the cable gland are not waterproof.

WIRING

- Do not wiring outdoors on a rainy day.
- Check the power supply and voltage.
Connect the signal as shown in the wiring diagram.
- Do not connect unnecessarily terminal.
- Use suitable flexible cable (Φ5 to 10.5 mm).
Lock and seal the cable completely to prevent condensation inside the actuator.
- Built-in terminal block can clamp up to 1.5 mm in diameter without using solderless terminal.
- Allow proper cable slack for maintenance.
- Actuator should be electrically grounded.
Use the terminal marked (≡) inside the actuator.

PREVENT DEW CONDENSATION

- When installing the cover after wiring, perform the bolt by the temporary tightening procedure and the permanent tightening procedure to tightly and securely tighten the rubber packing so that water does not enter from the outside.
- Tighten the cable gland nut so that there is no leakage from the wire entrance.

CONTROL**①AM1, AH1**

Control switch should be prepared one by one for actuator. Do not operate two or more actuator from one switch. It might malfunction.

②AM2

- Two or more actuators can be operated with one control switch.
- When using control switch with current leakage (more than 1 mA) such as TRIAC or relay with CR, it can cause malfunction.
- When wiring is long distance or handling a weak current signal, it may be affected by induced voltage or noise. In this case, please use countermeasures such as using a shielded wire, separating it from other power cables.

③DC POWER SUPPLY

- It is usable with a battery and full-wave rectification circuit.
- Consider an inrush current of motor.
(It is 1.5 to 3 times of consumed current.)
- They may cause malfunction with decreasing voltage by the long wiring.
- Do not use power supply that require more than 1 second with rise and fall time.

④USE OF OPEN/SHUT SIGNALS

Use signals within the capacity of output signal rating.

INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS**OPERATION****① TESTING**

- Make sure that power supply voltage is correct. Also check operating position, wiring, speed and signals.
- During trial operation, check that valve movement and output signal are correct.

② DUTY CYCLE

Confirm that the operation frequency is within the specified duty cycle.

Use beyond the load time rate range will affect product life. Also, it may cause burnout.

Duty cycle is a value that regulates the opening / closing frequency of the actuator. The meaning of 20 % 15 minutes for Duty cycle is that 3 minutes (20 % of 15 minutes) operation is possible. The calculated value obtained by dividing 3 minutes by the operation time is the number of times of operation within 15 minutes.

③ ATTENTION

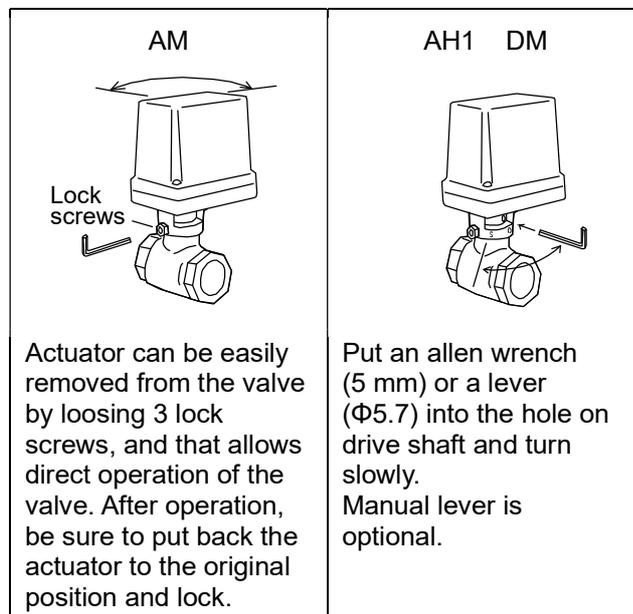
- Keep power supplied for built-in space heater to prevent condensation inside actuator.
- Do not touch the moving parts of actuator in operation.
- Do not insert a reverse signal during operation. It may shorten the life of product.
- Never put anything on the actuator or make it into a foothold.

MANUAL OPERATION**① PRECAUTIONS**

- Manual operation should be a temporary operation.
- Be sure to turn off the power before manual operation.

② NOTE

For manual operation, do not give more than the rated torque and make at a slow rate. Actuator might be damaged if excessive force is added.

**MAINTENANCE**

- To prevent electric shock, be sure to turn off the power when removing the actuator cover.
- Do the routine maintenance at least once in half a year.

Inspection items

- Confirm operation of opening and closing.
- Confirm that an actuator is not hot excessively.
- Confirm existence of abnormal noise and vibration during operation.
- Confirm whether screws are loose or not.
- Confirm that water or condensation no remains in the actuator.

INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS**TROUBLE SHOOTING**

Problem	Cause	Solution
Actuator does not move.	Faulty wiring.	Correct the wiring.
	No voltage is coming.	Check the voltage.
	Incorrect voltage.	When it's burned out by excess voltage, replace the actuator.
	Short the circuit, contact failure.	Review wires and connection.
	Motor is too old.	Replace the actuator.
Operation is unstable.	Excess surge or voltage was applied.	Replace the actuator.
	Rainwater entered the actuator.	
	Switch leakage current is large. (AM2)	Current leakage should be less than 1 mA.
Stop in the mid position.	Continuous irregular stop will shorten the motor life and wear the gear. Turn off the power and check. (AM1 AM2 AH1-030)	
	Overload protector runs because of over-torque.	Turn off the power for about 3 minutes to remove a heat from motor protection circuit.

For more information contact
NIPPON VALVE CONTROLS, INC. for consultation.