

**Final Control Elements**

**MINI-TOP ELECTRONIC ACTUATOR**

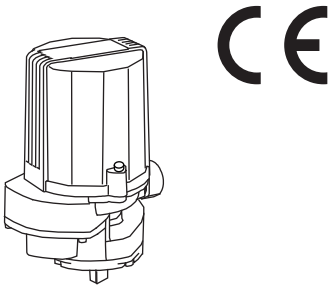
(rotary type)

**Functions & Features**

- Small-size control valve actuator
- 1/1000 high resolution
- Easy adjustment: electronic limiter at the valve open & closed positions
- Overload protection
- Various power inputs

**Typical Applications**

- Actuator for automatic control valve in pilotplants
- Air-conditioning in buildings or plants
- Micro-flow control for pharmaceutical injection
- For small-size control valves



**MODEL: MRP5-14[1][2]-[3][4][5]**

**ORDERING INFORMATION**

- Code number: MRP5-14[1][2]-[3][4][5]
- Specify a code from below for each of [1] through [5]. (e.g. MRP5-14LT-A0R)
- Special input range (for codes Z and 0)

**SPAN**

1: 45 to 90 degrees

**OPERATION TIME, TORQUE**

4: 13 seconds / 90°, 10 N·m

**[1] SEQUENTIAL CONTROL SIGNALS**

- L: Full-open/-closed signal
- F: Forced open/close signal
- B: Full-open/-closed and forced open/close signals (Select 'With Terminal Box.')
- 0: Without

**[2] TERMINAL BOX**

- T: With
- 0: Without

**[3] INPUT**

**Current**

- A: 4 - 20 mA DC (Input resistance 250 Ω)
- Z: Specify current (See INPUT SPECIFICATIONS)

**Voltage**

- 6: 1 - 5 V DC (Input resistance approx. 1 MΩ)
- 0: Specify voltage (See INPUT SPECIFICATIONS)

**[4] CE MARKING**

- C: With
- 0: Without

**[5] POWER INPUT**

**AC Power**

- K3: 100 - 120 V AC (Operational voltage range 90 - 132 V, 47 - 66 Hz) (Not selectable for CE)

**L3: 200 - 240 V AC**

- (Operational voltage range 180 - 264 V, 47 - 66 Hz) (Not selectable for CE)

**DC Power**

- R: 24 V DC (Operational voltage range 24 V ±10 %, ripple 10 %p-p max.)

**GENERAL SPECIFICATIONS**

**Degree of protection:** IP66

**Action:** Direct or reverse; field selectable with DIP switches (factory set to "reverse") (In "reverse" action, the output stem seen from the cover turns counterclockwise with an input signal increase.)

**Operation at abnormally low input:** Counterclockwise turn, clockwise turn or stop; field selectable with DIP switches (factory set to "clockwise")

Note: Counterclockwise or clockwise if seen from the cover.

**Detectable input drop level:** -16 ±2.5 %

**Electrical connection**

**•Without terminal box**

**Wiring conduit:** G 1/2 female; cable connector with 1 meter wire (0.5 mm<sup>2</sup>) provided

**•Terminal box**

**Wiring conduit:** G 1/2 female (two)

**Terminal screws:** M3 pillar terminal (Sequential control signal suffix code B)

M3 chromated steel (other terminal box types) (torque 0.5 N·m)

**Housing material:** Diecast aluminum  
**Drive:** Stepping motor  
**Insulation class:** E  
**Position detection:** Potentiometer  
**Deadband:** 0.1 – 4.5 % adjustable (factory set to 1.5 %)  
**Restarting timer:** 0 – 10 sec. adjustable (factory set to 1.5 sec.)  
**Isolation:** AC power to signal  
**Zero adjustment:** 0 – 25 %  
**Span adjustment:** 50 - 100 %  
**Protective functions:** Overload protection  
**Power indicator:** Green LED turns on with power supplied.  
**Input indicator:** Green LED turns on with normal input  
**Status indicator LED:** Red light blinks in 2 sec. intervals in normal operations; blinks in 0.5 sec. intervals when a foreign object is detected mechanically caught inside.  
**Manual operating handle:** Not available

## INPUT SPECIFICATIONS

- **DC Current:** Input resistor incorporated (250 Ω)
- **DC Voltage:** 1 – 5 V DC or specific range within 0 – 5 V DC, minimum span 1 V  
(For a current input, convert the current to a voltage with 250 Ω)
- Input resistance:** Approx. 1 MΩ
- **Forced open/close signal:**  
Dry contact inputs to command clockwise and counterclockwise turns  
**Rating:** 5 V DC @ 2.5 mA

## OUTPUT SPECIFICATIONS

- **Operation Time & Torque (at rated power voltage)**  
MRP5-14: 13 sec. / 90°; 10 N·m (7.38 ft·lbf)
- **DC Voltage:** 1 – 5 V DC (not isolated)  
With “direct” action, 5 – 1 V DC position output is provided proportionally to 4 – 20 mA DC (1 – 5 V DC) input.
- Load resistance:** ≥ 5 kΩ
- **Full-open / -closed signals:** Limit switch contact  
**Rating:** 125 V AC @ 0.75 A (cos φ = 1)  
30 V DC @ 0.6 A (resistive load)  
**Mechanical life:** 3 × 10<sup>7</sup> cycles  
**Maximum operation frequency:** 60 cycles/min.

## INSTALLATION

**Power consumption**

- **AC:** Approx. 25 VA
- **DC:** Approx. 0.6 A

**Operating temperature:** -5 to +55°C (23 to 131°F)  
**Operating humidity:** 30 to 85 %RH (non-condensing)  
**Vibration:** 0.5 G (4.9 m/s<sup>2</sup>) max.  
**Mounting position:** All directions

Do not mount the actuator with its output stem or cable connector on the upside if the actuator is to be exposed to dripping water.

### Weight

**DC powered:** 1.5 kg (3.31 lb)  
**AC powered:** 1.7 kg (3.75 lb)  
 Add 0.7 kg (1.54 lb) for the terminal box.

## PERFORMANCE

**Resolution:** 1/1000 or 0.09°, whichever is greater, with 0.1 % deadband setting

**Insulation resistance**

- **AC powered:** ≥ 100 MΩ with 500 V DC (signal or metallic housing to power) ≥ 100 MΩ with 100 V DC (signal to metallic housing)
- **DC powered:** ≥ 100 MΩ with 100 V DC (signal or power to metallic housing)

**Dielectric strength**

- **AC powered:** 1500 V AC @ 1 minute (signal or metallic housing to power) 100 V AC @ 1 minute (signal to metallic housing)
- **DC powered:** 100 V AC @ 1 minute (signal or power to metallic housing)

## STANDARDS & APPROVALS

**EU conformity:**  
 EMC Directive  
 EMI EN 61000-6-4  
 EMS EN 61000-6-2  
 Low Voltage Directive  
 EN 61010-1  
 Measurement Category II (Full-open/-closed signal)  
 Pollution Degree 2  
 Full-open/-closed signal to other, power or metallic housing: Reinforced insulation (125 V)  
 RoHS Directive  
 EN 50581

## TERMINOLOGY

- **Overload (Lock) Protection**  
 The Mini-Top Series is equipped with a protection circuit against overload caused by for example the valve catching an alien substance.  
 When an overload is detected, the Mini-Top stops supplying power to the motor and the status LED blinks in 0.5 sec. intervals.  
 The protection is reset automatically with applying opposite-direction input signal or turning the power off and restarting.

## • Restarting Timer

The Mini-Top Series is equipped with a timer circuit which gives an interval period (0 - 10 seconds) between stop-restart actions to prevent the motor and other internal components from overheating.

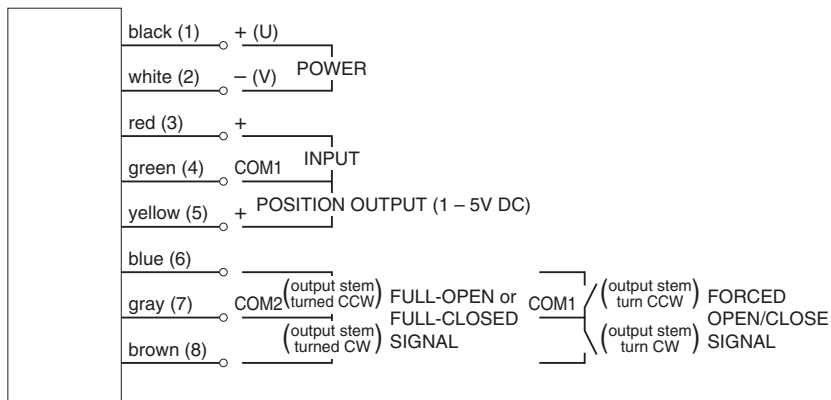
It is recommended to set a long restarting time when the ambient temperature and/or the temperature of flow material is high.

## • Electronic Limiter

This model is equipped with electronic limiters in order to prevent mechanical locks when the input goes below 0 % or above 100 %.

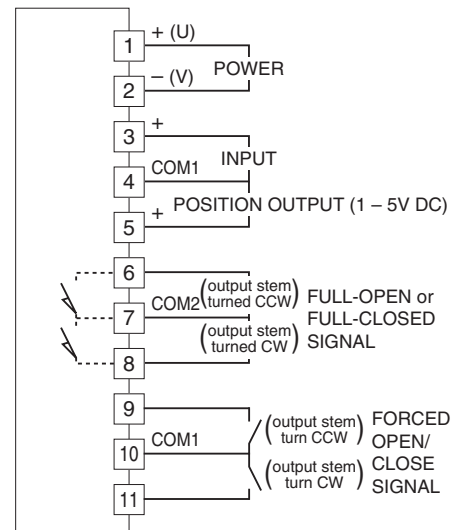
Limiters are set at approx. -0.5 % for the full-closed side, approx. 100.5 % for the full-open side.

## TERMINAL CONNECTIONS

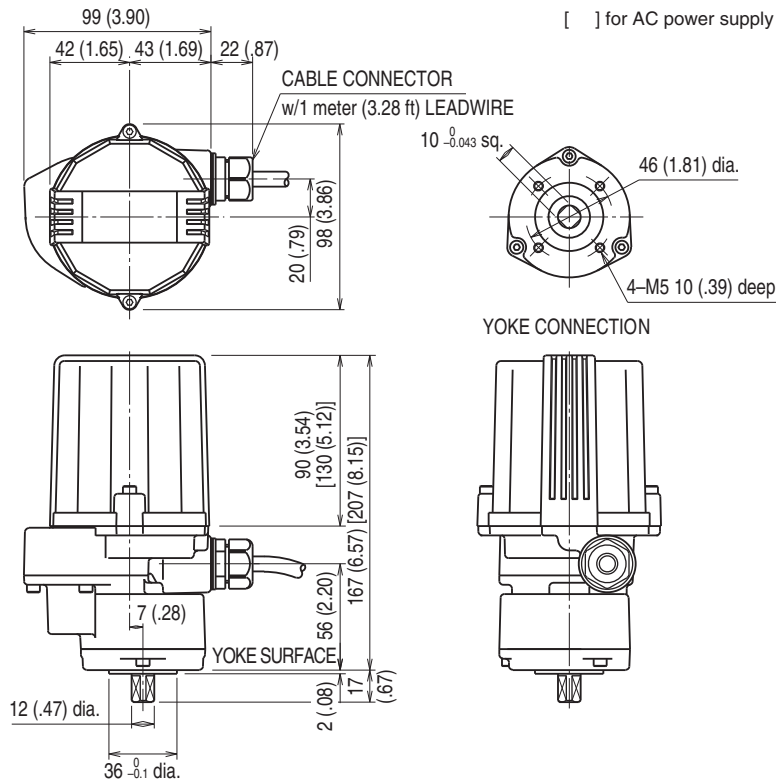


(1) to (8): Terminal No. of terminal box.  
Full-open/-closed signals and forced open/close signals are optional.

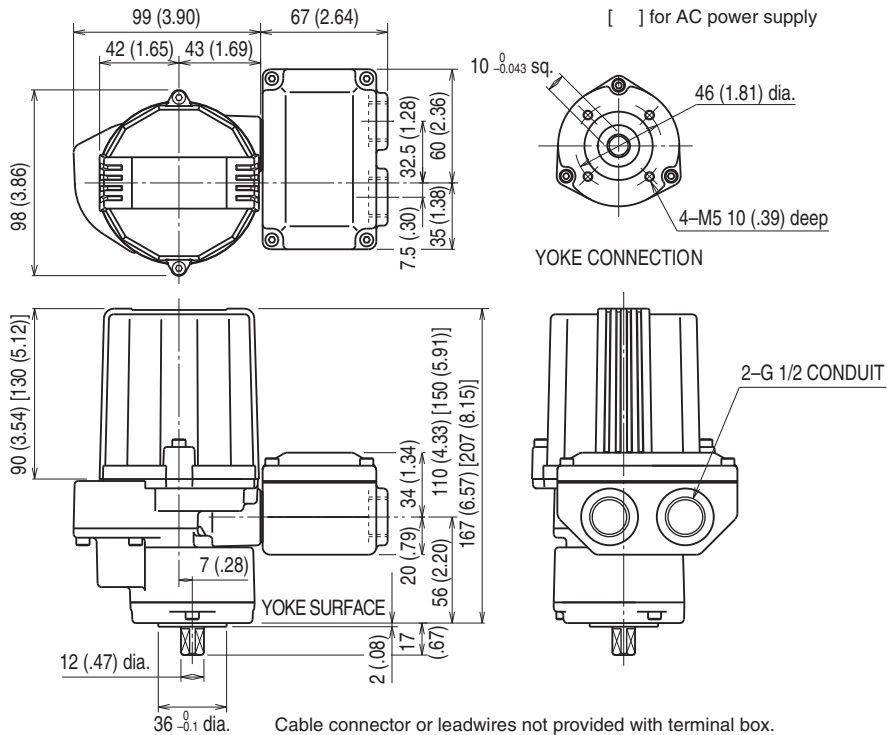
## • With Both Full-open/closed Signal and Forced Open/Close Signal



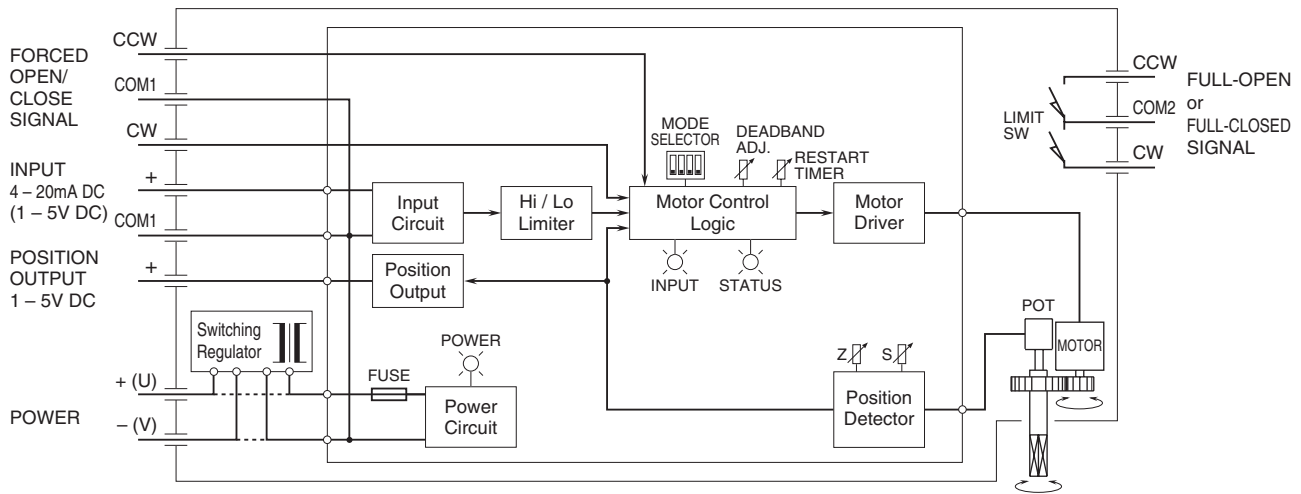
**EXTERNAL DIMENSIONS unit: mm (inch)**



■ TERMINAL BOX TYPE



## SCHEMATIC CIRCUITRY



Full-open/-closed signals and forced open/close signals are optional.  
Disregard the switching regulator circuit for DC power input.



Specifications are subject to change without notice.