Coreline

# Electric Actuator

## Fig.550

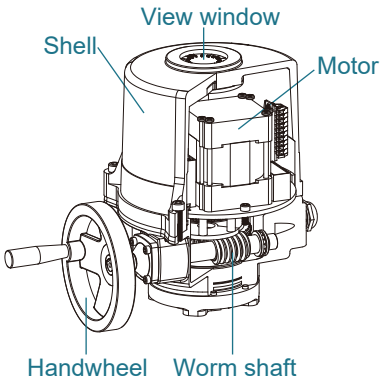
www.coreline.dk

# General information

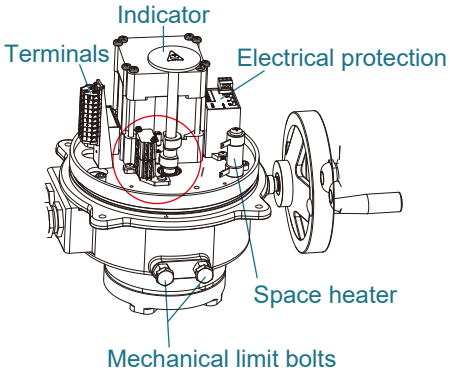
## *Product description*

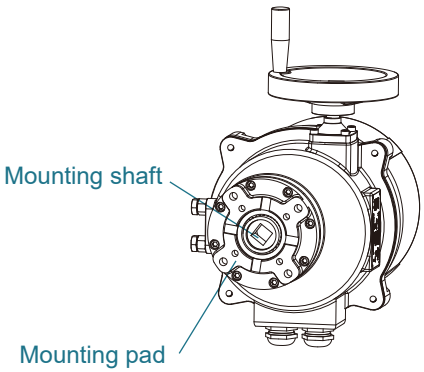
Fig.550 is a specially developed electrical actuators based on many years of experience in valve control applications. With compact deisgn, high structural strength as well as large output torque (20Nm~5000Nm), Fig.550 electric actuators offer users very reliable working performance.
With the outstanding design of actuators and our good service team, Coreline expect to provide our customers a complete set of automatic valve control system, as wells as effective mounting/adjusting and on-site service.

## *Design features*




| | |
|---|---|
| **Housing** | Hard anodized aluminum alloy with polyester powder coating. |
| **Protection class** | Weatherproof IP67; Exd IIC T6Gb(TBD)、Ex tb IIIC T80Db(TBD). |
| **Motor** | Whole sealing squirrel-cage type with compact size, large output torque, low rotational inertia, F-class insulation protection and built-in overheating protection. |
| **Manual operation** | Safe, reliable and labor-saving handwheel design. Declutch to operate by handwheel if without power, and reset automatically when power on. |
| **Installation standard** | ISO5211/DIN3337. Spline shape drive shaft design makes it easy for installation. |
| **Limit switch** | Mechanical limit + electronic limit. One for each of stroke control open and close position, one for each of passive feedback open and close position (Max. 250V 10A). |
| **Position indicator** | Continuous position mechanical indicator - convenient to observe. |
| **Space heater** | Is used for controlling temperature to avoid condensing internal of housing and keep dry. |
| **Environment temp.** | ON/OFF: -20℃~+70℃; Modulating: -20℃~+55℃ |
| **Environment humidity** | Max. 90% RH |
| **Anti-vibration** | X Y Z 10g. 0.2~34Hz, 30min |



# Different types

## 1. Fig.550 modulating type

Fig.550 normal modulating type has IN/OUT interface for receiving and feedback valve threshold analog quantity (4-20mA), with manual control inside which can be choosed by customers according to on-site requirements.

Fig.550 intelligent electrical actuator's control board is integration of multi-function servo amplifier and position signal transmitter. There are no adjustable componnents on the control panel. On-site debugging, sensitivity setting, manual automatic switching and other functions are all set through the four buttons on the control panel, making on-site installation and debugging quick and easy. The LED digital tubes and indicator lights on the panel display the current working status of the control panel, which can meet the different requirements of users.

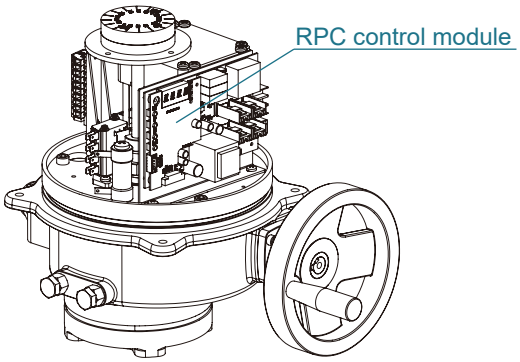
## 1.1 RPC control moduel

The control panel is installed interior electric actuator, directly receiving standard 4-20mA current control signal from DCS control system or other host computer control system.

Interior potentiometer signal works as valve position signal transmitter and makes comparison with control signal inside control panel chip. When signal difference exceeds control panel sensitivity value, control panel demands electric actuator motor move in the direction to narrow the signal difference by controlling alternating current contactor on the electric actuator until signal difference is less than control panel sensitivity value.

## 1.2 Main specifications

| | |
|---|---|
| **Input signal** | 4~20mA.DC, 0~10mA.DC |
| **Input impedance** | 250Ω (4~20 mA), 500Ω (0~10mA) |
| **Valve transmitting output signal** | 4~20mA.DC, 0~10mA.DC |
| **Intrinsic error** | ⩽±0.2% |
| **Motor blocking protection time** | 1~25.4s (default 6.4s) |
| **Power consumption** | ⩽3VA |
| **Action sensitivity** | 0.1% ~12.5% |
| **Insulation strength** | Working frequency 1500V, 1min |
| **Insulation resistence** | ＞50MΩ |
| **Power voltage** | AC220V/AC110V, 50/60Hz±10%; DC24V |




- ☐ Provide feature protection when there is signal disconnection, no feedback or motor rotating fearure.
- ☐ Instantaneous reverse rotation protection function:
  Prior to implementing reverse action instruction, control panel stops rotation with certain time delay (delay time is adjustable as per requirement) to avoid unnecessary damage to electric motor, speed reducer or valve rod etc.
- ☐ Failure code warning function.
- ☐ One-key calibration function.
- ☐ Passive feedback output function for full close position and full open position.

## 2. Fig.550 intelligent type

Fig.550 intelligent electrical actuator's control board is integration of multi-function servo amplifier and position signal transmitter. There are no adjustable componnents on the control panel. On-site debugging, sensitivity setting, manual automatic switching and other functions are all set through the four buttons on the control panel, making on-site installation and debugging quick and easy. The LED digital tubes and indicator lights on the panel display the current working status of the control panel, which can meet the different requirements of users.

The control panel is installed in the external control box of the electric actuator, which can directly receive standard 4-20mA current control signal from DCS control system or other host computer control system. Interior potentiometer signal works as valve position signal transmitter and makes comparison with control signal inside control panel chip. When signal difference exceeds control panel sensitivity value, control panel demands electric actuator motor move in the direction to narrow the signal difference by controlling alternating current contactor on the electric actuator until signal difference is less than control panel sensitivity value.

### 2.1 Main specifications

| | |
|---|---|
| **Input signal** | Two-position control mode.<br>① Analog quantity: 4~20mA.DC (Input impedance 150Ω);<br>② Switch quantity: inching mode. |
| **Valve transmitting output signal** | 4~20mA.DC |
| **Intrinsic error** | ≤±0.2% |
| **Motor blocking protection time** | 1~25.4s (default 6.4s) |
| **Power consumption** | ≤5VA |
| **Action sensitivity** | 0.4% ~12.5% |
| **Insulation strength** | Working frequency 1500V, 1min |
| **Insulation resistence** | > 50MΩ |
| **Power voltage** | ① AC380V/AC440V, 50/60Hz±10%;<br>② AC110V/AC220V, 50/60Hz±10%;<br>③ DC24V. |

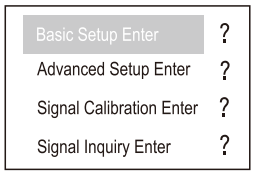
- Electronic or mechanical over-torque protection function. When electronic or mechanical over-torque failure occurs, retry function setting is available with parameters of retry times and retry control quantity.
- Failure protection functions of motor stalling, motor overheat protection etc.
- Three phase motor electrical braking function significantly improves positioning precision of actuators.
- Instantaneous Reverse Rotation Protection Function: When the actuator receives reverse action instruction in working process, prior to implementing reverse action instruction, the control panel stops rotation with certain time delay (delay time is adjustable as per requirement) to avoid unnecessary damage to electric motor, speed reducer or valve shaft etc.
- Failure code warning function.
- Factory data reset function.
- Relay contact alarm function of open position arriving, close position arriving, failure alarm, over-torque alarm, remote control, local status.
- Alarm function of signal disconnection and no feedback, and setting of maintaining current position, full open position, full close position or other required position is available.
- Free choices of two control modes for control panel on-spot debugging and function setting: hand-held infrared remote control or control through two buttons on the enclosure.
- When power supply is AC380V, automatic phase calibration protection function of three phase is available to ensure the actuator is always in correct rotation direction.

### 2.2 LCD

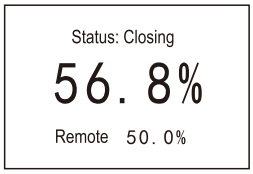
The actuator control panel is equipped with a 128*64 dot matrix graphic LCD. It can be divided to area I, II, and III as per the layout. Area I is valve position display area, presenting current valve position in the way of valve position opening degree percentage in real-time. Area II is control mode display area. Area III is operation status and alarm information presenting area (detailed displaying information please refer to alarm information in the remainder of the content). When entering working parameter setting menu, LCD will apply area I, II and III uniformly.

When the control panel of the actuator is powered on, self-checking on the instructions, the program area, the data area and A/D switching function in turn. LCD valve position display area presents current valve position opening degree percentage and the content of alarm area is deleted when all of the self-checking results are normal. The reminder of the abnormal failure will keep popping up and the control system cannot be operated and will wait for troubleshooting when any items is detected with negative results during self-checking process.

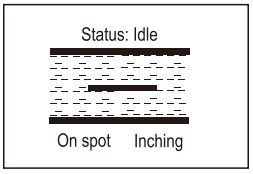
When the actuator control panel is initialized with power supply, area I presents the actual valve open degree in percentage. It presents in diagram (see picture below) when the valve is in full open or full close position. The lower right corner of area II,presents the signal transmitted from the host computer in percentage, when in analog quantity control mode. It presents the selected control mode of switch quantity(inching, two position, two position open valve, two position close valve) when in switch quantity control mode. The lower left corner of area II presents the current work mode of the actuator control panel (remote, idle and on spot).



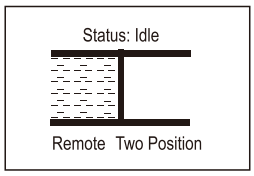

Main Menu Display




Valve Open Degree



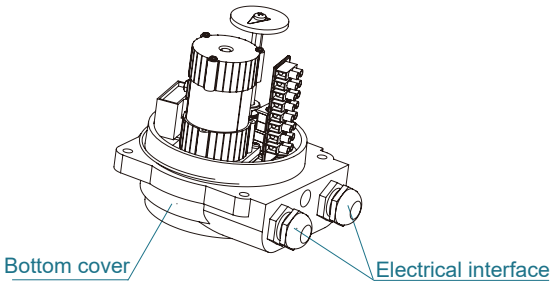

Close Position Arriving

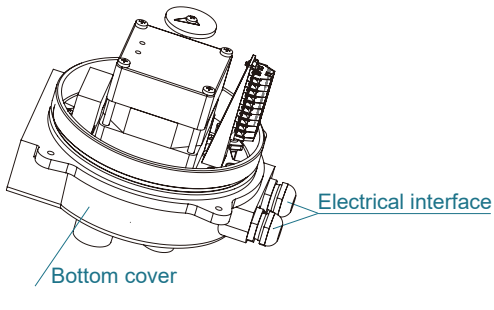



Open Position Arriving

### 3. Quick-Start type (ON/OFF)

Fig.550 electric quick-start electric actuator is researched and developed according to current market demands. The series have quick opening and closing function, high reliability and high stability.



# Technical specifications

| Model | Torque [Nm] | Switch time [sec/90°] | Mortor [W] | Insulation | ISO | Stem | Rated current on 50Hz [A] | | | | | | Weight [kg] | Manual override |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | DC24V | AC110V | AC220V | AC380V | AC400V | AC440V | | |
| 550-0S | 20 | 10 | 8 | E | F03-F05 | 11*11 | 0.2 | - | - | - | - | - | 1.2 | Spanner |
| 550-1S | 35 | 12 | 10 | E | F03-F05 | 14*14 | 1.2 | 0.4 | 0.3 | | - | | 2.8 | |
| 550-2S | 100 | 8 | 40 | F | F05-F07 | 17*17 | 3 | 0.65 | 0.33 | 0.26 | - | 0.21 | 8 | |
| | 200 | 8 | 60 | F | | | 4.2 | 0.89 | 0.45 | 0.27 | - | 0.21 | | |
| 550-3S | 350 | 8 | 90 | F | F07-F10 | 17*17<br>22*22 | 6.8 | 1.7 | 0.8 | 0.9 | - | 0.7 | 13 | |
| | 500 | 8 | 120 | F | | | 8.5 | 2 | 1.1 | 0.9 | - | 0.7 | | |

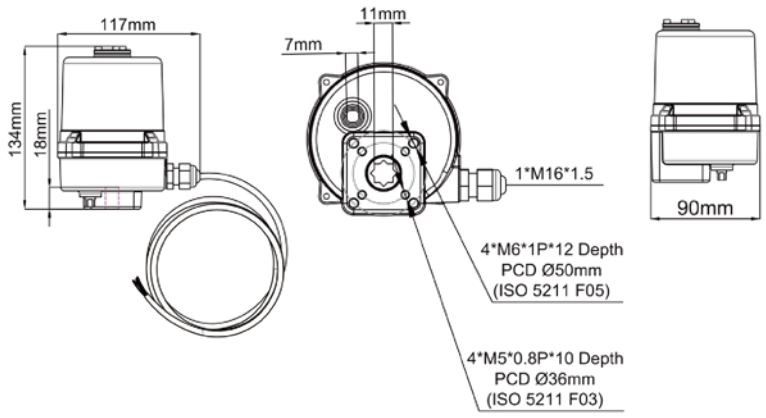
| Model | Torque [Nm] | Switch time [sec/90°] | Mortor [W] | Insulation | ISO | Stem | Rated current on 50Hz [A] | | | | | | Weight [kg] | Manual override |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | DC24V | AC110V | AC220V | AC380V | AC400V | AC440V | | |
| 550-1H | 50 | 10 | 18 | F | F03-F05-F07 | 14*14 | 1.6 | 0.8 | 0.4 | 0.2 | - | - | 3.2 | Push handwheel |
| | 70 | 15 | 18 | F | | | 1.6 | 0.8 | 0.4 | 0.2 | - | - | | |
| 550-2H | 100 | 8 | 40 | F | F05-F07 | 17*17 | 3.5 | 0.73 | 0.33 | 0.26 | 0.32 | 0.21 | 11 | |
| | 200 | 8 | 60 | F | | | 4.2 | 0.84 | 0.45 | 0.27 | 0.35 | 0.21 | | |

| Model | Torque [Nm] | Switch time [sec/90°] | Mortor [W] | Insulation | ISO | Stem | Rated current on 50Hz [A] | | | | | | Weight [kg] | Manual override |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | DC24V | AC110V | AC220V | AC380V | AC400V | AC440V | | |
| 550-2 | 100 | 20 | 20 | F | F05-F07 | 17*17 | 2.2 | 0.8 | 0.6 | 0.28 | - | 0.26 | 12 | Clutchless handwheel |
| | 200 | 30 | 20 | F | | | 2.3 | 0.8 | 0.6 | 0.28 | - | 0.26 | | |
| 550-3 | 300 | 20 | 40 | F | F07-F10 | 17*17<br>22*22 | 3 | 1.6 | 0.85 | 0.39 | 0.31 | 0.47 | 14 | |
| | 450 | 30 | 60 | F | | | 3.6 | 1.9 | 0.9 | 0.4 | 0.32 | 0.47 | | |
| 550-4 | 600 | 40 | 90 | F | F10-F12<br>F10-F14 | 22*22<br>27*27 | 8.5 | 1.8 | 0.95 | 0.46 | 0.4 | 0.54 | 22 | |
| | 1000 | 48 | 90 | F | | | 10.5 | 2 | 1.1 | 0.5 | 0.42 | 0.55 | | |
| 550-5 | 1500 | 35 | 120 | F | F12-F14-F16 | 36*36 | - | 4.8 | 2.8 | 1.2 | 0.9 | 1.1 | 43 | |
| | 2300 | 48 | 200 | F | | | - | 4.8 | 2.8 | 1.2 | 0.93 | 1.1 | | |
| 550-5G | 4000 | 81 | 200 | F | F12-F14-F16 | 36*36 | - | 4.8 | 2.8 | 1.2 | - | 1.5 | 78 | |
| | 5000 | 94 | 200 | F | | | - | 4.8 | 2.8 | 1.2 | - | 1.5 | | |
| 550-6 | 6000 | 40 | 200 | F | F14-F16 | 46*46 | - | - | - | 3.5 | - | - | - | |

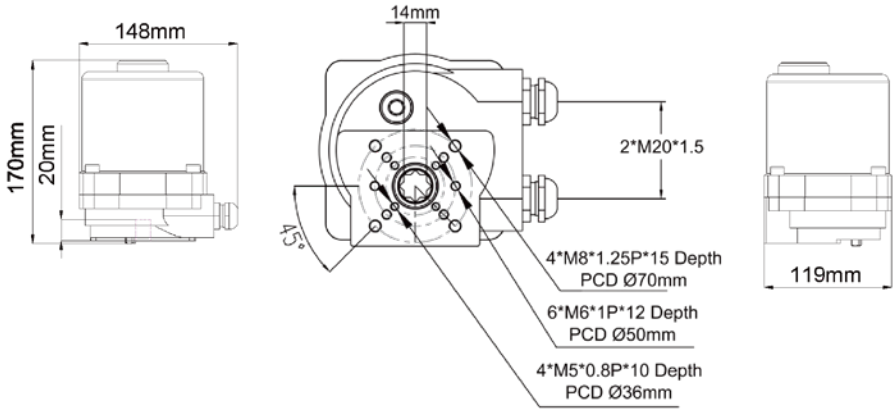
*Notes:*
*1. 550-S model is not available in an explosion-proof version.*
*2. The table shows the weight of the non-intelligent actuator. The intelligent version is about 5 kg heavier.*
*3. Switch time can be customized. For details, please contact Coreline.*

# Dimensions

## 550-0S




## 550-1S

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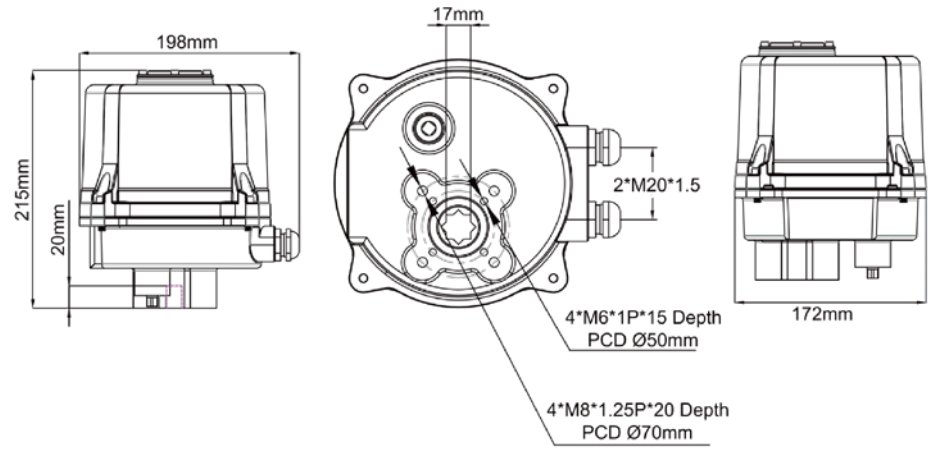
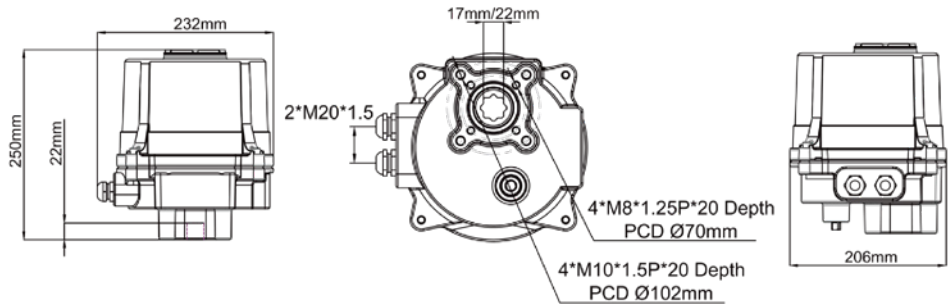
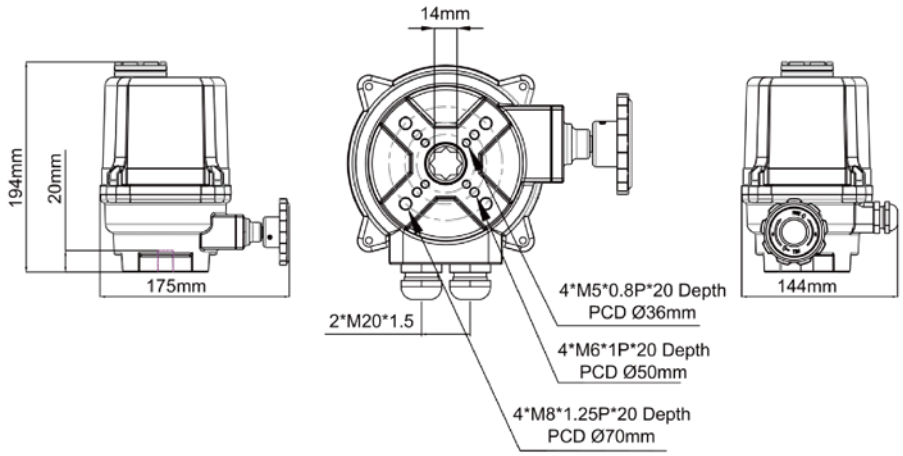



## 550-3S

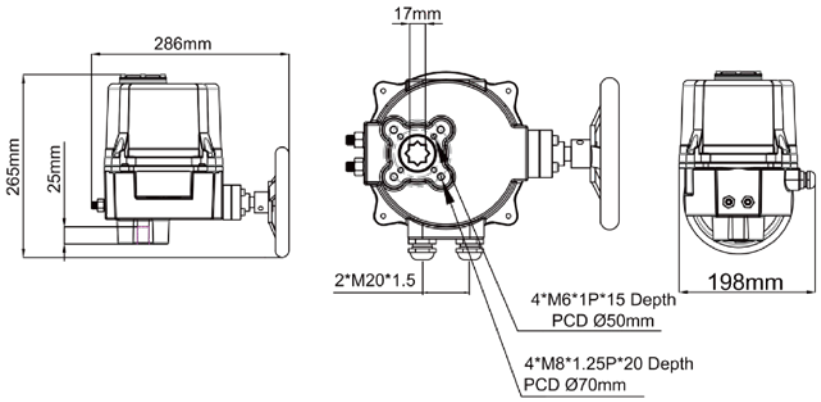


# Dimensions

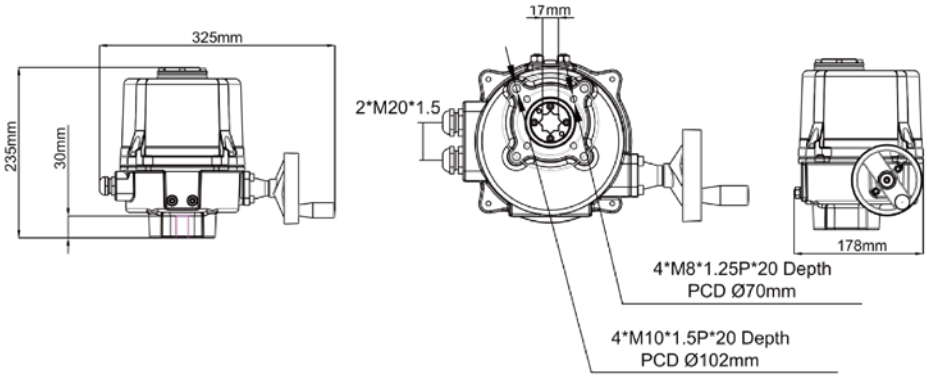
## 550-1H



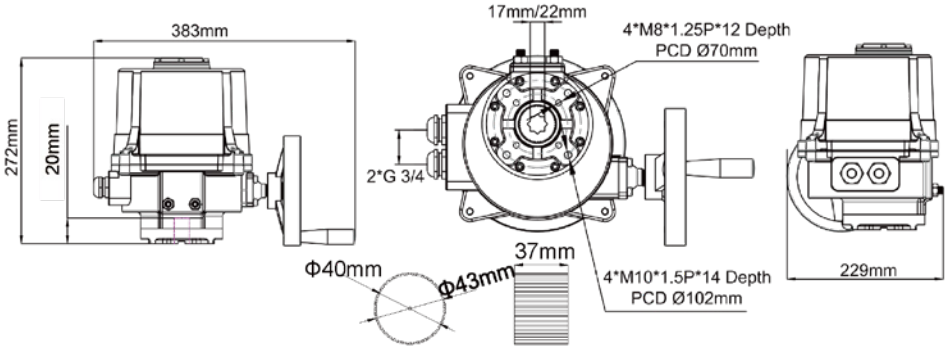

## 550-2H




## 550-2

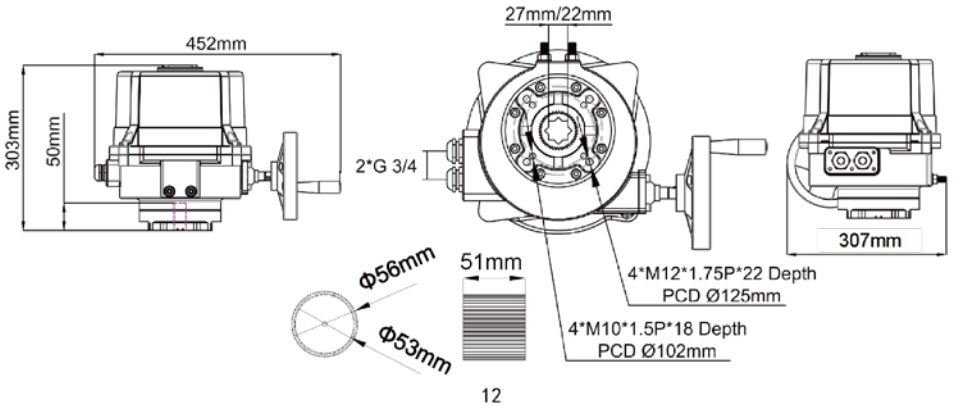



## 550-3

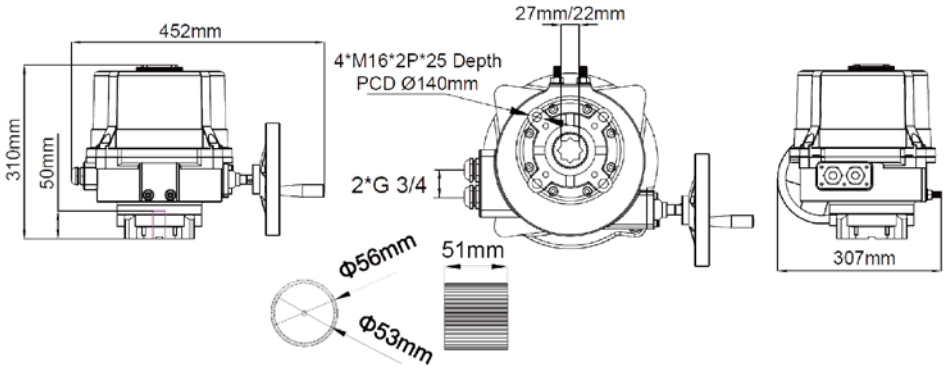


# Dimensions

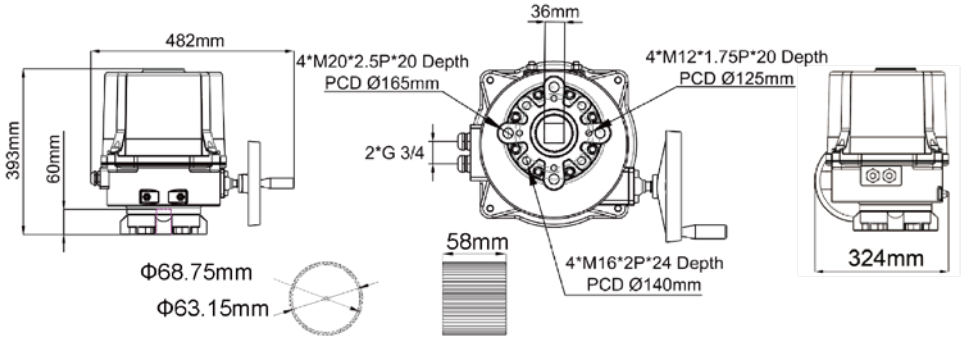
***550-4***
***F10+F12***



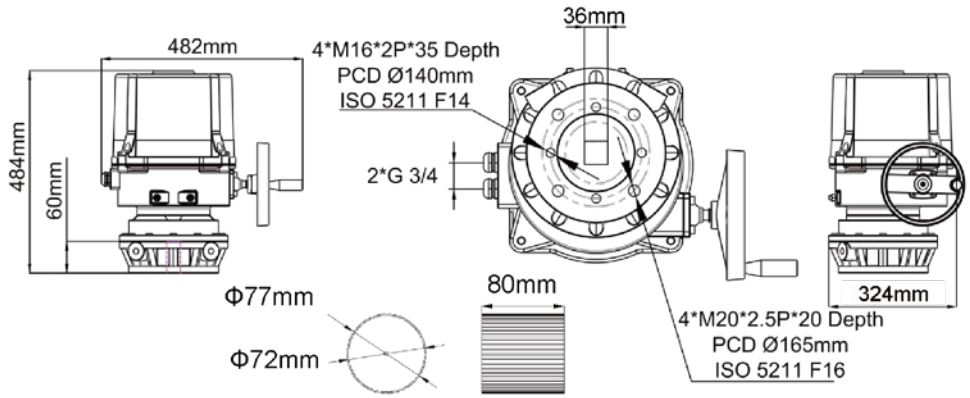

***550-4***
***F14***




***550-5***

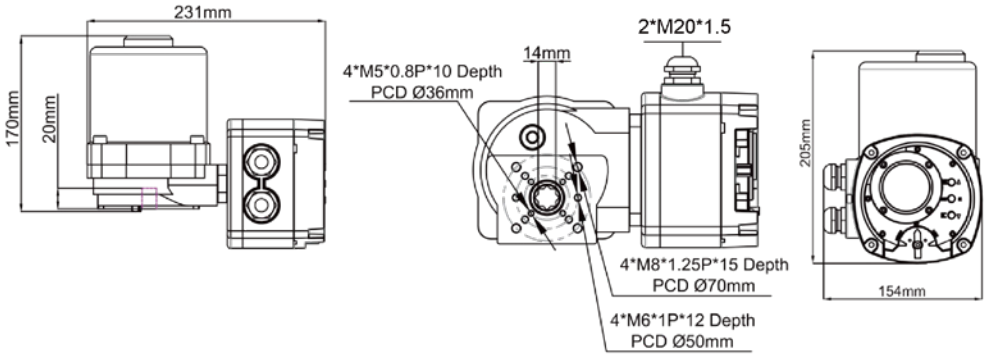



***550-5G***

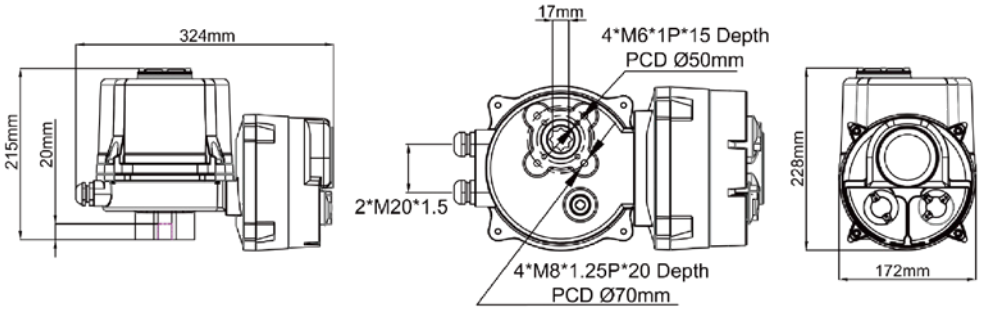


# Dimensions

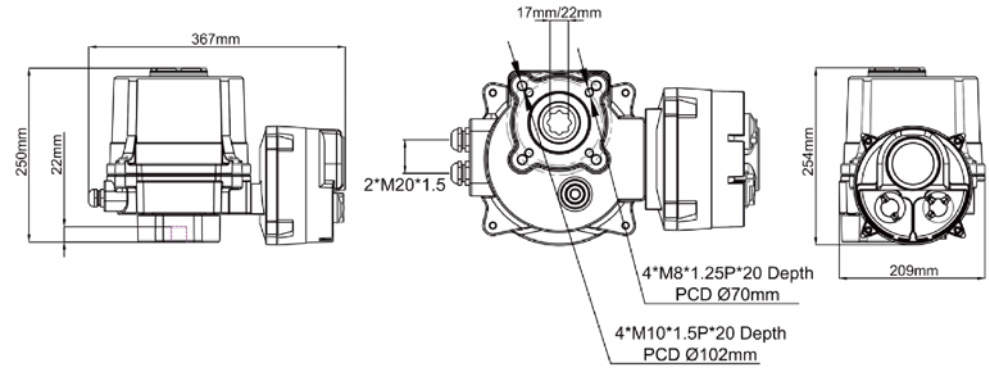
## 550-1S Intelligent type



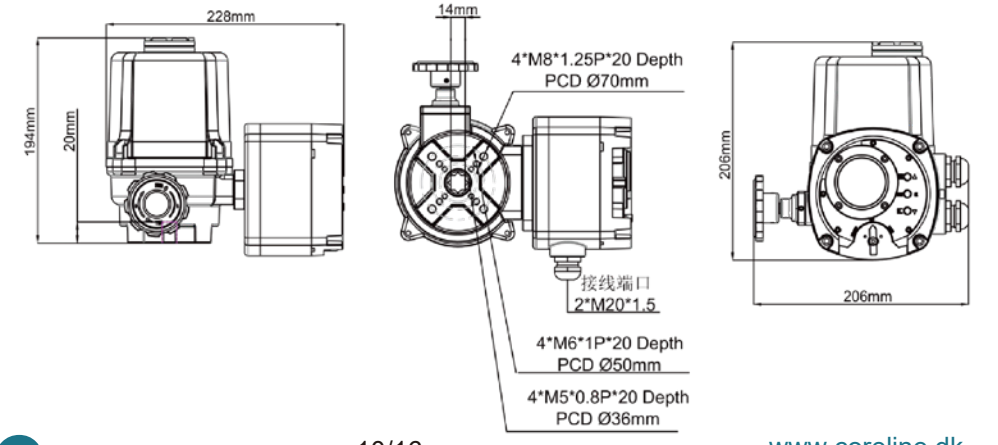

## 550-2S Intelligent type




## 550-3S Intelligent type

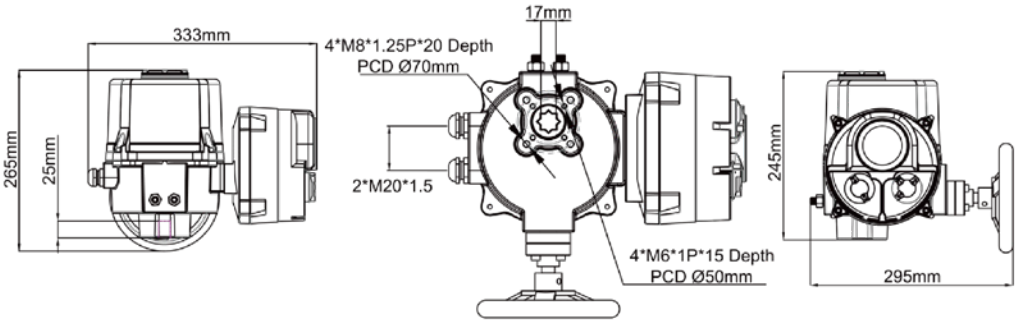



## 550-1H Intelligent type

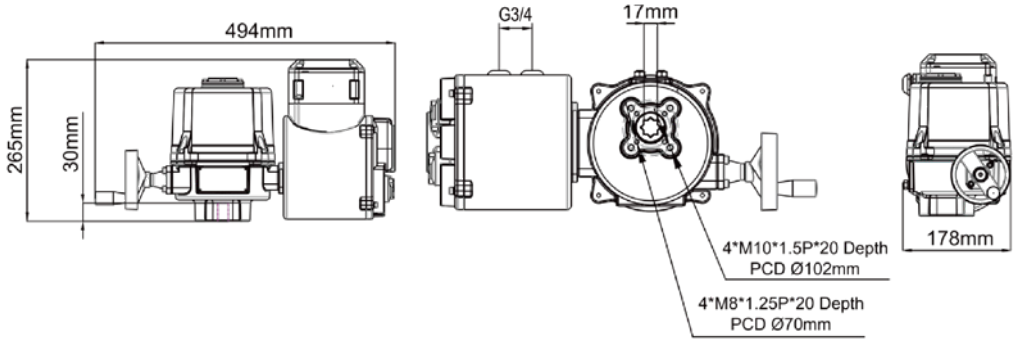


# Dimensions

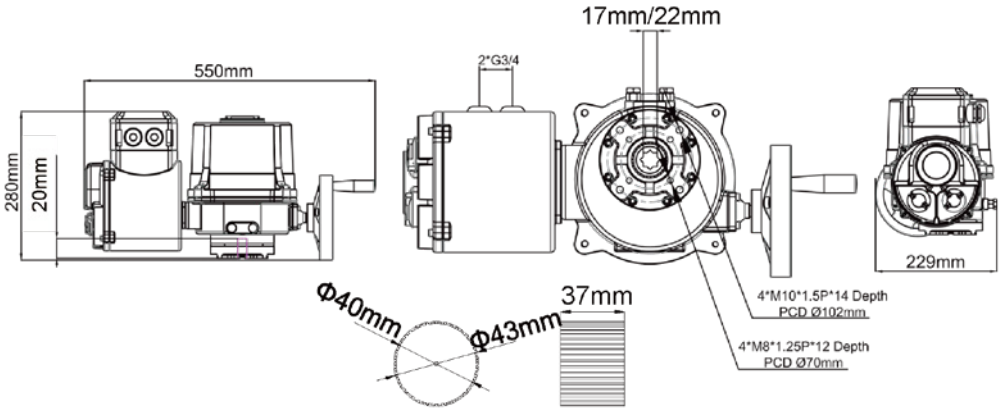
## 550-2H Intelligent type



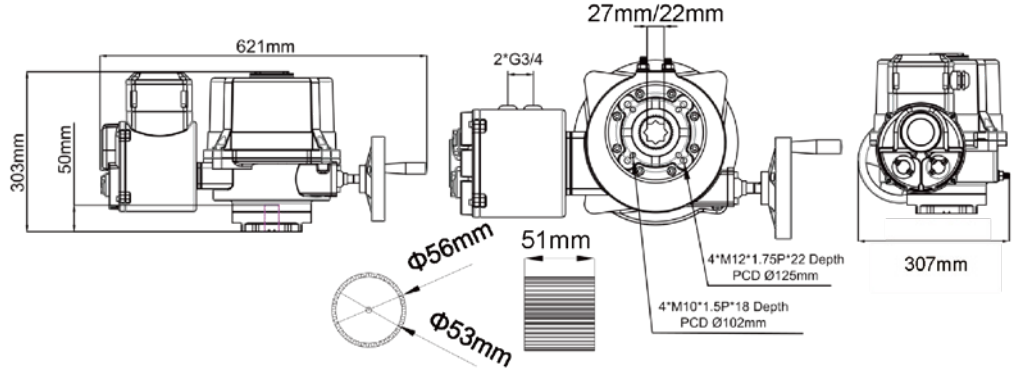

## 550-2 Intelligent type




## 550-3 Intelligent type

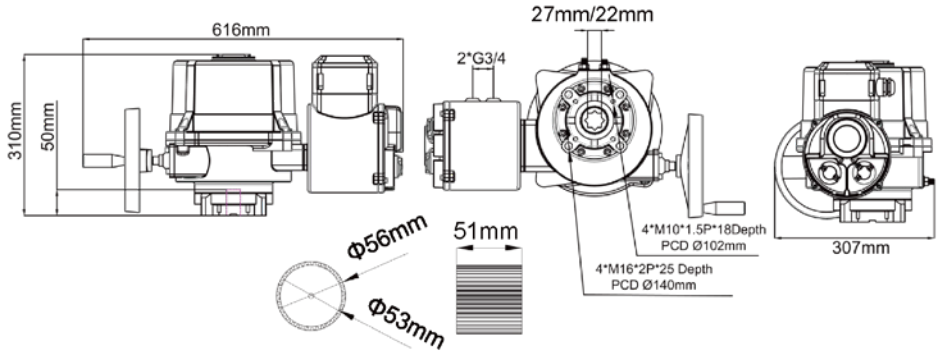



## 550-4 Intelligent type F10+F12

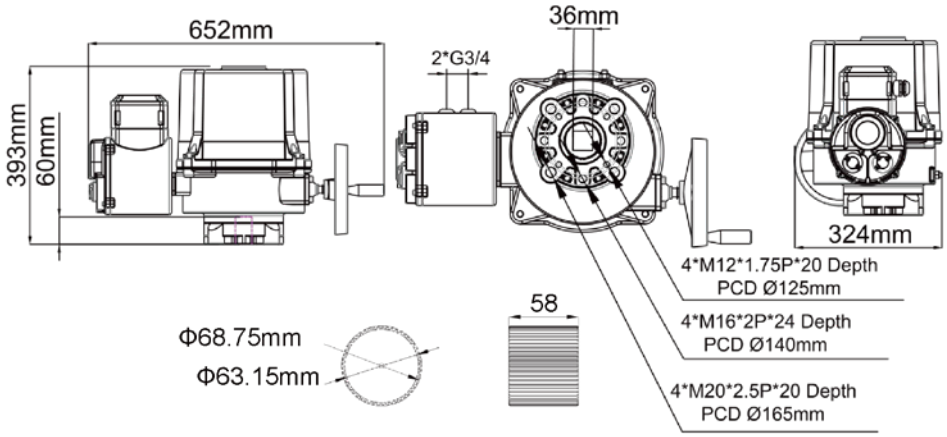


# Dimensions

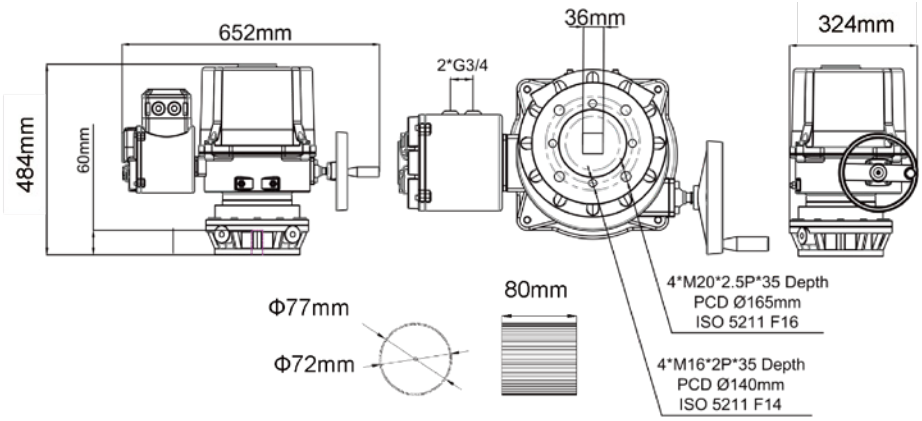
### *550-4 Intelligent type F14*



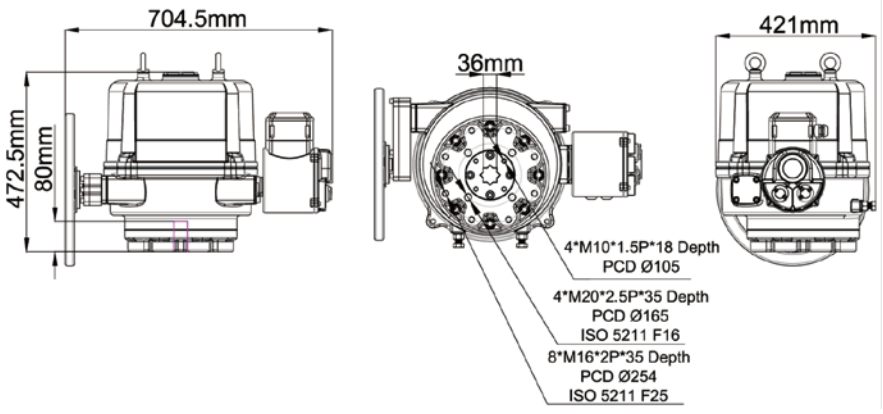

### *550-5 Intelligent type*




### *550-5G Intelligent type*

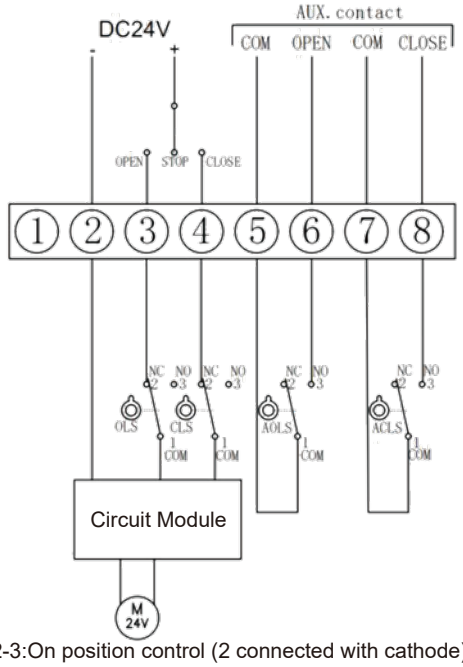



### *550-6 Intelligent type*



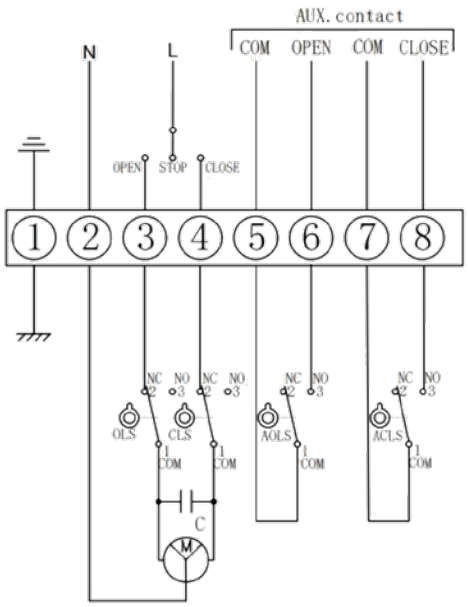
# Wiring diagram - ON/OFF type

## ON/OFF DC 24V



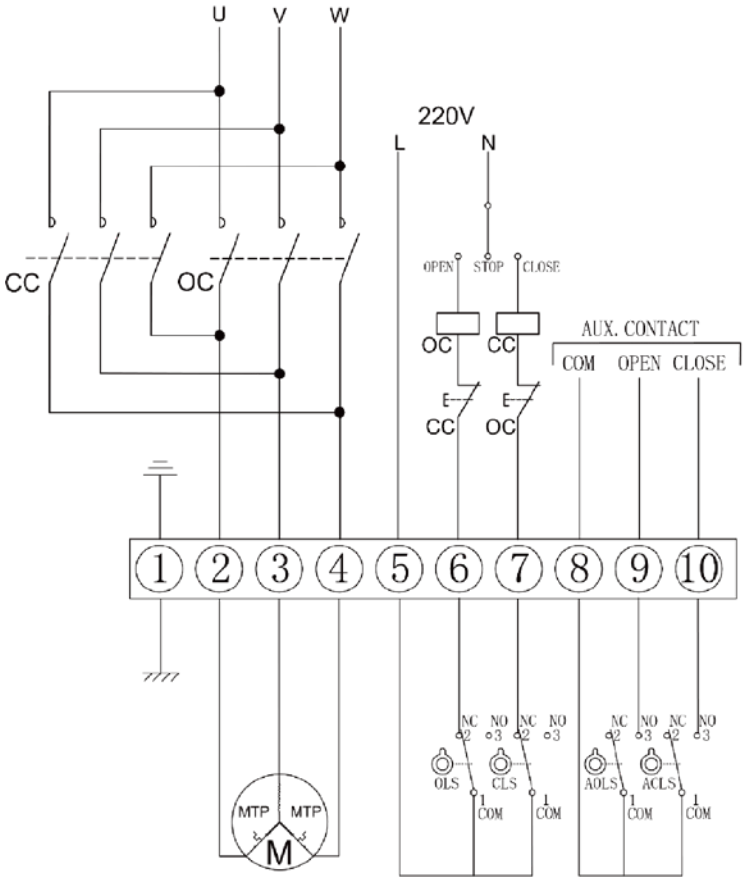

2-3:On position control (2 connected with cathode)
2-4: Off position control
5-6: Full Open signal feedback
7-8: Full Close signal feedback
5-7: COM is available for short connection

## ON/OFF AC110V/AC220V



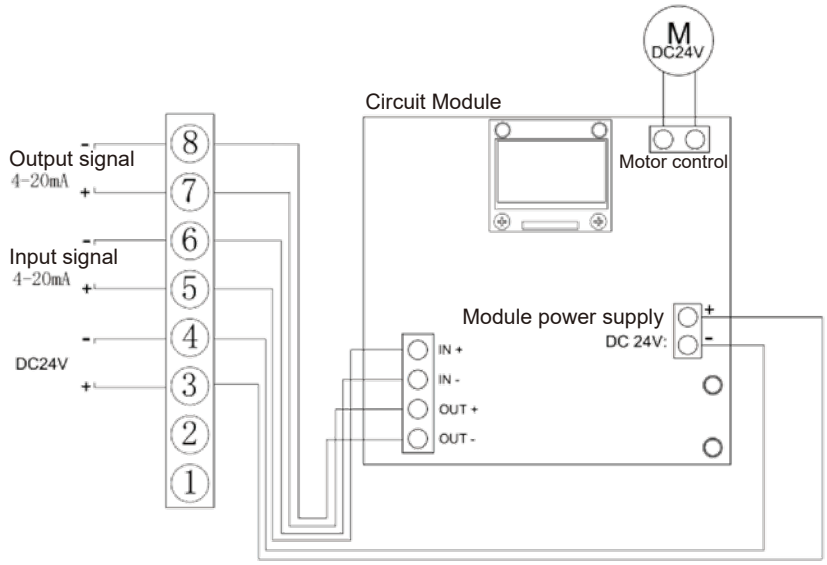

1: GND
2-3: On position control
2-4: Off position control
5-6: Full Open signal feedback
7-8: Full Close signal feedback
5-7: COM is available for short connection

## ON/OFF AC380V/AC440V



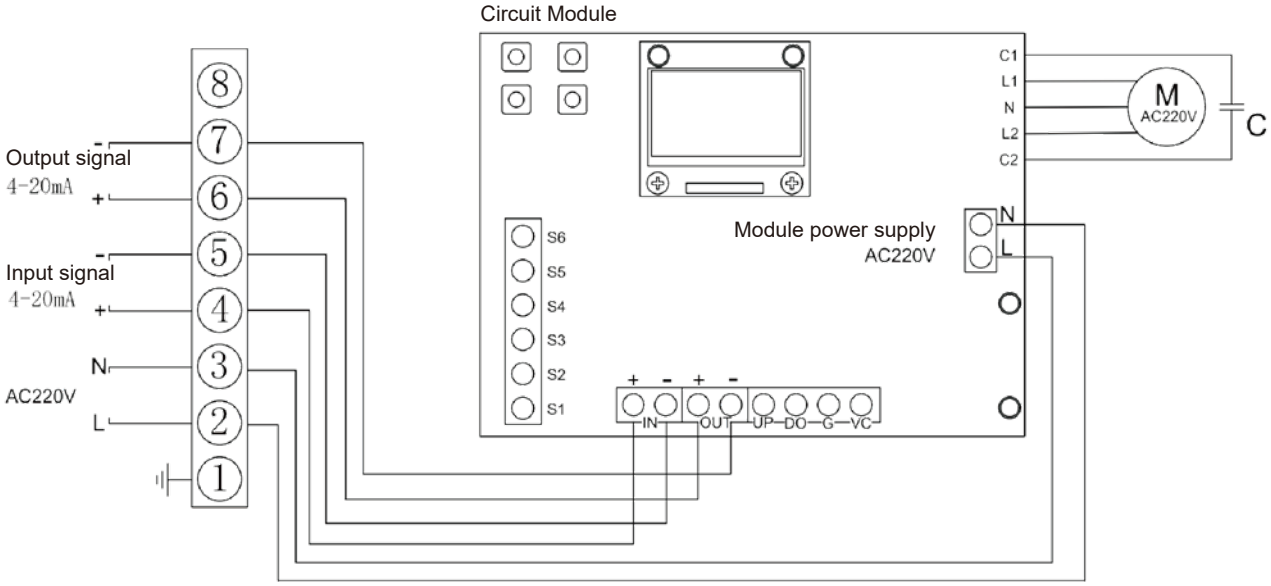

1: GND
2-3-4: Connection to power supply
5-6: On position control
5-7: Off position control
8-9: Full Open signal feedback
8-10: Full Close Signal Feedback
OC: Alternating current contactor (open)
CC: Alternating current contactor (close)

## MODULATING DC24V




3-4: Connect to power supply 24V (3 is connected with anode, 4 is connected with cathode)
5-6: 4-20mA signal input (5 is connected with anode, 6 is connected with cathode)
7-8: 4-20mA signal output (7 is connected with anode, 8 is connected with cathode)

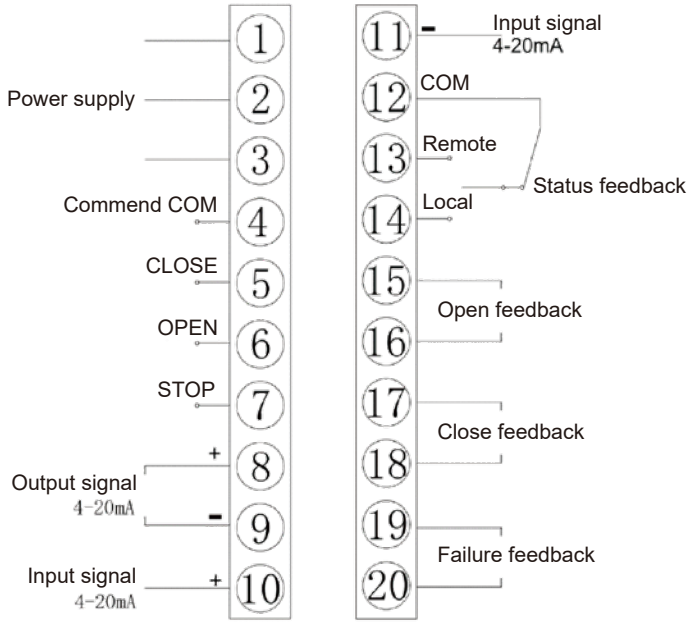
## MODULATING AC220V




1: GND
2-3: Connect to power supply 220V
4-5: 4-20mA signal input (4 is connected with anode, 5 is connected with cathode)
6-7: 4-20mA signal output (6 is connected with anode, 7 is connected with cathode)

# Wiring diagram - Intelligent type

## 550-S/550-H Intelligent type




1-2-3: Power supply
AC380V/AC440V: 1 - (A); 2 - B); 3 - C).
AC110V/AC220V: 1 -(L); 3 - (N).
DC24V: 1 - (+); 2 - (−).

4-5: Valve close control

4-6: Valve open control

4-7: Valve stop

8-9: 4-20mA signal output (8 is connected with anode, 9 is connected with cathode)

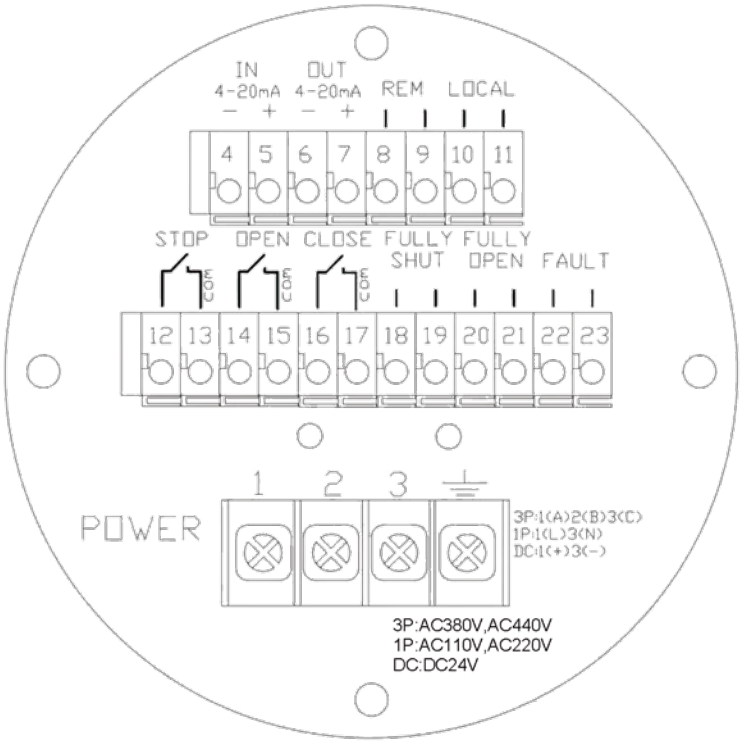
10-11: 4-20mA signal input (10 is connected with anode, 11 is connected with cathode)

15-16: Full open signal feedback

17-18: Full close signal feedback

19-20: Failure feedback

## 550 Intelligent type




1-2-3: Power supply
AC380V/AC440V: 1 - (A); 2 - B); 3 - C).
AC110V/AC220V: 1 -(L); 3 - (N).
DC24V: 1 - (+); 2 - (−).

4-5: 4-20mA signal input (4 is connected with cathode, 5 is connected with anode)

6-7: 4-20mA signal output (6 is connected with cathode, 7 is connected with anode)

12-13: Valve stop

14-15: Valve open control

16-17: Valve close control

18-19: Full close signal feedback

20-21: Full open signal feedback

22-23: Failure feedback

# Application and order instruction

## *Environment*

### Indoor

For mounting in environment with explosive gas, explosion-proof actuator is required;
For mounting in submerged or outdoor environment, please contact Coreline in advance;
There should be enough space for wiring, manual operation and maintenance activities.

### Outdoor

To avoid rainwater and direction sunlight, protective cover shall be installed; or use IP67 or above;
There should be enough space for wiring, manual operation and maintenance activities.

### Ambient Temperature

ON/OFF type: -20℃ to +70℃;
Modulating/Intelligent type: -20℃ to +70℃;
When ambient temperature is below 0℃, space heater is required.

### Medium Temperature

When the medium temperature is over 65℃, bracket and coupling should be used between the actuator and the valve - in case the high temperature transferring from the medium to the actuator which causes damage to the actuator.

## *Order instruction*

**550 – T – K – V – B**

- 550 ↓ Product model
- T ↓ Output Torque (NM)
- K ↓ Contol Mode
- V ↓ Voltage
- B ↓ Note

| Fig.550 | T(N.M) | K | | | | | V | | | | | | | B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | O | M1 | M2 | M3 | ICM | D | E | F | G | H | I | J | Optional |
| 550-0S | 20 | – | • | • | • | – | – | – | • | – | – | – | – | |
| 550-1S | 35 | • | • | • | • | • | • | • | • | • | – | – | – | |
| 550-2S | 100 | • | • | • | • | • | • | • | • | • | • | • | – | |
| | 200 | • | • | • | • | • | • | • | • | • | • | • | – | |
| 550-3S | 350 | • | • | • | • | • | • | • | • | – | • | • | – | |
| | 500 | • | • | • | • | • | • | • | • | – | • | • | – | |
| 550-1H | 50 | • | • | • | • | – | • | • | • | • | • | – | – | |
| | 70 | • | • | • | • | – | • | • | • | • | • | – | – | |
| 550-2H | 100 | • | • | • | • | • | • | • | • | • | • | • | • | X |
| | 200 | • | • | • | • | • | • | • | • | • | • | • | • | A |
| 550-2 | 100 | • | • | • | • | • | • | • | • | • | • | • | – | B |
| | 200 | • | • | • | • | • | • | • | • | • | • | • | – | |
| 550-3 | 300 | • | • | • | • | • | • | • | • | • | • | • | • | Custom color |
| | 450 | • | • | • | • | • | • | • | • | • | • | • | • | Special requirement |
| 550-4 | 600 | • | • | • | • | • | • | • | • | – | • | • | • | etc. |
| | 1000 | • | • | • | • | • | • | • | • | – | • | • | • | |
| 550-5 | 1500 | • | • | • | • | • | • | • | – | – | • | • | • | |
| | 2300 | • | • | • | • | • | • | • | – | – | • | • | • | |
| 550-5G | 4000 | • | • | • | • | • | • | • | – | – | • | • | – | |
| | 5000 | • | • | • | • | • | • | • | – | – | • | • | – | |
| 550-6 | 6000 | • | • | • | • | • | • | • | – | – | • | • | – | |

**Control modude: K**
**O:** ON/OFF, dry contact feedback
**M1:** 4-20mA input/output
**M2:** 0-5V input/output
**M3:** 2-10V input/output
**ICM:** Intelligent integrated type

**Voltage: V**
**D: AC220V(50/60hz)**
**E: AC110V(50/60Hz)**
**F: DC24V**
**G: DC12V**
**H: AC380V(50/60Hz)**
**I: AC440V(50/60Hz)**
**J: AC400V(50Hz)**

**Note: B**
**X: Space heater (Optional, recommended to use for high humidity, low temperature applications).**
**A: 0-1KΩ or 0-5KΩ resistance output.**
**B: ON/OFF type with optional 4-20mA output signal.**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