

Ontrac[®] MME Intelligence Electric Actuator

Operation Manual

- High Efficient Man-machine Interface
- ABB Variable Frequency Control Technology
- Highly Reliable Circuit Design
- Accurate Positioning
- Broad Range Adjustable Torque and Speed
- Durable and Long Life
- Optional Profibus DP Communication
- Broad Range Self Monitoring and Diagnosis



Safety

Assembly and Installation

Electrical Wiring

Panel Introduction

Handcrank Operation

Menu Structure

Error and Failure

Product Maintenance

ACK09-05A

1. If the content of this manual conflicts with laws regulations of local country or area, then follow relevant local and area laws and regulations.
2. Actuator should not be installed in air with ignition point below 135°C, or surface temperature of motor may ignite flammable gas surrounding.
3. Appropriate protection is needed in some poor operating environment.
4. All installation and commissioning work as well as electrical connection may only be carried out by trained technicians and qualified personnel.
5. Installation or maintenance can not be carried on when actuator is powered on, prior to any work at actuator, switch off the power.
6. When actuator is installed at high altitude, please pay attention to safety.
7. Please do not operate handcrank when not necessary (see Page 8).
8. Temperature of motor's surface can exceed 70°C under normal working condition. Please do not touch to avoid personal damage.
9. When ESD function is activated, some protection will not be functioning, may also cause actuator overheated.
10. Main power supply can be three phases or one phase, please be careful with wiring (see P4).

Assembly and Installation

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1. Actuators can only be installed on solid mounted valves. Reinforce the valves and pipelines when necessary .
2. If necessary, lifting equipment can be used to install, actuator weight is listed in below table. If there are additional components attached such as gear boxes, linear drive units, etc., please refer to relevant technical information.
3. If actuators are assembled to the valves or other heavier gears, lifting actuator is prohibited, only lifting valve or gearing units is allowed.
4. When actuators are assembled to the valves, before full engagement with valve stem axis, do not bear the weight of actuator to the stem (axis).
5. After the installation of the actuators, please replace the upper most drain hole with a red one-way venting valve in attached zipper bag (see the picture).
6. After the installation of the actuators, if it can not be wiring tight away, please do not remove wiring cover or sealing screw plug to avoid lower actuators protection level to below IP43.

Model	MOE706	MOE708	MOE712	MOE725	MOE750
	MME806	MME808	MME812	MME825	MME850
Weight (Kg)	19.5	20.5	22	32	40



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Electrical Wiring

Waterproof cable gland is provided in the attached zipper bag, protection class is IP67. There are several cable glands available:

1	1	1	1	1
				
M32×1.5 Applicable cable diameter Φ13 ~ Φ18	M25×1.5 Applicable cable diameter Φ10 ~ Φ16	M16×1.5 Applicable cable diameter Φ4.5 ~ Φ8	M32→M25 Waterproof connector converter	M25→M16 Waterproof connector converter

Note 1: Exclusively use same protection level connector cable with Ontrac actuator in order to ensure stated protection level

Note 2: All of the signal cable must be shielded

Note 3: Length of connecting cable between control part and transmission part of detached type actuator should not exceed more than 15 meters

Note 4: After wiring, please use the plastic cover in attached zipper bag to screw unused cable hole



Figure 1

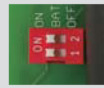


Figure 2



Figure 3



Figure 4

After opening Ontrac actuator end cover, switch two red DIP on top-right corner of wiring board to "ON" position (as shown in Figure 2), to enable the built-in lithium-ion battery connect to the circuit, this is a must.

Switch six red DIP as analog input impedance matching on top-left corner of wiring board to the position in normal condition to improve the load capacity (combination as Figure 3), otherwise as Figure 4.

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Ontrac power cable cross-section area are: flexible cable $\leq 6\text{mm}^2$, non-flexible cable $\leq 4\text{mm}^2$, cable cross-section area of signal terminals is $\leq 2.5\text{mm}^2$.



Spring press wiring terminal is adapted in Ontrac actuator other than screwing connection for better anti-vibration. Use screwdriver to press white plastic parts and then embed bare wire of signal into hole, release the screwdriver.

Wiring Steps

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1. Use hexagonal wrench remove the wiring cover of actuator
2. Unscrew the sealing end cap of cable hole , replace it with waterproof connector, please pay attention to plug-in end cover, cable hole is on the upper of cover
3. Remove arc shape metal article fasten on the cable(for plug-in end cover, three claps)
4. Thread wiring cable through the waterproof connectors, for plug-in end cover, remove connector before wiring, and resume it after wiring
5. After wiring resume all articles removed in step 3, tighten the screw ensure cable firmly fastened, not too tight to avoid damaging the external insulating layer of cable
6. Tighten waterproof screw to seal the cable entrance
7. After check-up, put end cover back, please do not forget the o-ring to ensure proper sealing

Basic Electrical Parameters

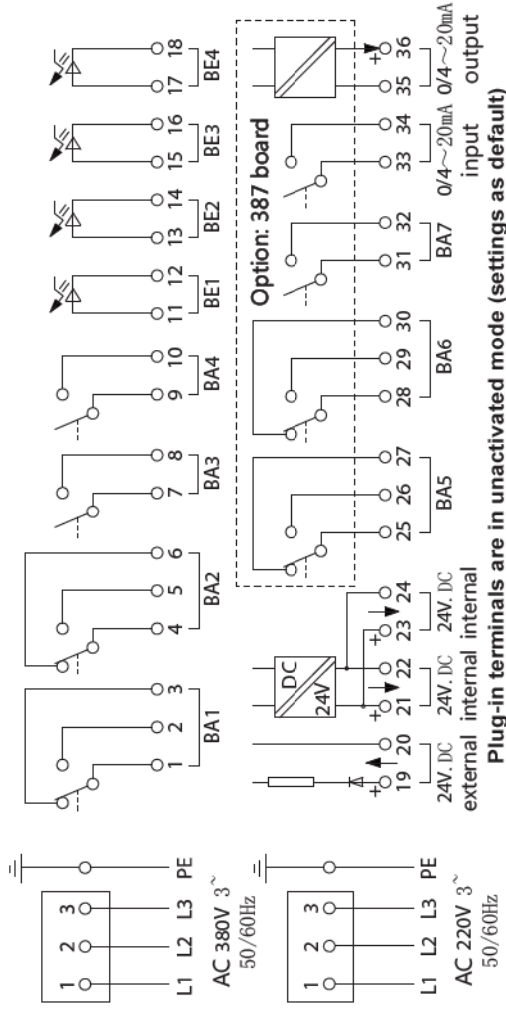
- Power Supply:
 - AC 380 V 3 ~ : -15% / +10%; 50/60 Hz $\pm$ 5%
 - AC 220 V 1 ~ : $\pm$ 10%; 50/60 Hz $\pm$ 5%
- Internal power supply:
 - DC 24 V; max. 30 mA; short-circuit protection
- External power supply:
 - DC 24 V; (18~33 V); max. 500 mA
- Input signal:
 - 1) Analogue: 4~20mA, DC, input impedance 250 Ω , rise characteristics
 - 2) Digital: pulse width $\geq$ 50ms, numerical number is "0" means -3~-+5V or open circuit, numerical number is "1" means +12~-+35V
- Output signal:
 - 1) Analogue: 0/4-20mA, DC, load resistance $\leq$ 750 Ω , temperature dependency $\leq$ 0.1%/10K, rise characteristics
 - 2) Digital: 30V DC 1A

ACK09-05A

0 4

Electrical Wiring

MME Connection:

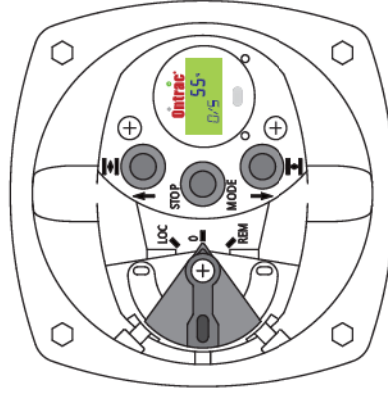


1. Optional 387 board is required to use the function in dotted line closed part.
2. BA contact is for output status. BE contact is for digital input.
3. Pin 19, 20 are external 24V power supply plug-in terminals. If use, when main power supply is out, actuator's output signals remain, analog output terminal (387 board required) will remain its own status, the LED screen of actuator displays normally.



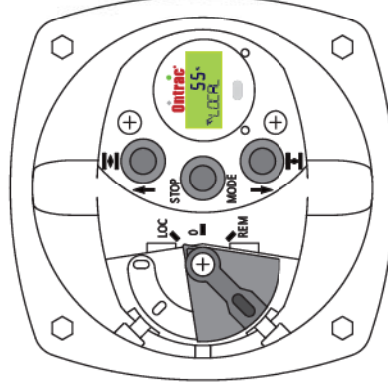
Mode Selector Switch Instruction

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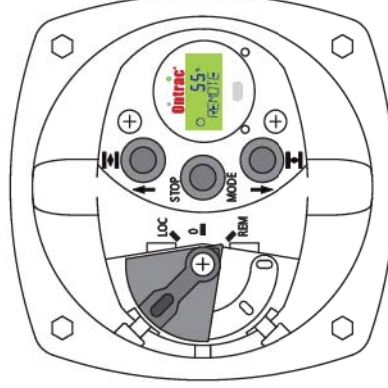
No Operation Mode

Actuator do not accept any local or remote commands, can enter the menu to view the actuator status or parameters only.



Local Control Mode

Locally open and close valve, stop the operation and menu operations (setting parameters).



Remote Control Mode

Actuator is accepting remote control signal, you may enter into the menu to view actuator's parameter and setting

5mm padlock can be used to lock mode selector, to prevent unauthorized operation.

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Panel Instruction

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Actuator has three buttons, each button in different state has different function.

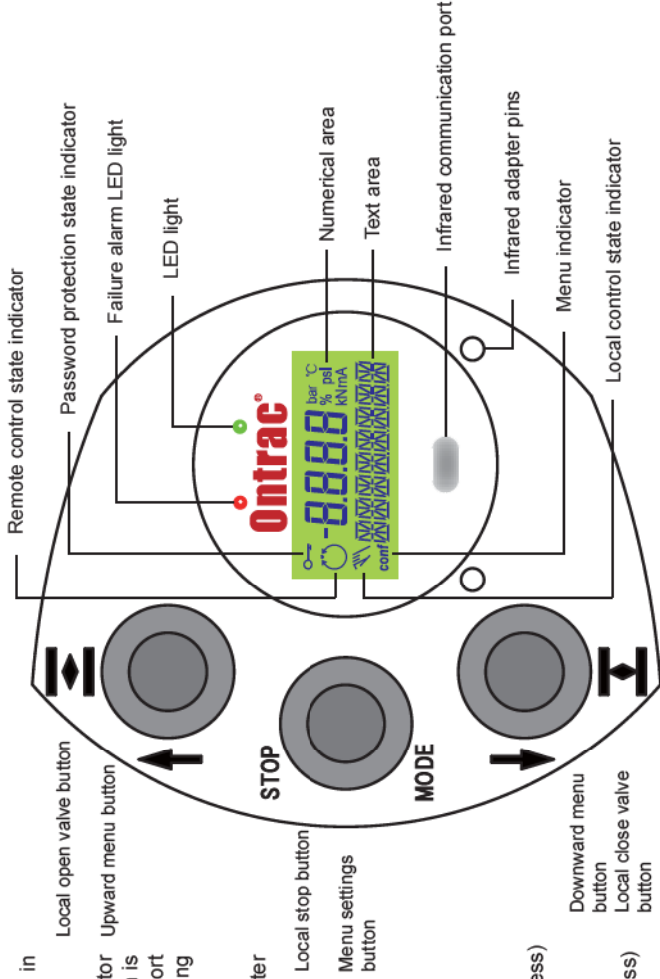
Local operating mode (when mode selector switch turn to LOC position), and their function is defined as: local valve opening (hold or short press), STOP (short press) and local valve closing (hold or short press, see Page13).

Menu mode (long press the middle button to enter the menu mode), their function is defined as:

↑ same menu level switch (short press) parameters adjustment (hold or short press)

MODE
 one menu level ahead (long press)
 one menu level back (short press)
 save changes or not (short press)
 Return to one menu level back (short press)

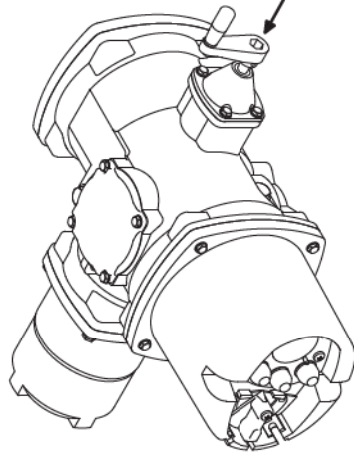
↓ same menu level switch parameters adjustment (hold or short press) code or password switch (short press)



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Handcrank Operation

When an actuator is in full stop, press handcrank in the direction as showing in the Figure. (If can not press-in, try from different angle), clock wise or counterclock wise will manually operate the actuator. Handcrank will maintain in press-in position when load is applied to actuator.



Please do not try to use handcrank when actuator is powered on and in running mode.

Menu Structure

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For better understanding the menu structure, we like to explain as follows:

1. Please note the "SAVE" step is not included.
2. Only when mode selector set to "LOC" , and with the correct password (see Page22), parameter change enabled.
3. When mode selector in other two positions, can only view parameters.
 3. **≡** and **↑** represents upper button, **MODE** and **STOP** represents middle button, and **≡** and **↓** represents lower button.
4. Horizontal direction means one level up or down menu, use **MODE** button to enter or exit, vertical direction means same level menu, use **↑** and **↓** to switch .
5. There are three ways to operate the button, short press, long press (press 2 seconds) and maintain (hold down buttons until the desire mode is achieved).
6. Initial values of the configuration or parameters are the factory default values.



Currently supports
English only

Only trained and experienced personnel can commission the actuators on site (in the field). Please do not touch the operation button to avoid unnecessary damage.



10% steps within 40% ~ 100% adjustment range. Maybe smaller than 100%



Basic parameters setup

When without recommended torque value, please try to set up switch off torque from small to large value until it meets the desired value. After actuators running for a while, if there is torque alarm message, please increase the settings of P1.1 or P1.2 but ensure that the valves within limit operation range.

The percentage of switch off torque for valve opening

The percentage of switch off torque for valve closing



10% steps within 40% ~ 100% adjustment range. when additional/external gearing applied



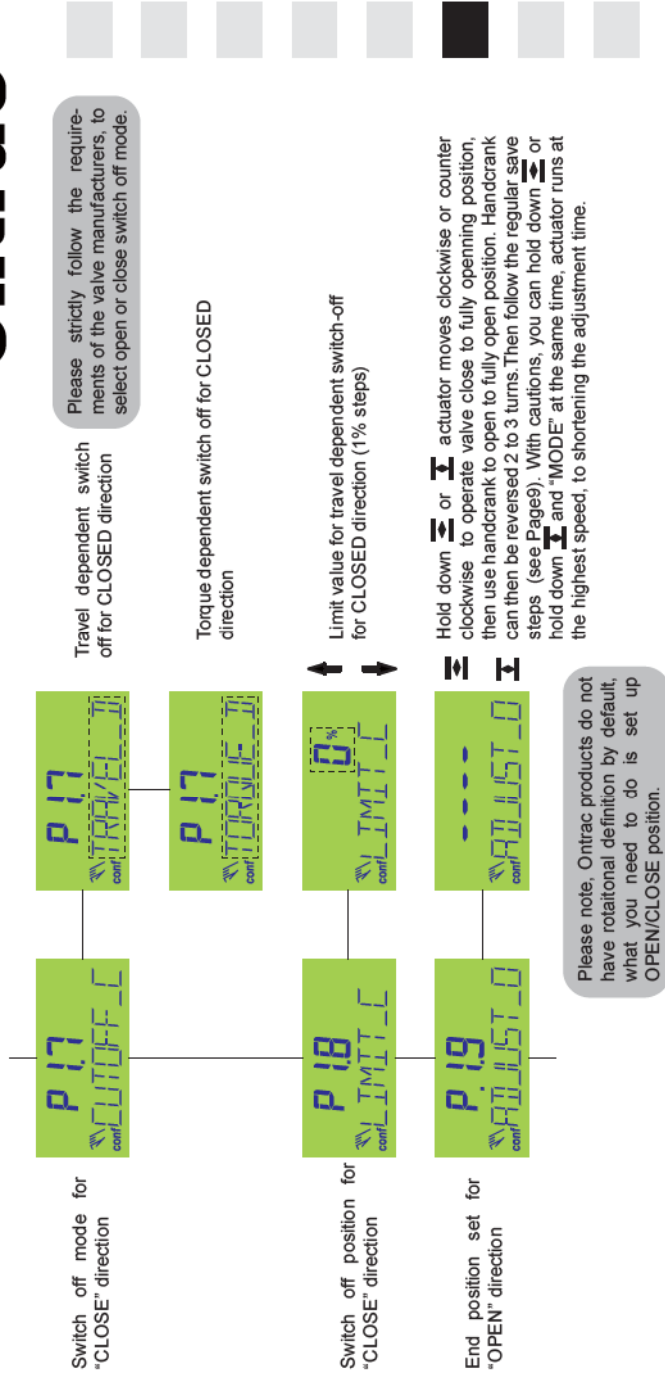
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Menu Structure



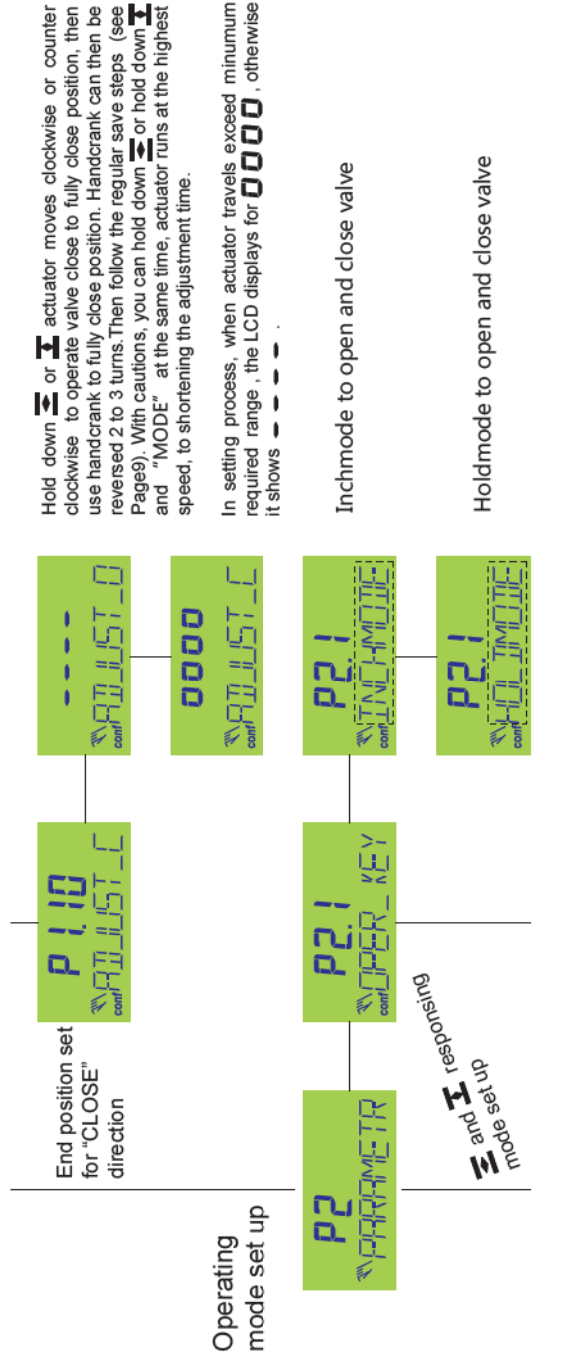
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Menu Structure



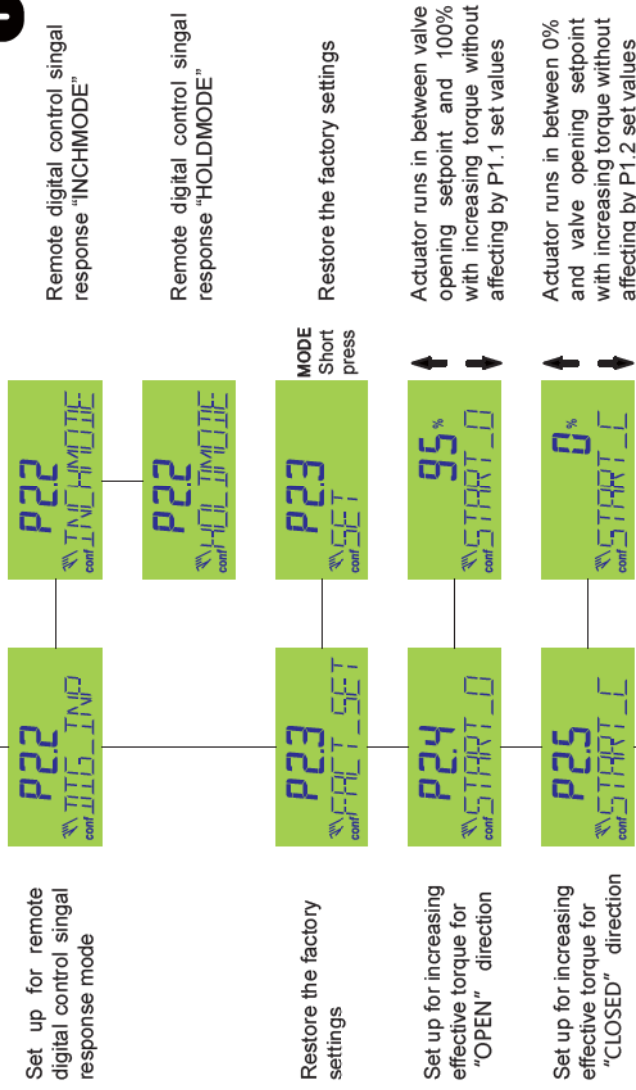
ACK09-05A

Menu Structure



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Menu Structure



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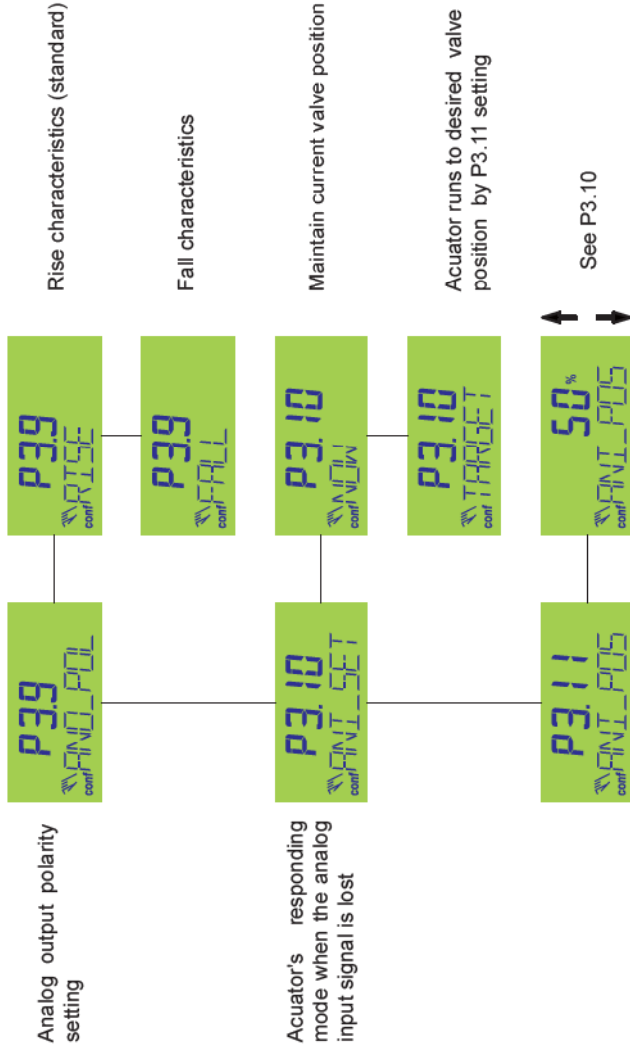
Menu Structure



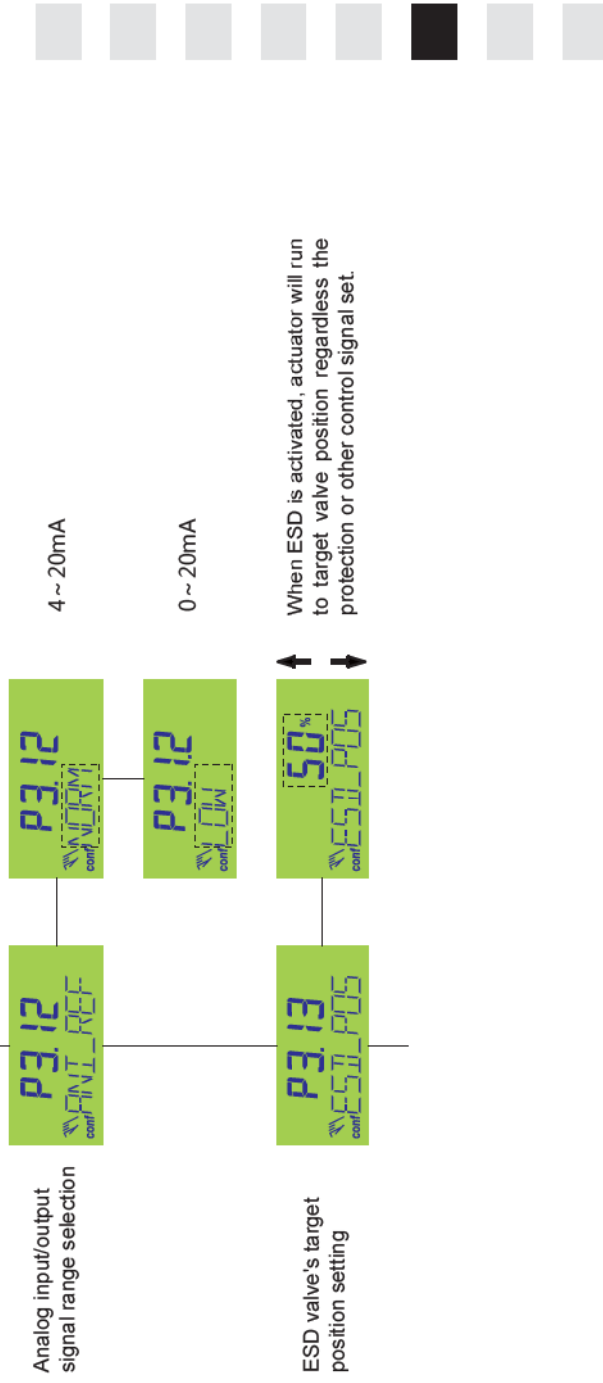
Menu Structure



Menu Structure



Menu Structure



Menu Structure

Self-diagnosis menu

Error information



Alarm information



LCD test



System information



Travel time to end position in "OPEN" direction

Travel time to end position in "CLOSED" direction

If actuator has error, actuator will not respond to control commands (except ESD), the numerical number on the screen shows current error serial number . if the number is greater than 1, use ↑ and ↓ to scroll.

If actuator has alarm messages, actuator will still respond to control commands, the numerical number on the screen shows current alarm serial number. if the number is greater than 1, use ↑ and ↓ to scroll.

Display all the contents on LCD screen to determine whether LCD is malfunctioning

Unit: seconds

P4 menu is read-only, you can not change it. Numerical number "8" on LCD is for display only.

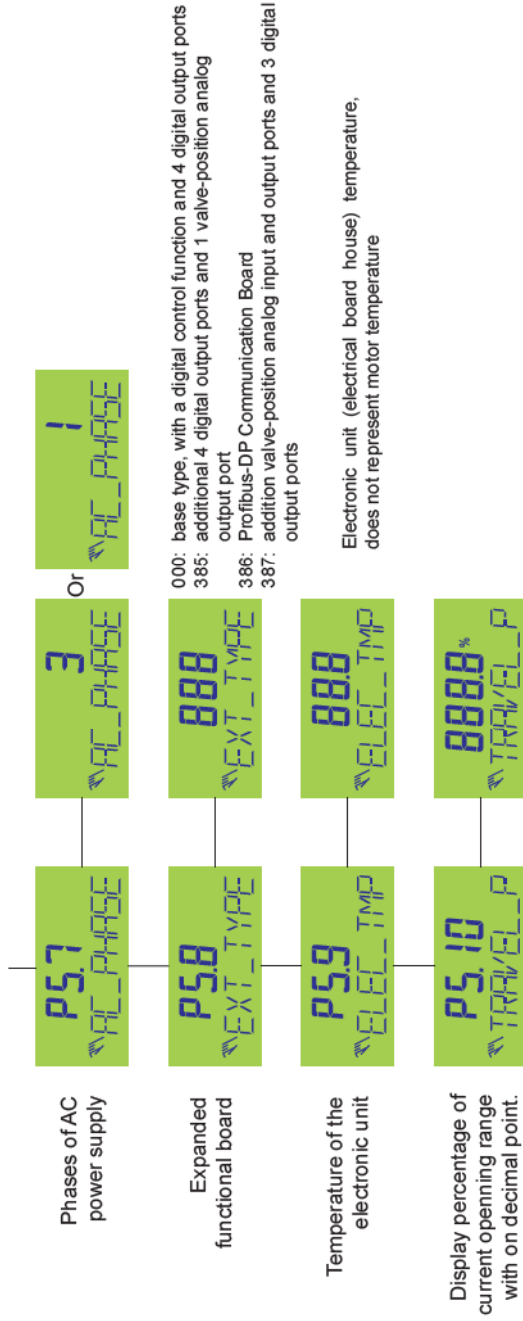
Unit: seconds

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02

Menu Structure



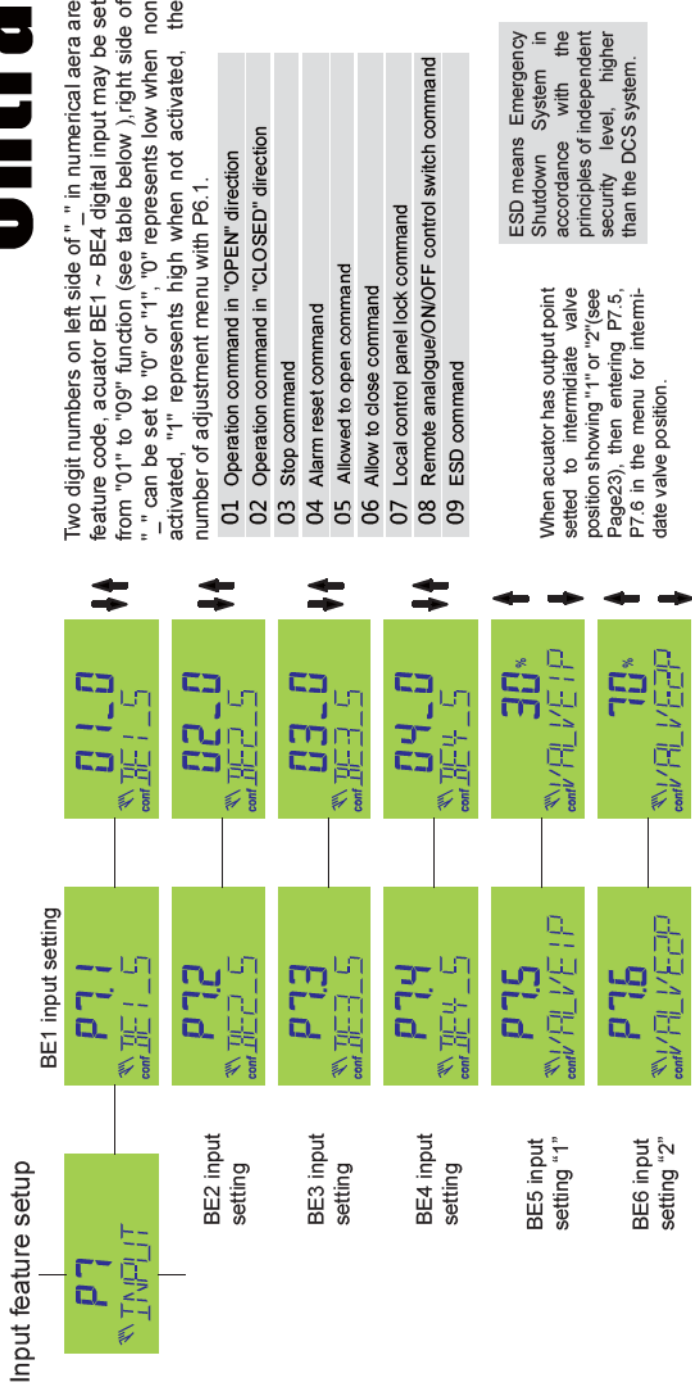
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If you would like to set up password-protection, please set the P6.3, and then set the P6.2, if you can not set the P6.3, password-protection may already active

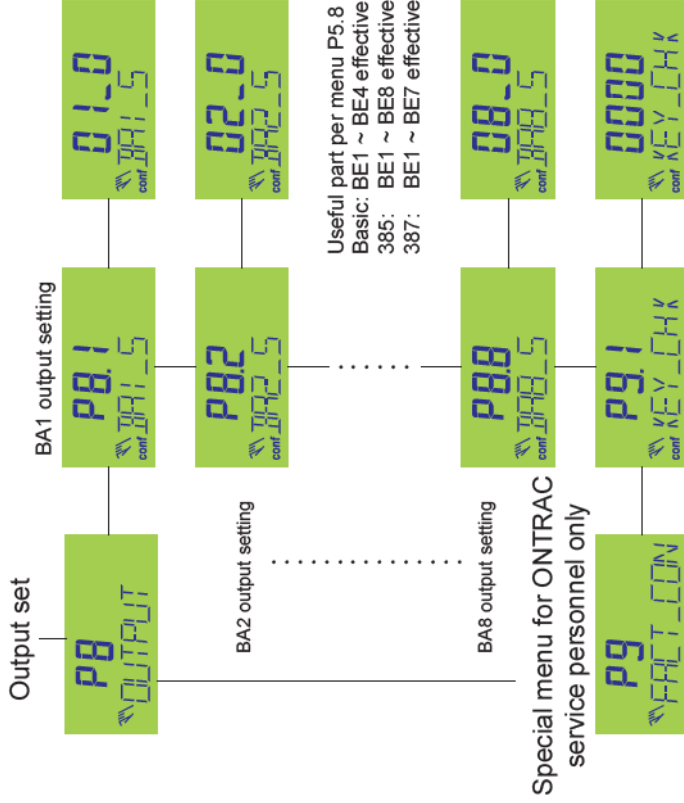
If actuator is set for deactive password protection as default (without password protection), if protection has been activated, you would like to deactivate, enter P6.1 for your password verifying, then it can be saved.

Menu Structure



ACK09-05A

Menu Structure



Two digit numbers on left side of " " in numerical area are feature code, actuator BA1 ~ BA8 digital output port may be any combination from "01" to "18" 18 kinds of function (see table below), right side of " " can be set to "0" or "1", "0" represents high then not activated, "1" represents low when not activated, the number of adjustment menu with P6.1.

01	Ready to run
02	Failure alarm
03	Open to the end position
04	Closed to the end position
05	Exceeded torque in "OPEN" direction
06	Exceeded torque in "CLOSED" direction
07	Intermediate valve position indication 1
08	Intermediate valve position indication 2
09	Remote control
10	Local control
11	Actuator operation (continuous signal)
12	Actuator operation (pulse signal)
13	Operation in "OPEN" (pulse signal) Valve end position (continuous signal)
14	Operation in "CLOSED" (pulse signal) Valve end position (continuous signal)
15	Analogue/ON/OFF control
16	Operating in "OPEN" direction indication (continuous signal)
17	Operating in "CLOSED" direction indication (continuous signal)
18	ESD state indication (continuous signal)

ACK09-05A

Error and Failure

No.	Display Text	Error Description	Reason / Measure
1	ELECTR	electronics failure	need Ontrac technical personnel instruction or on-site service
2	PHASE	phase of main power supply missing	check main power supply
3	TEMP_MOT	temperature limit for motor exceeded	actuator will stop working until motor cools down
4	TEMP_ELC	limit temperature for electronics exceeded	actuator will stop working until motor cools down
5	HANDWHL	handcrank failure	check handcrank to see if it is damaged, Ontrac technical personnel maybe needed or request on-site service
6	END_POS	over run of end position	use handcrank to operate the actuator to normal range or reset the range (P1.9 or P1.10 menu), alarm will disappear automatically
7	TORQUE_O	switch off torque in Open direction	try operate the actuator in opposite direction , if the alarm is still on, please increase the setting value in menu P1.1 with cautions
8	TORQUE_C	switch off torque in Close direction	try operate the actuator in opposite direction , if the alarm is still on, please increase the setting value in menu P1.2 with cautions
9	IPM_FLT	power module protection of variable frequency control board	exceeding current or temperature of frequency control board limit, use menu P3.1 to eliminate the alarm, contact Ontrac technical personnel if same error is recurring

Error and Alarm

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10	VOL_OVER	over voltage protection of main power	please make sure the main power voltage is within 342V~437V, when the power is recovered, the alarm will eliminate automatically, if necessary Ontrac personnel may be needed on site
11	VOL_UNDR	under voltage protection of main power	please make sure the main power voltage is within 342V~437V, when the power is recovered, the alarm will eliminate automatically, if necessary Ontrac personnel may be needed on site
12	BLOCK_O	blocking in Open direction	try operate the actuator in opposite direction, if the alarm is still on, please increase the setting value in menu P1.1, but make sure valve within limited working condition
13	BLOCK_C	blocking in Close direction	try operate the actuator in opposite direction, if the alarm is still on, please increase the setting value in menu P1.1, but make sure valve within limited working condition
14	MOT_LINE	wrong output wiring of motor	need Ontrac technical personnel instruction or on-site service
15	HALL_SEN	malfunction of motor(Hall)	need Ontrac technical personnel instruction or on-site service
16	RELAY	malfunction of secondary power on variable frequency electronic board	need Ontrac technical personnel instruction or on-site service
17	AUXPOWER	malfunction of relay on the variable frequency electronic board	need Ontrac technical personnel instruction or on-site service

When contact ontrac for technical support or field service request, please prepare and provide the information on nameplate, error message, and properly describe applications, installations and use history. This will help in identifying problems and facilitate problem solving in timely manner.

ACK09-05A

Alarm

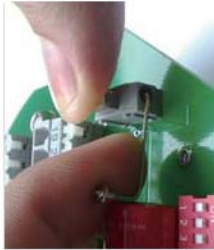
No.	Display Text	Alarm Description	Reason / Measure
1	BAT_CHANG	battery discharged	change battery and reset the actuator operating range
2	BAT_EMPTY	pre-alarm for discharged battery	change battery as soon as possible reset actuator operating range after battery change
3	TORQUE_O	torque alarm, OPEN .	check selected pre-alarm torque value, check actuator, valve and and gearing (if used) for increased friction and actuator probably used below permitted ambient temperature (oil viscosity)
4	TORQUE_C	torque alarm, CLOSED .	same as above
5	TEMP_MOT	critical motor temperature	once motor-alarm temperature is achieved, the actuator is only available with reduced speed, until the motor is sufficiently cooled down
6	TEMP_ELC	critical electronics temperature	once electronics-alarm temperature is achieved, the actuator is only available with reduced speed, until the electronics are sufficiently cooled down
7	24_VOLT	breakdown of external DC 24 Volt supply	actuator is still working, however, if main power lost, output contact will not be able to maintained, nor analog output.
8	CNT_TRQ	exceed torque switch off limit (default limit value: 10,000)	check valve working status
9	STEP/SH	switching frequency of 1200/hour exceeded	increase deadband (P3.8 menu) , to decrease the responding times
10	LOAD_EXC	modulating torque value exceeded	alarm can be reset with user interface, it will be reset automatically after 10 min
11	SETPOINT	input exceed the limit	please check current supply , make sure the current is within 3.6mA~20.8mA
12	ACT_TYPE	miss matching of actuator model	please check the actuator setting type or model in menu P5.6
13	AC_PHASE	miss matching of phase of power supply	please check AC power supply phase number setting in menu P5.7, check the power supply as well

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Product Maintenance

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Under normal condition, battery can last 10 years. If there is battery alarm message, please follow the steps to replace battery on your own



1. Remove the end cover, you can see a black case for battery
2. Unscrew as showing in left Figure, you can see the Li-battery
3. Press down the white plastic article (under the thumb), unplug the wiring between +/- pole and remove the battery
4. Place the new Li-battery back
5. Recover the end cover, please do not forget to put back sealing o-ring

Ontrac actuators are oil lubricated with MOBIL SHC 629. There is no need to change the lubricant during the entire actuator life. Please refer to follow table if there is exception.

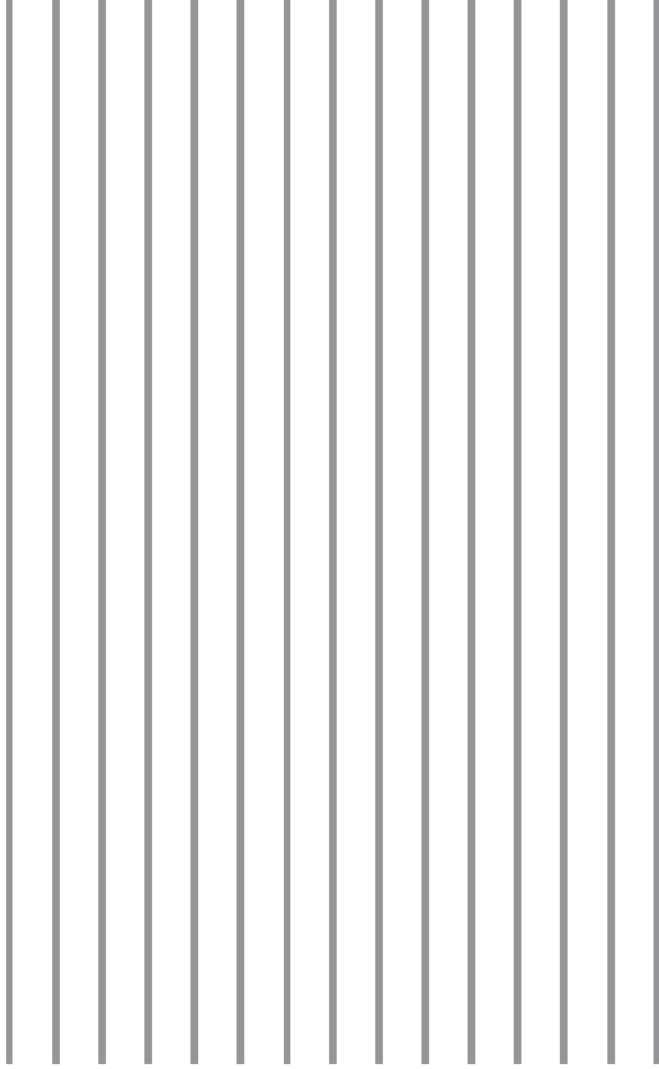
Actuator Type	MOE 706	MOE 708	MOE 712	MOE 725	MOE 750
	MME 806	MME 808	MME 812	MME 825	MME 850
Filling (L)	0.4	0.4	0.4	0.6	0.6

Notes

92

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03



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Former ABB Technology

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