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UNI-EL **Electric actuator**	**Installation** and operating **manual**	**Remote position controller** - **RPC-03-A**

Contents

Many thanks for purchasing our UNI-EL series electric actuator!
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. Check point before using actuator

1) Check if specification (Model No, Main Power, Control Power, Options) of delivered actuator meets your requirement or not.
2) Check the application such as valve, Damper & etc.
3) Check if mounting of actuator on application is correct and tight enough.
4) Check if settings of actuator such as limit switch, stopper bolts, indicator is correct or not.
5) Check if electric wiring is correct or not.
6) In case of 3 phase motor, must check rotating direction first before normal operation.

*** Check rotating direction of actuator**
*** Open actuator about 50% by manual, supply power to actuator for 2~3 second.**
*** Push close button and check if actuator move toward close direction or not.**
*** If yes, it is O.K, but reverse, stop to supply power to actuator and change the 2 power lines each other among 3 lines.**

7) Generally all function of RPC is set by factory before delivery and no need to set the functions again. Only in case that customer wants to adjust the limit switches, to set the function of RPC is required. Setting is so simple and customer just pushes the AUTO SETTING button after putting actuator about 50% open (Or close) position. RPC automatically accomplishes to set all the functions by itself.
8) Disassembly, modification without factory's consent may affect the performance of the actuator.

2. General performance

RPC is the local actuator controller, using 12bit A/D converter and 8 bits Microprocessor, which operate actuator to open and close according to the input signal from main controller.After positioning actuator, detect the current position of actuator and transmit feedback output signal (4-20mA) about current position to the main controller.

3. Standard specification

1) **Model:** RPC-01-A
2) **Power :** 110V/220VAC ±10% 50/60Hz 4VA Max(Changeable by DIP switch)
3) **Input signal:** 4-20mA DC, 2~10VAC, 0~5VAC, 0~10VAC, 1~5VAC **Input resistance:** 250 Ohm, Feedback signal: 100 ~ 10Kohm **Exaction**: 2.3VDC
4) **Output signal:** 4~2-mA DC
5) **Load resistance:** 750Ohm Max.
6) **Control output :** Relay contact 250VAC 10A Max (Inductive load)
7) **Number of output contact:** 2 ea (Open and close contact)
8) **Delay time adjustment:** 0.5 ~ 8 sec
9) **Dead band adjustment:** 0.1 ~ 4.5% (1 step 0.3%, total 15 steps)
10) **Resolution:** Min. 1/1000
11) **Position conversation accuracy :** ±0.5 ~ ±1.5%(Depends on installation)
12) **Ambient temperature:** -10°C ~ +60°C
13) **Ambient humidity:** 90% RH Max (Non-condensate)
14) **Dielectric strength:** 1500V AC 1Min (Input to output, Power to Ground)
15) **Insulation resistance:** Min. 500VDC 30Mohm
16) **Vibration & Shock (X, Y, Z):** 10g(6g based on RMF, Frequency: 0.2 ~ 34Hz, 30Min

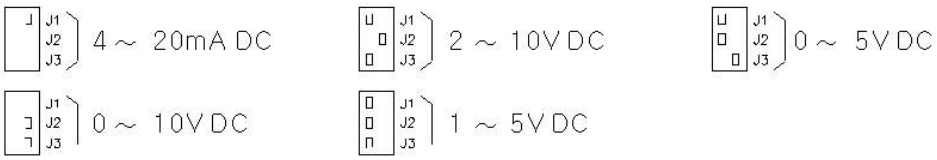
17) LED signal

LED	SIGNAL
Yellow on	Power on
Yellow Flicker	Auto setting
Green on	Open
Red on	Close
Red on	Card Manual mode
Red Flicker	Failure in either signal, CT, wiring

4. Function of RPC and how to set and use it

1) Select input signal

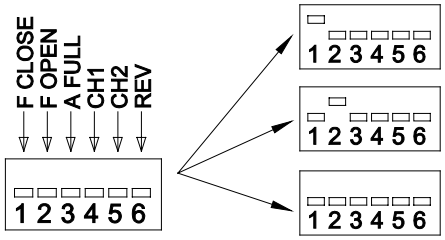
User can select suitable input signal by adjusting DIP switches as follows.



* If there is no instruction for the input signal, factory already set the signal as 4-20mA.

2) Setting fail position

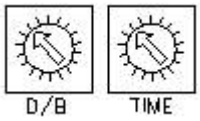
In order to prevent serious trouble when input signal is failed, user can set the fail position of actuator by setting of DIP switches as follows.



: Fail close
: Fail open
: Fail stop

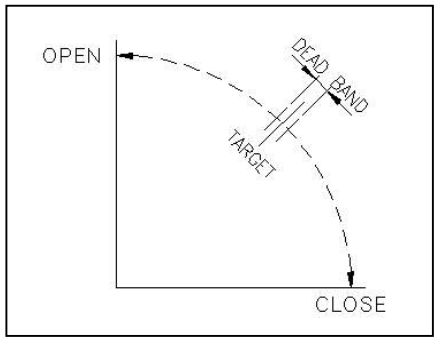
3) Delay time

This prevents continuous operation of RPC card caused by abnormal signal input such as noise, microphone and other foreign frequency.
Once signal is detect, RPC follows that signal but if there is preset time (Delay time), RPC doesn't move within the pre-set time.
RPC can move when input signal last a certain time which is preset and by turning the switch to clockwise, delay time is getting longer. Vice versa.
(Range:0.5 ~ 8sec, 1 step: 0.5sec, 0~15 step)



4) Dead band

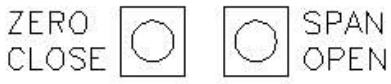
This is tolerance between input signal and position of actuator and if turn this to clockwise, it is getting wider. Vice versa.. Please be careful when turn this to counter-clockwise too much, sensitivity is getting increase, it could be the reason of called "HUNTING".
HUNTING is that actuator doesn't stop at a position and repeat to move to open and to close.



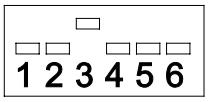
Range: 0.1~4.5%, 1step 0.3%, 0~15step * HUNTING could be the reason of motor burning, and damage of potentiometer and RPC card.

5) Manual operation

In order to operate actuator by manual, push the ZERO SPAN for 2 second.
Then yellow LED is on and RPC become into manual operation mode.
If push zero button, actuator moves toward close and if push span button, actuator moves toward open. Put as it is for 15 second without operation, RPC automatically come out from manual operation mode. (During manual operation mode, input signal is ignored)



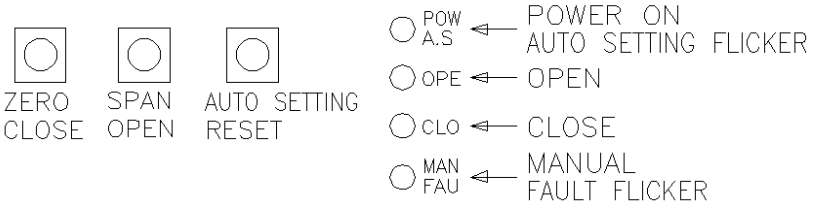
6) Special setting for full open and close



ACTUATOR
FULL

7) Auto setting

If actuator is properly mounted on application, and input signal, input power and wiring are done, Auto setting button (Red button) just 1 time for a second.
Then white LED flickers and actuator starts to move by itself in order to set the close and open position by itself. Once white LED stop flickering anymore, auto setting is done
After setting, actuator stops at the position, which is correspondence with the current input signal, and transmits the output signal.

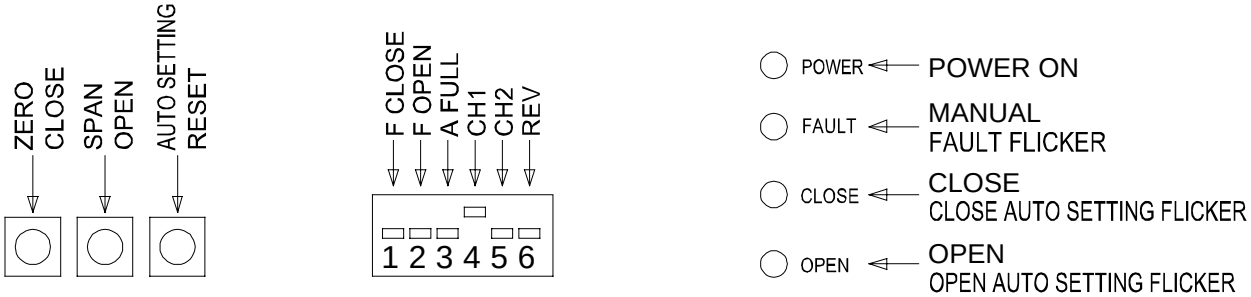


8) Spilt range (CH1)

This is useful function when customer wants to set actuator full close and full open position at a signal, or when input signal is not very exact,.
If customer wants to set actuator full close position at 5mA, supply 5mADC and actuator moves to the position.
Then put CH1 DIP switch on and push Zero button 1 time. Then actuator acknowledges that position as full close position and transmits 4mADC.
Open set is same but push Span Button.
Once setting is done, put CH1 DIP switch off.

Adjustable range is

- Close: 3 ~ 8mA DC
- Open: 16 ~ 21mA DC
- By using this DIP switch, customer may set various positions at certain signal**.**

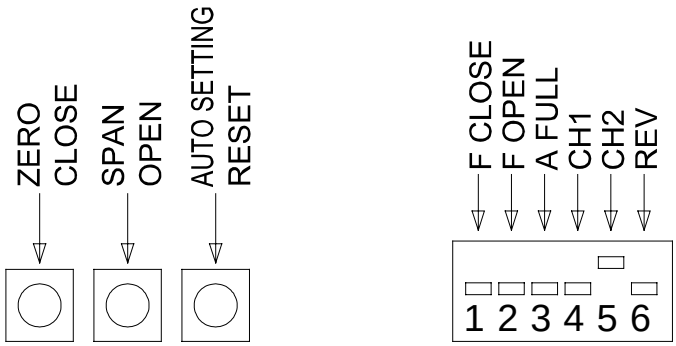


9) Manual setting (CH2)

This is useful function when user wants to set using control panel.
User put actuator close position by using control panel without input signal.
Then put CH2 DIP switch on and push Zero button. Close set is done.
Again, put actuator open position by using control panel without input signal.
Then push Span button. Open set is done.
After putting CH2 Dip switch off, check the operation supplying 2~20mA.

10) Signal LED

Printed	LED color and situation	Meaning of LED
POW A S	Yellow on Yellow flicker	Power on Auto setting
OPE	Green on	Open
CLO	Red on	Close
MAN FAU	Red on Red flicker	Manual operation Failure in CT, RPC



5. Special tool for adjustment

1) L-Wrench 1 set (metric) 2) Screw driver (-)
3) Monkey spanner (1 set) 4) DC signal generator (0~24mADC)
5) Multi-meter 6) mA DC meter (0~25mA DC)

6. Setting reverse action actuator

Generally clockwise-rotating direction of actuator is close but use wants reverse action, please follow below instruction.

1) Put Dip switch 6 on
2) Exchange 9 and 10, and 11 and 12 in main terminal block in actuator if customer do wiring for on-off control from remote.
3) Change the direction of indicator (only Applicable to ITQ1500, ITQ2000 and ITQ3000).
4) Put actuator 50% open (or close) position, and push Auto setting button.
5) Supplying 4~20mA, check operation and rotating direction.

7. Setting potentiometer

1) Put actuator full close position
2) Take P1 and P2 and measuring its resistance.
3) Turning potentiometer around by moving point shaft gear with L-wrench (M4) until measured resistance reaches between 80 ~120 Ohm (close position).
4) Tighten the unfixed screw in point shaft gear
5) Tighten the potentiometer by spring.

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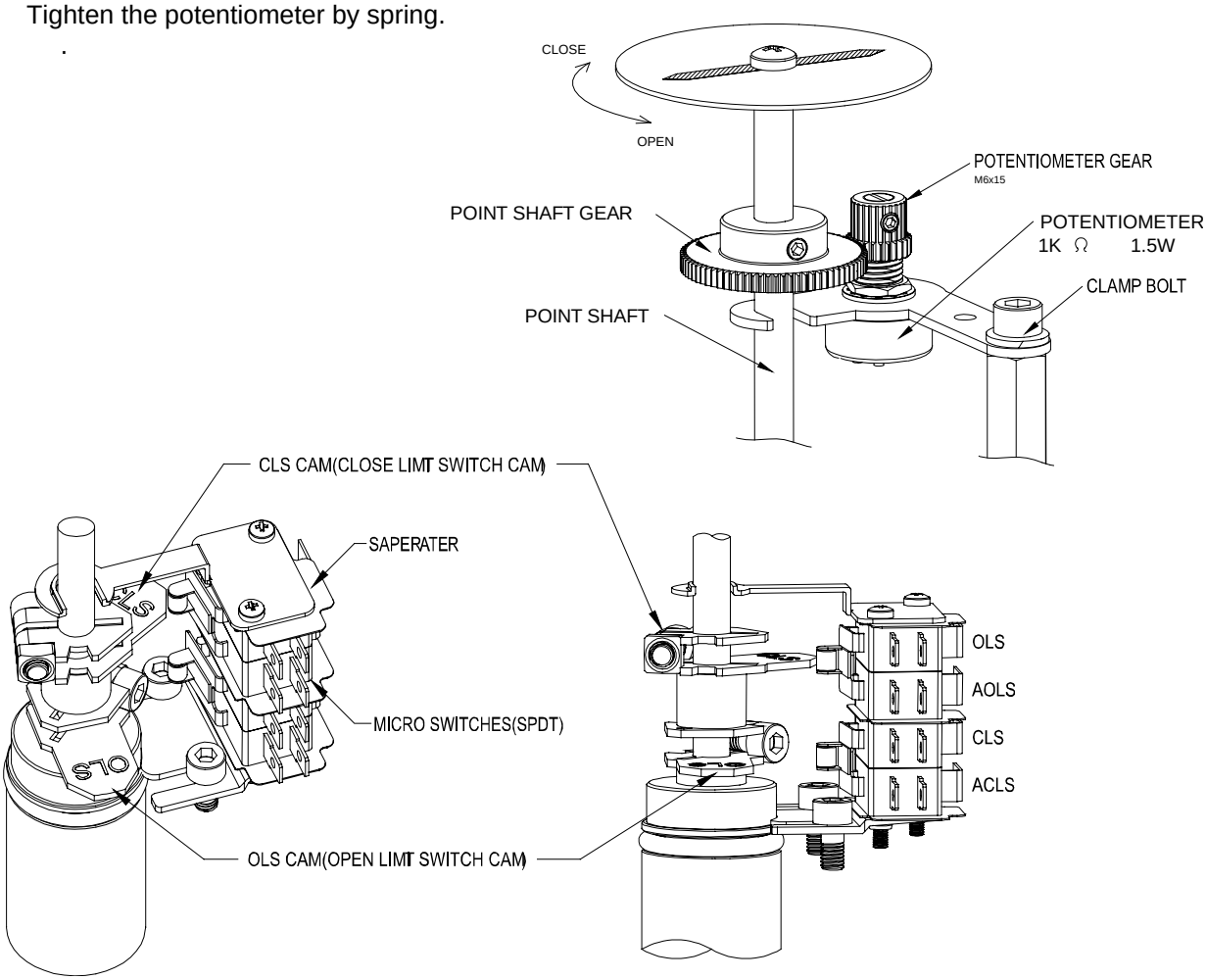
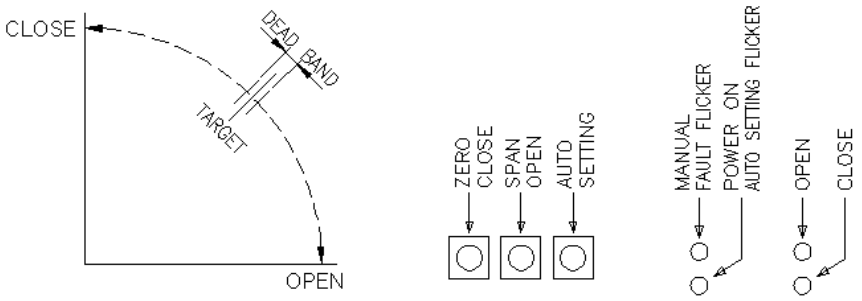
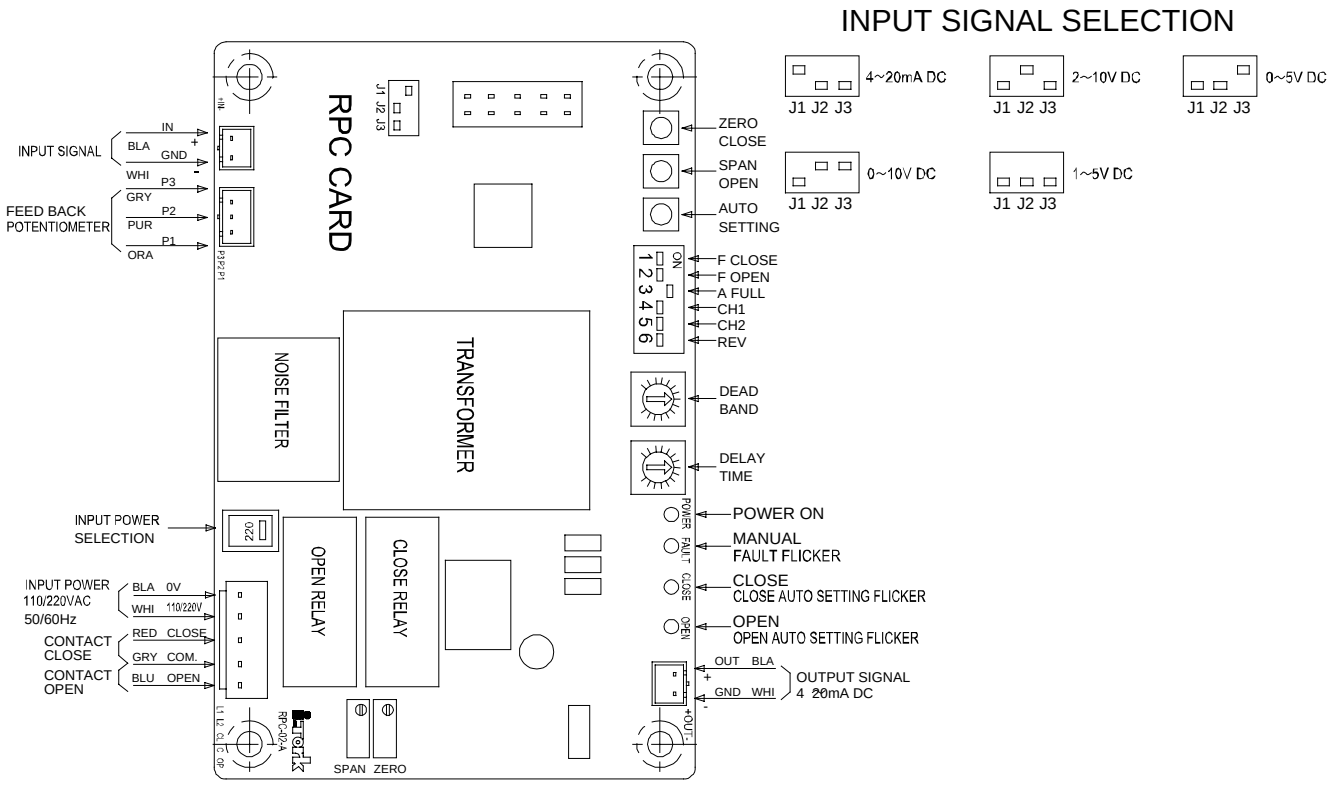


8. Check operation of RPC

Actuator	**Full close**	**Full open**
Input signal	4mA DC (1VDC, 2VDC)	20mA DC (5VDC, 10VDC)
Output signal	4mA DC	20mA DC
Signal LED	Red LED on	Green LED on
Auto setting	Yellow LED flicker	
Input signal fail	Red LED flicker	



9. Layout of RPC



10. Typical wiring diagrams