

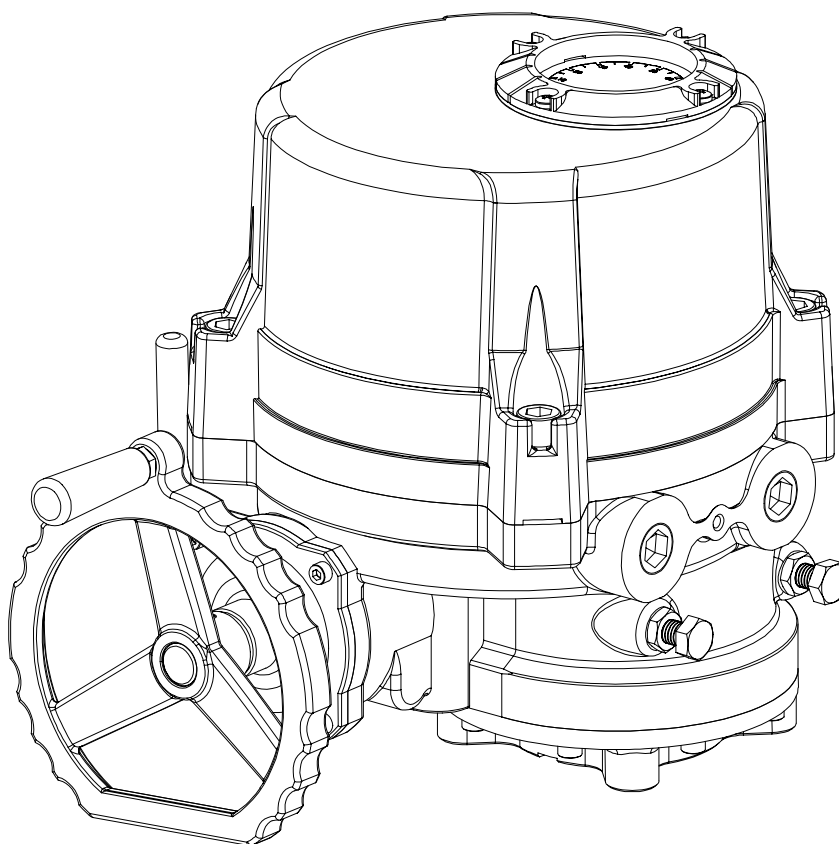
UNI-EL

Electric actuator

Installation and operating
manual

UNI-EL 0100

UNI-EL 1100



(UNI-EL-0100, 0160, 0240, 0350, 0500, 0800
1100, 1500, 2000 & 3000)

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For safe and proper operation, please carefully read this manual before using it and save it for reference.

Important note: The contents in this manual is subject to change due to the quality improvement without individual notice.

1. Before operating actuator

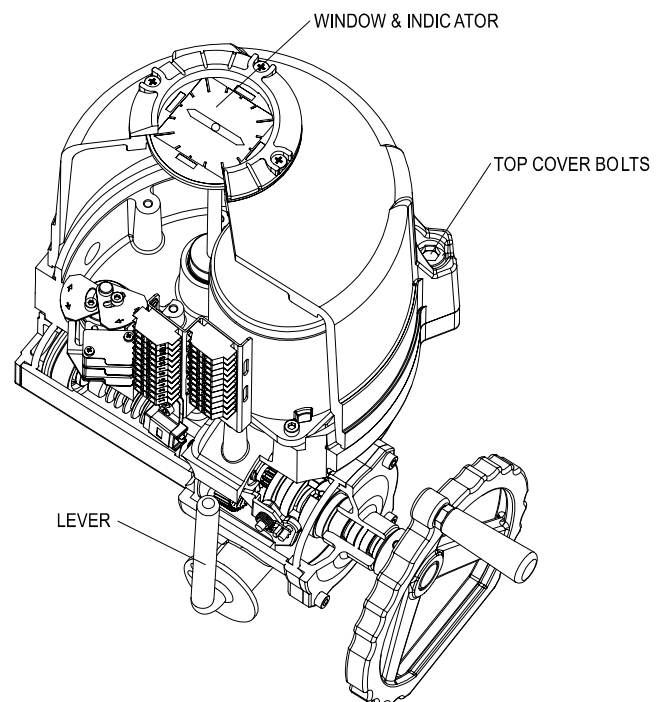
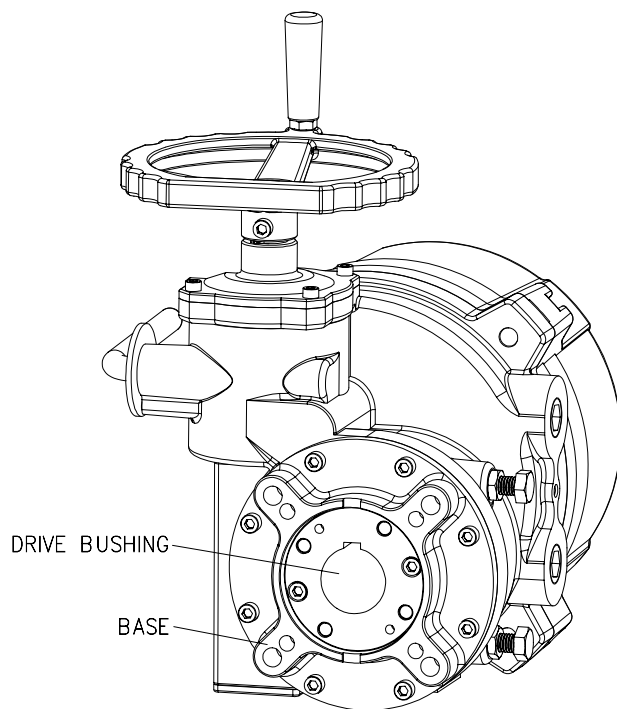
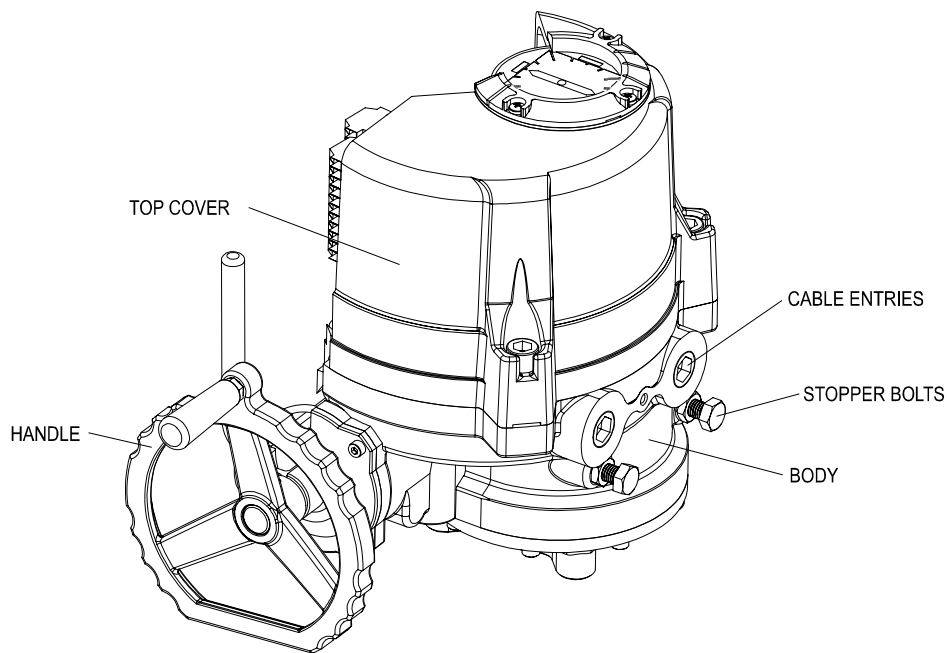
After getting UNI-EL actuator, please check if everything with actuator is just same with what you want to purchase. User can check with individual test report, nameplate and electrical wiring (inside of actuator).

- 1) Visual check: Painting, indicator, handwheel etc
- 2) Specification: users may check with test report and name plate if actuator is suitable your requirement specification of application
- 3) Optional items: Check if all optional items are correct or not
- 4) Check if electrical specification is correct or not (wiring diagram inside of actuator, name plate).
- 5) Check if the electrical power is correct or not.
- 6) Check if instruction manual, test report(Warranty papers) and electrical wiring diagram are supplied or not.

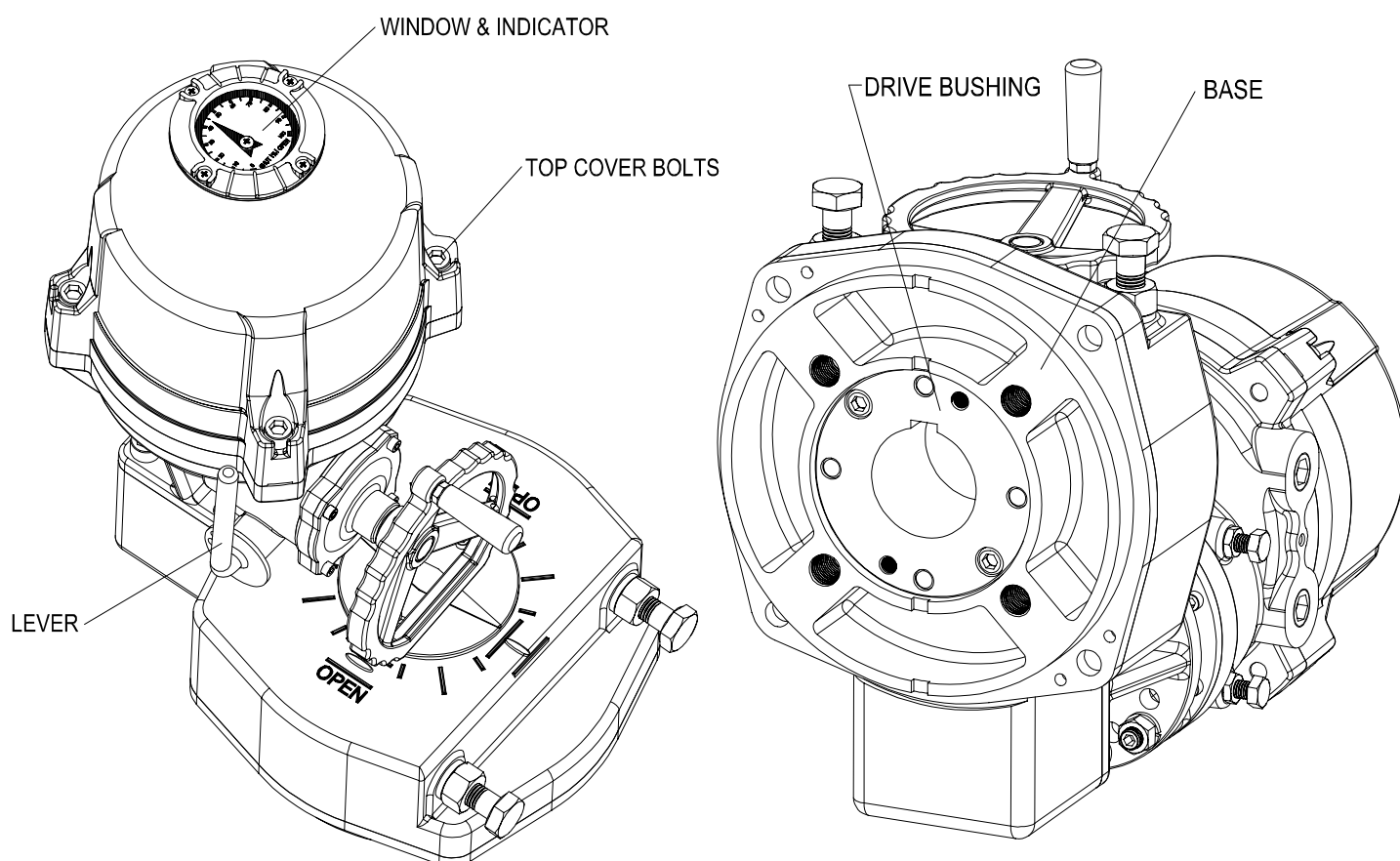
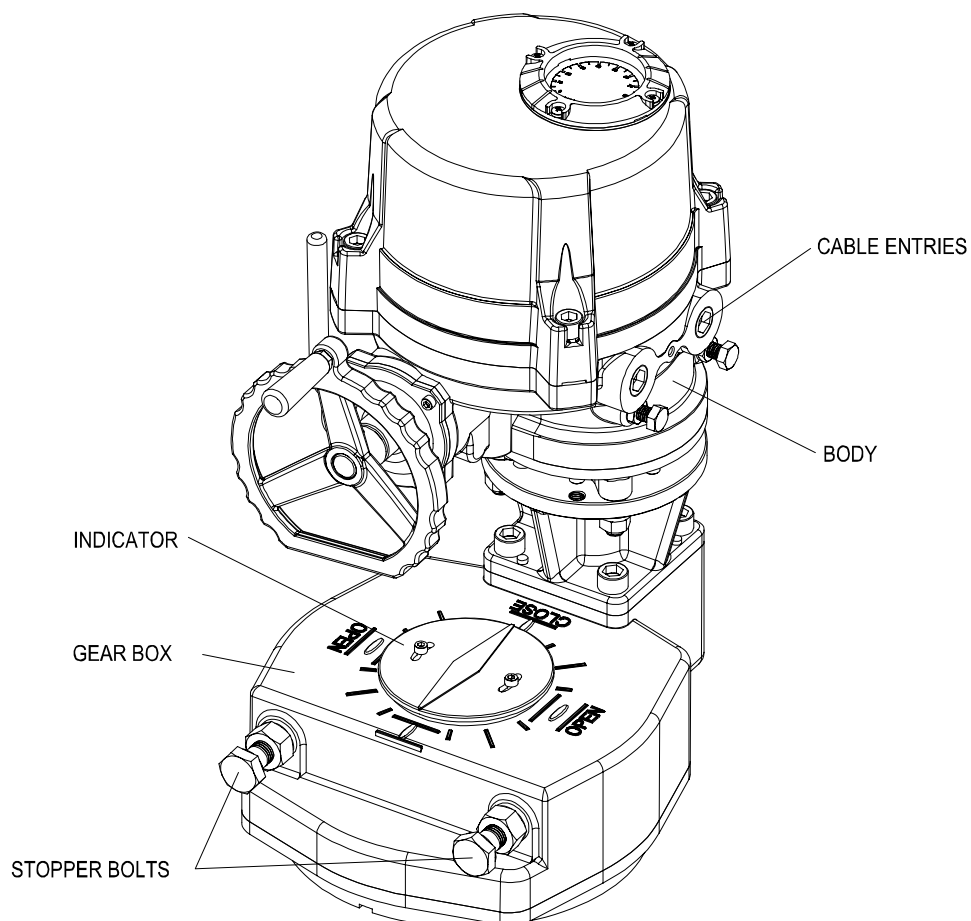
If there is any discrepancy, please ask UNI-VALVE A/S or local distributor to solve or replace that discrepancy immediately.

2. About UNI-EL actuators

1) External components

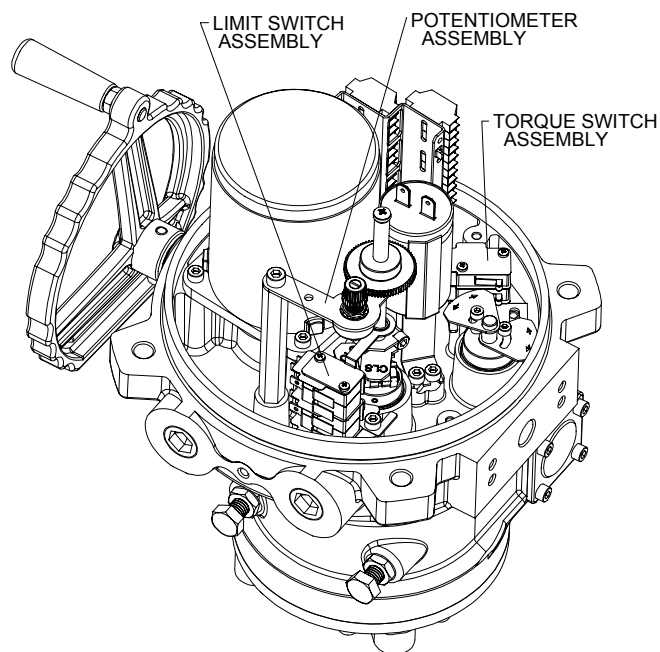
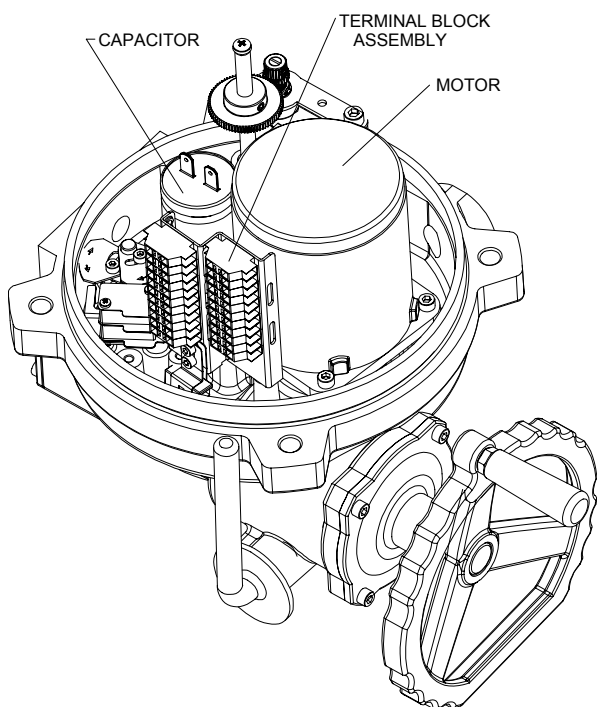


UNI-EL-0100 ~ UNI-EL-1100

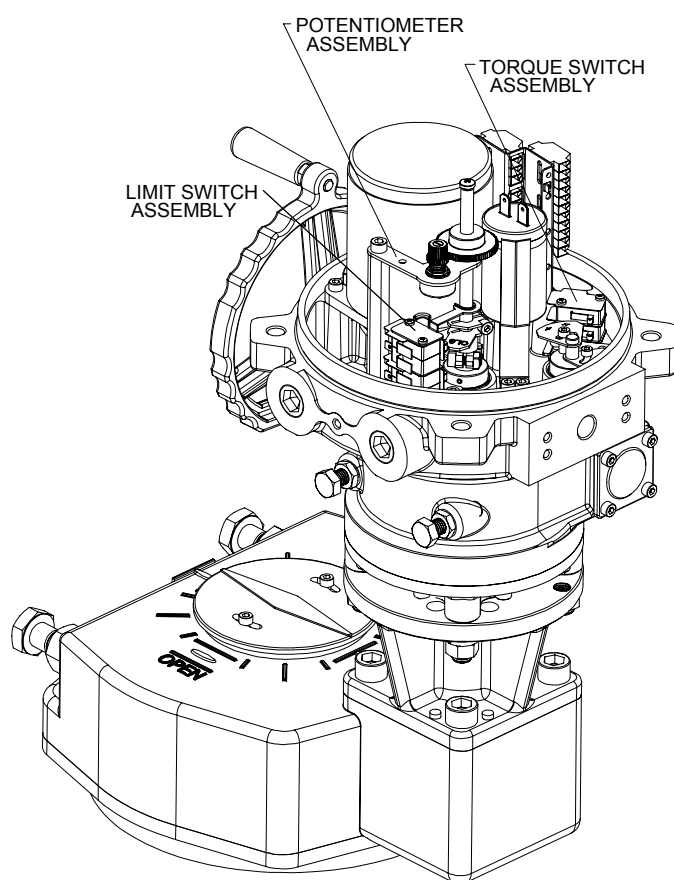
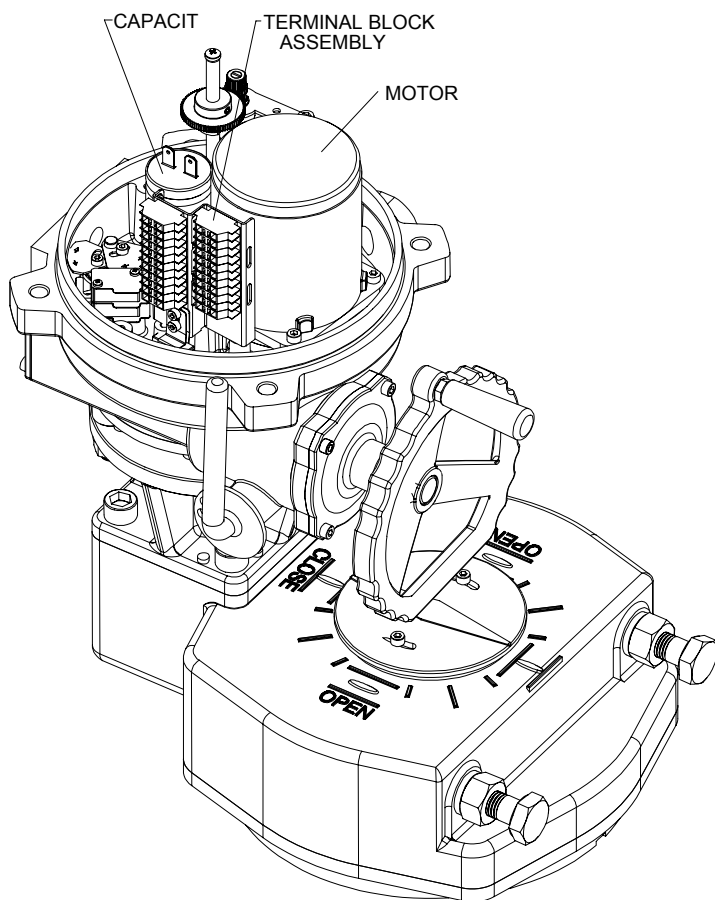


UNI-EL-1500 ~ UNI-EL-3000

Internal components



UNI-EL-0100 ~ UNI-EL-1100



UNI-EL-1500 ~ UNI-EL-3000

2) Specification

Enclosure	Weather proof enclosure IP67, NEMA 4 AND 4X, O-RING Sealed
Main power supply	110/220V AC 1Ph, 380/440V AC 3Ph 50/60Hz, $\pm 10\%$
Control power supply	110/220V AC 1Ph 50/60Hz, $\pm 10\%$
Duty cycle(On-Off)	S2, 20~50% Max 30Min
Duty cycle(Modulating)	S4, 30~50%, 300~1200starts/hour
Motor	Squirrel caged induction motor
Limit switches	OPEN/CLOSE, SPDT, 250V AC 10A RATING
Torque switches	OPEN/CLOSE, SPDT, 250V AC 10A Rating(Except for UNI-EL-0100)
Stall protection(Temp.)	Built in thermal protection, OPEN $150^{\circ}\pm 5^{\circ}$ /CLOSE $97^{\circ}\pm 15^{\circ}$
Travel angle	$90^{\circ}\pm 5^{\circ}$ ($0^{\circ}\sim 100^{\circ}$)
Position indicator	Plate with indication arrow
Manual override	De-clutchable
Self locking	Provided by double worm gearing(No brake)
Mechanical stopper	1 each for each travel end(OPEN and CLOSE), external adjustable
Heater	5W (110/220V AC) Anti-condensation
Cable entries	2- PF3/4" TAP
Lubrication	EP Type grease
Terminal block	Screw and lever push type(Spring loaded)
Ambient temperature	$-20^{\circ}\sim +70^{\circ}$ (Except for optional electronic board)
Ambient humidity	90%RH Max, (Non-condensate)
Dielectric strength	1500V AC 1minute
Insulation resistance	500V DC 30M Ohm
Anti-vibration	X Y Z 10g, 0.2~34Hz, 30minute
External coating	Dry powder (Polyester)

3) Features and structure

1) General:

UNI-EL series actuator is designed for the 90 degree turn application such as damper, ball, plug, butterfly valve and other equipment

2) Wide range of torque:

Min. 100Nm to Max 3000Nm. In between there are 12 models and cater for various torque depending on application.

3) Material:

Material is hard-anodized AL alloy and external coating of epoxy powder is suitable for the severe condition especially against the corrosion. Housing is designed in accordance with standard of ex-proof and IP67.

4) Sealing:

Sealing provided by double O-ring system

5) Manual Override:

Just by pulling over the lever, operating mode is switched to manual. then just supplying electrical power to actuator, clutch is automatically disengaged from manual and operating mode is switched to electric operation.

6) Gear & Self locking:

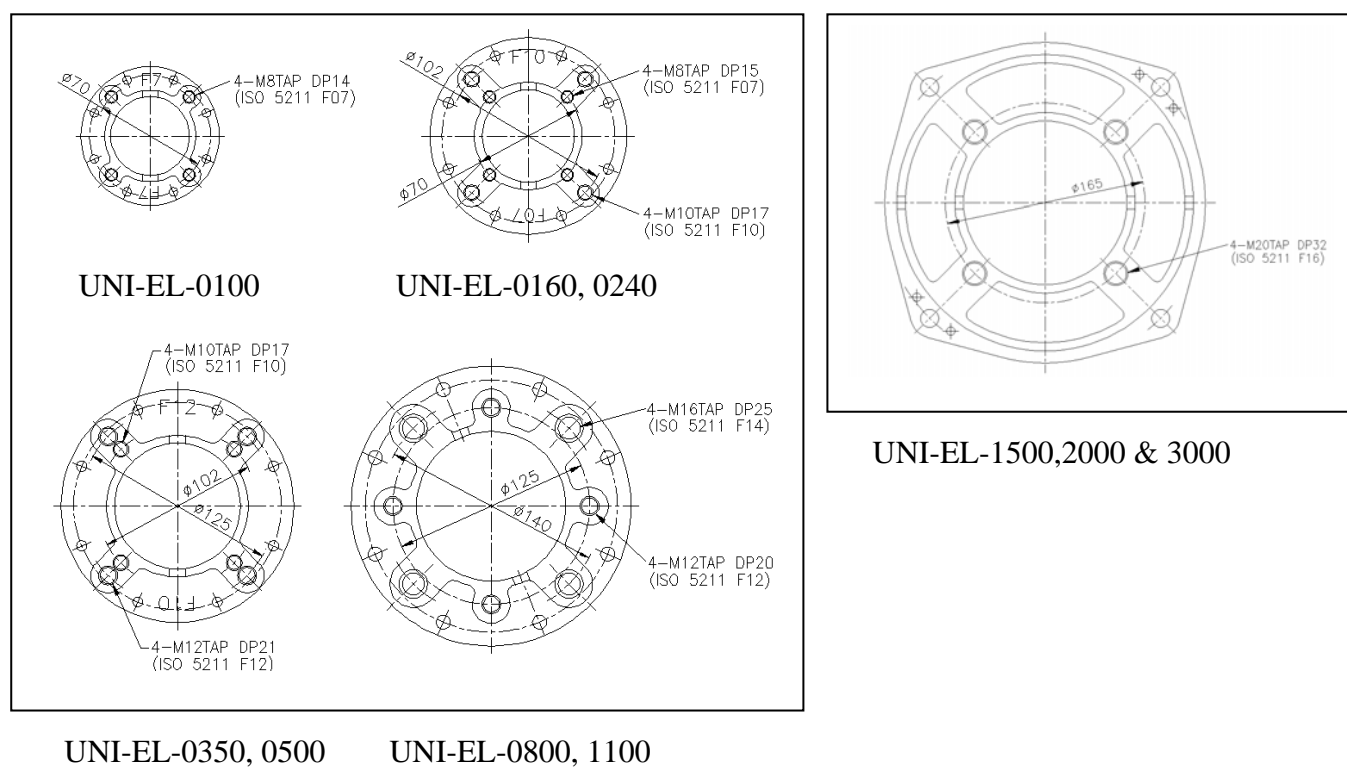
2nd staged Double worm gearing prevents movement caused by backward force transferred from valve and it provides the exact and stable position of actuator and valve when electrical power is off. High efficiency, low noise level and trouble free design are another advantage.

7) Manual hand wheel:

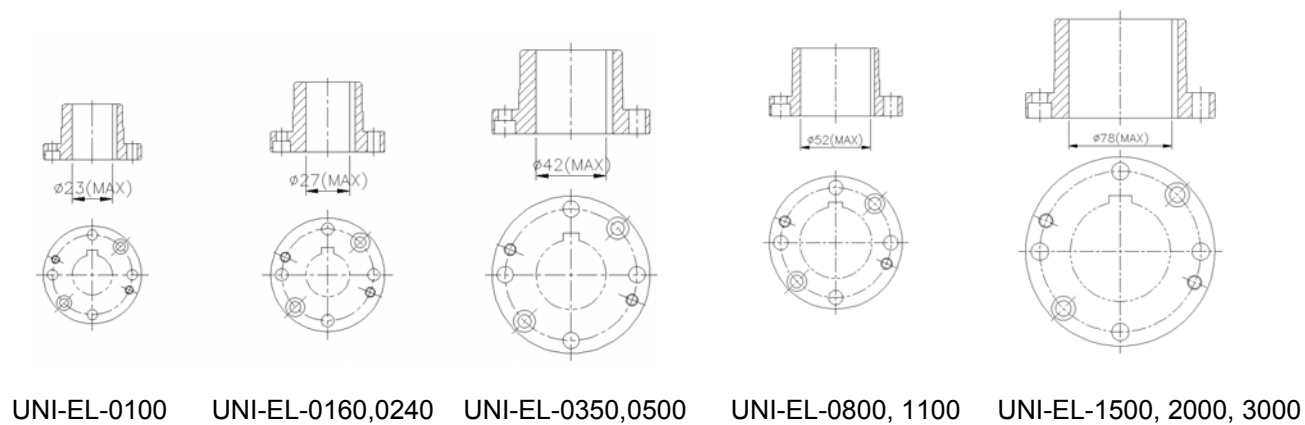
The Size of hand wheel is designed according to required torque to move the actuator, so that operator can easily move the actuator by hand.

- 8) Motor:
Motor specially designed for UNI-EL actuator has several features such as high output power, high efficiency and thermostat installed inside of motor prevent overheat of motor and thermal damage of motor coil.
- 9) Limit switch:
Since limit switch is directly driven by the 2nd output shaft, position during operation is continuous and accurate. Setting of Cam is so easy and once cam setting is done, position is almost permanent unless operator change setting again.
- 10) Torque switch:
Torque switch driven by the 2nd output drive shaft for continuous and accurate torque detection.
Torque spring which detects the variation of torque during operation is installed for preventing damage of valve and actuator under overload condition.
Once actuator is under overload, torque switch is tripped and actuator stops immediately. Switches are installed for both open and close direction.
These switches set by factory can not be set again without check with factory.
- 11) Space heater:
Spacer heater is installed for preventing damage caused by condensed water inside of actuator and includes thermostat inside to prevent overheating.
- 12) Stopper bolt:
Stopper bolt installed both close and open direction prevents actuator's travel over the limit during manual operation and also protects internal gearing from it's breakaway.
- 13) Indicator:
Indicator directly driven by 2nd output drive shaft.
Operator perceives exact current operating situation even from a distance.
- 14) Terminal block:
Spring loaded terminal strip is very strong against vibration and to add the number of strip for additional connection is so simple.
- 15) Wiring:
Basic wiring is standardized to be simplest and optimal, so that variation depending on electrical specification and options can be so easy and simple.
- 16) Adaption:
Mounting base is designed according to ISO5211 but different dimension depending on application is also possible. Removable drive bushing provides convenient machining for adaption.
- 17) Lubrication:
Using EP type Grease Moly, no need to refill lubricant for the long time.
- 18) Others:
We guaranty high performance, high quality product throughout various and severe test and inspection.

4) Mounting base (ISO 5211)



5) Removable Drive bushings for adaption



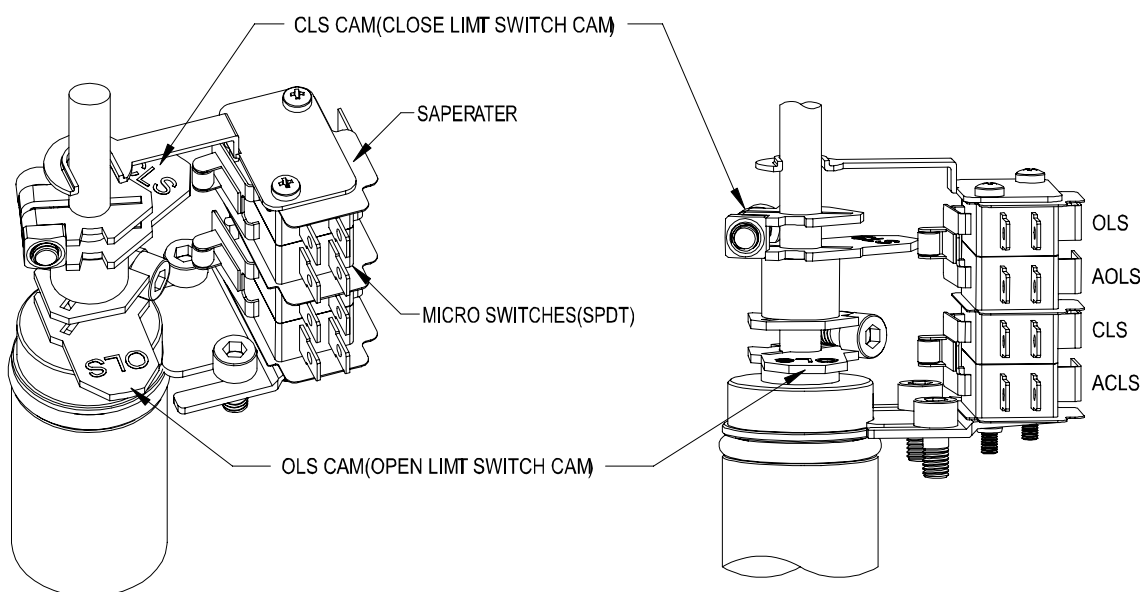
3. Settings

1) Manual operation

- 1) Pull over the lever toward hand wheel until lever stands perpendicularly.
- 2) If lever does not stand perpendicularly, pull over it again turning hand wheel slowly.
- 3) There is casting mark to indicate rotating direction on hand wheel.
- 4) Clockwise is close direction and counter clockwise is open direction.
- 5) No need to position the lever to original for electrical operation.
- 6) Once electrical power is on, the lever automatically return its original position by internal clutch mechanism.

2) Limit switches

- 1) Pull over the lever for manual operation and turn hand wheel to move actuator full close (or open) position
- 2) Loose the bolts tightening cam by L-wrench, and turn CLS (or OLS) cam to CW (or to CCW), so that cam may hit the lever of close (or open) limit switch.
- 3) Then tighten the bolt by L-wrench



3) Torque switches

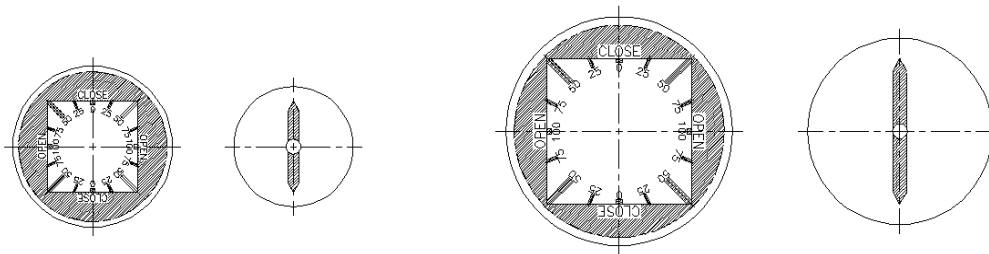
- 1) Push the lever of close switches by screw driver until it sounds "click" then actuator should stop immediately. If it stops, switches work well.
- 2) Check open switches as per just same with above.
- 3) No guaranty in performance once these switches are set again.
- 4) Before setting, if it is really necessary to adjust, please consult with factory.

4) Stopper bolts

- 1) Before manual operation, get both nuts loose which are engaged with stopper bolts and turn stopper bolt to come out by 3~ 4 threads.
- 2) Move actuator full close position by manual.
Once cam hit the lever of limit switch to trip, stop manual operation.
- 3) Then turn close stopper bolt to go forward until it does not go further (end of stopper bolt contacts the 2nd worm wheel).
- 4) Turn close stopper bolt to come out by 2 threads and tighten the loosen nut.
Do as per same with above for open stopper bolt

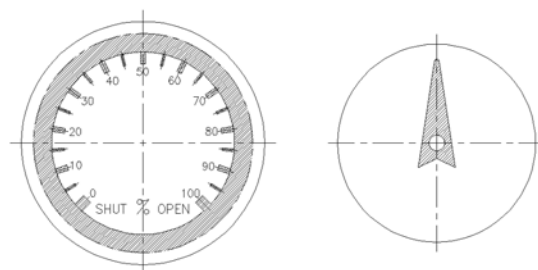
5) Indicator

- 1) Move actuator full close position and turn indicator by hand until orientation of indicator is aligned to the figure of window.
- 2) Tighten the bolt (Be careful not to be injured by the cutting edge of indicator and leakage of electricity when power is on)
- 3) Figure of Window and indicator according to AWWA standard



UNI-EL-0100

UNI-EL-0160 ~ UNI-EL-1100



UNI-EL-1500 ~ UNI-EL-3000

4. Electrical wiring

1) Before wiring

- Cable entries are machined with PF3/4" tap and sealed by Plug before delivery.
- Please remain the plug as it is if user doesn't use both cable entries.
- Please make sure to seal the entries by using rubber or metallic packing after wiring, so that water may not come in.
- When user use actuator as ex-proof, please make sure to use the certified connection component which is at least same grade with actuator.
- This is not our scope of supply, but if user don't use suitable component, factory won't guaranty the performance of ex-proof actuator.

2) Electrical wiring

- Check if electrical specification like as power, wiring & etc are correct or not.
- One sheet of wiring diagram is to be supplied together with actuator.
- Do the wiring as per the given wiring diagram, such as power, control power, internal wiring and ground.
- Make sure to supply electric power to heater for keeping inside of actuator clean and dry.
- Make sure to check wiring to the terminal is strong enough.
- Make sure that one relay operates one actuator only (can not operate two or more actuators simultaneously)
- Make sure to clean inside of actuator and no foreign material inside.

3) Check rotating direction of actuator

- In 3-phase actuator, operator should check the rotating direction of actuator before electrical operation.
- If operating direction is wrong, limit switches does not function and it results damage from jamming or motor's overheating.
- So, put the actuator at 50% open (or Close) position by manual and supply power into the actuator and check it's rotating direction.
- If actuator moves open as per open signal, the direction it is O.K, but reverse, need to change the wiring.
- Among 3 of power wires, change 2 wires each other.
- Then check the rotating direction again in order to confirm it again.

4) Commissioning (electrical)

- Make sure to check the rotating direction of actuator first before operation.
- Check the function of limit and torque switches, direction of indicator and space heater.
- Check lever movement is O.K (Manual override)
- Check the lamps in the control panel.
- After commission, please make sure to tighten the 4 bolts of the top cover and to do proper sealing.

5. Others

1) Change the rotating direction of actuator (open to close, close to open)

Generally actuator is set as close → clockwise and open → counterclockwise. If user want to use reverse direction actuator, please do as follows.

UNI-EL-0100

- Open the cover using L-wrench.
- Change wires each other which are connected to terminal no 6 and 7 and do same way for 8 and 9.
- Change the direction of indicator.
- Put actuator about 50% open position and check rotating direction is correct.

UNI-EL-0160 ~ UNI-EL-1100 (on-off)

- Open the cover using L-wrench.
- Change wires each other which are connected to terminal no 6 and 7 and do same way for 8 and 9.
- Change the direction of indicator.
- Put actuator about 50% open position and check rotating direction is correct.

UNI-0100 ~ UNI-EL-1100 (proportional control)

- Open the cover using L-wrench.
- Change wires each other which are connected to terminal no P1 and P3 in the PCU card.
- Change wires each other which are connected to terminal no 9 and 10 and do same way for 11 and 12.
- Change the direction of indicator.
- Put actuator about 50% open position and just push the auto setting button.
- Supply 4~20 mA and check the operation.

2) Potentiometer setting

- Put actuator full close position and check resistance between P1 (orange) and P3 (grey), it should be around 1000 Ohm.
- Put the resistance between P1 (orange) and P2 (purple) of potentiometer around 80~120 Ohm.
- Engage potentiometer gear with pointer shaft gear and tighten the bolt.
- Put spring between potentiometer and pointer shaft and fix both.
- If user wants to use reverse direction actuator, change the wires of P1 (orange) and P3 (grey) of PIU each other.

3) Jamming

- In case that actuator moves wrong direction and moves over the travel limit, internal worm gear contact the stopper bolt and engage each other. This is so call jamming and cannot move actuator at all.
- How to solve:
 - 1) Off the power
 - 2) If jamming is happened during close, take close stopper bolt to come out by about 2 ~3 threads
 - 3) Pull over the lever and put it manual position.
 - 4) Turn hand wheel to counterclockwise until 50% open position.
 - 5) Check rotating direction again.
 - 6) If everything is O.K, put stopper bolt original position.
 - 7) If jamming is happened during open, procedure is same with close, but turn hand wheel to clockwise by manual.

4) Special tools for setting

- L-Wrench 1 set (metric)
- Screw drivers (–, +)
- Spanner set (Metric), Monkey spanner 200mm, 300mm 1 each,
- Wire stripper, Long nose, Light
- Multi Meter (AC, DC Volt, Resistance)
- DC signal generator (0~4mA DC) : RPC option
- mA DC Meter (0~25mA DC) : RPC and CT

6. Caution

1. Selection of valve and actuator : Review all specification of valve and actuator carefully before making selection and reserve about 30% torque of actuator for safety purpose. If required torque is 90Kg-m, recommended actuator torque is about 117Kg-m.
2. Option: Please consult with factory before making selection, if possible.
3. Before necessary setting such as limit switch, please don't operate actuator either fully open or fully close.
4. After electrical wiring, make sure to secure the sealing of cable entries.
5. Before operating actuator, please review this manual carefully and follow the instruction without fail. Please be careful at temperature, humidity, vibration, voltage drop.
6. Storage: Keep actuator dry, clean and cool.
7. Trouble: Please refer to following trouble shooting but please don't dismantle the actuator without consulting with factory.
8. If repair or maintenance is required, please check the model, electrical condition, serial Number and current situation to inform factory.

7. After sales service

1) Free of charge

- When delivered actuator is different from the specification of customer's order.
- When quality of actuator is different from the specifications.
- When trouble of component is found.
- When trouble is generally recognized as factory's fault.
- Warranty period is 1 year after delivery.

2) User's charge

- When trouble caused by misuse ignoring actuator specification.
- When trouble caused by user's mistake or intention (dismantling).
- When trouble caused by modification by user's intention.
- When trouble caused by not checking of rotating direction for 3 phase actuator.
- When trouble caused by the un-proper sealing of cable entries.
- When trouble caused by fire, flood and other natural disaster.
- When trouble is generally recognized as user's fault.
- When trouble happen after warranty period.

3) Trouble shooting

110/220VAC 1Ph, 380/440VAC 3Ph actuator

Trouble	Cause	Counter plan
Actuator doesn't work at all	Check if power is on	Power on
	Check if voltage is too low	Check power
	Motor and supplied power is different	Check motor power and supplied power
	Wiring is not correct and tight or loosen	Do wiring again tightly
	Coil of motor is damaged	Change the motor
	Thermostat of motor trips	Change thermostat
	Capacitor is damaged	Change the capacitor
	Setting of limit and torque switch is not correct	Do setting switches again
Torque switch open	Jamming happens	Check rotating direction per instruction
	Actuator is undersized	Select again as per real require
	Foreign material between valve seat and disc	Remove foreign material
Switching to manual is not possible	Stopper bolt is set prior to limit switch	Reset the stopper bolt
	Lever is not fully pulled over	Fully pull over the lever
	Lever is not pulled over because of jamming	Disengage the jamming
Abnormal signal indicator	Clutch of lever and handle is engaged each other	Turning handle slowly, pull over lever
	Damage of signal LED	Change the signal LED
	Damage of micro switches	Change the micro switches
	Setting of limit switch is wrong	Do setting switch again
	Stopper bolt is set prior to limit switch	Do setting stopper bolt again

8. Maintenance

1) Lubrication

Lubrication is already done by factory and generally no need to refill it again.

But in the places such as very dry condition below R.H 15% or high temperature higher than 30°C, it is required to do lubrication once two year through Grease Nipple.

2) Regular operation

Electrical power always should be supplied to actuator and it is recommended to operate actuator once a week.

3) Maintenance

In order to use actuator for long time, regular maintenance once a year is required.

Please check operating condition, corrosion, painting & etc.

4) Others

Should you have any further queries, please contact us through Phone, fax and E-mail without hesitation.