

SERVO-TOP SERVO ACTUATOR TYPE C
(rotary type)

model

CRP

Thank you for choosing us. Before use, check specifications on the product label.
If you have any problems or questions with the product, please contact our sales office or representatives.

General Descriptions

- Lightweight, compact design
- Simple adjustments
- ISO flange standard

Installation

- Installation site must meet the following conditions:
- Indoor, or outdoor where the CRP is not exposed to direct sunlight
 - Ambient temperature: -10 to +50°C (14 to 122°F)
 - Operating humidity 30 to 85% RH (non-condensing)

Points of Caution

- DO NOT change the potentiometer position in the position sensor.

Thermal Protector

The temperature of the AC motor used in the CRP may rise abnormally when the load applied to it is very high (frequent operations with large load, ≥50% load rating). It is not a malfunction, however, the thermal protector may be activated and stops the motor when the ambient temperature is high. The CRP cannot be reactivated before 30 minutes (approx.) after that.
If this happens too often, check the input signal and consider changing conditions such like sampling time.

Lock Protection

The CRP is equipped with an overload protection circuit to stop supplying power if the valve stroke does not come into deadband range for longer than approx. 2 minutes. RUN LED flashes in 2 Hz intervals when the protection is activated.
The stop operation is reset automatically when the power is turned OFF and ON, or when the input signal is switched between 0% and 100% several times.
A foreign object caught in the valve, improper adjustments, ground screw of the valve tightened too much, etc. can be the cause of overload.

Mechanical Stoppers

The mechanical stoppers are factory adjusted to proper positions. If you want to change the positions, be sure that the mechanical stoppers are set outside of electronic limits. In order to confirm that, check that:

- 1) the stopper does not touch the "OPEN" side stopper adjuster with an input smaller than 3.8mA.
- 2) the stopper does not touch the "CLOSED" side stopper adjuster with an input larger than 20.2mA.

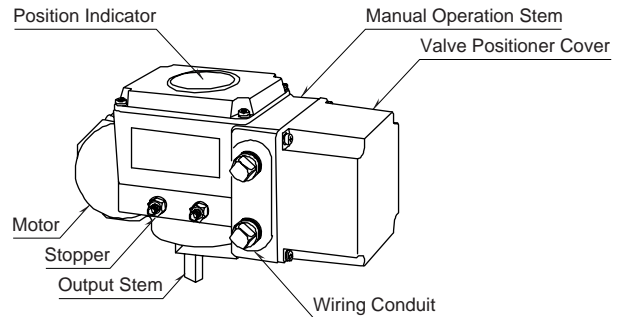
Default Setting

The CRP is factory adjusted to the following specifications, if not specified otherwise.

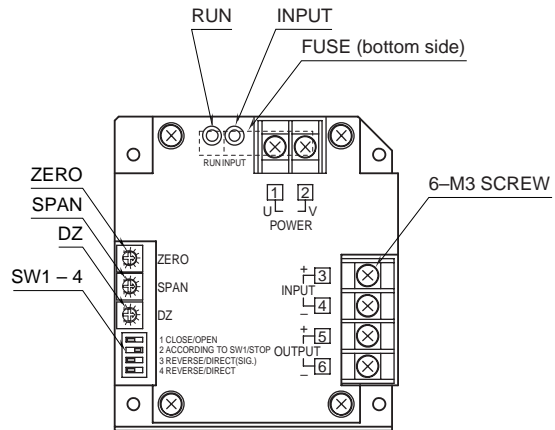
| ITEM | DESCRIPTION |
|---|-------------------------|
| Action Operation when input is lost Stem position | Reverse Stop Fully open |

Component Identification

[SERVO ACTUATOR]

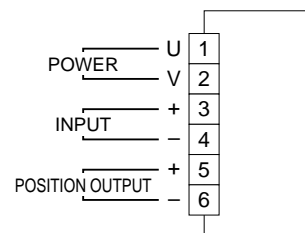


[POSITIONER UNIT MEX-KC]



- ZERO : Zero adjustment
- SPAN : Span adjustment
- DZ : Deadband adjustment
- SW1 - 4 : Mode selectors
- RUN : Run LED (flashing in 0.5 Hz with power on)
- INPUT : Input LED (green light turning on with input applied)

Connection Diagram



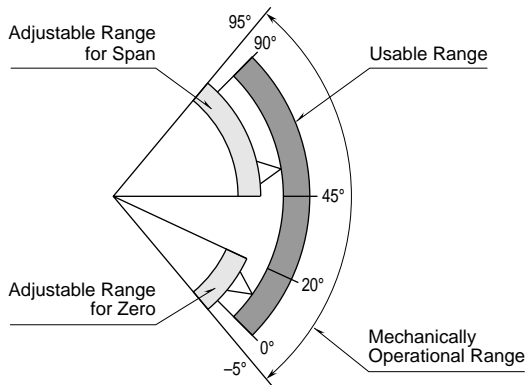
Adjustments

1) General Description

In the following explanation, the Full-Closed means that the actuator's position (opening angle) is at the Fully Clockwise, while the Full-Open means that it's at the Fully Counterclockwise.

As shown in the figure below, the zero is adjustable within approx. -5° to $+20^{\circ}$, while the span is adjustable within approx. 45° to 95° . General operating range is within 0° to 90° , however, approx. 5° of margin is provided.

After installing the valve and actuator, go to adjustment in order of zero, span and deadband or other adjustments.



2) Preparation

Locate the DIP switches at the rear side of the positioner unit and set them referring to the following table. Be sure that the power is turned off when you change the switch positions.

| ITEM | | SW1 | SW2 | SW3 | SW4 |
|----------------------------------|-------------|------|------|------|------|
| Operation when the input is lost | Full-Closed | OFF | OFF | ---- | ---- |
| | Full-Open | ON | OFF | ---- | ---- |
| | Stop | ---- | ON | ---- | ---- |
| Valve action | Direct | ---- | ---- | ON | ON |
| | Reverse | ---- | ---- | OFF | OFF |
| Position output signal | Direct | ---- | ---- | ON | ---- |
| | Reverse | ---- | ---- | OFF | ---- |
| Factory set to | | OFF | ON | OFF | OFF |

The following table shows the percentage representation for 4 – 20mA and 1 – 5V input ranges with both direct and reverse actions. In the following explanations, the input signals are referred in percentage.

| INPUT RANGE | | 4 – 20mA | | 1 – 5V | |
|----------------|------|----------|---------|--------|---------|
| OPERATION MODE | | DIRECT | REVERSE | DIRECT | REVERSE |
| Value | 0% | 20 | 4 | 5 | 1 |
| | 100% | 4 | 20 | 1 | 5 |

3) Adjustment Procedure

A) Full-Closed Position (Zero)

This is applied to the full-open position for those valves which are opened when its shaft is turned fully clockwise.

- With the valve fully-open, assemble the actuator, yoke and valve.
- Connect power supply (Terminals 1 – 2) and input (Terminals 3 – 4). Do not turn on the power yet.
- Turn the zero adjustment fully clockwise.
- Apply 0% input signal.
- Turn the power supply on.
- Turn the zero adjustment until the valve is fully closed.

B) Full-Open Position (Span)

This is applied to the full-closed position for those valves which are closed when its shaft is turned fully counterclockwise.

- Turn the span adjustment fully counterclockwise.
- Apply 100% input signal.
- Turn the span adjustment until the valve is fully closed.

Remark: The span is not adjustable when the deadband (DZ) is adjusted to fully clockwise. Check that the DZ is turned back by at least two divisions from the fully clockwise position.

C) Controllability (Deadband)

When the motor repeats small inverting movements without stopping completely for small input changes, widen the deadband by turning the adjustment clockwise.

D) Open/Close Limits

The positioner is equipped with an electrical input limiter circuit. The lower limit is set to 3.8mA, and the upper limit is set to 20.2mA for zero and span adjusted range. The limits are linked to the zero and span adjustments.

E) Position Output Signal

4 – 20mA DC is provided at the terminals 5 (+) – 6 (–). With the SW3 set to OFF, 4mA is provided at the full-closed position adjusted with ZERO, while 20mA is provided at the full-open position adjusted with SPAN. With the SW3 set to ON, the signals are inverted.

The negative terminal is internally connected with that of input signal, and is not independently isolated.

F) Manual Operation Handle

A manual operation handle is provided for adjustments and emergency operations. The valve is closed by turning it clockwise*. The CRP requires 25 turns for moving from the full-closed through full-open positions.

*For those valves which closes with the stem turning clockwise.

Lightning Protection

For eliminating inductive surges caused by lightning, lightning arresters are recommended. Consult factory or representative for the M-RESTER lightning arresters.