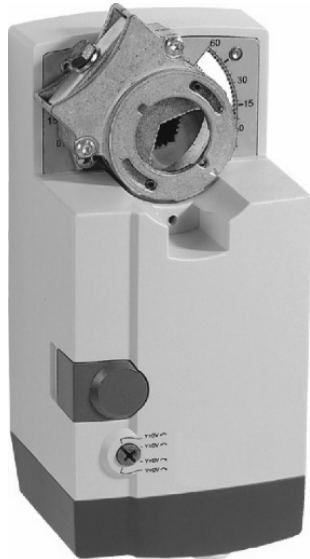


Honeywell

N20, N34 Series MN7220, MN7234

NON-SPRING RETURN DAMPER ACTUATOR 20/34 NM (175/300 LB-IN) FOR MODULATING AND FLOATING CONTROL

PRODUCT DATA



GENERAL

These direct-coupled damper actuators provide modulating control for:

- rotary valves,
- linear valves with appropriate linkage,
- air damper applications.

FEATURES

- **Self-centering shaft adapter**
- **Access cover to simplify wiring**
- **Declutch for manual adjustment**
- **Mechanical stroke limits (MN7220 only)**
- **Internal auxiliary switches (MN7220 only)**
- **Rotation direction selectable by switch**
- **Mountable in any orientation (no IP54 if upside down)**
- **Mechanical position indicator**

SPECIFICATIONS

Supply voltage:	24 Vac \pm 20%, 50/60 Hz; 24 Vdc -10...+20%
Nominal voltage:	24 Vac, 50/60 Hz; 24 Vdc
All values stated hereinafter apply to operation under nominal voltage conditions.	
Power consumption	
MN7220	6 VA / 6 W
MN7234	8 VA / 6 W
Ambient limits	
Ambient operating limits	-5...+140 °F (-20...+60 °C)
Ambient storage limits	-40...+175 °F (-40...+80 °C)
Relative humidity	5–95%, non-condensing
Safety	
Protection standard	IP54 (non-USA models) NEMA2 (USA models)
Protection class	II as per EN 60730-1
Overvoltage category	II
Lifetime	
Full strokes	60000
Repositions	1.5 million
Mounting	
Round damper shaft	3/8...1-1/16" (10...27 mm)
Square damper shaft	3/8...11/16" (10...18 mm); 45° steps
Shaft length	min. 7/8" (22 mm)
Control signal	
Input impedance	0(2)...10 Vdc 0(4)...20 mA 100 k Ω [0...10 V] 500 Ω m [0...20 mA]
Feedback signal	
Limits	\pm 1 mA at 0...10 V
Auxiliary switch (when included)	
Rating	5 A (resistive) / 3 A (inductive)
Triggering points	5° / 85°
Torque rating	
MN7220	175 lb-in (20 Nm)
MN7234	300 lb-in (34 Nm)
Runtime	95 sec (60 Hz) / 110 sec (50 Hz)
Rotation stroke	95° \pm 3°
Dimensions	See "Dimensions" on page 7
Weight	3 lbs. (1.35 kg)
Noise rating (driving)	40 dB(A) max. at 1 m



63-2587-03

ACCESSORIES

- 27518 Balljoint (5/16 in.)
- 103598 Balljoint (1/4 in.)
- 205649 Anti-Rotation Bracket (supplied with actuator)
- 205860 Electronic Minimum Position Potentiometer
- 27520A-E,G,H-L,Q Pushrod (5/16 in. diameter)
- 32000085-001 Water-tight Cable Gland/Strain-relief Fitting (10 pack)
- 32003036-001 Weather Enclosure
- 172092060 Self-Centering Shaft Adapter for N34 (supplied with actuator)
- 172092062 Self-Centering Shaft Adapter for N20 (supplied with actuator)
- 50001194-001 Foot Mount Kit
- SW2-US Auxiliary Switch Package

MODELS

M – Electrical motor
N – Fail Safe Function (Non-Spring Return)
72 – 24V Modulating control
20 – 20 Nm (175 lb-in)
34 – 34 Nm (300 lb-in)
A – Standard Model
1 – No Feedback
2 – Voltage Feedback Signal
0 – No Internal Auxiliary Switches
2 – Two Internal Auxiliary Switches
XX – System Controlled Numbers

M	N	72	20	A	2	0	XX
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Fig. 1. Product Identification System.

OPERATION/FUNCTIONS

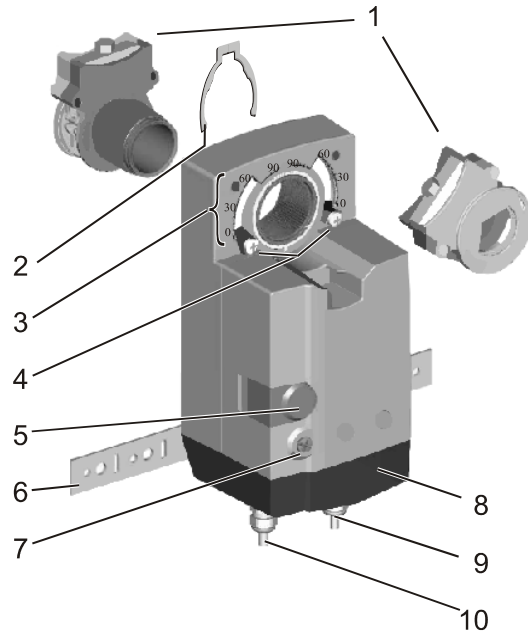


Fig. 2. Setting units and control elements.

Legend for Fig. 2 Setting units and control elements:

1. Self-centering shaft adapter
2. Retainer clip
3. Rotational angle scales (0...90° / 90...0°)
4. Mechanical stroke limits (20 Nm [175 lb-in] models, only)
5. Declutch button
6. Anti-rotation bracket
7. Rotation direction switch
8. Access cover
9. Internal auxiliary switch wire
10. Power and control wire

Contents of Package

The delivery package includes the actuator itself, parts 1 through 10 (see Fig. 2; in the case of U.S. models – e.g. MN7220 – parts 1 through 8), the anti-rotation bracket screws, and the SM mounting plate and screws.

Modulating Control

The actuator is capable of being operated by several controllers providing Vdc or mA output.

Rotary Movement

The control signal and the corresponding rotation direction (clockwise or counterclockwise) can be selected using the rotation direction switch (see part Rotation direction switch in Fig. 2), thus eliminating the need to re-wire. To ensure tight closing of the dampers, the actuator has a total rotation stroke of 95°.

As soon as operating power is applied, the actuator may start to run. When power is removed, the actuator remains in position. For actuator-controller wiring instructions, see section “Wiring” on page 5.

Rotation Direction Switch

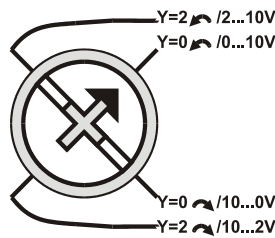


Fig. 3. Rotation Direction Switch.

Table 1. Feedback/control signal values.

Rotation direction switch position	Feedback/control signal when actuator is	
	totally ↺	totally ↻
2 ↻/2...10V	2 Vdc	10 Vdc
0 ↻/0...10V*	0 Vdc	10 Vdc
0 ↺/10...0V	10 Vdc	0 Vdc
2 ↺/10...2V	10 Vdc	2 Vdc

* Default shipping position.

Feedback Signal and Manual Adjustment

If, while the actuator is not rotating, the user declutches it and manually repositions the shaft adapter, the feedback signal will then follow the new position at which the shaft adapter has been left.

Power Off/On Behavior

In case the power to the actuator fails, after re-applying power, the actuator acknowledges its present position and follows the signal from the controller.

Dip Switches

The actuators are equipped with two dip switches accessible after removing the access cover (see Fig. 4). Dip switches 1 and 2 will be in the off position from the factory.

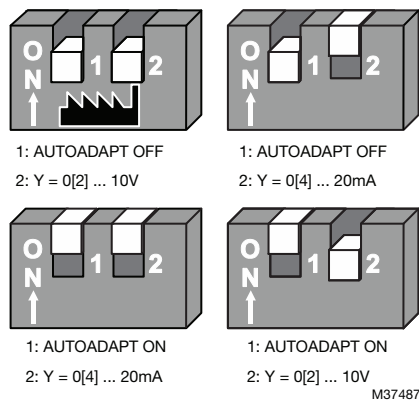


Fig. 4. Dip switches.

Autoadapt Dip Switch for Normal Operation

In its default shipping position, the autoadapt dip switch for normal operation is set to **OFF** as shown in Fig. 4; in this case, no autoadapting is performed, and the control signal map remains constant.

If the autoadapt switch is set to ON, the SmartAct actuator will automatically trigger the autoadapt functionality when the min. and max. control signals are provided (see Fig. 5); the feedback signal is likewise autoadapted.

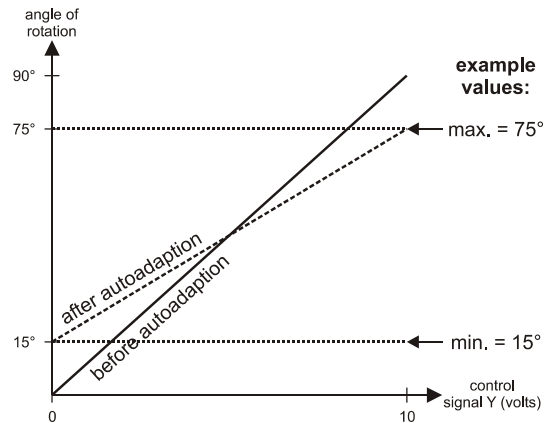


Fig. 5. Actuator positioning curve.

Adjusting the Actuator for Autoadapt

In order to make use of the autoadapt functionality, proceed as follows:

1. If the autoadapt dip switch is not already set to the ON position (default), set it to ON position.
2. If necessary, limit the stroke to the desired range using the mechanical end limits.
3. Drive the actuator to the left end limit (totally CCW) by setting the control signal as specified in Table 1.
4. Drive the actuator to the right end limit (totally CW) by setting the control signal as specified in Table 1. The stroke has now been limited to 0...100% of the control signal range.

Voltage/Current Control Signal Selection Dip Switch

When dip switch 2 is in its default shipping position, the voltage/current control is set to OFF (0[2]...10Vdc) as shown in Fig. 4. Setting it to ON results in current control (0[4]...20mA). Feedback signal remains as Vdc irrespective of dip switch position.

Position Indication

The hub adapter indicates the rotation angle position by means of the rotational angle scales (0...90° / 90...0°).

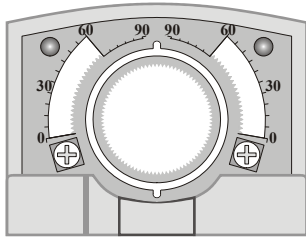


Fig. 6. Position indication.

Manual Adjustment

IMPORTANT

In order to prevent equipment damage, you must remove power before manual adjustment.

After removing power, the gear train can be disengaged using the declutch button, permitting the actuator shaft to be manually rotated to any position. The feedback signal will then follow the new position.

Limitation of Rotation Stroke

Two mechanical end limits (adjustable in 3° increments) are provided (20 Nm [175 lb-in] models, only) to limit the angle of rotation as desired (see Fig. 7).

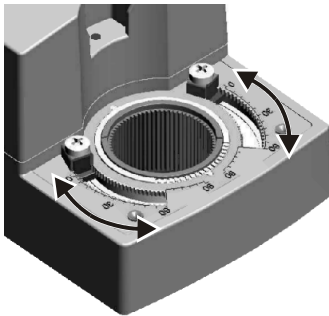


Fig. 7. Mechanical end limits.

The mechanical end limits must be securely fastened in place as shown in Fig. 8. Specifically, it is important that they properly mesh with the rotational angle scales when the screws are tightened.

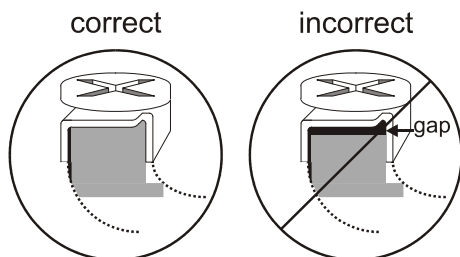


Fig. 8. Correct/incorrect tightening of end limits.

Internal Auxiliary Switches

The internal auxiliary switches are set to switch at angles of 5° and 85°, respectively, from the totally counterclockwise position.

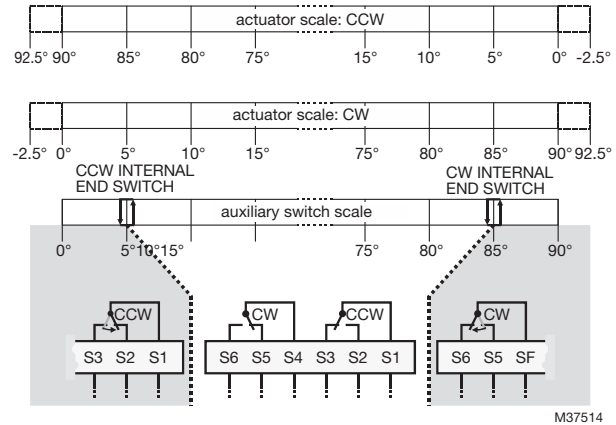


Fig. 9. Internal auxiliary switches.

Override

If terminal 3Y of the terminal strip (see section “Wiring” on page 5) is unplugged, the stroke will be 0%; reversing the rotation direction using the rotation direction switch will result in a max. stroke of 100%. If terminal 3Y is jumped with terminal 1 (24 V), the stroke will be 50%.

INSTALLATION

These actuators are designed for single-point mounting.

IMPORTANT

In order to prevent equipment damage, you must remove power or set the rotation direction switch to the “Service/Off” position before manual operation.

Mounting Instructions

All information and steps are included in the Installation Instructions supplied with the actuator.

Mounting Position

The actuators can be mounted in any desired orientation (no NEMA2 or IP54 if mounted upside down; see Fig. 10). Choose an orientation permitting easy access to the actuator's cables and controls.

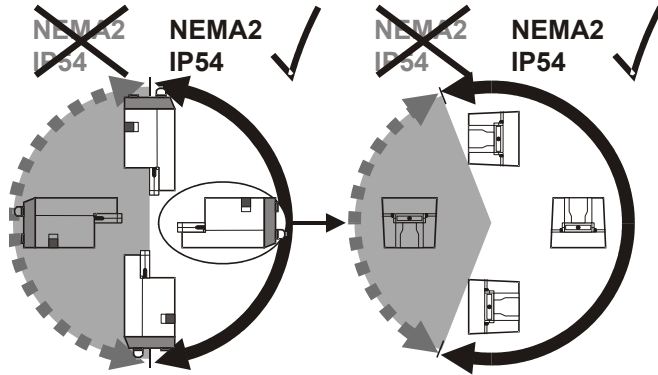


Fig. 10. Mounting for IP54/NEMA2.

Mounting Bracket and Screws

If the actuator is to be mounted directly on a damper shaft, use the mounting bracket and screws included in the delivery package.

Self-Centering Shaft Adapter

The self-centering shaft adapter can be used for shafts having various diameters (3/8...1-1/16" [10...27 mm]) and shapes (square or round).

In the case of short shafts, the shaft adapter may be reversed and mounted on the duct side.

Stroke Limitation with Mechanical Stroke Limits

The mechanical stroke limits (20 Nm [175 lb-in] models, only) enable the stroke to be limited from 0...90° in increments of 3°.

Wiring

Access cover

To facilitate wiring the actuator to the controller, the access cover can be detached from the actuator.

IMPORTANT

Remove power before detaching the access cover. Once the access cover has been removed, please take care to avoid damaging any of the parts now accessible.

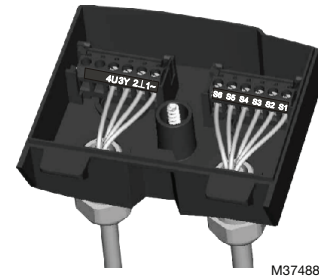


Fig. 11. Access cover.

Depending upon the model, the access cover will have one or two terminal strips, including a layout with a description for each of the terminals.

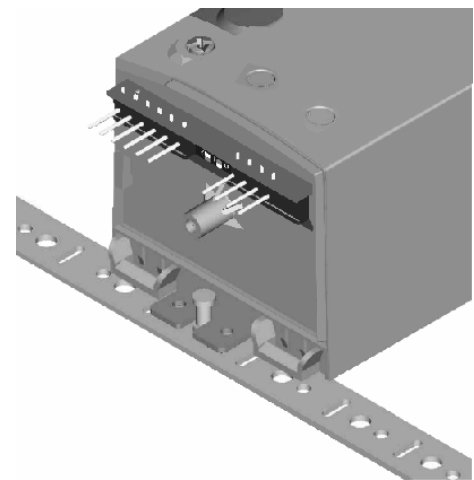
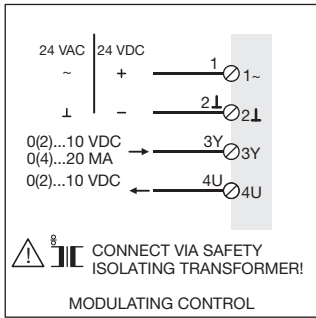
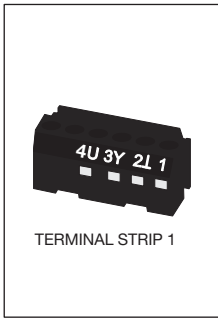


Fig. 12. Actuator with access cover removed.

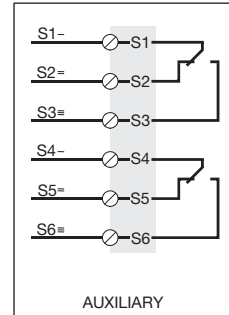
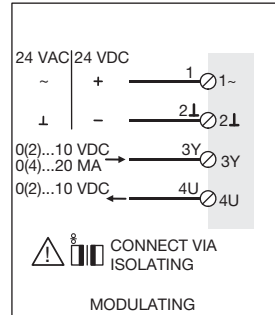
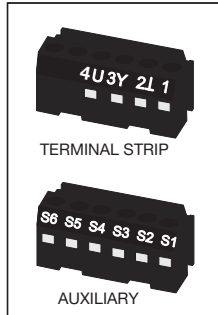
Wiring Diagrams

MN7220/MN7234



M37489

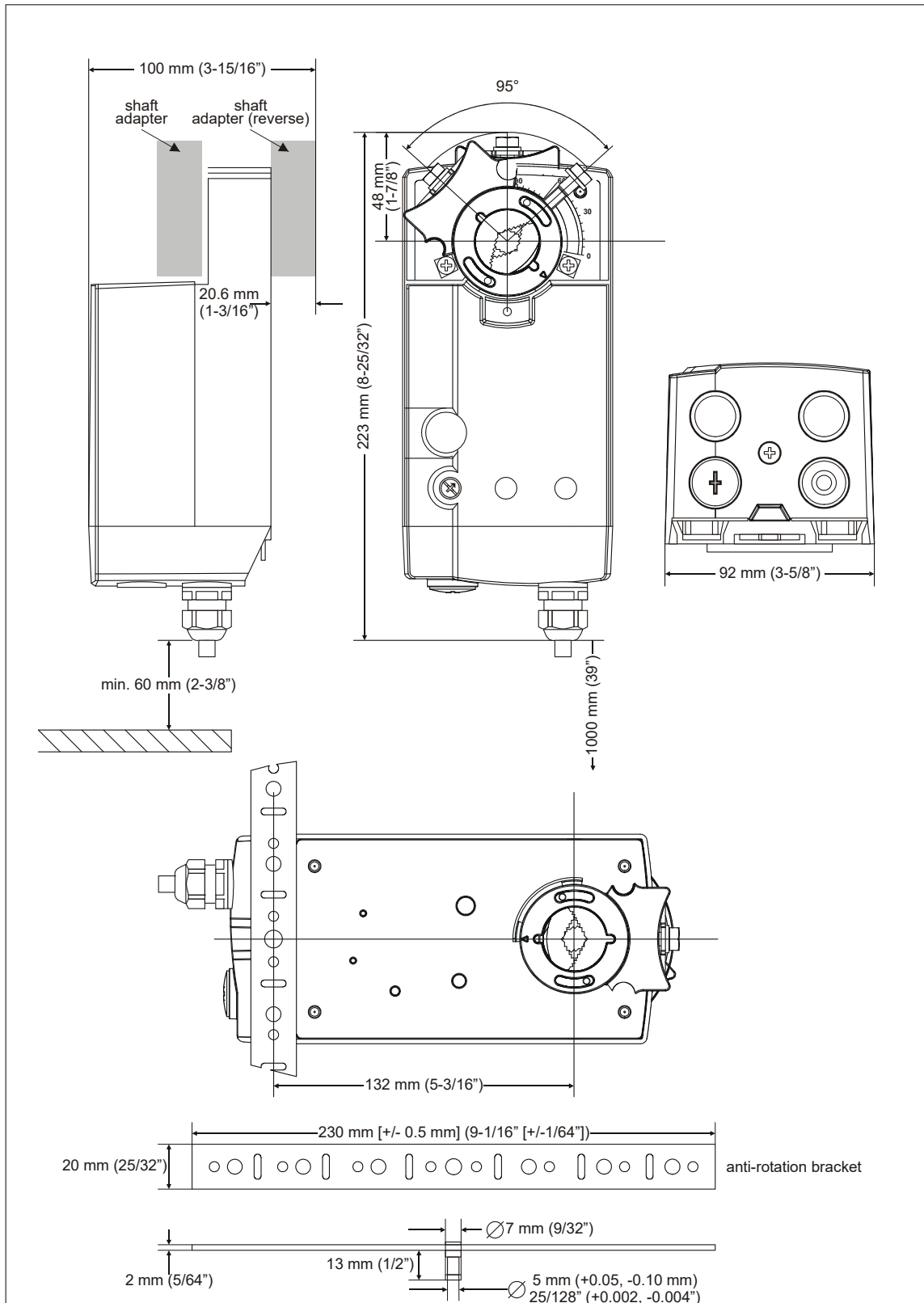
MN7220 WITH SWITCHES



NOTE: INTERNAL AUXILIARY SWITCHES S1 AND S4 MUST BE CONNECTED TO THE SAME POWER SOURCE.
M37490

connecting cable	terminal	name	
supply and signal lines	1~	24 Vac~ / 24 Vdc+	
	2⊥	24 Vac⊥ / 24 Vdc-	
	3Y	0(2)...10 Vdc / 0(4)...20 mA control signal	
	4U	0(2)...10 V feedback signal	
auxiliary switched (when included)	CCW (left) 0-5°	S1	Common
		S2	Closed
		S3	Open
		S4	Common
		S5	Closed
		S6	Open
	5-85°	S1	Common
		S2	Open
		S3	Closed
		S4	Common
		S5	Closed
		S6	Open
	CW (right) 85-90°	S1	Common
		S2	Open
		S3	Closed
		S4	Common
		S5	Open
		S6	Closed

DIMENSIONS



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