

Operating specification of intelligent type diameter measure instrument

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I Summary

SCR25A/B-R intelligent type diameter measure instrument is the professional non contact type dynamic online diameter measure instrument, it is applied in diameter online measurement of fibre optical, optical cable, wire, cable, glass tube, plastic tube, bearing and other round shape workpiece, not only measure and display the diameter value and deviation value, but also able to automatically control the diameter and print each parameters.

Characteristics:

1: Suitable to any round shape wire materials, workpiece online measurement.

2: Non contact type online measurement, quick test speed, high precision and stable performance.

3: Adopt optics level lens, ultra small shake affection of the tested wire materials.

4: Internally configured PID adjustment algorithm, able to be applied in automatic control wire diameter.

5: It has remote communication RS584 interface.

6: Diameter measurement instrument self with data record function.

7: Self with real time curve display function.

8: Able to assorting connect remote display meter with various sizes.

9: Adopt the originally imported semi conductor laser, high reliable brushless motor, suitable to continue and long time working under various serious environments.

II Model and technical index

Model and specification:

SCR25A/B-R	
SCR	SICRA brand marks
25	Specification (the max measure range Unit: mm)
A/B	A: single shaft type B: dual shafts type
R	R: intelligent type

Technical index:

Model and specification	Measure range	Measure precision
SCR25A/B-R	0.2~25 mm	$\pm 2\mu\text{m} \pm 0.01\% * Z$
SCR40A/B-R	1~40 mm	$\pm 3\mu\text{m} \pm 0.01\% * Z$
SCR50A/B-R	1~50mm	$\pm 4\mu\text{m} \pm 0.01\% * Z$

Z: means the actual diameter value of standard bar

Working condition:

Supply power voltage: 100~240V AC 50/60HZ

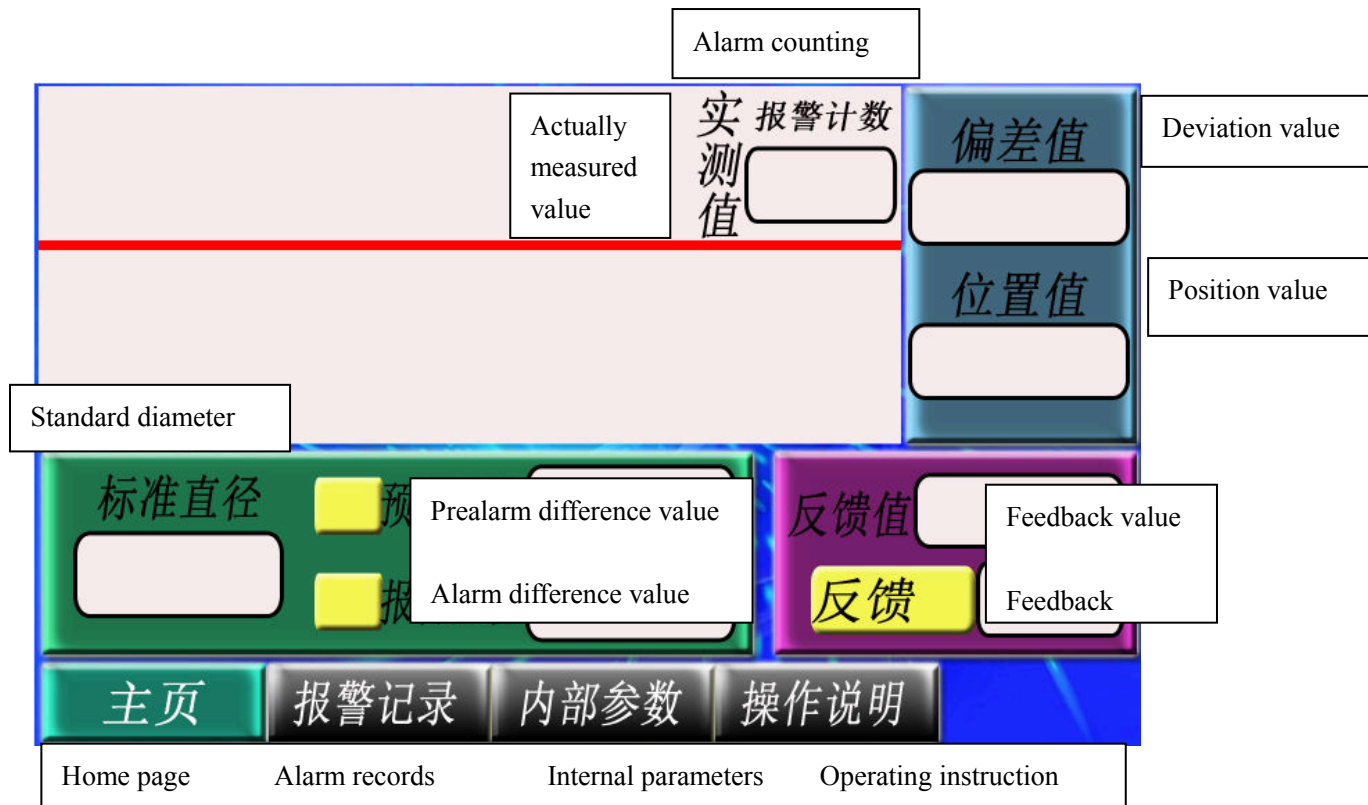
Working environment: 0~50℃ ≤90% RH No condensation

Power consumption: ≤35W

III Interface operation (single shaft type)

The operating tableau mainly divided into four tableau, they are **Homepage tableau, Alarm record tableau, Internal parameters tableau and Operating instruction tableau** respectively.

Homepage tableau (single shaft type):



Actual measure value (display at up left blank position): means the actual value of current actual measurement

Alarm counting: means the counting value of current alarm

Deviation value: means the deviation value between the actual measure value and standard value (note: only display)

Position value: means the position value of measured objects in the optical way, the position value displayed as 0 then means the most centering (note: only display)

Standard diameter: means the user setting standard diameter value.

Forecast open/close: used in open and close the forecast alarm

Difference value of forecast: used in setting the difference value of forecast alarm

Alarm open/close: used in alarm open and close

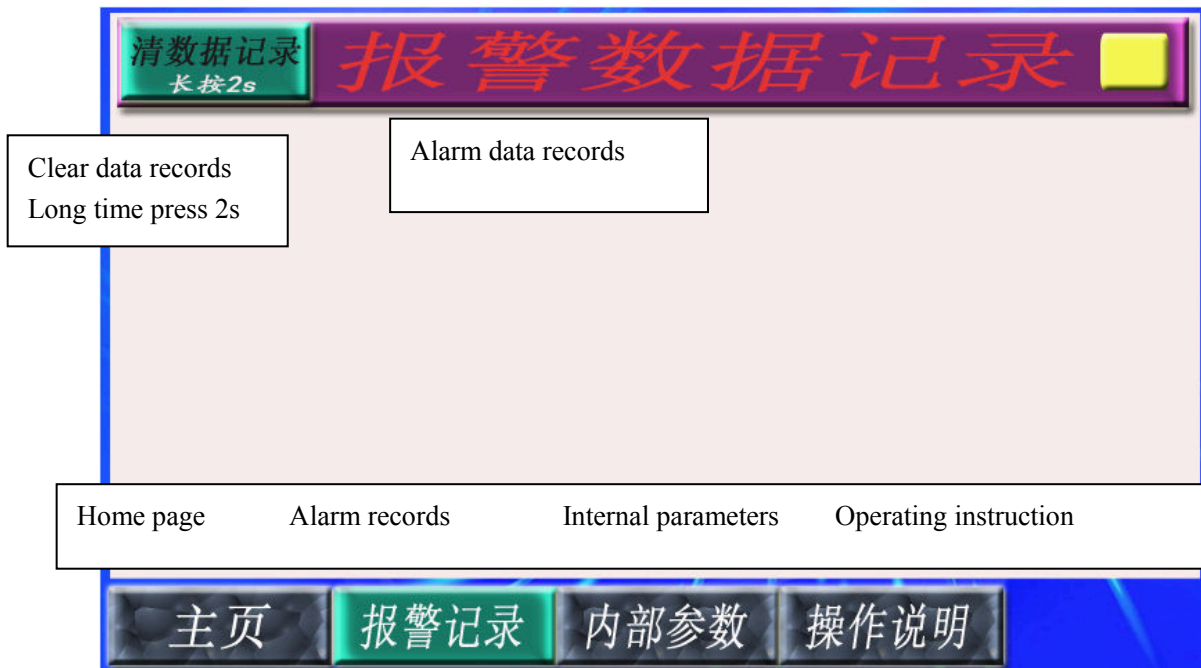
Difference value of alarm: used in setting alarm difference value

Feedback value: used in setting the action feedback value when automatic controlling, example: set at 0.05mm under feedback open status, the instrument will process automatically adjust the control value of extrude machine and drag machine through internal PID algorithm when our wire diameter deviation already bigger (less than)and equal to 0.05mm, thus make the deviation less than this feedback value, to achieve the purpose that intelligent feedback control.

Feedback open/close: used in switch automatic feedback control function, right side frame is the change value of monitor automatic feedback, only display.

Under the red mark division line: the white blank position is the real time display of wire diameter curve;

Alarm record tableau (single shaft type):



Alarm data records open/close: used in that open and close the alarm data records open/close, data record information format is month at 2 bits, day at 2 bits, hour at 2 bits, minute at 2 bits, bigger or smaller, example: 10100930 Big, means 9:30, October 10, bigger

When the alarm data records open/close is open, now the instrument will start alarm data record function, able to display at the down blank position, the instrument will cover the early display when data recorded quantity bigger than 25 pieces. The data record function close when the alarm data records open/close is close.

Long time press 2s to clear data records: 2s long time press this button then can clear the currently recorded data, now the data record function will restart to record;

Internal parameters tableau (single shaft type):

Enter into this tableau, need input four bits password 1379

Standard bar	Current diameter	Calibrate	
采样次数	标棒	当前直径	校准
Shrink value	缩水值	地址	波特率
控制信号类型	报警延时	校验位	停止位
报警延时	P值 (1~100)	I值 (1~100)	D值 (1~100)
主页	报警记录	内部参数	操作说明
Home page	Alarm records	Internal parameters	Operating instruction

Sampling times: use to set the times of sampling diameter data, more data times more stable diameter data, setting range 3~100

Shrink value: use to set the shrink value, should set at 0 if not use this function, the measurement actual value of this instrument (as the display)=measure actual value - shrink value

Alarm delay: how long the alarm signal continue output, 0~100s.

Standard bar The setting standard bar value which used in instrument calibrating

Address Baud rate Check bit Stop bit Used in external communication RS485

Address: range 1~124 (default 1)

Baud rate: 2400 4800 9600 14400 19200 (default 9600)

Check bit: 0 No check 1 Odd check 2 Even check

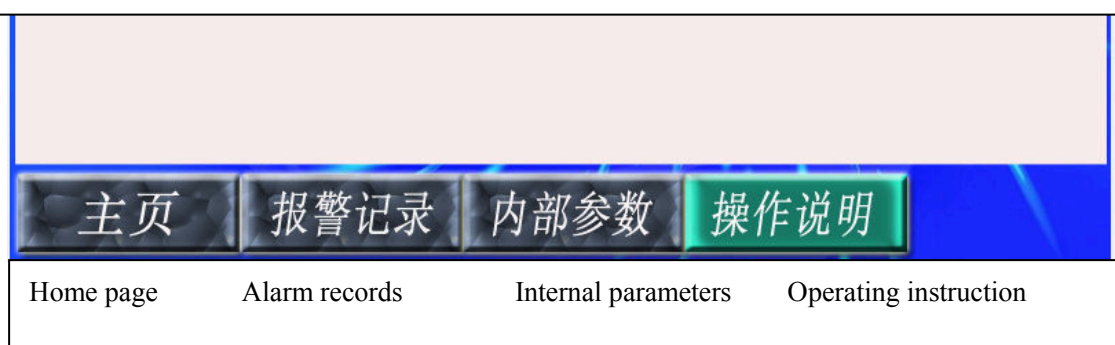
Stop bit: 1 1 bit stop bit 2 2 bit stop bit

P value I value D value: used in parameter adjustment of automatic feedback control

Control signal type: please select extrude when the control signal connect extrude machine signal; please select drag when the control signal connect drag machine signal.

Operating instruction tableau:

1. Power supply switch at button behind the laser.
2. Please one time clean the dust on down lens per 3 days.
3. Please place the wire at up, down, left, right and center of lens.
4. Set well standard value in screen, alarm difference value, prealarm difference value, feedback value total four values, the above function able to select open or close.
5. Records and feedback able to select open or close in screen, back has 485, contact, link motion wiring for optional.
6. Alarm records in screen able to reset, internal parameters only calibrate measured value.
7. Others never change (put into standard bar and set well calibrating value, stably display value about 8s according to calibration then ok.

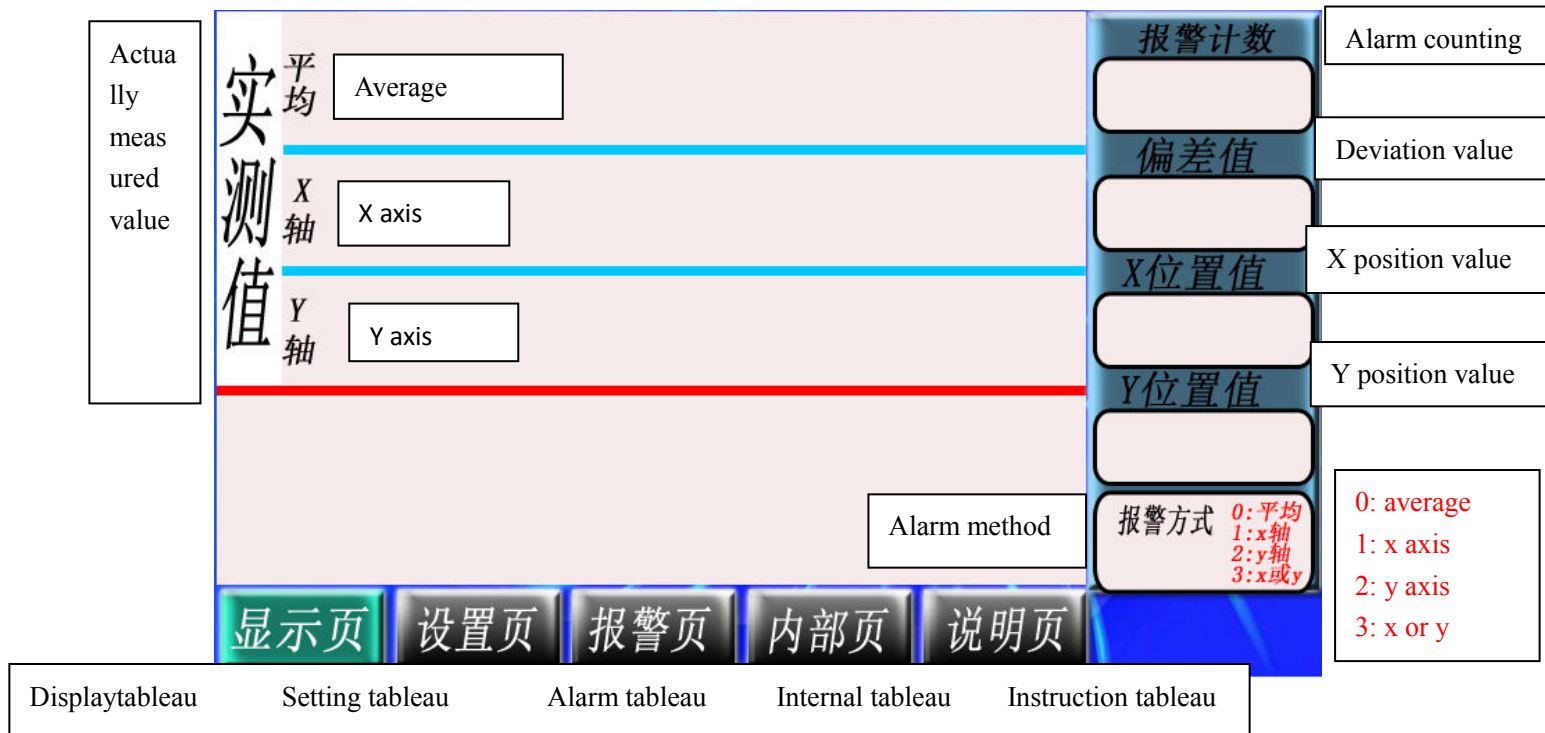


This tableau mainly process some simple operating instruction to the daily application of this instrument.

IV Interface operation (dual shafts type)

The operating tableau mainly divided into four tableau, they are **Display tableau, Setting tableau, Alarm tableau, Internal tableau and Instruction tableau** respectively.

Display tableau:



Actual measure value (average axis X and Y): means the actual value of current actual measurement

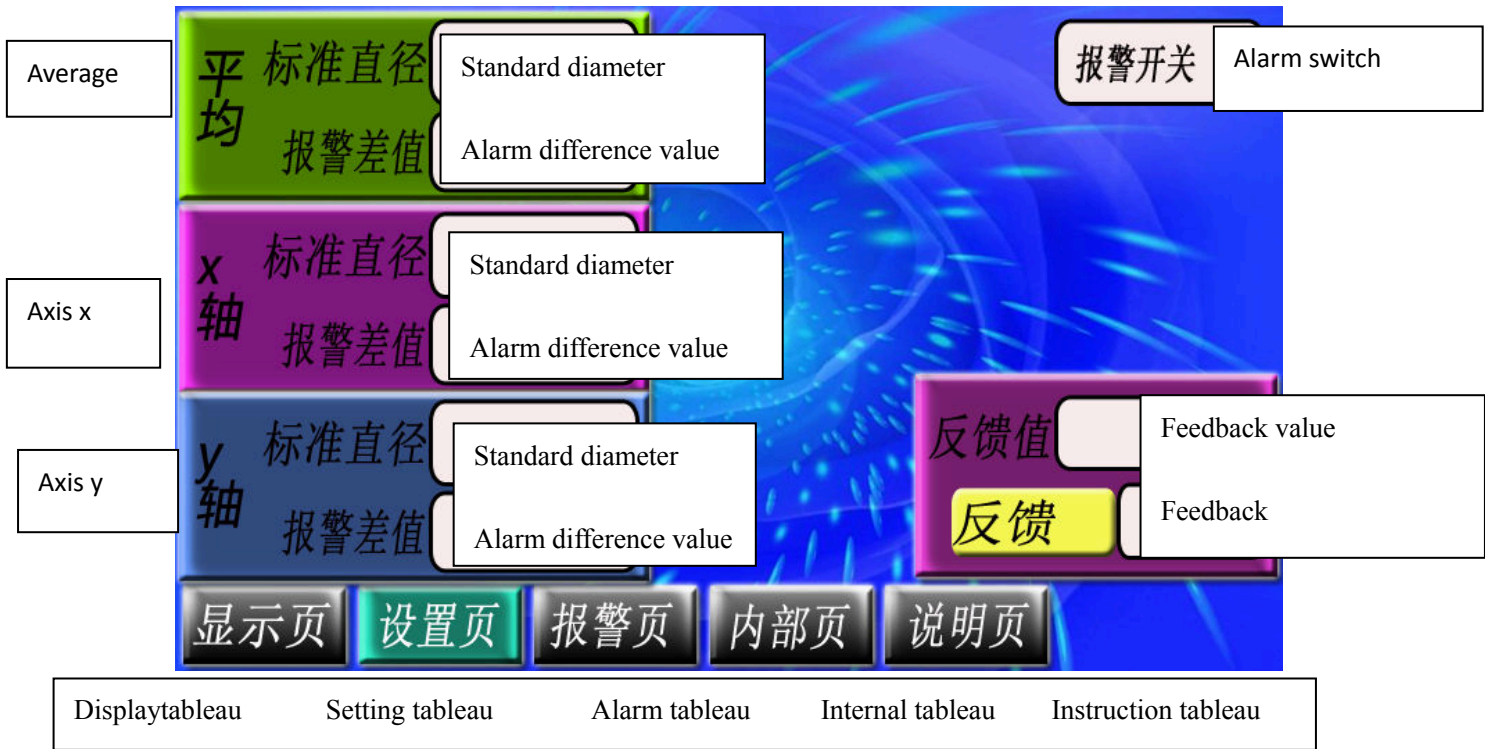
Alarm counting: means the counting value of current alarm

Deviation value: means the deviation value between the actual measure value and standard value (note: only display)

Position value: means the position value of measured objects in the optical way, the position value displayed as 0 then means the most centering (note: only display)

Alarm method: means set that shaft as alarm reference, default 0, alarm when average value over limit.

Setting tableau:



Standard diameter (include average axis X and Y): means the user setting standard diameter value.

Difference value of alarm: used in setting alarm difference value

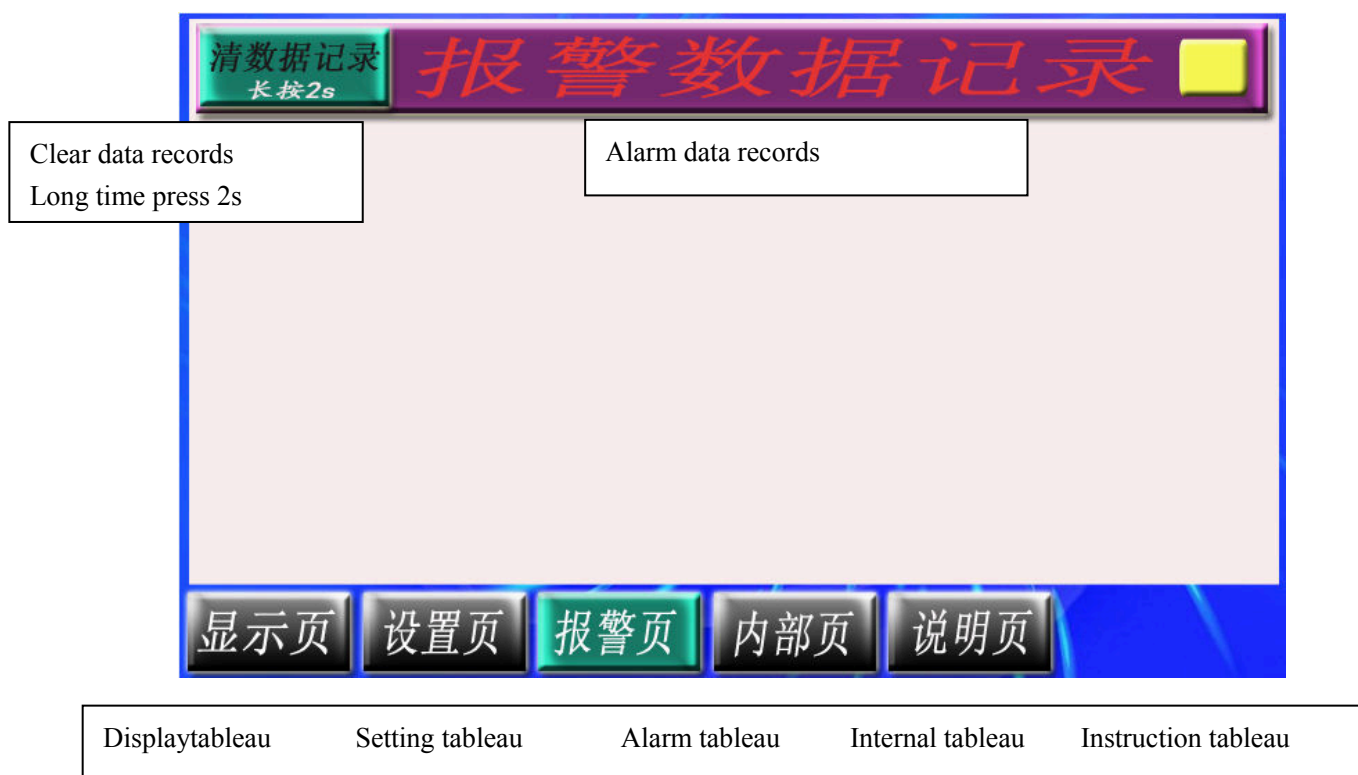
Alarm open/close: used in alarm open and close

Feedback value: used in setting the action feedback value when automatic controlling, example: set at 0.05mm under feedback open status, the instrument will process automatically adjust the control value of extrude machine and drag machine through internal PID algorithm when our wire diameter deviation already bigger (less than) and equal to 0.05mm, thus make the deviation less than this feedback value, to achieve the purpose that intelligent feedback control.

Feedback open/close: used in switch automatic feedback control function, right side frame is the change value of monitor automatic feedback, only display.

Under the red mark division line: the white blank position is the real time display of wire diameter curve;

Alarm tableau:



Alarm data records open/close: used in that open and close the alarm data records open/close, data record information format is month at 2 bits, day at 2 bits, hour at 2 bits, minute at 2 bits, bigger or smaller, example: 10100930 Big, means 9:30, October 10, bigger

When the alarm data records open/close is open, now the instrument will start alarm data record function, able to display at the down blank position, the instrument will cover the early display when data recorded quantity bigger than 25 pieces. The data record function close when the alarm data records open/close is close.

Long time press 2s to clear data records: 2s long time press this button then can clear the currently recorded data, now the data record function will restart to record;

Internal tableau:

Enter into this tableau, need input four bits password 1379

		Standard bar	Current diameter	Calibrate		
Sampling times	采样次数	标棒	当前直径	校准		
Shrink value	缩水值	地址	波特率	校验位	停止位	
		Address	Baud rate	Check bit	Stop bit	
Control signal type	控制信号类型	P值 (1~100)	I值 (1~100)	D值 (1~100)		
		Value P (1~100)	Value I(1~100)	Value D(1~100)		
Alarm delay	报警延时					
		显示页	设置页	报警页	内部页	说明页
		Displaytableau	Setting tableau	Alarm tableau	Internal tableau	Instruction tableau

Sampling times: use to set the times of sampling diameter data, more data times more stable diameter data, setting range 3~100

Shrink value: use to set the shrink value, should set at 0 if not use this function, the measurement actual value of this instrument (as the display)=measure actual value - shrink value

Alarm delay: how long the alarm signal continue output, 0~100s. (time=2+alarm delay (S))

Standard bar The setting standard bar value which used in instrument calibrating

Address Baud rate Check bit Stop bit Used in external communication RS485

Address: range 1~124 (default 1)

Baud rate: 2400 4800 9600 14400 19200 (default 9600)

Check bit: 0 No check 1 Odd check 2 Even check

Stop bit: 1 1 bit stop bit 2 2 bit stop bit

P value I value D value: used in parameter adjustment of automatic feedback control

Control signal type: please select extrude when the control signal connect extrude machine signal; please select drag when the control signal connect drag machine signal.

Instruction tableau:

1. Power supply switch at button behind the laser.
2. Please one time clean the dust on down lens per 3 days.
3. Please place the wire at up, down, left, right and center of lens.
4. Set well standard value in screen, alarm difference value, prealarm difference value, feedback value total four values, the above function able to select open or close.
5. Records and feedback able to select open or close in screen, back has 485, contact, link motion wiring for optional.
6. Alarm records in screen able to reset, internal parameters only calibrate measured value.
7. Others never change (put into standard bar and set well calibrating value, stably display value about 8s according to calibration then ok.



Displaytableau Setting tableau Alarm tableau Internal tableau Instruction tableau

This tableau mainly process some simple operating instruction to the daily application of this instrument.

V Remote RS485 communication agreement definition (single shaft type)

Communication physical interface: RS485 half duplexing

Communication agreement: Modbus			
Transmit method: RTU (remote terminal unit) format			
Panel display code	Code meanings	Contents and notes	
ADD	Address	1~124(default 1)	
BPS	Baud rate	24/48/96/144/192 (*100bps)(default 9600)	
ECC	Check bit	No check	
S_B	Stop bit	Stop bit 1	
MODBUS register operating instruction			
Operating method	Register name	Register address	Contents instruction
Only read	Diameter value	0X0041	0~25000MM
Only read	Position value	0X0044	-100 to 100
Can read and write	Alarm counting value	0X0042	Only can write in 0 when write in operating, invalid when write other value, read out the max value: 9999
	Standard value	0X0046	0~25000MM
	Alarm difference value	0X0047	0~2000MM
	Buzzer open or close	0X004a	0~1(0:close 1:open)Low 2 bits represent that: bit0 alarm open/close, bit1 pre-alarm open/close
	It is complement type when data is negative number; the method of complement shift to origin code method: complement select the reverse according to bit except the symbol bits, plus 1; example: -100, complement is 0x9c		

Support function code: 0x03 read single register, 0x06 write single register;

Attention: any equipment which communication with it should guarantee every one time communication interval with the diameter measurement instrument shouldn't less than 50ms, to guarantee the normal communication.

VI Remote RS485 communication agreement definition (dual shafts type)

Communication physical interface: RS485 half dual working station			
Communication agreement: Modbus			
Transmit method: RTU (remote terminal unit) format			
Panel display code	Code meanings	Contents and notes	
ADD	Address	1~124(default 1)	
BPS	Baud rate	24/48/96/144/192(*100bps)(default 9600)	
ECC	Check bit	No check	
S_B	Stop bit	Stop bit 1	
MODBUS register operating instruction			
Operating method	Register name	Register address	Contents instruction
only read	Average diameter value	0X0041	0~25000MM
only read	Axis x diameter value	0X0042	0~25000MM
only read	Axis y diameter value	0X0043	0~25000MM
only read	Axis x position value	0X0044	-100 to 100
only read	Axis y position value	0X0045	-100 to 100
Can read and write	Alarm counting value	0X0053	Only can write in 0 reset and counting when write in operating, invalid when write other value, read out the max value: 9999
	Standard value	0X0046	0~25000MM
	Alarm difference value	0X0047	0~2000MM
	Buzzer open or close	0X004a	0~1(0:close 1:open)Low 2 bits represent that: bit0 alarm open/close, bit1 pre-alarm open/clos
	Axis x standard value	0X0051	0~25000MM
	Axis y standard value	0X0052	0~25000MM
	Axis x alarm difference value	0X004f	0~2000MM
	Axis y alarm difference value	0X0050	0~2000MM

Write order format: M_ID+F_CODE+R_H+R_L+data length high bit+data length low bit+data high bit+data length low bit+CRC16_H+CRC16_L
check data calculated in the calculate program. It is complement type when data is negative number; the method of complement shift to origin code method: complement select the reverse according to bit except the symbol bits, plus 1; example: -100, complement is 0x9c

Support function code: 0x03 read single register, 0x06 write single register; 0x10 write multiply continue register.

Attention: any equipment which communication with it should guarantee every one time communication interval with the diameter measurement instrument shouldn't less than 50ms, to guarantee the normal communication.

When the host computer communicating between PLC or human computer touch screen and diameter measurement instrument, the start address of used register assemble register is: 4000 (decimal) or 4001 (decimal), the final operating register address = start address + register address (diameter measurement instrument), example: start address of the PLC is 4001 Need visit the diameter value register of diameter measurement instrument, the actual address of PLC program should be 4001 (decimal) + 0x0041 (hexadecimal) (decimal is 65)=40066

VII Interface and wiring definition

Interface definition instruction:



Alarm lamp interface: used to connect the alarm lamp alarm device.

Among, it includes automatic feedback control wire: IN connect the 0~10V signal wire of frequency transformer, OUT connect 0~10V signal signal terminal of frequency transformer, 0V 0~10V connect 0V of frequency transformer.

485 communication/remote meter interface:

Used to connect the external RS485 communication and remote display meter

Among, A and B are external RS485 communication wire, D_B and D_A are communication wires of remote display meter.

Alarm contact interface: used in normally open contact output of external alarm signal, contact close when alarming, the max power of electric relay contact is AC 250V 3A DC 36V 3A.

Power supply interface: used in DC supply power of diameter measurement instrument, power is DC18V 2A