

Instructions for intelligent valve controller

Non intrusive 7 cover opening free operation

Dead time adaptive non oscillation

Fault self diagnosis and protection

Field operation jog and hold adaptation

Real time query of remote control signal and valve position signal

Version: v1.0.1

- please read this instruction carefully before using and installing this product
- please keep this book properly for future reference (keep it for future use)
- please use it correctly on the basis of full understanding of the content

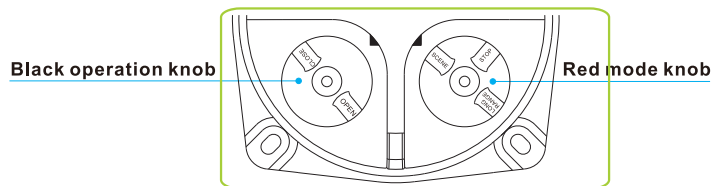
This instruction is subject to change without notice.

1.FUNCTIONAL FEATURES

- LCD multi-function icon display window, the user can grasp the basic equipment parameters and monitor% line status at any time, Fault +, information one-79 of course;
 - Equipped with=external remote control, real AB connects H type A field control and parameter setting, real A does not need to open the cover and O protection;
 - Actuator real-time monitoring function; after detecting the fault, it will stop the% line of the motor to protect the equipment system c.
- After the display shows +, in addition to the information, you can send m+ to the control system c through the no iH point;
- n has p-phase r dynamic protection function and phase sequence r dynamic phase discrimination, r dynamic correction function, A field does not care about phase sequence problems;
 - Adopt the original improved PID control algorithm to improve the success rate of 9--times positioning; the improved PID control algorithm
- The method can adjust the PID parameters dynamically according to the inertia, wear and load force (moment) of the actuator brake mechanism.
- According to PID parameters, calculate the best stop time for m forward and reverse rotation to ensure the success of the second positioning;
- n has an over-torque protection function, when mA fails, the actuator can be disconnected% line;
 - Waterproof design, the waterproof grade reaches IP65 waterproof.;
 - Support various control signal input, the adjustment type and the switch type are combined into one, r is selected by the adjustment type and the switch type.
- At the same time, embedded 9 supports the Modbu communication protocol RTU communication mode based on the 485 follow-up interface (optional);
- Embedded one-piece, perfectly integrated with the body, beautiful and generous;

2.OPERATING INSTRUCTIONS

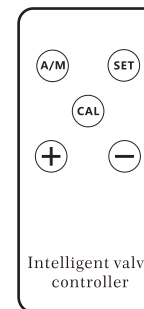
Knob operating instructions



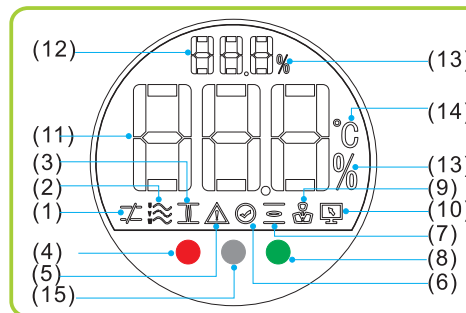
	Black operation knob		Red mode knob
Function One:	1: Turn the operating button to "close" to close the valve 2: Turn the operating button to "open" to open the valve 3: Rotate the operating button to "off" or "on" "On" for more than 3 seconds, enter the hold mode	Function One:	The two-color knob is the mode button, which can be in the A field, .. Switch between stop and remote;
Function Two:	In the parameter setting mode, the operating button rotates to "Open valve" means the value is added, turn to "close valve" to decrease the value;	Function Two:	Parameter setting mode: the mode button rotates from "Stop" to "A field" to confirm, and the mode starts from "Stop" to "Remote" rotation is retreat m

Remote control instructions

BUTTON	FUNCTION
AM	Switch between remote control mode and A field, stop, and remote mode.
SET	Long press for 3 seconds to enter the parameter setting interface";
CAL	Reserved key
+	Press the "+" key to open the valve or add the corresponding parameter value;
-	Press the "-" key to close the valve or reduce the corresponding parameter value;



3.SYMBOL DESCRIPTION



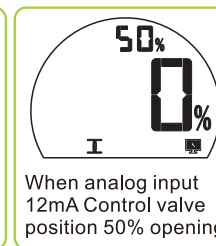
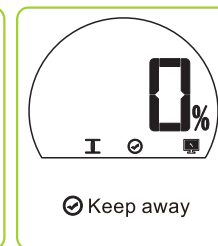
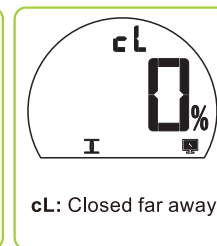
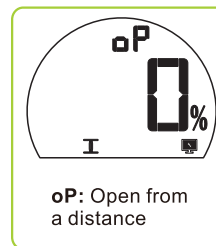
- (1) Stalled rotor error
- (2) P phase error
- (3)(4) indicates that the valve position is fully closed, or Flashing indicator off% line

- (5) Error+,
- (6) H hair keeps opening or closing the valve continuously in%
- (7)(8) indicates that the valve position has been fully opened in place, Or flashing indicates to open% line
- (9) A field mode
- (10) Remote mode
- (11) Valve opening display area or temperature value display area
- (12) Auxiliary information display area
- (13) Percentage unit
- (14) Temperature unit
- (15) =External remote control receiving window

4. STATUS QUERY

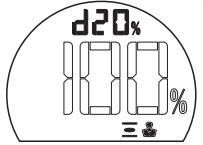
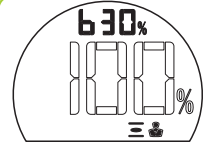
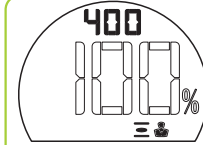
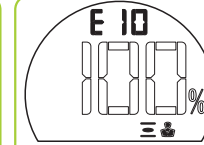
Remote control information query

Rotate the knob to the remote, and display the received remote control signal in the auxiliary information display area;



Valve position acquisition signal query

When turning the mode button to the A field, the valve position acquisition signal will be displayed in the auxiliary information display area;

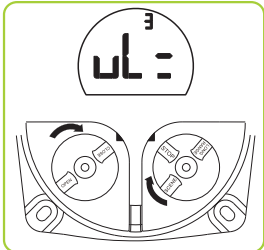
 <p>d20: Percentage of potentiometer resistance value. Range: d00~d99</p>	 <p>b30: Encoder percentage Range: b00~b99</p>	 <p>400: Multi-turn encoder per thousand ratio. Range: 000~999</p>	 <p>E10 stands for error code</p>
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5.GENERAL SETTING

Stroke calibration

Note: The over-limit switch wiring of the electric actuator has been set by default before leaving the factory, and it is used under special circumstances.

Zero calibration



1: Enter the calibration zero position: rotate the mode button to the "stop" position, and rotate

Press the button to the "close" position and wait for 3 seconds, when the display shows "uL"

Release; the screen flashes "uL";

2: Adjust the valve position: rotate the mode to the "A field" position, and rotate the operation

Move the button to the "close" or "open" position so that the valve position% moves to the x position

3: Determine the calibration zero position: Rotate the mode button from "A field" position to "Stop"

Position, turn the operating button to the "close" position once to confirm this position

The calibration is all off, the screen flashes 0%, then go back to m calibration zero position, () to the constant display interface;

Full calibration



1: Enter the full calibration position: rotate the mode button to the "stop" position, and rotate

Press the button to the "open" position and wait for 3 seconds, when the display shows "uH"

Release; the screen flashes "uH";

2: Adjust the valve position: rotate the mode button to the "A field" position, rotate the operation

Move the button to the "close" or "open" position so that the valve position% moves to the x position full

3: Confirm the full calibration position: Rotate the mode button from "A field" position to "Stop"

Position, turn the operating button to the "open" position, make sure to set this position

After the calibration is fully open, the screen flashes 100%, and then back to m calibration full position, () to always display interface;

6.ADVANCED SETTINGS

Enter advanced settings



Note: The advanced setting options generally do not need to be operated after leaving the factory, if they need to be operated, they need to be used under the guidance of the engineer

● Turn the mode button to the "stop" position, and the operation button to the "off" position for about 30 seconds, and wait until the display

Release the operating button when the screen displays "P=", the screen flashes "P=5.0" to enter the advanced settings interface;

● Parameter setting mode: the mode button rotates from "stop" to "A field" to confirm the mode button from "stop" rotate to "distant" to exit;

● Parameter setting mode: turning the operating button to "open valve" means the value is added and turned to "close valve" is the value minus

Flow chart of advanced parameter setting

<p>P= 2.1 Other parameter settings</p> <p>P=2.1 Enter P parameter, modify P=2.1, Enter the parameter setting world.</p> <p>Eb=1 Electronic brake: 1=Use electronic brake, 0=take electronic brake</p> <p>Ac=0 Positive and negative action: 0=positive action side 7, 1=Reaction mode</p> <p>I=0 Interrupt signal mode: I=1 open action, I=2 no action, I=3 closed action</p> <p>cL=0.0% Electronic limit lower limit (default=0.0%)</p> <p>cH=100.0% Electronic limit upper limit value (default = 100.0%)</p> <p>d=0.4% Control accuracy value: (default=0.4%)</p> <p>P=5.0 Adjust P=5.0 to save and exit.</p>	<p>P = 1.1 output current calibration</p> <p>P=1.1 Enter P parameter, modify P=1.1, Enter the parameter setting world.</p> <p>oL=X.X Calibration of output current zero value (default 4mA)</p> <p>oH=X.X output current full value calibration (default 20mA)</p> <p>t=80 Motor alarm temperature, default 85°C</p> <p>P=5.0 Adjust P=5.0 to save and exit.</p>
<p>P= 4.1 Stall time setting</p> <p>P=4.1 Enter P parameter, modify P=4.1, Enter the parameter setting world.</p> <p>bT=4 Blocking time setting (default=4 seconds)</p> <p>P=5.0 Adjust P=5.0 to save and exit.</p>	<p>P=11.1 input current calibration</p> <p>P=11.1 Enter P parameter, after modifying P=11.1, Enter the parameter setting world.</p> <p>iL=X.X input current zero value calibration (default 4mA).</p> <p>iH=X.X Input current zero value calibration (default 20mA).</p> <p>P=5.0 Adjust P=5.0 to save and exit.</p>
	<p>P=9.1 Remote control signal setting</p> <p>P=9.1 Enter P parameter, after modifying P=9.1, Enter the parameter setting world.</p> <p>iP=0 0=Remote adjustment type; 1=Conventional switch type; 2=Open with letter, open without letter; 3=Close with letter, open without letter; 4=Modbus communication (optional);</p> <p>P=5.0 Adjust P=5.0 to save and exit.</p>

7.ERROR CODE TABLE

Note: The error code is displayed in the auxiliary information display area

Error code	Meaning	Solution
E0	Electric ip phase	Check that b380VAG phase power iDE is well connected to H
E1	The parameter T is stored incorrectly.	R0s Input current calibration
E2	Over temperature inside the machine+	If the temperature inside the equipment or machine is too high, take u-temperature measures
E3	Open to% line stall	Check b valve or actuator mechanical part, when the motor is running% Lead to valve position/change
E4	Close to% line stall	Check b valve or actuator mechanical part, electric actuator% running time□Lead to valve position/change
E6	Control signal current is too small or missing	Check b signal input 1DE is connected Or re-calibrate the input current value
E7	Control signal current is too large	Check b current is greater than 150% of the calibrated standard current value iH
EL	Limit switch or Torque switch reversed	Connect the opening torque and closing torque of the 10 points to 1;
E9	Given signal in electron Beyond the limit value	Check bDE set 9 "E, "cH" electronic limit, Or re-calibrate the input current
E10	Zero full stroke difference is too small	% Travel difference is too small, re-calibrate the valve to zero full position
E11	External motor temperature switch Or moment common o disconnect	Take u temperature measures or check b torque public o (temperature switch 1 Connect 1DE to disconnect;
E12	Potentiometer, encoder failure Barrier or potentiometer p zone	Check b potentiometer and encoder are connected to 1DE or connected to the drive. Gear_engaged /good, adjust the effective range of the potentiometer;
E13	Open torque	Encountered open torque switch or open limit switch
E14	Closing torque	Encountered close torque switch or close limit switch
E15	Wrong steering	Adjust the phase sequence of the motor 1

8.COMMON PROBLEM HANDING

Power-on indication display screen/show	A. Electric i0 access B. Electric i2 C. connect 1 wrong D. Electricity 3 over 4
5 for 6- Display screen Show 8 regular	A. Display 2 indication-2 B. Fault code C. Electricity: Board 2
Field A. Remote control average/capable action	A. Torque connection 1 open: or touch open B. Temperature switch 1 open: C. Motor drive power: 2 D. Fault protection, lock the motor
A field can move, C remote control/action	A. Reverse connection of control signal or no signal B. Fault protection, lock motor C. potentiometer DEF buckle
A field/action, C remote control can move	A field/action, A. Mode button plate 2 or I is in field A B. The operating button 0 is turned in place or tilted P C remote control can move or magnetic steel magnetic L or M far away C. Electricity: 2
Can be on/off Or can be turned off/ can be turned on	A. Torque connection 1 is wrong or open: B,% travel to the limit or over the moment C. Motor 2 is blocked or connected wrongly 1 C. Electricity: 2
No control signal Power on R to act.	A, then 1 kae B. The control signal is indeed T in C. Lost signal action C. Set to U1 control mode
6 positions can move To the limit / move	A. Torque switch is connected to 1 reverse B. Motor V stays in place C. Connect 1 open: C. Electricity: 2
The direction of action is reversed	A, the motor is connected 1 reverse B. Valve position calibration reverse C. Positive and negative action or reverse closing direction C, reverse signal
No output current Or sometimes no	A. Input m is connected to 1 wrongly or connected to H/good B. Potentiometer or encoder failure or pick H/Good C. Electricity: 2.
The reverse Z current is too large Or too small or/change	A. Potentiometer or encoder failure or too small or/change C. Potentiometer and transmission gear _ meshing/good D. Electricity: 2

9.485 COMMUNICATION PROTOCOL SPECIAL INSTRUCTIONS

Introduction to Icommunication

RS485 communication is widely used in 5 industry r dynamic control, far away from data transmission; usually, The data transmission specification adopts the Modbus protocol; In practical application 6, increase the reliability of data transmission, far distance, and load capacity for 9, usually in the sub System c 6 adds 4856 relay amplifier; if the transmission M distance is less than 300 meters, in the 485 load 4 25 order system c 6, Can/add 6 relays (environmental factors should be considered); data transmission 1, using shielded cable D is a better choice; in When laying 1:, avoid external factors such as magnetic field i, possible lightning interference, etc.;

Communication mode 7

- Communication physical layer: RS-232 RS-485 international standard in line with the national standard
- Data format: 1 bit P start bit + 8 bits data + no parity check bit + 1 stop bit, each character or byte is as follows:
~The 4 most significant bits and the last most significant bit are transmitted in bytes (from left to right);
- Communication mode: adopts Modbus standard RTU communication mode
- RTU frame format:
Initial structure ≥ 4 bytes time address code = 1 byte Function code = 1 byte
Data area = n bytes Error check = 16-bit CRC code End structure ≥ 4 bytes time
Address code: The address code is the first byte of communication transmission. In a communication network 6 each slave corresponds to the unique .One address code, the range of which can be set is 0-254 (+ hexadecimal), the address code table sent by the host, the address of the slave that will be sent to, the address code sent by the slave indicates the address of the slave that will be sent;
Function: The function code is the second byte of communication transmission; the function defined by MODBUS communication protocol
The number is 1-127, this watch only uses part of the function code of 9 and 6; the host sends the function code
D tells the slave machine what operation should be performed, under normal circumstances, the slave machine will perform the operation
And as a response) send the function code, if the highest bit of the function code sent is 1, it means
Machine I has a response operation or sends m error;
Data area: The organization of the data area is based on the function code of the same/the same; the data area can be the actual number
Value, you can also set the address or status of the D instrument to the T device;
Error check: CRC check; treat the entire RTU frame as a continuous binary data string, check Only the data bits are involved in the verification, the P start bit and stop bit are discarded.
Optional parity bit;
- The steps to generate CRC code are as follows:
 1. Pre-register a 16-bit register with all 1s (that is, hexadecimal FFFF), and call this register as a CRC register;
 2. Phase 8 OR the first 8-bit data with the 48 bits of the CRC register, and place the result in the CR register;
 3. Shift the 16-bit CRC register to the right by - bit, add 0 to the highest bit, and check S to shift m bits;
 4. If the shift m bit is 0, repeat the third step (shift m again); if the shift m bit is 1, then the CRC is sent to the T device;
 5. Phase 8 OR with polynomial A001H, the result is put) CRG register T device;

6. Repeat steps 3 and 4, Move to m8 bits;
7. The next 8-bit data is ORed with the 48-bit CRC register, and the result is put) CR to T Device, repeat Steps 2, 3, 4, and 5; the content of the last CRC transmitter is the generated CRC check code; Positioner default: communication baud rate 9600, 8-bit data, 1-bit stop bit, no check; in continuous sending and receiving When sending a command data, it takes 10ms, and the maximum receiving-group data is 20ms. So for reliable applications, build Proposal> = 30ms to give a command to the positioner.

Register description

- The internal register mapping of the module

Number	Function	Register address	Attributes	Range	Illustrate
1	Local Remotely	0x0000	Read and write.	0x0000 local 0x0001 remote	
2	Set value	0x0001	Read and write.	0x07CF~ 0x0BB7	When reading data: reduce the cost of the value read by communication 1999 result is the actual threshold value When writing data: the actual valve position value is added 1999 results are communication values
3	Threshold value	0x0002	Read	0x07CF~ 0x0BB7	Communication read value minus 1999 result is the actual threshold value
4	Error code	0x0003	Read	0x0000~ 0xFFFF	Each code has a certain type of error message, refer to the error code table

- According to the Modbus specification, define the function code 03 as read and 06 as write
Function code 03 reading: The host reads the current valve position value from the positioner 6, and sends the data packet as follows (hexadecimal byte):

Send grid7	Address	Function code	Register high byte	Register low byte	Number high byte	Number low byte	CRC check low byte	CRC check high byte
For example	01	03	00	02	00	01	25	CA
Parsing	01 Locator	read function code	Threshold value register		Read-only valve position register		According to CRC16 specification.Checksum calculated by method	

The data transmitted by the locator includes 9 address, function code, data length, data (or error response value), CRC Check code;

Send grid7	Address	Function code	Data length	Number high byte	Number low byte	CRC check Low byte	CRC check high byte
For example	01	03	02	09	C3	FE	45
Parsing	01 Locator	read function code	2 bytes of data	Read-only valve position register		According to CRC16 specification.Checksum calculated by method	

Enter the CRC16 check for the received data 01 03 02 09 C3, To 0x45FE, and the received The CRC check value is compared, the CRC check result is equal; that is, the () The data is valid and the acceptance is successful; the example 6 Read the valve position value of No. m9 locator, 0x9c3 decimal D2499, according to the data algorithm: 2499-1999=500, because the positioner data retains a decimal point, the current threshold value is 50.0%

Function code 06 write: the host writes 80.0% of the set threshold value to the positioner, 800+1999= after data conversion 27996, hexadecimal 0x0AEF, so write data 0AEF to register 0001, real A controls the valve to open setting the degree to 80.0%, the data packet sent is as follows (hexadecimal byte)

Send grid7	Address	Function code	Register high byte	Register low byte	Number high byte	Number low byte	CRC check Low byte	CRC check high byte
For example	01	06	00	01	0A	EF	9F	26
Parsing	01 Locator	read function code	Threshold value register		Set value data		According to CRC16 specification. Checksum calculated by method	

The data transmitted by the locator includes 9 address, function code, data length, data (or error response value), CRC Check code;

Send grid7	Address	Function code	Register high byte	Register low byte	Number high byte	Number low byte	CRC check Low byte	CRC check high byte
For example	01	06	00	01	0A	EF	9F	26
Parsing	01 Locator	read function code	Threshold value register		Set value data		According to CRC16 specification. Checksum calculated by method	

Enter the CRC16 check for the received data 0106 00 010A EF, to 0x269F, and the received data, the CRC check value is compared, the CRC check result is equal; that is, the ()

The data is valid and the data is written successfully;

●When receiving a frame of data, if D/supported command or mA CR (when error, /) responds, E will 8 regular response frames are as follows;

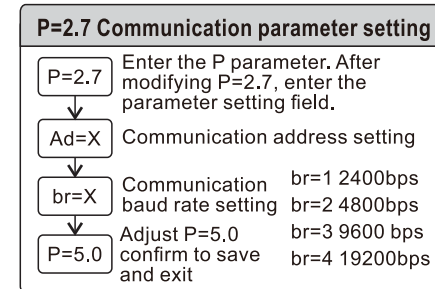
Send grid7	Address	Function code	Exception code	CRC check Low byte	CRC check high byte
For example	01	86	01	6F	26
Parsing	01 Locator	The highest bit of function code 1	Refer to the 8 regular function table	According to CRC16 specification. Checksum calculated by method	

Error code table

Exception code	Name	Exception code	Name
01	B method function.	06	Slave device is busy
02	Method B data address	08	T storage parity error
03	Method B data value	0A	/Available Gateway: Path
04	Slave equipment failure	0B	Gateway 7 standard device response failed
05	Confirm		

Communication parameter setting

- The grid mode is applied to the "stop" instrument. Operation group
- Turn to the "US Closed" position for about 30 seconds, and wait until the display shows
- Release the operation button when "p=" is displayed. Looking at the screen and flashing stars "P=5.0" enters the advanced setting interface; Parameter setting mode: mode button from "stop" to. "A field" rotates as confirmation mode button from "stop" rotate to "shipping party" to exit; Parameter setting mode: turn the operating button to "open valve" to numerical increase, turn to "close valve" to decrease the numerical value:



ELECTRICAL WIRING DIAGRAM