

ELECTRIC ACTUATOR

“ Unic Series “

ROTARY TYPE

Unic – Z, 05

Unic – 10

Unic – 20, 40

Unic – 60, 100, 150, 200

OPERATION MANUAL

Koei Industry Co., Ltd.

FOR YOUR SAFETY

In order for better and safety use of the product for a long period, please observe this “WARNING and CAUTION “ carefully.

Here are the specification and operation manual for the product to prevent suffering injury or loss by accidents.

The contents are divided into “WARNING” and “CAUTION” for different degree of risks.

Please strictly observe them, as both of them are very important for your safety.



WARNING: Improper handling of the product disregarding the notes under this mark may cause injury or death to a man.



CAUTION: Improper handling of the product disregarding the notes under this mark may cause injury or material loss.



WARNING



- ※ This product is not of explosion-proof.
Do not use it in the environment with flammable gas (gasoline etc.) or corrosive gas.
- ※ Do not dismantle the actuator from the valve during power operation.
- ※ Do not make wiring work when power is being supplied.



CAUTION

- ※ Do not drop the product or give a shock to the product, for it may cause defects to the product.
- ※ Do not get on the actuator, or it may cause defects or an accident.
- ※ Do not make wiring work in the rain or in splashing water.

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1. GENERAL

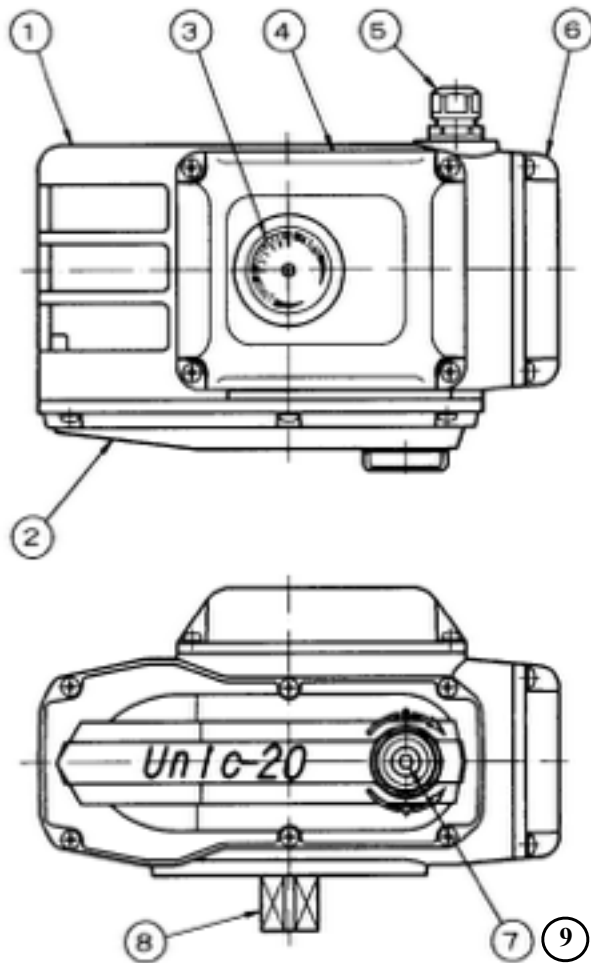
“Unic Series” is a super high quality quarter-turn rotary type electric valve actuator for on/off and intermediate position service.

FEATURES

- ◇ Compact and light
- ◇ Easy of installation and maintenance
- ◇ Simple structure with fewest trouble
- ◇ Manual operation by crank handle
- ◇ Thermal protection from motor burn-out
- ◇ Terminal block for simple wiring
- ◇ Water tightness to NEMA-4X (to IP-66)

2. CONFIGURATION

2-1 Configuration and names of parts



No Name

- 1 Body: NEMA 4X Housing
- 2 Gear Cover
- 3 Valve Position Indicator
- 4 Limit Switch / Pot Cover
- 5 Conduit
- 6 Terminal Strip Cover
- 7 Manual Over Ride Socket
- 8 Output Shaft (Male)
- 9 O/R Socket Dust Cover

FIG. 1

2-2 Unic-Z, 05 Configuration

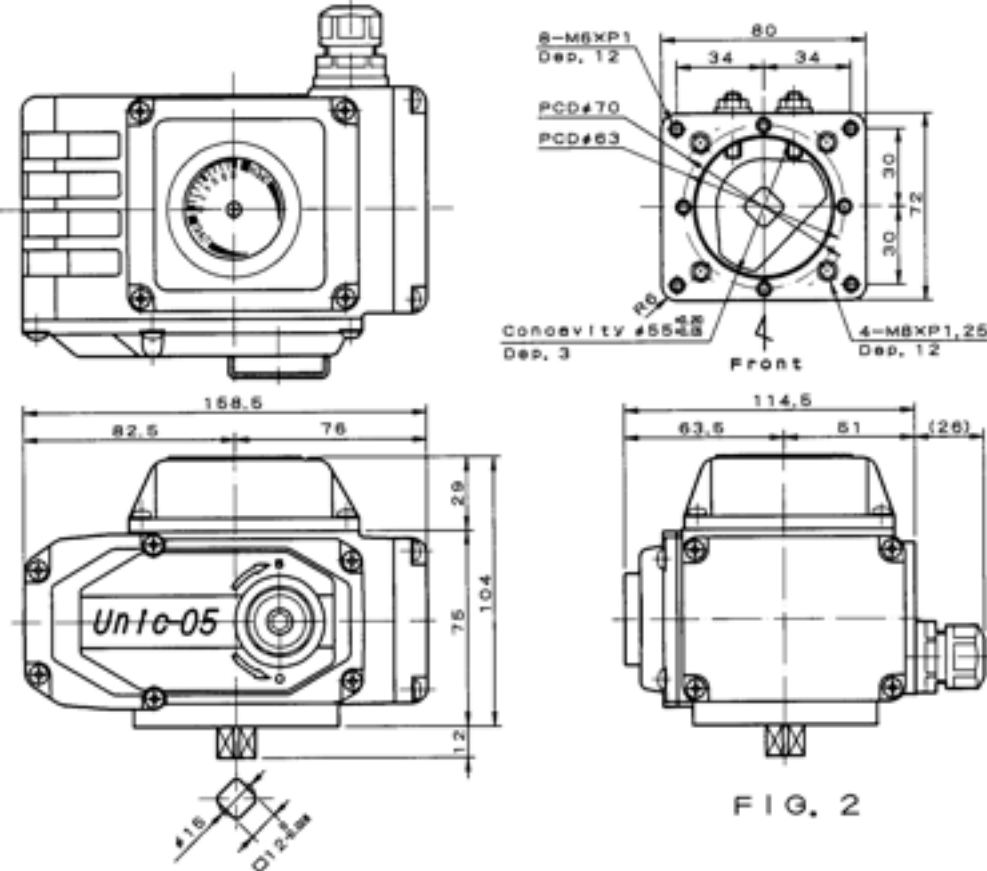


FIG. 2

2-3 Unic-10 Configuration

2-4 Unic

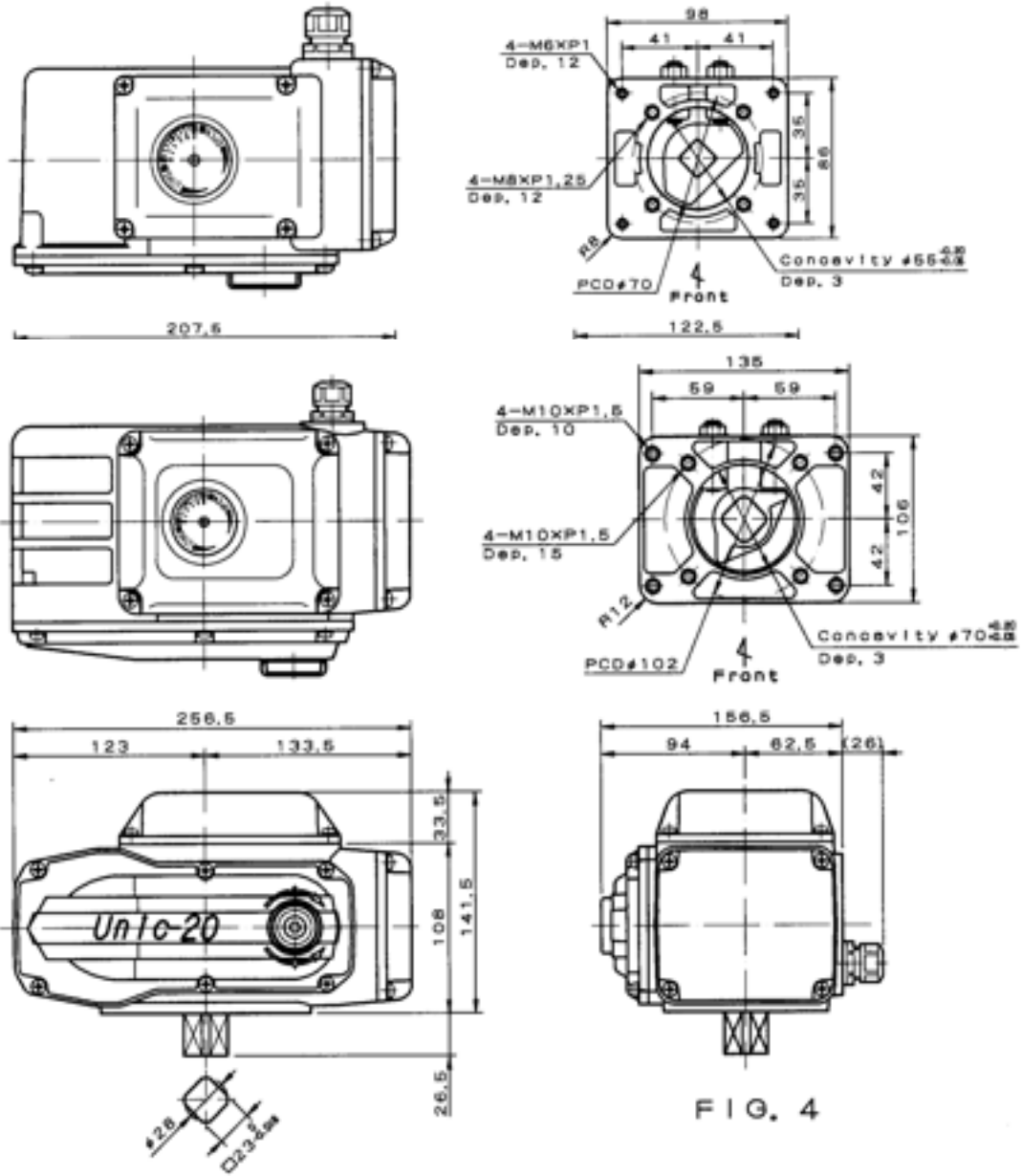
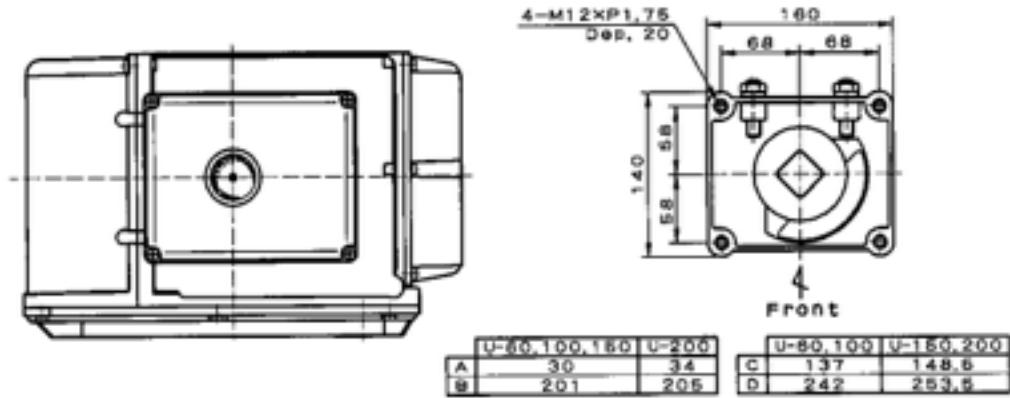


FIG. 4

2-5 Unic-60, 100, 150, 200 Configuration



3. FUNCTIONAL SPECIFICATION

ITEM			Unic-20, 40	Unic60,100,150,200
RATED VOLTAGE	MODEL Unic-Z, 05 AC110/110/115/120V±10% (50/60 Hz) AC200/220/230/240V±10% (50/60 Hz)		Unic-10	
RATED CURRENT	(U-60,100,150) 	(U-200) 	Unic-20: 1A/100V 0.45A/200V Unic-40: 2A/100V 0.9A/200V	Unic-60: 2A/100V 0.9A/200V Unic-100,150,200: 3.5A/100V 1.7A/200V
OUTPUT SHAFT TORQUE	Unic-Z: 9.8N•m (1kgf•m) Unic-05: 39N•m (4kgf•m)	Unic-10: 98N•m (10kgf•m)	Unic-20: 196N•m (20kgf•m) Unic-40: 392N•m (40kgf•m)	Unic-60: 588N•m(60kgf•m) Unic-100: 981N•m(100kgf•m) Unic-150: 1471N•m(150kgf•m) Unic-200: 1962N•m(200 kgf•m)
OPERATION SPEED	Unic-Z : 4sec Unic-05:15sec	30sec/50Hz	30sec/50Hz	Unic-60/100: 30sec/50Hz Unic-150: 45sec/50Hz Unic-200: 60sec/50Hz
MOTOR	8W E-class	20W E-class	Unic-20: 30W E-class Unic-40: 90W E-class	Unic-60: 90W E-class Unic-100,150,200: 100W E-class
OPERATION ANGLE	0 ~ 90°			
PROTECTOR	Thermal protector			
AMBIENT TEMPERATURE	Ambient temperature within : -25 ~ 55°C			
INSULATION RESISTANCE	100MΩ/500DC			

WITHSTAND VOLTAGE	1500V AC/1minute			
MANUAL OPERATION	Crank handle attached			
STOP	Mechanical type(OPEN/CLOSE)			
ENCLOSURE PROTECTION	Water tightness NEMA-4X(to IP-65)			
MOUNTING ANGLE	From vertical to horizontal angles			
POSITION DETECTION	OPEN/CLOSE limit switches			
BODY MATERIAL	Die cast Aluminum			
COATING COLOR	Silver gray N-6			
CONDUIT ENTRANCE	P1/2×1 with resin connector			
WEIGHT	2kg	4.5kg	Unic-20: 9kg Unic-40: 9.5kg	Unic- 60: 20kg Unic-100: 21kg Unic-150, 200: 22kg

CAUTION ON ENVIRONMENTAL INSTALLATION CONDITIONS



4.INSTALLATION

4-1 Installation

☒ Caution on indoor installation

- * The actuators are not of explosion-proof type. Do not install in a hazardous place.
- * Cover whole the unit, if it is installed at a place where water or materials are splashing.
- * Reserve a space for manual maintenance work.

☒ Caution on outdoor installation

- * Shade the unit from direct sunlight, that may cause overheat and defect to the unit.
- * Reserve a space for manual maintenance work.

Materials and treatment of the unit surface



PART	MODEL	Unic-Z/05	Unic-10	Unic-20/40	Unic-60/100/150/200
BODY BASE		Die cast Aluminum Oxidation treatment Electrostatic coating			

DRIVING UNIT COVER	Die cast Aluminum Oxidation treatment Electrostatic coating			
ELECTRIC UNIT COVER	Heat resisting ABS resin Electrostatic coating			Die cast Aluminum Oxidation treatment Electrostatic coating
CONTROL UNIT COVER	Heat resisting ABS resin Electrostatic coating	Die cast Aluminum Oxidation treatment Electrostatic coating	Heat resisting ABS resin Electrostatic coating	Die cast Aluminum Oxidation treatment Electrostatic coating
OUTPUT SHAFT	SUS 303			

4-2 AMBIENT TEMPERATURE / FLUID TEMPERATURE

☒ Ambient temperature

* Environmental temperature range for use : $-25^{\circ}\text{C} \sim 55^{\circ}\text{C}$.

* For use in minus temperature, in-fit space heater is available at option.

* For use in temperature beyond the specified range, refer to our Sales Dept.

☒ Fluid temperature

It is occasional that if the actuator is applied to a high temperature fluid line, the unit may overheat by transmission of line heat. In such a case, use radiation type bracket and couplings. (available at option)

* Standard bracket and couplings : Fluid temperature max. 65°C

* Radiation type bracket and couplings : Fluid temperature over 65°C

CAUTION ON ASSEMBLY WITH A VALVE



5. ASSEMBLY WITH A VALVE

☒ Names of parts

Actuator Bolt Bracket Coupling Valve

⌘ Assembly procedure

1. Be sure that power is off before making manual operation.
2. Confirm that a valve smoothly turns by hand without eccentricity, then position it at full close.
Note : There are some valves designed in reverse direction of open/close.
3. Bolt a bracket on the valve.
4. Tentatively mount an actuator on the bracket with loose bolts.
5. Position the actuator at 0 (close), joint the output shaft and the valve stem with couplings.
6. Screw up the bolts.
7. Check with the attached crank handle if the valve is turns smoothly without eccentricity.

CAUTION ON WIRING WORK



6. WIRING

6-1 Power and input signals

Use a cable of $\phi 9\sim 11$ mm for the standard connector. (See FIG.7)

If a customer connector is used, select a cable of proper diameter, preventing water ingress to the unit.

Actuator body

Seal Tight Device

Cable outer diameter $\phi 9\sim\phi 11$

1/2" NPT

Seal

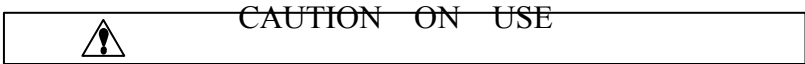
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6-2 Wiring work

Use sufficiently sealed tubes or conduit to prevent water ingress.

Connector

PVC Conduit



7. POWER SOURCE AND CIRCUITS

7-1 Power source

Standard supply

AC 100/110/115/120V±10% (50/60Hz)
AC 200/220/230/240V±10% (50/60Hz)

For different supply from the above, refer to our Sales Dept.

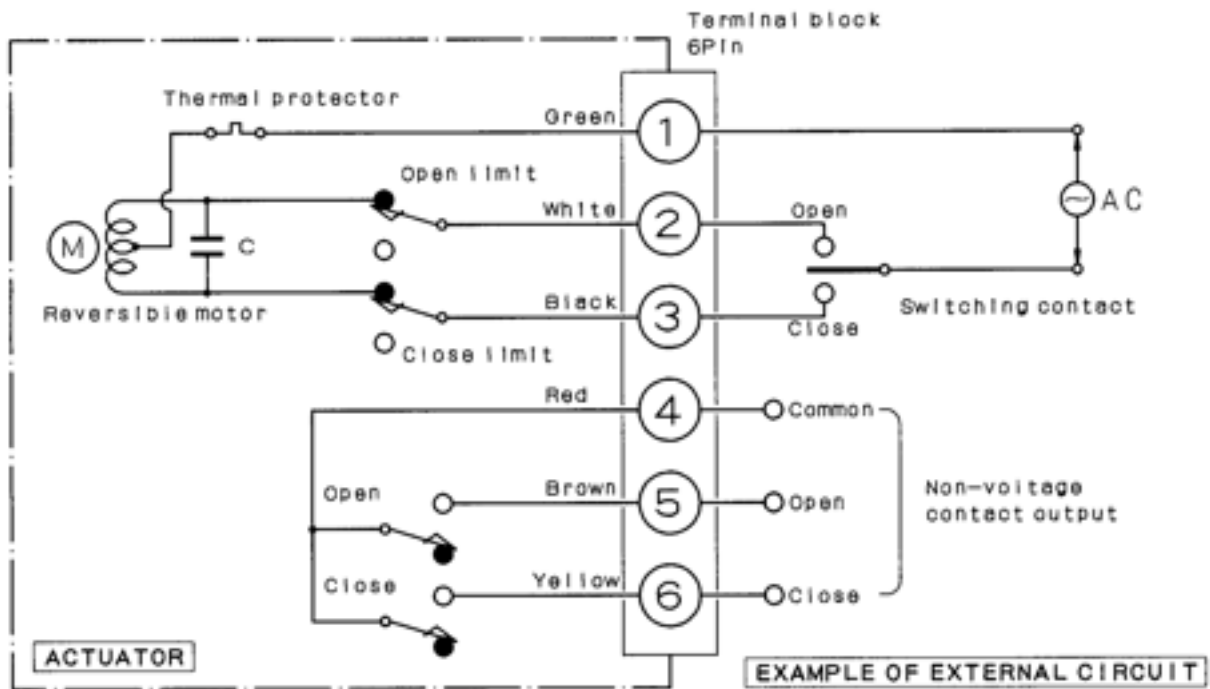
7-2 Recommendable fuse and breaker

Install a fuse or breaker for protection according to the following table.

Model	Capacity of fuse/breaker	Motor capacity
Unic-Z, 05	5A	8W
Unic-10	5A	20W
Unic-20	5A	30W
Unic-40	7A	90W
Unic-60	7A	90W
Unic-100,150, 200	10A	100W

Note: Wiring should be made properly to avoid noise disturbance etc.

7-3 Circuit diagram



Do not make parallel operation with plural actuators.

If they are operated at the same time through one open-close switch, the actuators may draw abnormal current into the units, causing chattering, then disturbance to normal operation.

If it goes as is for a long time, actuators may become defective.

Confirm that power is OFF before making manual operation



8. ADJUSTMENT

1. Adjustment of limit switches and position meter

(1) Unic-Z, 05

Valve Position Indicator

Dog Setting Nut

Limit Dog

Output Shaft

LS1: Open limit switch
LS2: Open contact output
LS3: Close limit switch
LS4: Close contact output

1. Fully open the valve by manual handle.
Loosen and turn the lower limit dog and confirm that the limit switch is effective.
 2. For close side, fully close the valve, turn the upper limit dog, and confirm that the switch is effective.
 3. Tighten the dog nut up. Adjustment of the valve position indicator is now completed. Contact output positions are also adjusted.
- * Position limit switch is normally at “B” contact, contact output is at “A” contact, respectively.

(2) Unic-10

Limit Dog

Valve Position Indicator

Output Shaft

Socket Set Screw

The upper limit switch is for close, lower one is for open direction. 2 extra limit switches (contact output) are available at option.

1. Open the valve fully by manual handle.
Loosen and turn the lower dog. Confirm that the switch has been off, then screw the dog up.
2. Adjust the close side in the same manner.
The adjustment is now over.
3. The limit switch is normally at “A” contact.

(2) Unic-20, 40

Limit dog

Dog Set Screw
Valve Position Indicator
Set Screw

The limit switch at right is for close, left one is for open direction.

1. Open the valve fully by manual handle.
 2. Remove the opening meter.
 3. Loosen and turn the limit dog and confirm that the limit switch clicks. Then screw up the dog.
 4. Adjust close side in the same manner.
Adjustment is now over.
- * The limit switches are normally at "B" contact.

Output Shaft

(2) Unic-60, 100, 150, 200

Limit dog

Valve Position Indicator
Set Screw

The limit switch at right is for close, left one is for open direction.

1. Open the valve fully by manual handle.
 2. Loosen, then set the position meter at full open.
 3. Loosen, and turn the lower limit dog.
Confirm that the limit switch clicks. Then screw up the dog.
 4. Adjust close side in the same manner.
Adjustment is now over.
- * The limit switches are normally at "B" contact.

Output Shaft

2. Intermediate limit switch (option)

Intermediate limit switch can be set at any position.

1. After setting the actuator at a desired rate, adjust LS-1 dog to a position where the limit switch clicks.
 2. Set LS-2 in the same manner.
- * Refer to Fig.13 for wiring diagram.

Sleeve

Limit Dog

Spacer

Output Shaft

3. Potentiometer (option)

Standard resistance for your choice:

135, 500, 1000 Ω

1. Open the valve fully by manual handle.
2. Loosen opening-meter gear.
3. Applying a tester between 4-5 terminals on the terminal block, set the opening-meter at a point where the resistance rate becomes below 5 Ω , then screw it up.

* Refer to Fig.14 for wiring diagram.

Potentiometer

Sleeve
Set screw

4. Mechanical stop

Limit Dog
Adjustment Bolt
Locknut
Output Shaft
Pot Gear

1. Open the valve fully by manual handle.
2. Loosen, and return the stop by 1/2 turn with the adjuster bolt.
3. Screw up the locknut.
4. Adjust close side in the same manner.
Adjustment is now over.

Stopper

9. TEST OPERATION

1. Manual operation

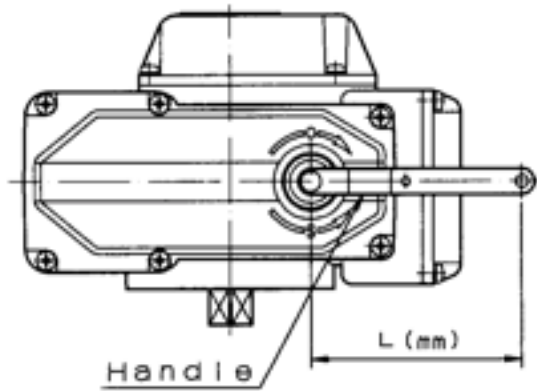


FIG. 16

1. Cut power off before making manual operation.
 2. Insert the manual handle into the hexagonal hole underneath the rubber cap.
 3. Turn the handle clockwise for close, counter clockwise for open.
- Note: The limit switches become effective at open/close of position meter. The stops are at 1/2 turn beyond those points. Do not apply excessive force to the handle, for it might damage the unit.

<SIZE OF MANUAL HANDLE>

Item	Model	Unic-Z/05/10	Unic-20	Unic-60,100 150,200
Opposite of hexagon		5mm	6mm	15mm
Number of handle turns		15	15	15
Length		100mm	120mm	255mm



When making manual operation,
b e sure that power is off.
If power is on while manual operation,
the handle will
suddenly return!

2. Power operation

⚙ Before making power operation:

- Confirm that the indication on the position meter and the valve opening are matching each other.
- Confirm that the circuits are properly wired, also that the unit operates in correct direction with external switches.

10. MAINTENANCE, INSPECTION

⚙ Lubrication

As the major parts of the products are lubricated with long life di-sulfate molybdenum grease (MoS₂) before shipment, re-lubrication is in principle not required.

⚙ Inspection

When re-starting operation after a long period of rest, make the following confirmation.

- Cut power off, confirm by manual operation that valve moves smoothly without eccentricity.
- Open body cover and check if there is no condensation inside the unit, also no problem on wiring.

Note: After checking, secure the cover to prevent water ingress.

11. TROUBLE SHOOTING

TROUBLE AND PROBABLE CAUSE	SOLUTION
MOTOR DOES NOT START UP	
Power is off	Supply power
Circuits or terminal are open	Renew cables or re-connect terminal
Supply voltage is improper or too low	Check terminal voltage with a tester
Trouble on thermal protector (Ambient Temperature is too low or valve is constrained)	Lower ambient temperature or check valve movement by manual operation
Limit switch is faulty	Renew a limit switch
Motor is defective or lead wire is broken	Renew an actuator
Over capacity for motor advancer	Replace an advancer (condenser)
Limit dog is not correctly adjusted	Re-adjust limit dog
LAMP(open/close) DOES NOT LIGHT UP	
Lamp is broken	Replace a lamp
Limit switch is faulty	Renew a limit switch
Stop is not correctly adjusted	Re-adjust a stop

* For other situation of troubles than the above, please refer to our Sales Dept.

12. OPTION EXTRAS

- * No voltage extra limit switches : 2pcs.
- * Potentiometer : 135/500/1000 Ω
- * R/I converter : 4 ~ 20 mA DC
- * Torque limiters
- * Speed controller
- * Space heater

For any special version, contact our Sales Dept.

