

ITM (i-Tork Intelligent Multi-turn)

IOM

(MANUAL REV 1.0)

MODEL : ITM-0180/0450/0750

(13 MAR 2013)



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1. NOTICE (prior to installation)

- 1.1 Prior to installation, please confirm if the Actuator specifications are perfectly in match with the requirements.
(MODEL, MAIN POWER, CONTROL POWER, OPTIONAL ITEM, and so on)
- 1.2 Please confirm if the Size and Type of Valve/Damper are in match with the ordered specifications.
- 1.3 Please confirm if the Actuator and Valve/Damper are clearly coupled/assembled.
- 1.4 Please confirm electrical specifications (Main Power, IN/OUT Signal, Wiring Condition upon Wiring Diagram).
- 1.5 Please do NOT randomly modify, repair, wire, and/or change the Actuator.
- 1.6 When it is raining, please do not work on wiring due to possibility of electric shock.
- 1.7 Every wiring job should be done when power is blocked.
- 1.8 In case of 3PH, please be noticed of Loss and/or Reverse of the Phase.
- 1.9 When using the Actuator with RPC and/or CT option equipped, if CLOSE/OPEN limit position value is changed, please reset the output value for sure since Factory setup is proper before shipment.
- 1.10 If the Actuator is dis/assembled and/or modified on user's own decision without our company's technical support and/or explanation, our company is not responsible for that actuator even within warranty period.
- 1.11 Exterior, Wiring Diagram, Control Card, and this Installation Operation Manual's contents may be changed for performance improvement without any prior notice to users.

2. GENERAL FEATURES

- 2.1 ITM Actuator is able to be setup and controlled without opening front cover.
- 2.2 Even in explosion-proof area, it is convenient/possible to setup and control the indication function such as Torque Setup and Limit Setup promptly using remote controller and/or CLOSE/OPEN Selector and LOCAL/REMOTE Selector. Even though main power is not connected, set-up is possible by installed battery.
- 2.3 On Diagnostics MENU, it is possible to confirm overall condition of Control System, Valve, and Actuator.
- 2.4 Since this IOM includes every instruction for users to install, inspect, control, and operate the Actuator, installers and users must be aware of this IOM's instruction.
- 2.5 If there is Explosion-proof indication on the name plate, it is possible to use in the area of explosion-proof such as ZONE 1 and ZONE 2.

- 2.6 Please remove the actuator to Non explosion-proof area for repair and maintenance. The Actuator should be repaired and/or maintained by such experienced technician only so please contact our company's technical department if necessary.
- 2.7 In case of excessive use of the Actuator, the temperature on the Motor surface may reach up to 132°C so please be noticed.
- 2.8 There is BYPASS function for Motor TP. In case of ESD, certificate of explosion-proof is not in valid.
- 2.9 This Actuator has no self-protection function against for local environment. Users should arrange/organize such proper local environment for operation and protect the actuator properly from the local environment.
- 2.10 If the local area/environment is not such condition for the Actuator to be installed immediately, please store the Actuator in a dry place. If it is possible to make cabling job after the Actuator is installed, please change the Cable Entry Plug for such metal Plug sealed with PTFE tape.

3. DRIVE BUSH

3.1 DRIVE BUSH ASS'Y DISASSEMBLY



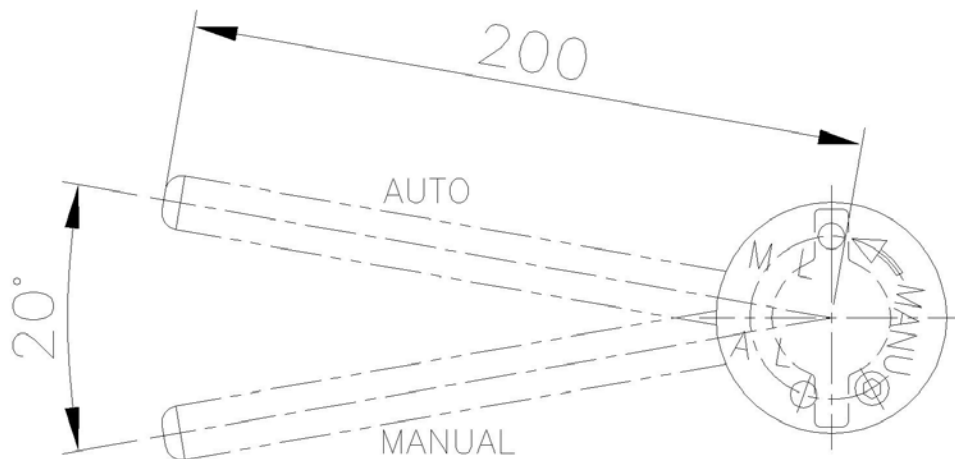
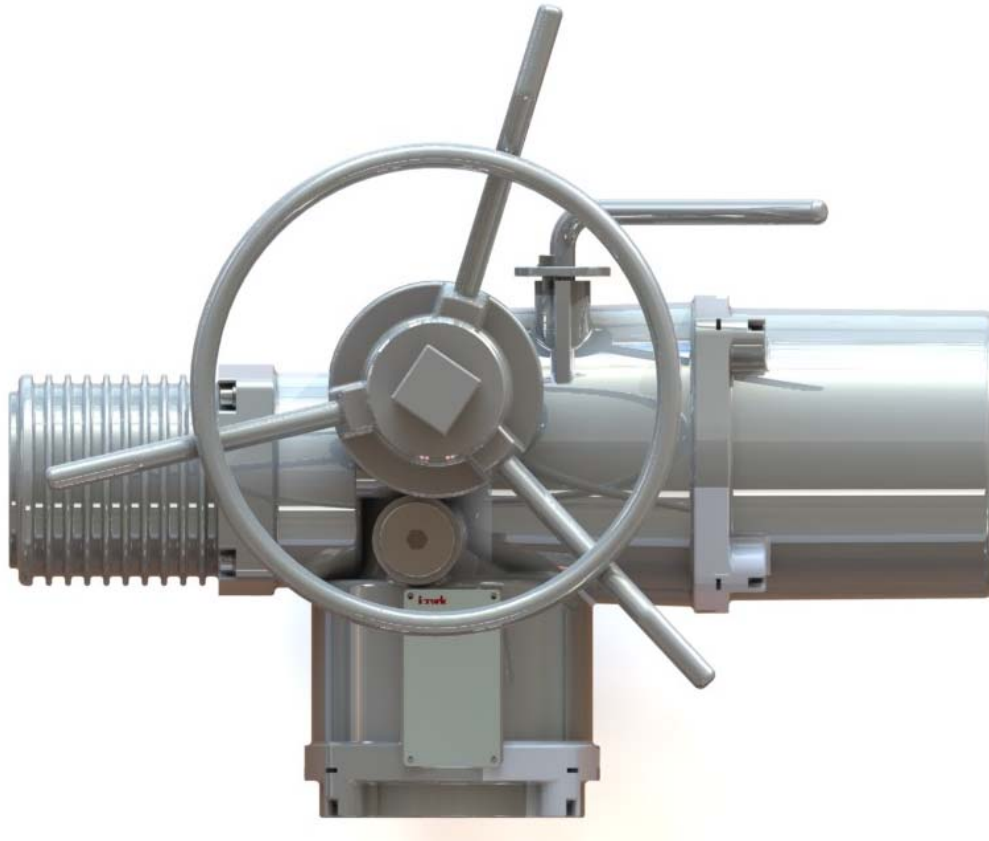
- 3.1.1 Please release those 4pcs of NUT from the Actuator body.
- 3.1.2 Please release the bolt on bearing cover using hexagonal L-WRENCH and disassemble the Bearing Cover.
- 3.1.3 Please take off Drive Bushing and Thrust Bearing Ass'y from the Housing.
- 3.1.4 After disassemble Snap Ring, Lock Nut, and Thrust Bearing, please keep those parts in a clean place.
- 3.2 DRIVE BUSH PROCESS
 - 3.2.1 Please confirm the Valve's Stem Screw standard or Gear Box spindle size.
 - 3.2.2 Please make the Drive Bushing properly upon standard and confirm size/type.
- 3.3 DRIVE BUSH ASS'Y

- 3.3.1 Please assemble Thrust Bearing on the Drive Bushing. In the meantime, please be noticed that some dust or foreign substance should not be put in the Bearing. Also, if lack of Grease is noticed, please apply some proper amount of Grease and then assemble it.
- 3.3.2 Please lock/tighten the Lock Nut and then assemble the Snap Ring.
- 3.3.3 Please assemble the Drive Bushing Thrust Bearing Ass'y on the Housing.
- 3.3.4 Please assemble the Bearing Cover and tighten using hexagonal L-Wrench.
- 3.3.5 Please assemble the Drive Bush Ass'y onto the Body and then tighten those 4pcs of Nut as well.

4. INSTALLATION

- 4.1 Please confirm if the Valve is fixed before installing the Actuator. Due to the heavy weight of the Actuator, it may be dangerous while installing so please be noticed accordingly.
- 4.2 If necessary, please use some lifting equipment or something to lift the Actuator up for easy installation. Especially, the whole procedure of Actuator installation should be operated under such experienced technician.
- 4.3 The Actuator should lean on some proper support until the Actuator Drive Bushing is installed on the Valve Shaft completely and the Actuator is completely mounted on the Valve Flange.
- 4.4 The Actuator Flange and the Valve should be under ISO5210.
- 4.5 After the Actuator is mounted on the Valve, please never lift up the Actuator itself only and please lift it with the Valve for sure all the time. Each assembly procedure should be operated individually upon such safe lift work procedure standard.
- 4.6 The Drive Bushing should be made by user or the Valve maker's data. However, the Bushing should be separated before process.
- 4.7 The Drive Base Flange is followed by national standard. ITM Actuator Flanges are F10, F14, and F16 under ISO5210.
- 4.8 Please confirm if all power is disconnected before connecting the power and/or opening the terminal cover for wiring job. Also, please confirm if the power supply is perfectly in match with the power indicated on the Actuator name plate.
- 4.9 In Explosion-proof area, such Explosion-proof Cable Joint should be used for Cable Entry. The cable joint should be in match with the cable's external diameter.
- 4.10 Please block the cable entry that is not in use with the Plug for explosion-proof.

5. MANUAL OPERATION



- 5.1 Please turn the switching lever to the body by about 20°. In this case, if the handle clutch and the clutch edge of the body are in touch, please turn the handle by about 30° and then turn the switching lever to the body by 20°.
- 5.2 Please turn the handle for Clockwise (CW, SHUT) to close the Actuator. Please turn the handle for counter-clockwise (CCW, OPEN) to open the Actuator.
- 5.3 Once the Handle operation is done, please just leave the switching lever or the handle without returning by force. If the Motor is running by electric power, the

internal clutch is automatically back to motor position by declutching system so the Actuator is run by motor power.

6. STANDARD SPECIFICATIONS

- 6.1 MODEL : ITM-0180/0450/0750
- 6.2 RATED TORQUE : 180Nm/450Nm/750Nm
- 6.3 INCOMING POWER
 - 6.3.1 3PH, AC 220V/380V/400V/415V/440V/460V/480V, 50/60Hz, $\pm 10\%$
 - 6.3.2 About 1PH, AC 110V/220V, 50/60Hz, $\pm 10\%$; please send inquiry to our company.
- 6.4 CONTROL POWER
 - 6.4.1 INTERNAL POWER : DC 24V
 - 6.4.2 EXTERNAL POWER : AC/DC 24V~48V
 - 6.4.3 EXTERNAL POWER : 1PH, AC 110V/220V, 50/60Hz, $\pm 10\%$
- 6.5 INPUT RESISTANCE (MODULATION) : 250 Ω
- 6.6 OUTPUT SIGNAL (MODULATION) : 4-20mA/DC, SOURCE TYPE
- 6.7 LOAD RESISTOR (MODULATION) : MAX. 750 Ω
- 6.8 INDICATOR (DRY CONTACT)
 - 6.8.1 RELAY : 9 PORT (S1~S8, FAULT)
 - 6.8.2 ANALOG SIGNAL (OPTION : RPC/CT) : 4~20mA/DC
- 6.9 Ambient Temperature : -20°C ~ +70°C (-4°F ~ +158°F)
- 6.10 Ambient Humidity : 90% RH MAX. (NON-CONDENSING)
- 6.11 Dielectric Test : AC 1800V/1SEC
- 6.12 Insulation Resistance : 100M Ω or more/DC 500V
- 6.13 Vibration Test : Axis X, Y, Z 10g (6g RMF), Frequency 0.2~34Hz, within 180min.
- 6.14 ON-OFF DUTY : S2, 20MIN
- 6.15 MODULATING DUTY (RPC) : S4, 30%
- 6.16 ACTUATOR : IP68 WATERPROOF RATE (10M 100HOUR)
- 6.17 REMOTE CONTROL : IP67 WATERPROOF RATE
- 6.18 LED : 4EA (POWER/FAULT/CLOSE/OPEN)
- 6.19 DISPLAY : 128X64 GRAPHIC LCD
- 6.20 BATTERY : U9VL(9V, 1200mAh), LITHIUM/MANGANESE DIOXIDE DESIGNATION : NEDA 1604 LC
- 6.21 OIL
 - 6.21.1 AGMA 250.04, AGMA251.02, U.S.STEEL 224, DAVID BROWN TABLE E and so on should be satisfied with the performance.
 - 6.21.2 ISO Viscosity : 150

6.21.3 Freezing Point -21°C, Flashing Point 248°C

6.21.4 Category/Type : Industrial User 2Types(ISO VG 150) / GS CALTEX MEROPA 150

6.21.5 Usage : For gear of heavy industrial machine (INDUSTRIAL GEAR OIL)

7. WIRING AND OPERATION

7.1 BATTERY

7.1.1 As factory set up, the Battery is supplied in but not connected to ensure safety and prevent discharge while transporting and/or storing for a long time.

7.1.2 Prior to input power, please open the Battery Holder Cover and connect the Jack accordingly. If the Actuator is operated without connecting this Battery, the Display continuously shows "LOW BATTERY" and it may cause malfunction due to loss of set-up values when the power is off while using the Actuator.

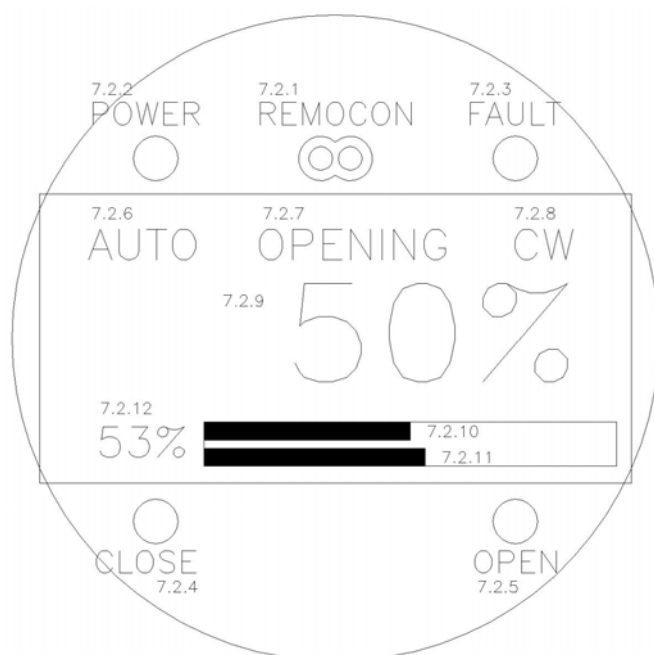
7.1.3 REPLACEMENT

7.1.3.1 The Battery change is recommended one every three (3) years and please use the one that our company has specified as standard. However, this recommended replacement period may be different depending on installation conditions and local environment. Also, if "LOW BATTERY" is indicated, please immediately replace the Battery.

7.1.3.2 When replacing the Battery, please turn the LOCAL/REMOTE SELECTOR to "STOP" for sure.

7.1.3.3 The Battery should be replaced when the power is "ON" for sure. If the Battery is replaced when the power is 'OFF', the Valve position may not be ensured after replacing.

7.2 DISPLAY WINDOW



7.2.1 REMOCON

7.2.2 POWER :
WHITE, LAMP

7.2.3 FAULT :
YELLOW, LAMP

7.2.4 CLOSE :
GREEN, LAMP

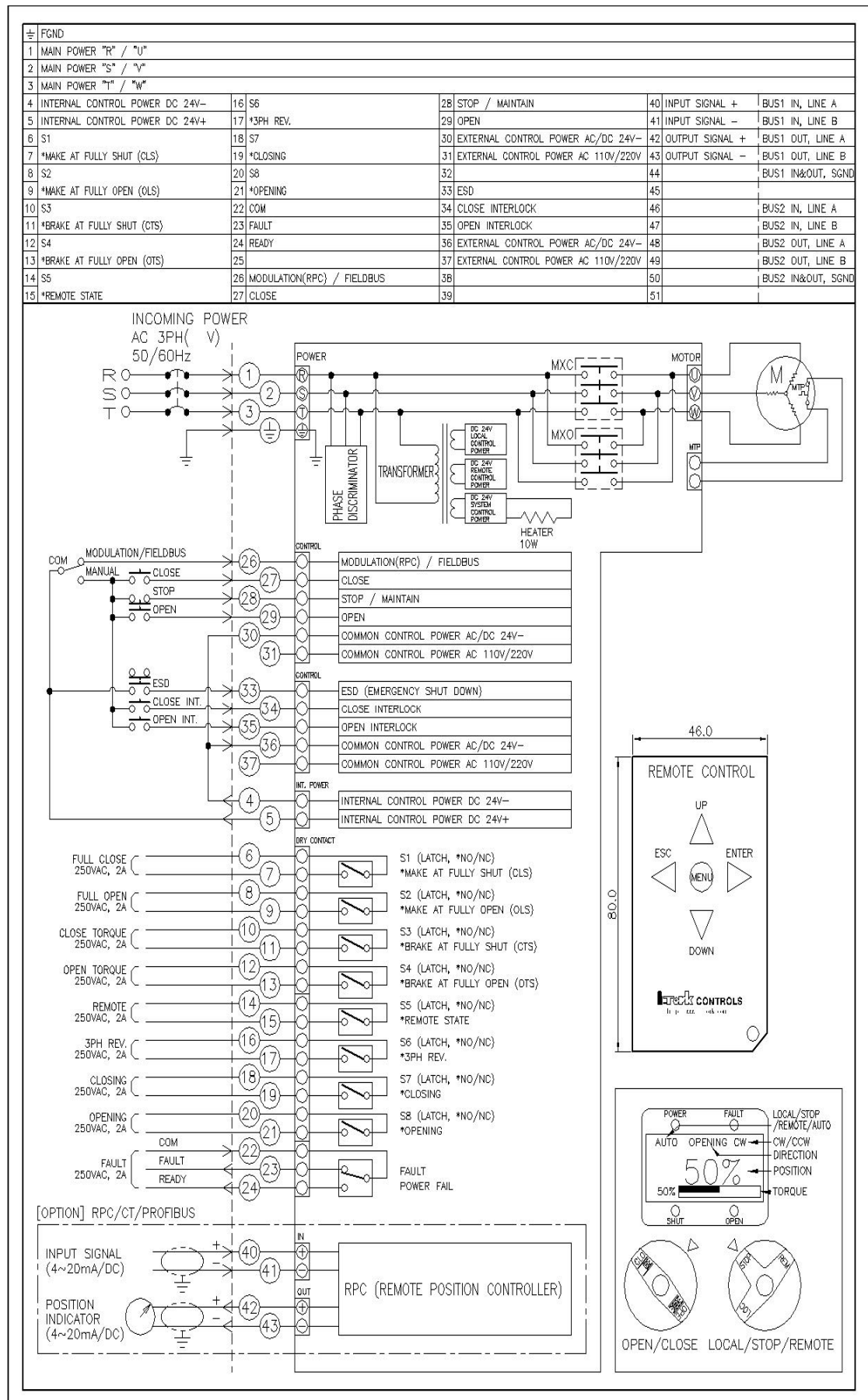
7.2.5 OPEN :
RED, LAMP

7.2.6 MODE :
LOCAL / STOP /
REMOTE / AUTO

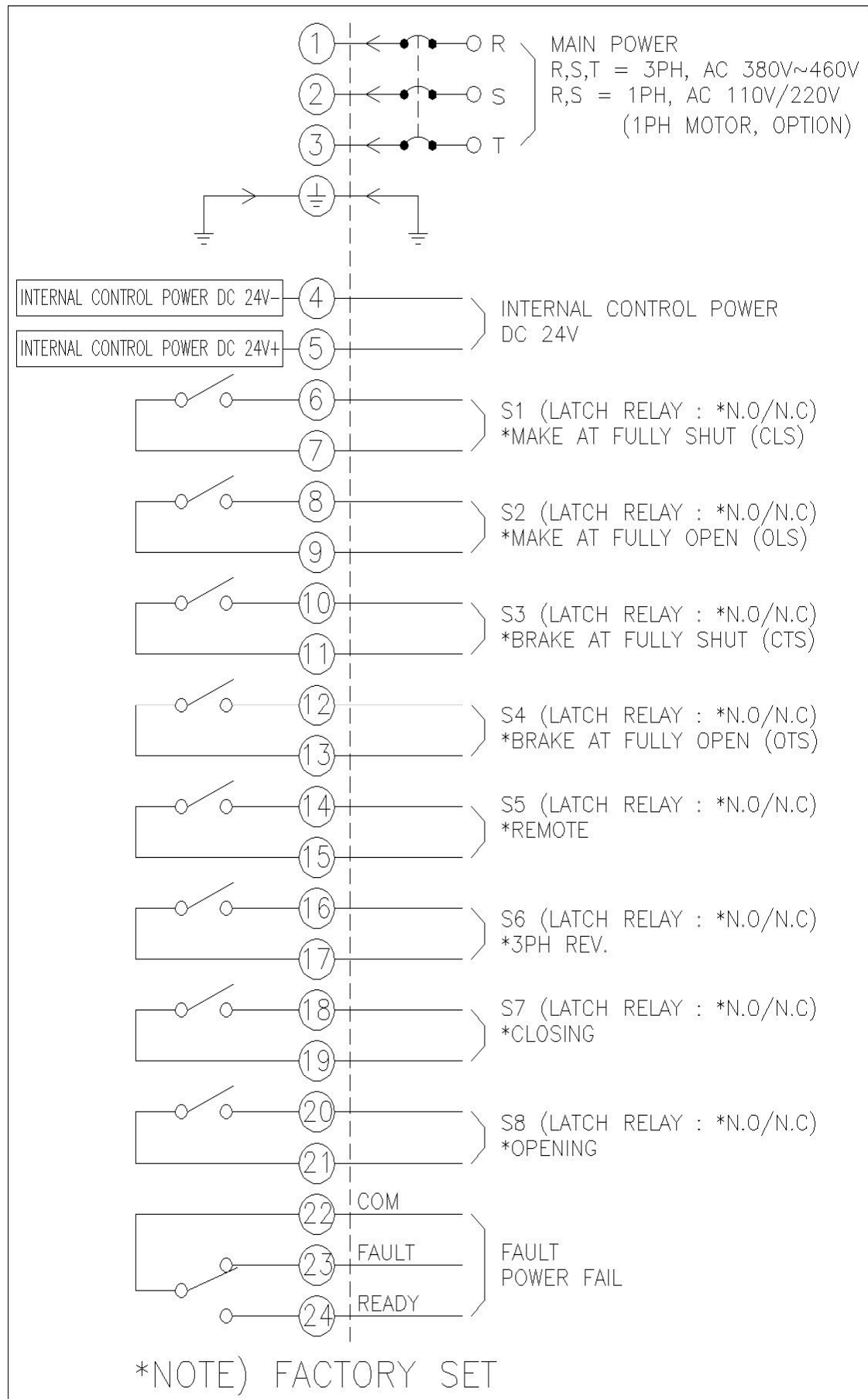
- 7.2.7 OPERATION : OPEN / CLOSE / OPENING / CLOSING / STOP
- 7.2.8 CLOSE Operating Direction : CW / CCW
- 7.2.9 POSITION : indicates current ACTUATOR/Valve position, 0%~100%
- 7.2.10 The Torque set is indicated by Graph.
- 7.2.11 The current Torque occurred on the Actuator is indicated by Graph.
- 7.2.12 The current Torque occurred on the Actuator is indicated by percentage.
- 7.3 CLOSE/OPEN Set-up
 - 7.3.1 Please turn the LOCAL/REMOTE SELECTOR to "STOP" and start setting up with the remote controller.
 - 7.3.2 If "ENTER(▶)" is selected, our company's Logo is indicated. If "ENTER(▶)" is selected once again, MENU list is displayed.
 - 7.3.3 Please select the BASIC SET-CLOSE LIMIT on the MENU.
 - 7.3.4 Using the handle or DOWN(▼) Key, please set the Actuator as CLOSE.
 - 7.3.5 Once it is reached to CLOSE point, please input the DOWN(▼) Key once again. Then, the Actuator stops.
 - 7.3.6 Using the handle, please set the Actuator "CLOSE" up to the point that LEAK does not occur.
 - 7.3.7 At this moment, the CLOSE position value is indicated on the LCD.
 - 7.3.8 Please input the 'ENTER(▶)' Key so the currently indicated value is saved and the CLOSE LIMIT point/value is set up.
 - 7.3.9 Please select the BASIC SET-OPEN LIMIT.
 - 7.3.10 Using the handle or UP(▲) Key, please set the ACTUATOR as OPEN.
 - 7.3.11 Once it is reached to OPEN point, please input the UP(▲) Key once again. Then, the Actuator stops.
 - 7.3.12 Using the handle, the user can set the Actuator as OPEN up to the point that the user wants.
 - 7.3.13 At this moment, the OPEN position value is indicated on the LCD.
 - 7.3.14 Please input the 'ENTER(▶)' Key so that currently indicated value is saved and the OPEN LIMIT point/value is set up.
 - 7.3.15 Please select the BASIC SET-CLOSE TORQUE.
 - 7.3.16 Using the UP(▲)/DOWN(▼) Key, please set up the TORQUE values to use between the range of 30% ~ 100%. The value to set up is the percentage about the maximum TORQUE and the maximum TORQUE value is accordingly set up to the Actuator model in the factory.
 - 7.3.17 Please press the ENTER(▶) Key so that the changed value is saved and the set up the CLOSE TORQUE value.

- 7.3.18 Please select the BASIC SET-OPEN TORQUE.
- 7.3.19 Using the UP(▲)/DOWN(▼) Key, please set up the TORQUE values to use between the range of 30% ~ 100%. The value to set up is the percentage about the maximum TORQUE and the maximum TORQUE value is accordingly set up to the Actuator model in the factory.
- 7.3.20 Please press the ENTER(►) Key so that the changed value is saved and the set up the OPEN TORQUE value.
- 7.3.21 If pressing the MENU(■) Key on the remote controller or release "STOP" on the LOCAL/REMOTE Selector, the display screen changes as operational condition.
- 7.3.22 Please confirm if the Actuator is normally operated depending on such set-up values/points while trying to operate the Actuator on LOCAL or REMOTE.

7.4 ELECTRIC WIRING DIAGRAM

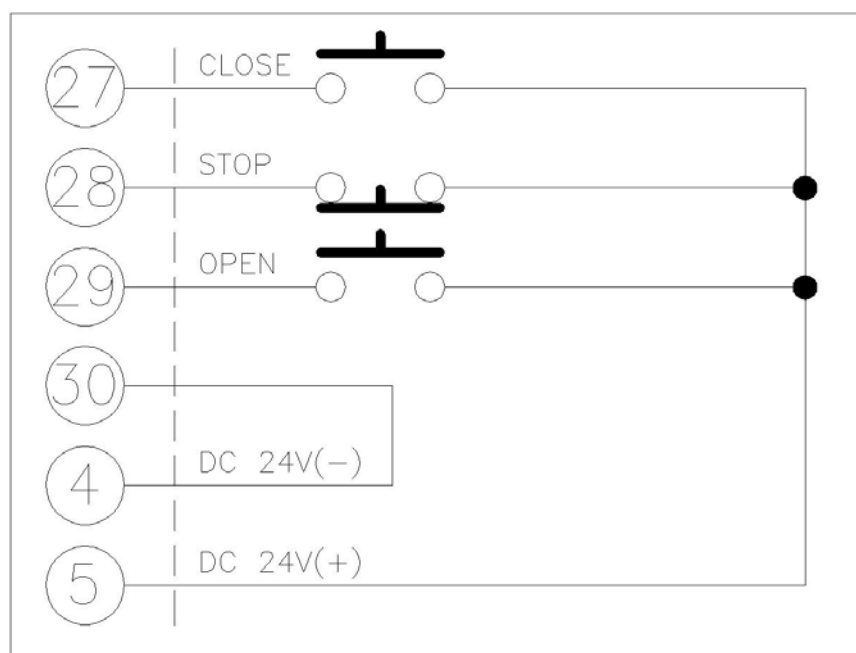


7.5 POWER & INDICATOR RELAY – DRY CONTACT

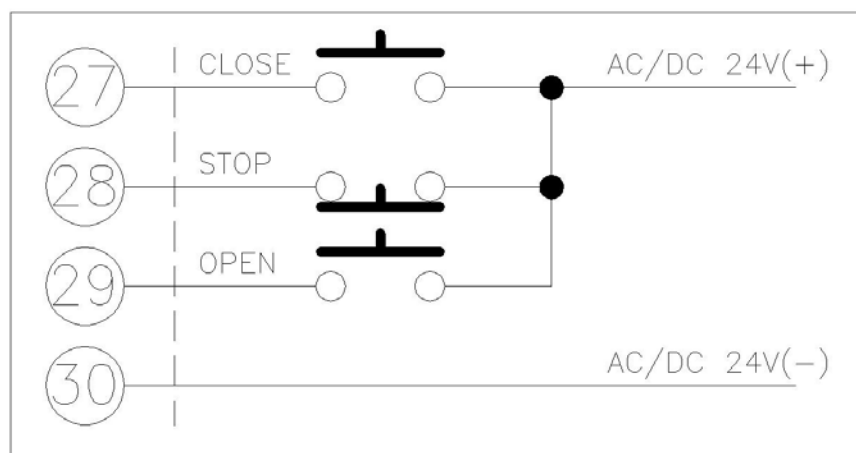


7.6 HOLDING 1 (SELF-LOCKING 1) : IF "STOP" SWITCH IN USE

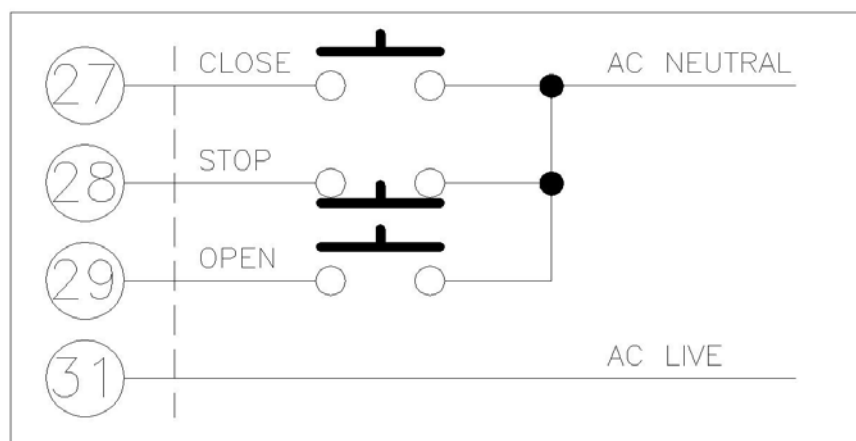
7.6.1 INTERNAL POWER : DC 24V



7.6.2 EXTERNAL POWER : AC/DC 24V~48V

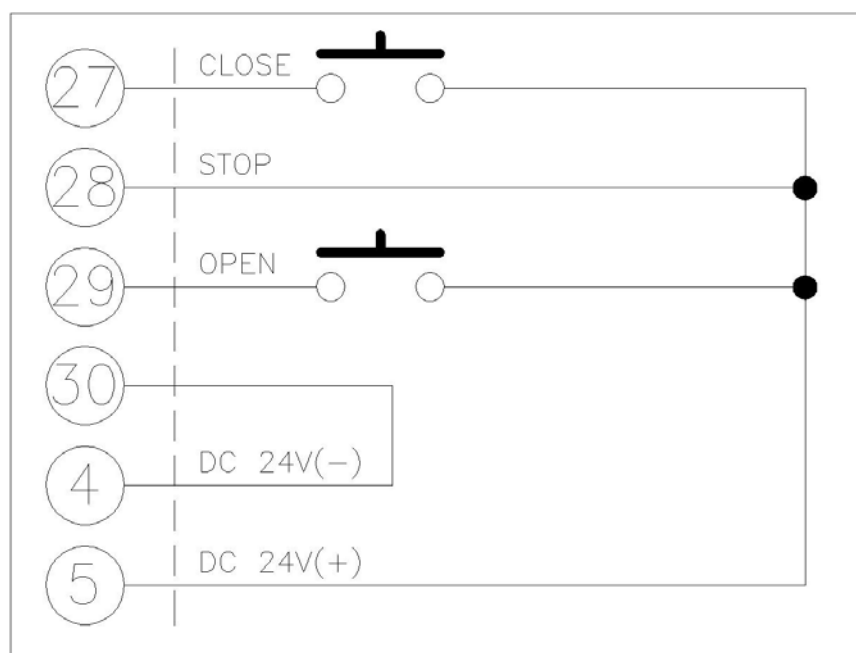


7.6.3 EXTERNAL POWER : 1PH, AC 85V~265V

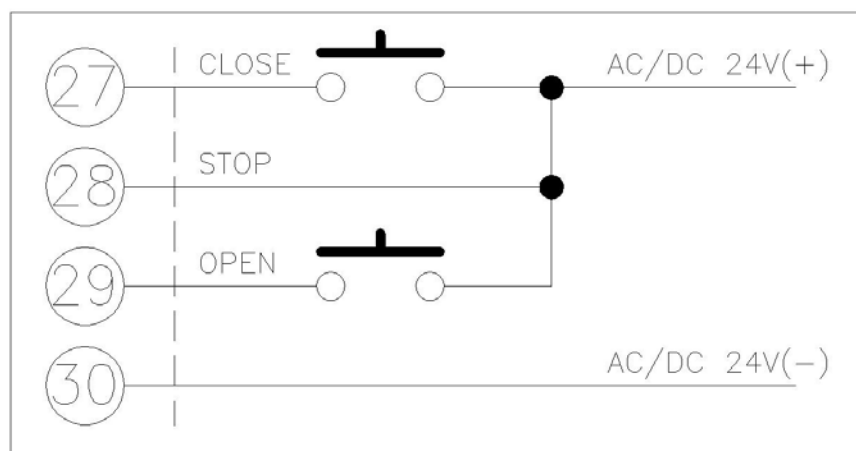


7.7 HOLDING 2 (SELF-LOCKING 2) : IF "STOP" SWITCH NOT IN USE

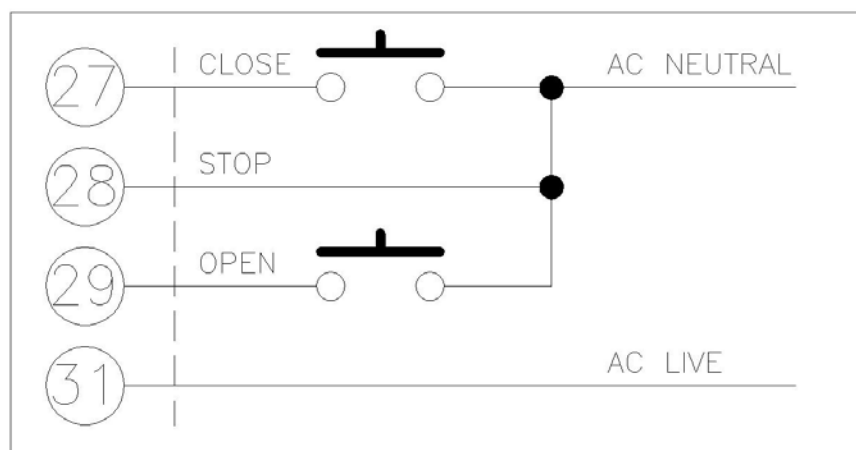
7.7.1 INTERNAL POWER : DC 24V



7.7.2 EXTERNAL POWER : AC/DC 24V~48V

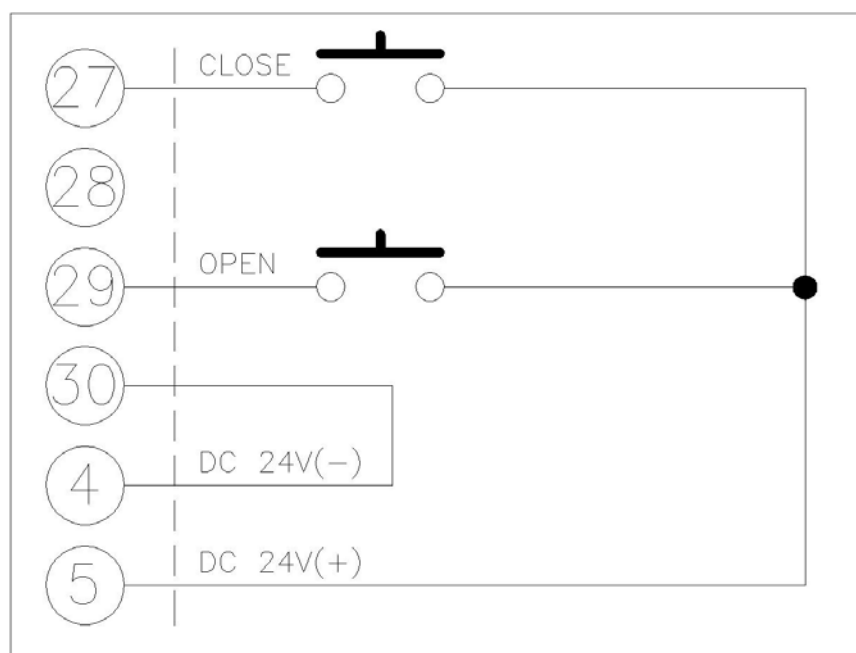


7.7.3 EXTERNAL POWER : 1PH, AC 85V~265V

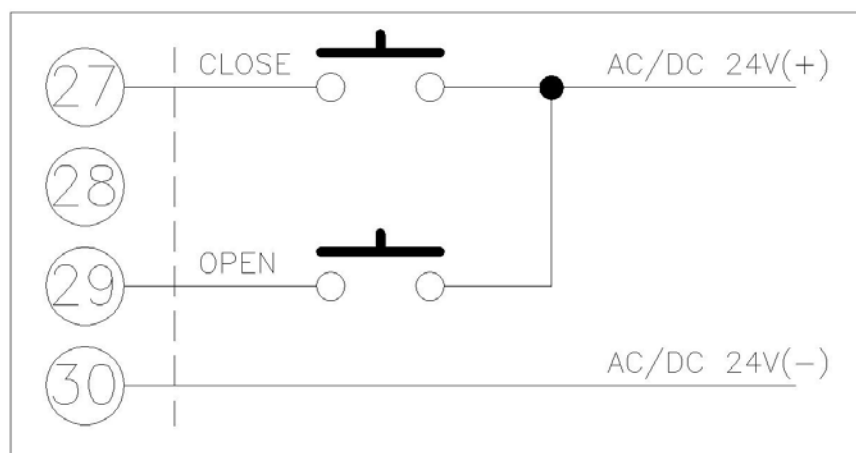


7.8 INCHING : "STOP" SWITCH NOT IN USE

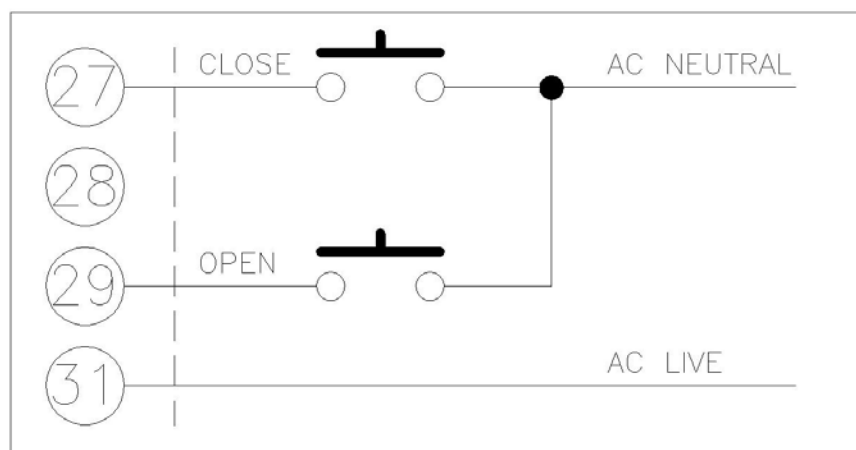
7.8.1 INTERNAL POWER : DC 24V



7.8.2 EXTERNAL POWER : AC/DC 24V~48V



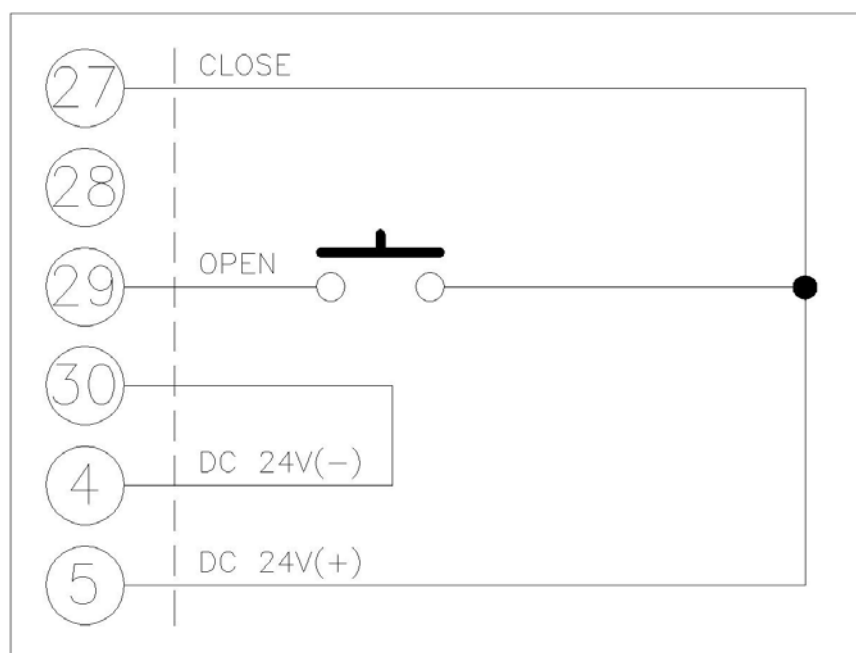
7.8.3 EXTERNAL POWER : 1PH, AC 85V~265V



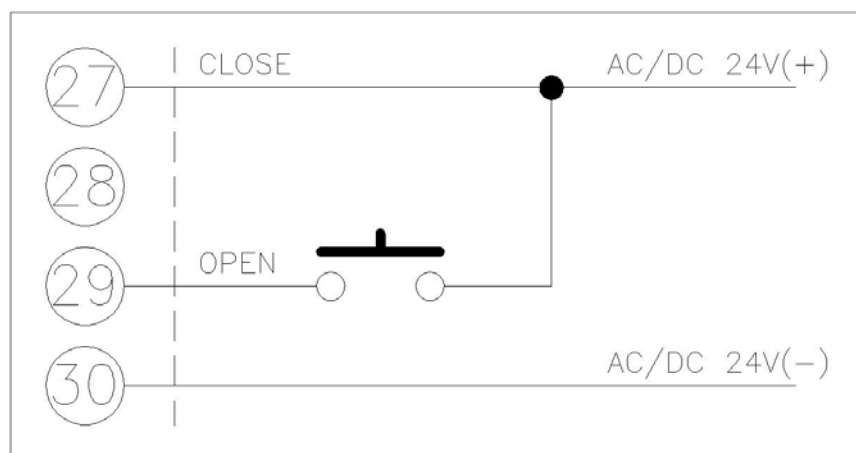
I-Tork Intelligent Multi-Turn Actuator

7.9 2 WIRE CONTROL : OPEN VALVE PRIORITY

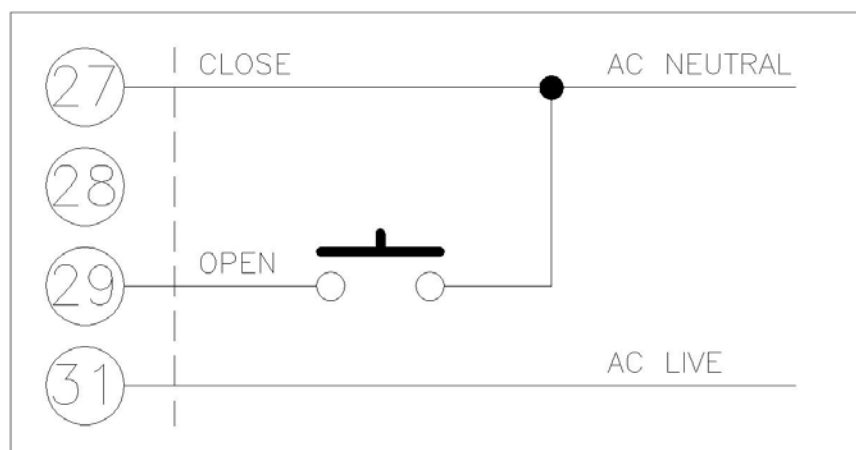
7.9.1 INTERNAL POWER : DC 24V



7.9.2 EXTERNAL POWER : AC/DC 24V~48V

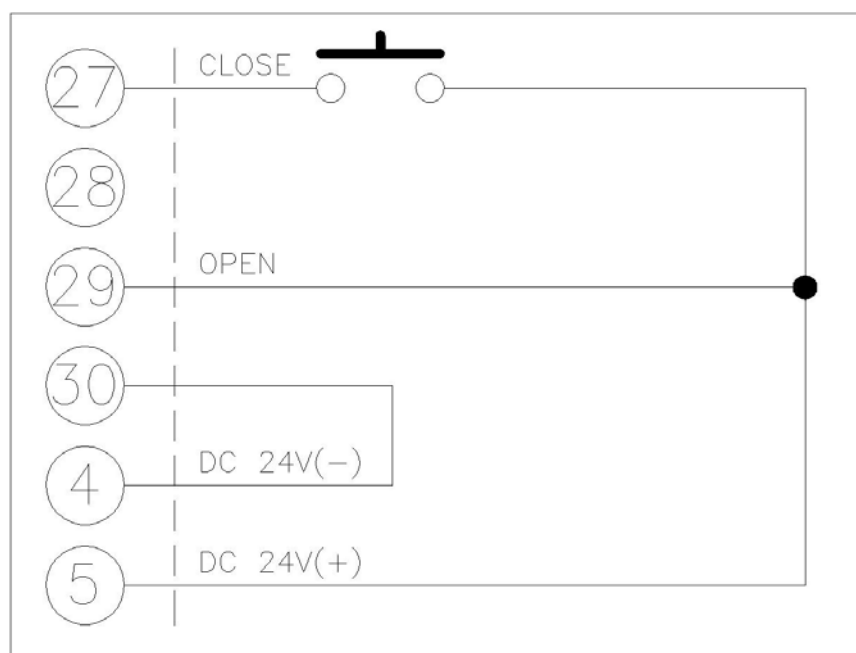


7.9.3 EXTERNAL POWER : 1PH, AC 85V~265V

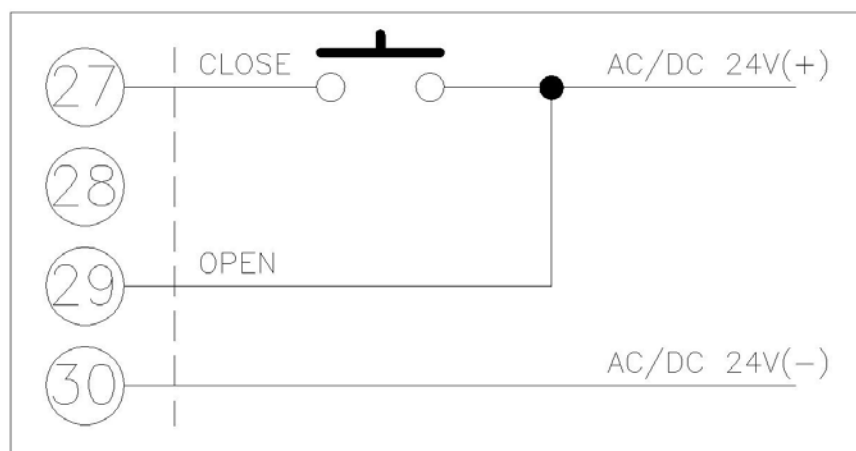


7.10 2 WIRE CONTROL : CLOSE VALVE PRIORITY

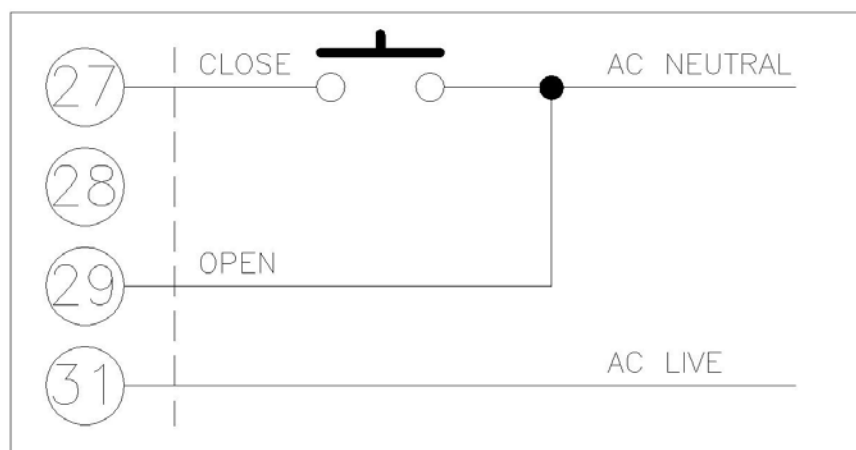
7.10.1 INTERNAL POWER : DC 24V



7.10.2 EXTERNAL POWER : AC/DC 24V~48V

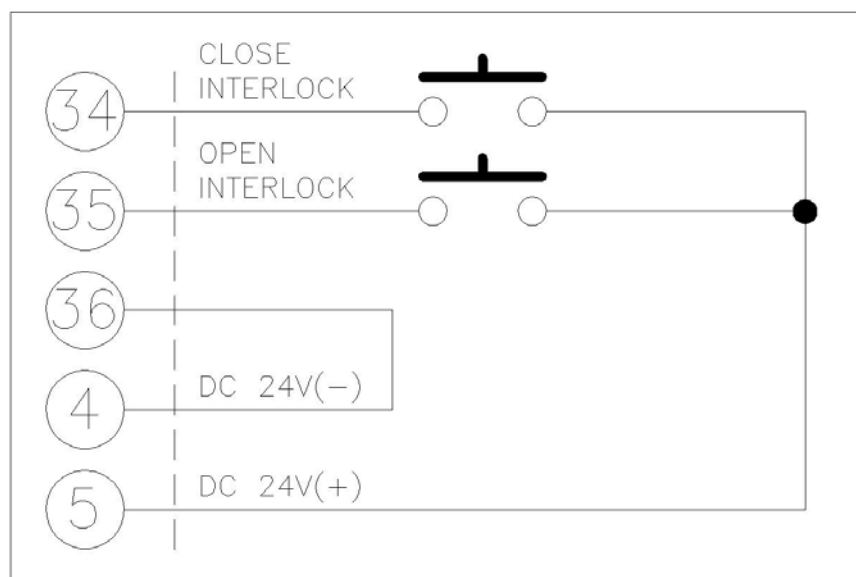


7.10.3 EXTERNAL POWER : 1PH, AC 85V~265V

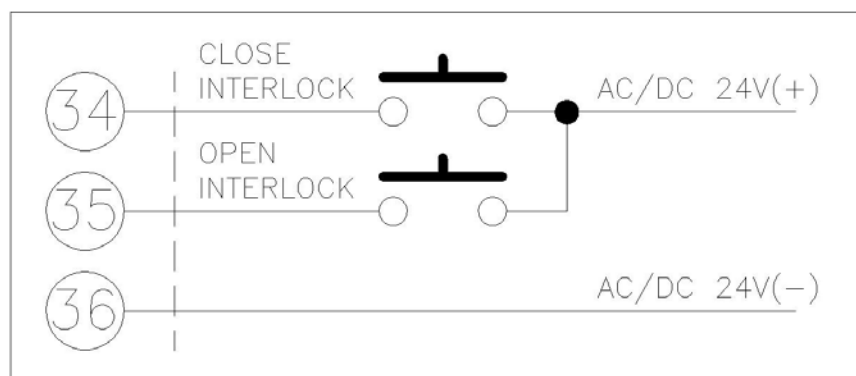


7.11 INTERLOCK

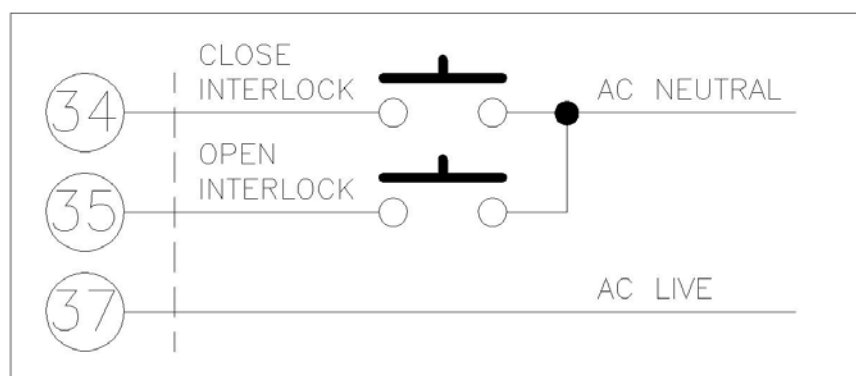
7.11.1 INTERNAL POWER : DC 24V



7.11.2 EXTERNAL POWER : AC/DC 24V~48V

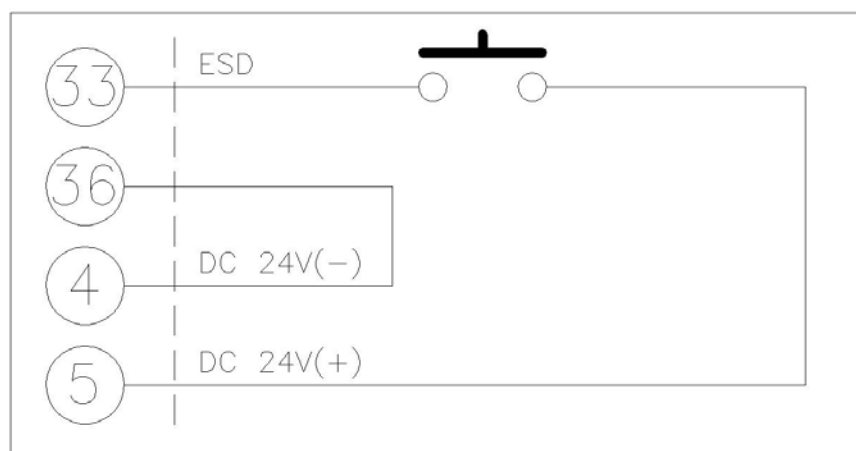


7.11.3 EXTERNAL POWER : 1PH, AC 85V~265V

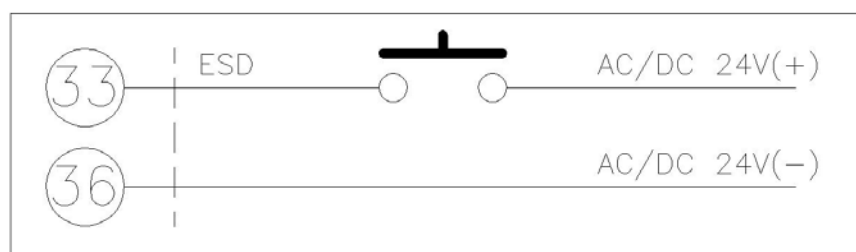


7.12 ESD : EMERGENCY SHUT DOWN

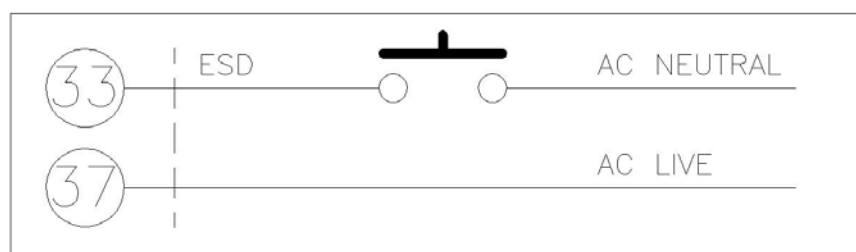
7.12.1 INTERNAL POWER : DC 24V



7.12.2 EXTERNAL POWER : AC/DC 24V~48V

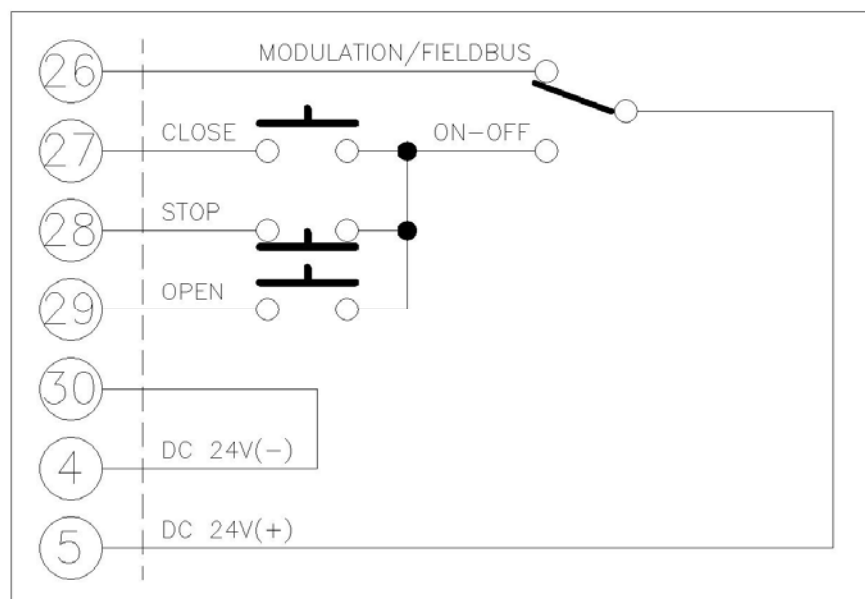


7.12.3 EXTERNAL POWER : 1PH, AC 85V~265V

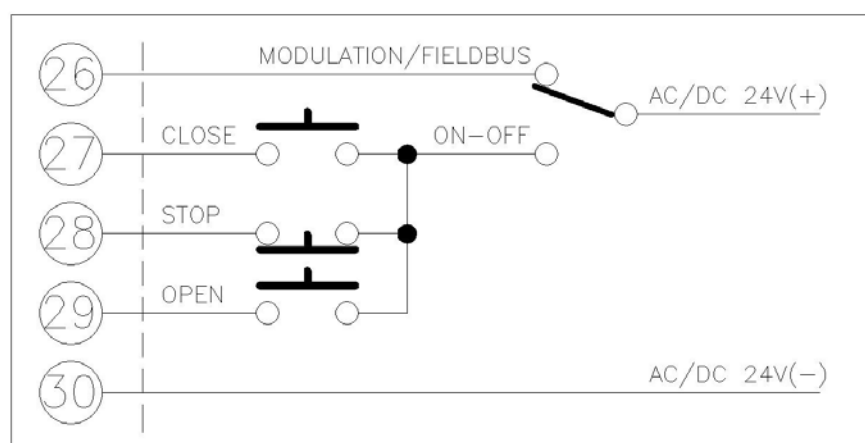


7.13 MODULATION/ON-OFF SELECT CONTROL

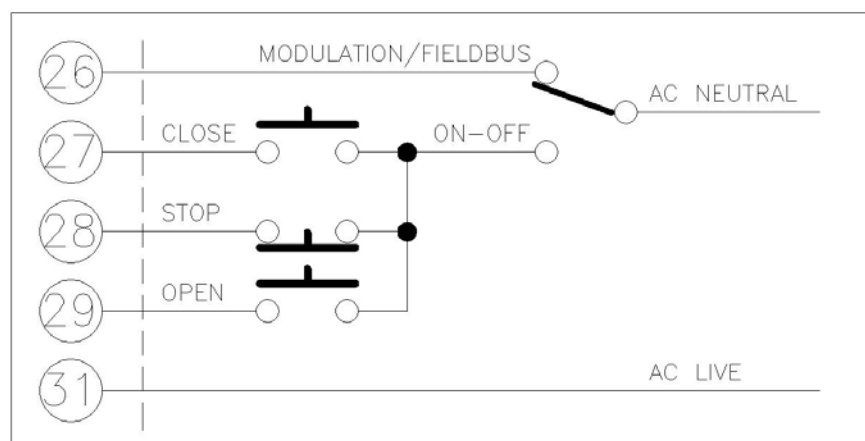
7.13.1 INTERNAL POWER : DC 24V



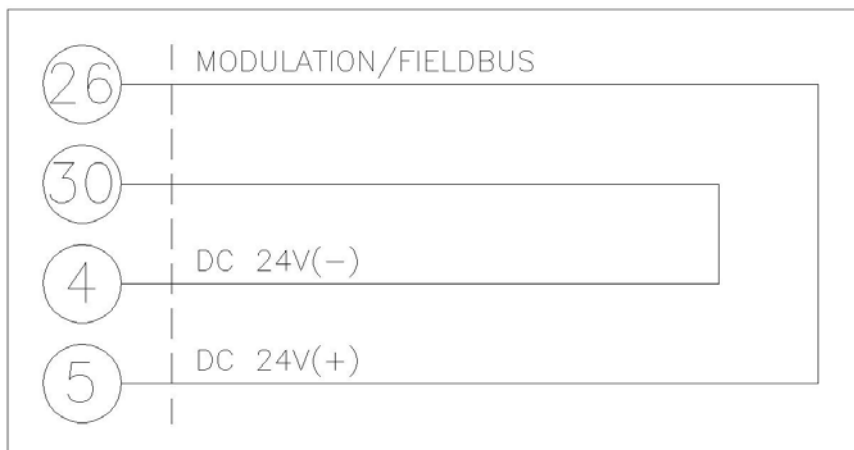
7.13.2 EXTERNAL POWER : AC/DC 24V~48V



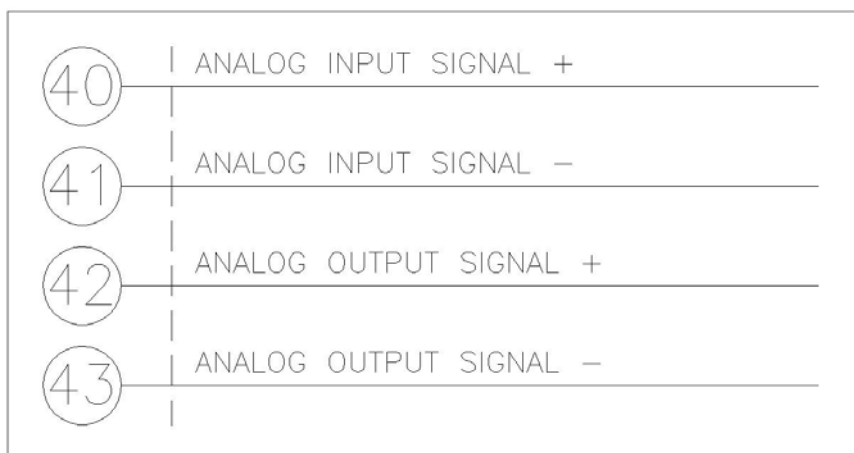
7.13.3 EXTERNAL POWER : 1PH, AC 85V~265V



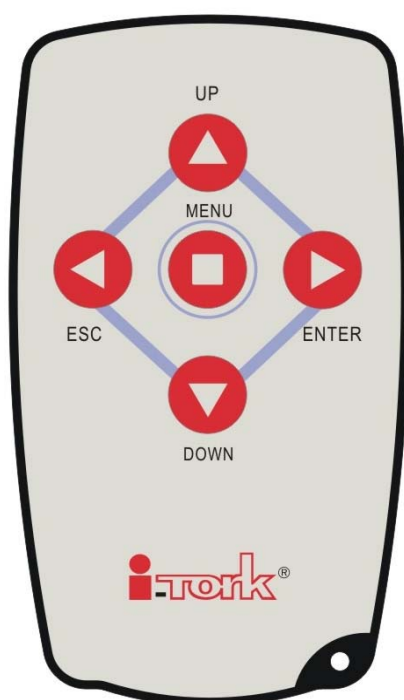
7.14 ONLY MODULATION CONTROL



7.15 ANALOG INPUT/OUTPUT SIGNAL (ONLY USE THE MODULATION (RPC/CT))



8. REMOTE CONTROLLER



8.1 MENU (■)

8.2 UP (▲)

8.3 DOWN (▼)

8.4 ESC (◀)

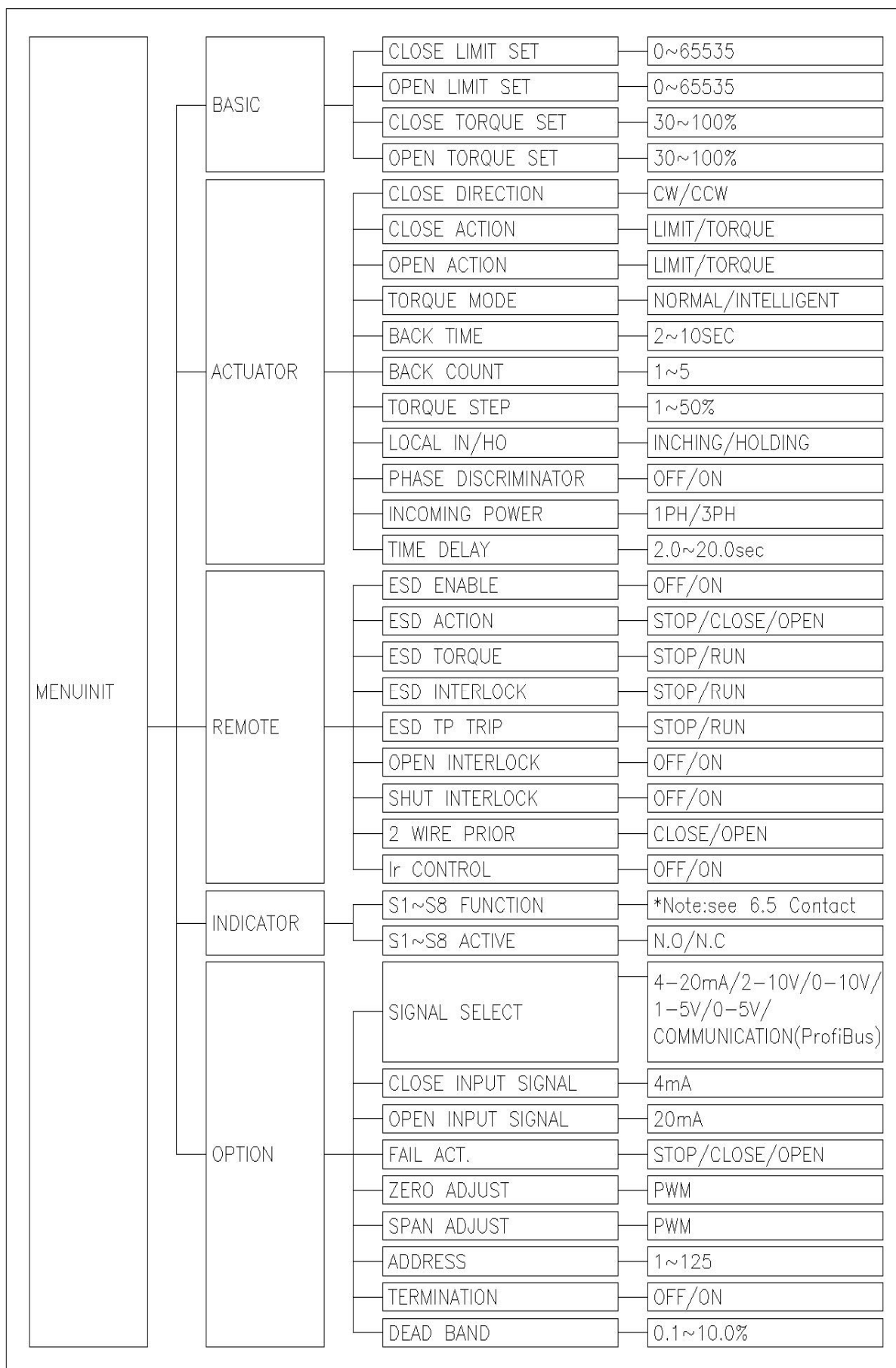
8.5 ENTER (▶)

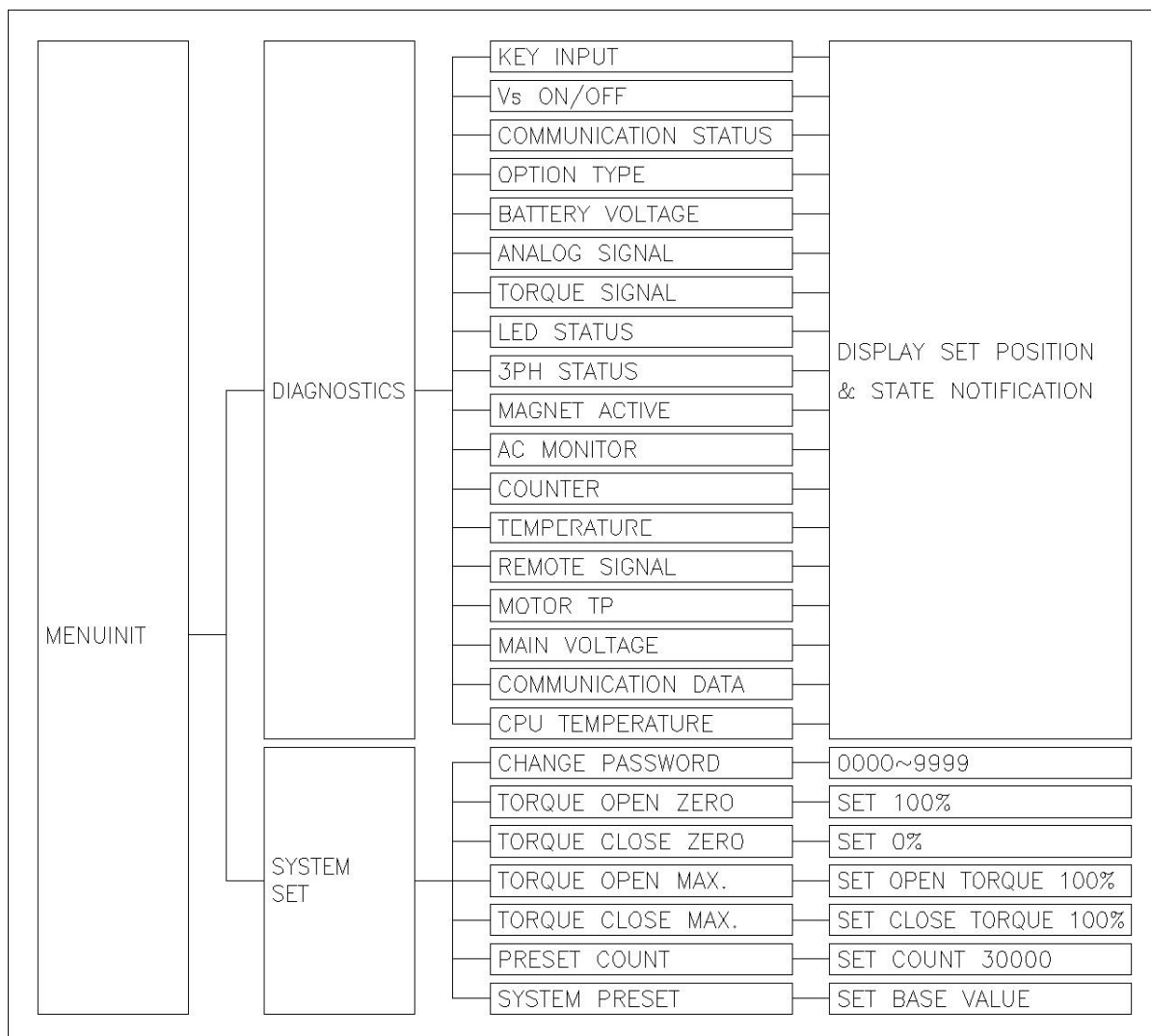
8.6 FEATURE : WATERPROOF REMOTE CONTROL, UP TO IP-67 WATERPROOF RATE

8.7 SIZE : 80*46*11.2MM

8.8 POWER : 3.0V DC, CR2025 x 1PCS

9. MENU & CONFIGURATION





MENU set-up and confirmation should be done by remote controller when LOCAL/REMOTE Selector is on "STOP".

Once the selector switch is on "STOP" and the ENTER(▶) Key is selected once again, MENU list is indicated on display.

There are BASIC, ACTUATOR, REMOTE, CONTACT, OPTION, DIAGNOSTICS, and SYSTEM SET on the MENU.

9.1 SET-UP CHANGE

9.1.1 When the current set-up values need to be changed, such correct PASSWORD should be input. Factory set-up PASSWORD is "0000" as well.

9.1.2 Once PASSWORD is input correctly, it is continuously authorized to use until MENU process ends. However, in order to reset-up after ending the MENU, please confirm/input the PASSWORD again.

9.1.3 It is possible to change the PASSWORD (0000~9999) upon user's decision/choice.

- 9.1.4 In the window of PASSWORD, please input the accurate value using those Keys of UP(▲) and DOWN(▼).
 - 9.1.5 In order to move No.1 to No.2, please use the ENTER(►) Key as well.
 - 9.1.6 If selecting the ENTER(►) Key after inputting 4th Number, a window comes up in order to confirm if the PASSWORD input is correct. If it is correct, please select the UP(▲, YES) and please select the DOWN(▼, NO) if it is required to reset up.
 - 9.1.7 In case of new setting/saving due to setting value changes, please select the ENTER(►, SET) and please select the ESC(◀, EXIT) in case of no changes.
- 9.2 BASIC SET
- 9.2.1 CLOSE LIMIT SET : 0~65535
Please set the Actuator 'FULL CLOSE'. At this moment, the current position value is indicated on the display. If this position value is saved, this value becomes CLOSE LIMIT as well.
 - 9.2.2 OPEN LIMIT SET : 0~65535
Please set the Actuator as FULL OPEN. At this moment, the current position value is indicated on display. If this position value is saved, this saved value becomes OPEN LIMIT.
 - 9.2.3 CLOSE TORQUE SET : 30~100%
Please set up the CLOSE TORQUE value. If such TORQUE occurs over the set value, CLOSE OVER TORQUE is occurred.
 - 9.2.4 OPEN TORQUE SET : 30~100%
Please set up the OPEN TORQUE value. If such TORQUE occurs over the set value, OPEN OVER TORQUE is occurred.
- 9.3 ACTUATOR
- 9.3.1 CLOSE DIR : CW/CCW
Please set the CLOSE direction on the Actuator.
 - 9.3.1.1 CW : CLOCK WISE
 - 9.3.1.2 CCW : COUNTER CLOCK WISE
 - 9.3.2 CLOSE ACTION : LIMIT/TORQUE
Please set the FULL CLOSE position on the Actuator.
 - 9.3.2.1 LIMIT : FULL CLOSE position is set as LIMIT.
 - 9.3.2.2 TORQUE : FULL CLOSE position is set as TORQUE.
 - 9.3.3 OPEN ACTION : LIMIT/TORQUE
The Actuator's FULL OPEN position is set.
 - 9.3.3.1 LIMIT : FULL OPEN position is set as LIMIT.

9.3.3.2 TORQUE : FULL OPEN position is set as TORQUE.

9.3.4 TORQUE MODE : NORMAL/INTEL

When CLOSE or OPEN OVER TORQUE is occurred, operational condition is set up here.

9.3.4.1 NORMAL : In case of OVER TORQUE, the ACTUATOR stops.

9.3.4.2 INTEL : In case of OVER TORQUE, it operates for automatic release OVER TORQUE condition/status upon such set-up values on TORQUE STEP, BACK COUNT, and BACK TIME by INTELLIGENT way/type.

9.3.5 BACK TIME : 2~10SEC

9.3.5.1 Only in case of "TORQUE MODE-INTEL" set, such set-up values are in valid.

9.3.5.2 If OVER TORQUE is occurred, it is operated in opposite direction (against for the direction that OVER TORQUE is occurred).

9.3.6 BACK COUNT : 1~5

9.3.6.1 Only in case of "TORQUE MODE-INTEL" set, such set-up values are in valid.

9.3.6.2 If OVER TORQUE is occurred, it is operated in the direction that OVER TORQUE is occurred for such number of times set up.

9.3.7 TORQUE STEP : 1~50%

9.3.7.1 Only in case of "TORQUE MODE-INTEL" set, such set-up values are in valid.

9.3.7.2 It is operated in the direction that TORQUE is occurred by increasing TORQUE value for each time upon amount of set-up changes. When OVER TORQUE is released, it is recovered as set-up values.

9.3.8 LOCAL IN/HO : INCH/HOLD

When operating with selection of "LOCAL" on the LOCAL/REMOTE SELECTOR, CLOSE/OPEN SELECTOR's operation is set. When operating with selection of REMOTE, it is followed by the user's wiring ignoring the set-up values.

9.3.8.1 INCH : It is operated only for the time that the signal is kept as CLOSE or OPEN.

9.3.8.2 HOLD : If CLOSE or OPEN signal is input once, it is operated for FULL CLOSE or FULL OPEN.

9.3.9 PHASE DISC : ON/OFF

9.3.9.1 ON (PHASE DISCRIMINATOR : Automatic Phase Change) : It automatically detects/confirmes the phase when 3PH power is input. If power is input as reverse phase, it automatically changes the phase so that it is normally operated.

9.3.9.2 OFF (PHASE PROTECT : Phase Protection) : If 3PH is input as reverse, it stops operation and shows FAULT in order to prevent reverse-directional operation. Factory set-up is OFF (Phase Protection Function) as well.

9.3.10 INCOM POWER : 1PH/3PH

9.3.10.1 It should be set up exactly same as the local power supply. Also, there is no Phase detection if 1PH is selected.

9.3.10.2 When the input power is 3PH and the set-up is 1PH, it could be reverse operation without Phase detection so it should be noticed.

9.3.10.3 When the input power is 1PH and the set-up is 3PH, it could not be operated since it could be detected as reverse phase.

9.3.11 TIME DELAY : 2.0~20.0SEC

9.3.11.1 In case of direction change while operation for the target position of the Actuator, stop time of the Motor is set up. It stops for such set-up time and then it is operated for the opposite direction upon direction change.

9.3.11.2 Since the time of Motor-stop gets short while direction change if it is as close as ZERO(0), the Motor gets over-heated if it is frequently operated.

9.3.11.3 In case of such local area with frequent operation or Modulating(RPC) condition, it should be set up with such time that HUNTING is not occurred.

9.4 REMOTE SIG

9.4.1 ESD ENABLE : ON/OFF

9.4.1.1 ON : ESD Signal is activated. If ESD signal is input, it is operated by such set-up values on ESD TP TRIP, ESD INT.LOCK, ESD TORQUE, and ESD ACTION.

9.4.1.2 OFF : ESD signal is ignored.

9.4.2 ESD ACTION : STOP/CLOSE/OPEN

It is in valid only in "ESD ENABLE-ON". When ESD signal is input, the Actuator operation is set up.

9.4.2.1 STOP : If ESD signal is input, the Actuator stops.

9.4.2.2 CLOSE : If ESD signal is input, the Actuator becomes FULL CLOSE.

9.4.2.3 OPEN : If ESD signal is input, the Actuator becomes FULL OPEN.

9.4.3 ESD TORQUE : STOP/RUN

It is in valid only in "ESD ENABLE-ON". When ESD signal is input, it is set up if the Actuator is operated or not if OVER TORQUE is detected.

9.4.3.1 STOP : If ESD signal is input, it is operated for the direction that is set up on ESD ACTION. The Actuator stops if OVER TORQUE is occurred while operation.

9.4.3.2 RUN : If ESD signal is input, it is operated for the direction that is set up on ESD ACTION. The Actuator is continuously operated ignoring OVER TORQUE even though OVER TORQUE is occurred.

9.4.4 ESD INT.LOCK : STOP/RUN

It is in valid only in "ESD ENABLE-ON". If ESD signal is input, it is set up for INTERLOCK signal to be activated or not

9.4.4.1 STOP

9.4.4.1.1 If ESD signal is input, it is operated for the direction that is set up on ESD ACTION.

9.4.4.1.2 Please confirm the INTERLOCK signal for the direction after confirming the set-up values on CLOSE INTERLOCK and OPEN INTERLOCK.

9.4.4.1.3 If OPEN INTERLOCK and CLOSE INTERLOCK set up are ON, it is operated for the direction that is set on ESD ACTION when the INTERLOCK signal is input.

9.4.4.1.4 If OPEN INTERLOCK and CLOSE INTERLOCK set up are OFF, it is operated for the direction that is set on ESD ACTION no matter INTERLOCK signal.

9.4.4.2 RUN

9.4.4.2.1 If ESD signal is input, it is operated for the direction that is set on ESD ACTION.

9.4.4.2.2 It is operated for the direction that is set on ESD ACTION ignoring set-up value on OPEN INTERLOCK and CLOSE INTERLOCK.

9.4.5 ESD TP. TRIP : STOP/RUN

It is in valid only in "ESD ENABLE-ON". When ESD signal is input, it is set up for the Motor TP signal to be activated or not.

9.4.5.1 STOP : It is operated for the direction that is set on ESD ACTION if ESD signal is input. If MOTOR TP signal is input while in operation, the Actuator stops.

9.4.5.2 RUN : If ESD signal is input, it is operated for the direction that is set on ESD ACTION. It is continuously operated for the set-up direction ignoring signal even though the MOTOR TP signal is input while in operation.

9.4.6 OP INTERLOCK : OFF/ON

In case of OPEN operation, it is set up for the INTERLOCK to be in use or not.

9.4.6.1 OFF : OPEN INTERLOCK DISABLE

9.4.6.2 ON : OPEN INTERLOCK ENABLE

9.4.7 CL INTERLOCK : OFF/ON

In case of CLOSE operation, it is set up for the INTERLOCK to be in use or not.

9.4.7.1 OFF : CLOSE INTERLOCK DISABLE

9.4.7.2 ON : CLOSE INTERLOCK ENABLE

9.4.8 2 WIRE PRIOR : CLOSE/OPEN

This is for setting up the priority in case of operation with 2-WIRE wiring. Also, this set-up makes decision for priority of operation when CLOSE/OPEN signal is input at the same time.

9.4.8.1 CLOSE : CLOSE VALVE PRIORITY

9.4.8.2 OPEN : OPEN VALVE PRIORITY

9.4.9 Ir CONTROL : OFF/ON

The Valve's CLOSE/OPEN to be operated or not is set up using remote controller when "LOCAL" is selected on LOCAL/REMOTE SELECTOR. It is not operated when "REMOTE" or "STOP" is selected.

9.4.9.1 OFF : Remote Controller (REMOCON) signal not allowed

9.4.9.2 ON : Remote Controller (REMOCON) signal allowed

9.4.9.2.1 It can be in use only when the set-up is "ACTUATOR-LOCAL IN/HOLD".

9.4.9.2.2 UP(▲) : OPEN

9.4.9.2.3 DOWN(▼) : CLOSE

9.4.9.2.4 MENU(■) : STOP

9.5 CONTACT

As a DRY CONTACT using LATCH RELAY, it provides the user of the Actuator's conditions and information.

9.5.1 S1~8 FUNCTION

9.5.1.1 CLS : FULL CLOSE LIMIT

9.5.1.2 OLS : FULL OPEN LIMIT

9.5.1.3 MLS : INTERMEDIATE LIMIT

9.5.1.4 CTS : CLOSE OVER TORQUE

9.5.1.5 OTS : OPEN OVER TORQUE

9.5.1.6 MTS : INTERMEDIATE OVER TORQUE

9.5.1.7 TRQ : CLOSE/OPEN/INTERMEDIATE OVER TORQUE

- 9.5.1.8 RUN OP : OPENING
- 9.5.1.9 RUN CL : CLOSING
- 9.5.1.10 RUN : OPENING/CLOSING
- 9.5.1.11 BAT : LOW BATTERY
- 9.5.1.12 HAND : Manual operation using Handle
- 9.5.1.13 CL LOK : CLOSING STALL
- 9.5.1.14 OP LOK : OPENING STALL
- 9.5.1.15 LOCK : CLOSING/OPENING STALL
- 9.5.1.16 ESD : EMERGENCY SHUT DOWN
- 9.5.1.17 REV : REVERSE 3 PHASE
- 9.5.1.18 DROP : 3 PHASE LOSS/LOW POWER
- 9.5.1.19 LOCAL : LOCAL MODE operation available
- 9.5.1.20 REMOTE : REMOTE MODE operation available
- 9.5.1.21 24V

INCOMING POWER(Main Power) is normal but DC24V that is used in the circuit is problem.

- 9.5.1.22 MOTOR TP : MOTOR TP FAULT
- 9.5.1.23 CPU T : CPU that is equipped on electric circuit board (PCB) is over heated.
- 9.5.1.24 BAT T : BATTERY OVER TEMPERATURE

9.5.2 S1~8 FORM : N.C/N.O

9.5.2.1 N.C (NORMAL CLOSE)

Contact is OPEN in case of indicating condition/status.

9.5.2.2 *N.O (NORMAL OPEN)

Contact is CLOSE in case of indicating condition/status.

9.5.3 FACTORY SET-UP

Using LATCH RELAY, it is possible to change and/or set up N.C/N.O and/or such signal value that the user wants.

- 9.5.3.1 S1 : CLS (FULL CLOSE LIMIT) / N.O
- 9.5.3.2 S2 : OLS (FULL OPEN LIMIT) / N.O
- 9.5.3.3 S3 : CTS (CLOSE OVER TORQUE) / N.O
- 9.5.3.4 S4 : OTS (OPEN OVER TORQUE) / N.O
- 9.5.3.5 S5 : REMOTE / N.O
- 9.5.3.6 S6 : 3PH REV / N.O
- 9.5.3.7 S7 : CLOSING / N.O
- 9.5.3.8 S8 : OPENING / N.O

9.5.3.9 FAULT(set-up change NOT available) : 1C

9.5.3.9.1 POWER FAIL / N.C

9.5.3.9.2 READY or POWER SUPPLY / N.O

9.6 OPTION

In case of using MODULATING(RPC) or FIELDBUS(PROFIBUS, MODBUS, ETC.), OPTION BOARD should be set up.

9.6.1 SIG SELECT

9.6.1.1 MODULATION (RPC) : 4-20mA / 2-10V / 0-10V / 1-5V / 0-5V

9.6.1.2 FIELDBUS : COMM (PROFIBUS, MODBUS, ETC.)

9.6.2 CL INPUT

9.6.2.1 CLOSE signal value is set up.

9.6.2.2 Please input the CLOSE input signal (4mA ~ 8mA) to be used.

9.6.2.3 Please confirm the value indicated on the LCD display and then save it.

9.6.3 OP INPUT

9.6.3.1 OPEN input signal value is set up.

9.6.3.2 Please input the OPEN input signal (16mA ~ 20mA) to be used.

9.6.3.3 Please confirm the value indicated on the LCD display and then save it.

9.6.4 FAIL ACT. : STOP/CLOSE/OPEN

9.6.4.1 STOP : STOP in case of SIGNAL FAULT

9.6.4.2 CLOSE : FULL CLOSE operation in case of SIGNAL FAULT

9.6.4.3 OPEN : FULL OPEN operation in case of SIGNAL FAULT

9.6.4.4 This function is not operated if input signal set up is 0-5V or 0-10V.

9.6.5 CL ADJUST

9.6.5.1 After setting the Actuator FULL CLOSE, please confirm if 4mA is normally output.

9.6.5.2 Please adjust ZERO output value using UP(▲) and DOWN(▼) Keys on the remote controller in order to adjust CLOSE output value.

9.6.5.3 If output value is changed, please save it before end so that such changed output values are applied correctly.

9.6.6 OP ADJUST

9.6.6.1 After setting the Actuator FULL OPEN, please confirm if 20mA is normally output.

9.6.6.2 Please adjust SPAN output value using UP(▲) and DOWN(▼) keys on the remote controller in order to adjust OPEN output value.

9.6.6.3 If output value is changed, please save it before end so that such changed output values are applied correctly.

9.6.7 ADDRESS : 1~125

9.6.7.1 It is in valid only when "SIG SELECT-COMM" is selected.

9.6.7.2 The Actuator's ADDRESS is set using the UP(▲) and DOWN(▼) Keys on the remote controller.

9.6.8 TERMINATION : OFF/ON

9.6.8.1 It is in valid only when "SIG SELECT-COMM" is selected.

9.6.8.2 Please set up "ON" for the device installed in the last terminal of the wiring structure which is not the last number of ADDRESS. Please set up "OFF" for all other devices.

9.6.9 DEADBAND : 0.1~10.0%

9.6.9.1 The tolerance for the Actuator's stop position is set up.

9.6.9.2 The Actuator's stop position is the position that has error of "Position Value \pm DEADBAND" input.

9.6.9.3 In order to operate the Actuator that is stopped, such changed signal value that is equal or higher than DEADBAND that is set up from the current position should be input.

9.6.9.4 Using UP(▲) and DOWN(▼) Keys on the remote controller, please set up the DEADBAND value within such range that HUNTING is not occurred.

9.6.9.5 If it is as close as ZERO(0), the tolerance gets smaller. Then, the Actuator may not stop on the target position and HUNTING may occur.

9.6.9.6 Due to continuous HUNTING, it could cause malfunction on PCB, VALVE/DAMPER, MOTOR, and so on.

9.7 DIAGNOSTICS

It is possible to confirm the Actuator's condition/status and set-up values. However, it is not possible to change set-up values.

9.7.1 KEY INPUT : to confirm input condition of KEY that is used in SYSTEM [RESERVED]

9.7.2 Vs ON/OFF : to confirm SYSTEM power condition/status [RESERVED]

9.7.3 COMM STATUS : to confirm communication condition/status [RESERVED]

9.7.4 OPTION TYPE : category of OPTION BOARD (RPC, FIELDBUS, ETC.) [RESERVED]

9.7.5 BAT VOLTAGE : to confirm battery voltage condition [RESERVED]

9.7.6 ANALOG SIG : input signal value that is input into the ACTUATOR (4-20mA) [RESERVED]

9.7.7 TORQUE SIG : A/D change values that is input from the TORQUE SENSOR

9.7.8 LED STATUS : to confirm ACTUATOR LED condition/status

- 9.7.9 3PH STATUS : to confirm reverse phase and phase loss of 3PH
- 9.7.10 MAGNET ACT. : to confirm CLOSE/OPEN MCC operation status/condition [RESERVED]
- 9.7.11 AC MONITOR : to confirm POWER FAIL or not by measuring AC24V of TRANSFORMER output.
- 9.7.12 COUNTER : indicates the COUNTER value of current position
- 9.7.13 TEMPERATURE : to confirm the internal temperature of the ACTUATOR
- 9.7.14 REMOTE SIG : to confirm signal input from REMOTE (CLOSE, OPEN, ESD, Etc.)
- 9.7.15 MOTOR TP : to confirm MOTOR TP condition/status
- 9.7.16 MAIN VOLTAGE : to confirm condition/status of power that is supplied to CPU (3.3V)
- 9.7.17 COMM DATA : to indicate DATA that is received by communication [RESERVED]
- 9.7.18 CPU TEMP : to confirm CPU temperature installed on the MAIN BOARD

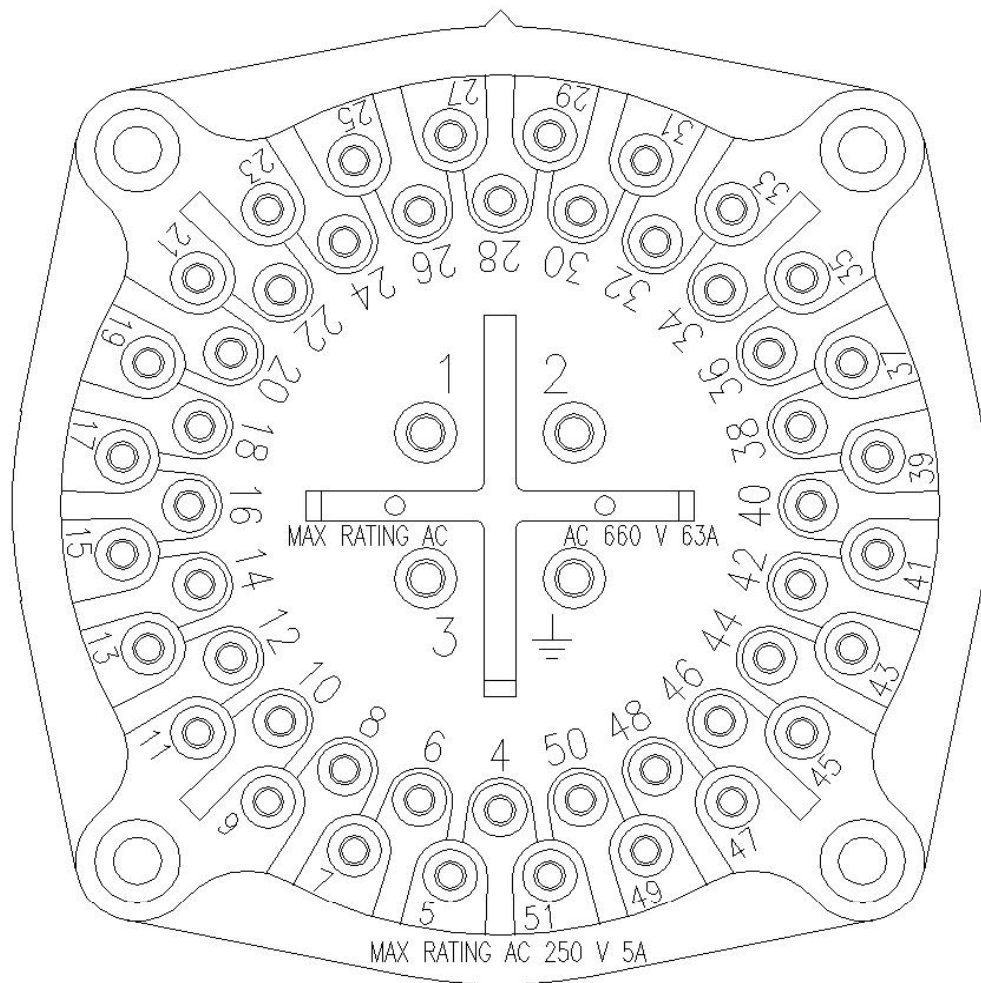
9.8 SYSTEM SET : WARNING!!!

If users randomly make any changes, there could be a serious problem caused on the Actuator operation so please do NOT make any random adjustment/changes other than changing PASSWORD. In case of changing SYSTEM SET, please be consulted with our company's technician for sure. Any problems caused by random adjustment/changes will not be guaranteed by our company's warranty service.

- 9.8.1 CHANGE PASSWD : PASSWORD Change. Factory set-up Password is "0000".
- 9.8.2 TORQUE OZERO : OPEN TORQUE SENSOR value that changes when only Actuator is operated. It is set up properly as factory set-up so it should not be randomly changed.
- 9.8.3 TORQUE CZERO : CLOSE TORQUE SENSOR value that changes when only Actuator is operated. It is set up properly as factory set-up so it should not be randomly changed.
- 9.8.4 TORQUE OP MAX : It is to set up the Actuator's maximum OPEN TORQUE value. It is set up properly as factory set-up so it should not be randomly changed.
- 9.8.5 TORQUE CL MAX : It is to set up the Actuator's maximum CLOSE TORQUE value. It is set up properly as factory set-up so it should not be randomly changed.
- 9.8.6 PRESET COUNT : It is to initialize ENCODER COUNTER value as "30000" by force in the current position.

- 9.8.7 SYSTEM PRESET : It is to initialize the SYSTEM as factory set-up. It should be noticed since all changed/set-up DATA could be deleted and cause malfunction due to this function.

10. TERMINAL LAY-OUT



1	FGND		
1	MAIN POWER "R"		
2	MAIN POWER "S"		
3	MAIN POWER "T"		
4	INTERBAL CONTROL POWER DC 24V-	20	S8 FUNCTION
5	INTERNAL CONTROL POWER DC 24V+	21	*OPENING
6	S1 FUNCTION	22	COM
7	*MAKE AT FULLY SHUT (CLS)	23	FAULT
8	S2 FUNCTION	24	READY
9	*MAKE AT FULLY OPEN (OLS)	25	
10	S3 FUNCTION	26	MODULATION / FIELDBUS
11	*BRAKE AT FULLY SHUT (CTS)	27	CLOSE
12	S4 FUNCTION	28	STOP / MAINTAIN
13	*BRAKE AT FULLY OPEN (OTS)	29	OPEN
14	S5 FUNCTION	30	COMMON CONTROL POWER AC/DC 24V-
15	*REMOTE	31	COMMON CONTROL POWER AC 110V/220V
16	S6 FUNCTION	32	
17	*REV. 3PH	33	ESD
18	S7 FUNCTION	34	CLOSE INTERLOCK
19	*CLOSING	35	OPEN INTERLOCK
		36	COMMON CONTROL POWER AC/DC 24V-
		37	COMMON CONTROL POWER AC 110V/220V
		38	
		39	
		40	INPUT SIGNAL + BUS1 IN, LINE A
		41	INPUT SIGNAL - BUS1 IN, LINE B
		42	OUTPUT SIGNAL + BUS1 OUT, LINE A
		43	OUTPUT SIGNAL - BUS1 OUT, LINE B
		44	BUS1 IN&OUT, SGND
		45	
		46	BUS2 IN, LINE A
		47	BUS2 IN, LINE B
		48	BUS2 OUT, LINE A
		49	BUS2 OUT, LINE B
		50	BUS2 IN&OUT, SGND
		51	

11. FACTORY SET

MENU/INIT	BASIC	CLOSE LIMIT SET	NONE (0~65535)
		OPEN LIMIT SET	NONE (0~65535)
		CLOSE TORQUE SET	50%
		OPEN TORQUE SET	50%
ACTUATOR	ACTUATOR	CLOSE DIRECTION	CW
		CLOSE ACTION	LIMIT
		OPEN ACTION	LIMIT
		TORQUE MODE	NORMAL
		BACK TIME	5SEC
		BACK COUNT	3
		TORQUE STEP	10%
		LOCAL IN/HO	HOLDING
		PHASE DISCRIMINATOR	OFF
		INCOMING POWER	3PH
		TIME DELAY	2.0sec
		ESD ENABLE	ON
		ESD ACTION	STOP
		ESD TORQUE	STOP
REMOTE	REMOTE	ESD INTERLOCK	STOP
		ESD TP TRIP	STOP
		OPEN INTERLOCK	OFF
		CLOSE INTERLOCK	OFF
		2 WIRE PRIOR	CLOSE
		Ir CONTROL	OFF
	INDICATOR	S1 FUNCTION	CLS
		S1 ACTIVE	N.O
		S2 FUNCTION	OLS
		S2 ACTIVE	N.O
		S3 FUNCTION	CTS
		S3 ACTIVE	N.O
		S4 FUNCTION	OTS
		S4 ACTIVE	N.O
		S5 FUNCTION	REMOTE
		S5 ACTIVE	N.O
		S6 FUNCTION	3PH REV
		S6 ACTIVE	N.O
		S7 FUNCTION	CLOSING
		S7 ACTIVE	N.O
		S8 FUNCTION	OPENING
		S8 ACTIVE	N.O
OPTION	OPTION	SIGNAL SELECT	4-20mA
		CLOSE INPUT SIGNAL	NONE (USER SETTING)
		OPEN INPUT SIGNAL	NONE (USER SETTING)
		FAIL ACT.	STOP
		ZERO ADJUST	NONE (USER SETTING)
		SPAN ADJUST	NONE (USER SETTING)
		ADDRESS	1
		TERMINATION	OFF
		DEAD BAND	1.0%