NS-YB05C-B- Type Measurement Display Controller

Operating Instructions

Contents

1. Main features and technical parameters

1.1 Main features

● Applicable to directly match with various kinds of pressure, displacement, weighting, pulling pressure and sensors for the measuring control of the corresponding physical quantity

Open type instrument parameter setting

● Support multi-machines network communication, with special software that can easily achieve the network monitoring and control management of the instrument and the upper computer

● Set parameter password lock, permanent save after power cut

1.2 Technical parameters

Input signal:　Analog quantity 0 ~ 20mV, 0 ~ 5V, 0 ~ 10V, 0 ~ ± 5V, 4 ~ 20mA and resistance input

Display range 　-19999~99999 字

Measurement accuracy 　0.1%FS

Resolution 　± 1 F character

Display mode 　Five phases high bright nixietube

Light emitting diode work state display

Feeding output 　DC24V or DC5V

Transmission output 　0~5V or 4~20mA

Control mode: Can choose1 to 4 limit control or 1 to 4 group difference type control, LED indication, control output is the relay contact output

Controlled resolution 　± 1 F character

Type of alarm: Can choose 1 to 4 limit alarm, LED indication. The type of alarm is relay ON / OFF with return difference (the user can freely to set up)

Alarm precision 　±1character

Parameter setting   Panel soft-touch type keystroke numeral setting

Permanent save for the parameter setting value after power cut

Parameter setting value password lock

Status indicator   Relay output state LED indication

Input exceed/Lack of range scale indication

Protected mode   Power under-voltage power supply automatic reset

Abnormal work automatic reset (Watch Dog)

On-line communication   RS232 or RS485, baud rate 300 ~ 9600bps can be freely set by the instrument internal parameters

Environmental conditions   Ambient temperature 0 ~ 55 ℃

Relative humidity ≤ 85% RH

Avoid strong deep-etching gas

Power supply source   AC220V +10% -15% (50Hz ± 2Hz) or DC24V ± 25% power supply

Power consumption   ≤5W

Exterior size: 160×80mm

Structure：Standard snap-in

2. Wiring and electrifying

After the instrument car enters the dial plate, please refer the following instructions of input and output signals and power wire, and make sure that is correct. Please confirm if the instrument specification, input type and input range are according with the requirements.

Notice: Please connect wire in the condition of disconnecting the electrical source!

2.1.1 Instrument power supply

Power-line connection terminal is 13, 14 legs, please confirm the working power supply of the purchased instrument before electrifying before electrifying is（AC220V/DC24. This instrument is no power switch available. After finishing the wiring and checking that it is correct, switch-in

electrical source then can enter into the operating condition.

2.1.1   The connection of the instrument and sensor

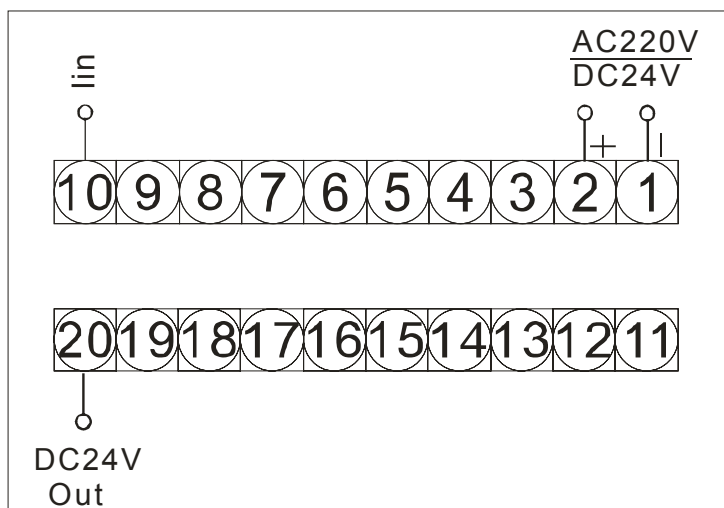①. **The wiring of 4 ~ 20mA output sensor and instrumentation**

Iin
AC220V
DC24V
+ I

10 9 8 7 6 5 4 3 2 1

20 19 18 17 16 15 14 13 12 11

DC24V
Out

Chart 2. 1.0 The view of after inputting NS-YB05C-A 4~20mA signal

Instrument feeding output (15 legs): connecting current output type sensor red line

Instrument current signal input (2 legs): connecting current output type sensor green line

②. **0 ~ 5V output sensors and instrument wiring diagram**

Vin
AC220V
DC24V
+ I

10 9 8 7 6 5 4 3 2 1

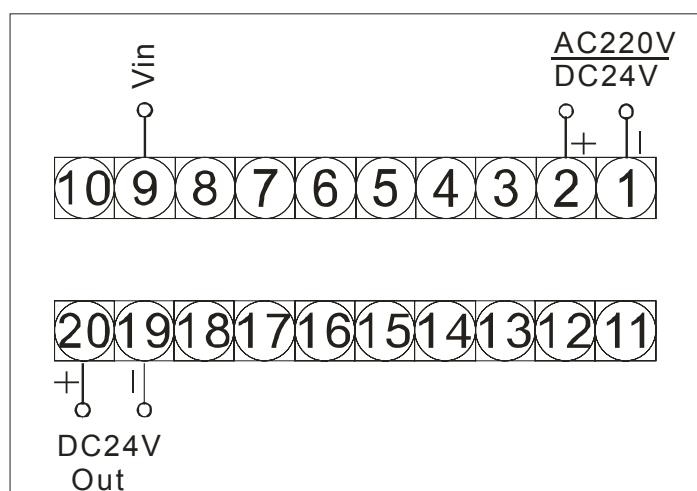20 19 18 17 16 15 14 13 12 11

+ I
DC24V
Out

Chart 2. 1.1 The view of after inputting NS-YB05C-A 4~20m A signal

Instrument feeding output (15 legs): connecting current output type sensor red line

Instrument current signal input (16 legs): connecting current output type sensor green line

Instrument current signal input (three legs): connecting current output type sensor yellow line

③ **Resistance output sensors and instrument wiring diagram:**
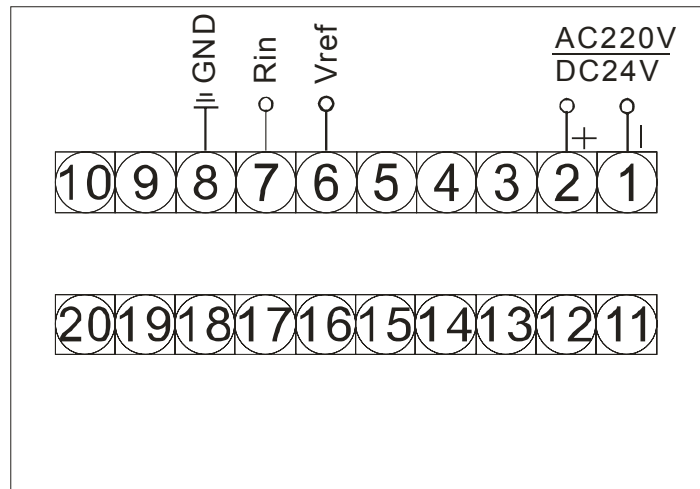
Chart 2.1.2 The view of NS-YB05C-A after inputting resistance

Instrument resistance signal input (6 legs): The resistance centretap connecting resistance output sensor

The five and seven legs of the instrument: Respectively connecting other two wires of the resistance output sensor

④、**0~20mV output sensor and instrument wiring diagram**

Chart 2. 1.3 The view of inputting NS-YB05C-A 4~20mV signal

Instrument feeding output +5V (15 legs): Connecting mV output sensor red line

Instrument feeding output GND (16 legs): Connecting mV output sensor green line

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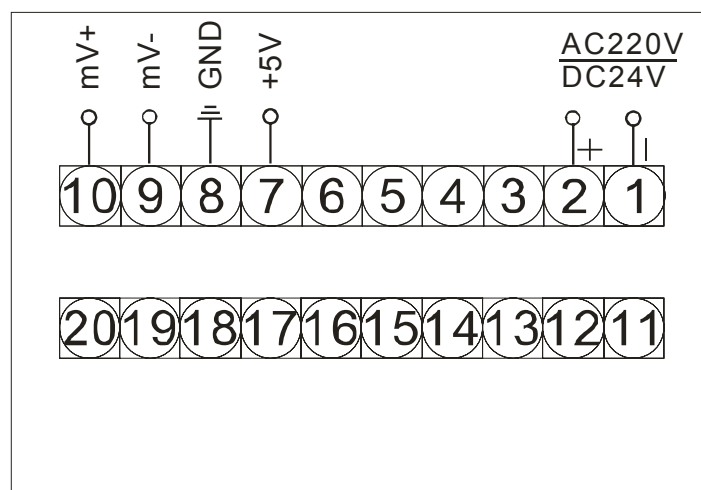Instrument mV signal input output positive (20 legs): Connecting mV output sensor yellow line

Instrument mV signal input output negative (21 legs): Connecting mV output sensor white line

Notice: The above sensor wiring mode is applicable to the sensors produced by our company. For other brand type sensor wiring modes, please refer to the instructions or contact the technical service department of our company.

2.1.3 Other common segment wiring
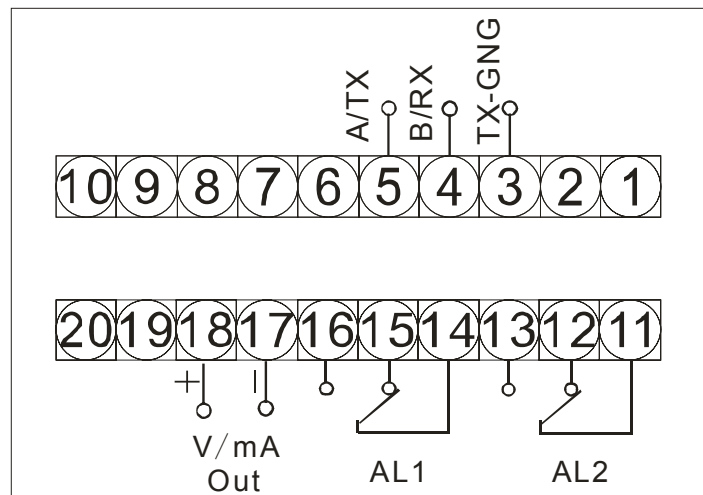
Chart 2. 1.4 The view of inputting NS-YB05C-A common signal

Transmission output (mA / V): + OUT   17 legs
            - OUT   18 legs

RS485 communication interface: A   26 legs
                                B   27 legs

RS232 communication interface: TX   26 legs
                                RX   27 legs
                                TX-GND   28 legs

3. Instrument panel definition

Zero clearing light
The second warning indicator lamp
Peak value holding indicator lamp
Measured value holding indicator lamp

The first alarm indicator lamp → AL1 AL2 REF PEAK HOLD
Display window → PV

REF/SHIFT → **Zero clearing/Shift Key**
SET → **Set key**
▲ PEAK → **Increase key (Peak value Holding key)**
▼ FUNC → **Reduce key (Function key)**

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• **Chart 3.0.0 NS-YB05C-B panel**

Item		Function		
Display window	PV display measured value	Display real-time measured value		
	SV display value	Under the state of parameter setting, display parameter symbols or setting value		
		DIS= Under the common state, when DIS =	0： prohibit to display	2. Transmission output
			1:Peak value	3～6: 1 to 4 alarm value
Operation key	SET Parameter setting key	Press to hold on for 3 seconds	Press then raise	
		1) Under the nonparametric setting state, display parametric CLK symbol, enter parametric setting state. 2) Under the parametric setting state, then return to display output value	1) Under the parametric setting state, display parameter symbol and parameter value. 2) If CLK parametric setting is not correct, then return to display output value	
	▼/ FUNC Setting value reduce key/function key	1) Under the parametric setting state, if the current parameter can be modified (namely there is flicker place), then the numerical value of this place is reduced 1 2) Under the nonparametric setting state, freeze to hold the real time measured value. If the parameter BT=7, then print this value.		
	▲/PEAK Setting value increase key/peak value key	1) As the same as above, numerical value is added 1 2) Under the nonparametric setting state, then capture the instantaneous maximum value of the measured value		
	REF/SHIFT Clear key/ Setting value shift key	1）Make zero clearing to the current display value 2) Under the parameter setting state, if the current parameters can be modified, successively press that can modify the numeral place order from single place → ten's place →hundred's place→ thousand's place→ ten thousand's place in turn switch and flicker to indicate the current modification place.		
	UNIT Unit switch key	Press once unite indicator lamp to convert, the display value is also corresponding changed.		
Indicator lamp	（AL1～AL4）(red)	The first to fourth indicator lamps. When the alarm occurs, the corresponding indicator lamp is bright; when the alarm is eliminated, the lamp is off		
	（REF）(green)	Zero cleaning indicator lamp		
	(PEAK)（green）	Peak value capture indicator lamp, to indicate the capture state of the peak value		
	（UN1）（green）	The first unit indicator lamp		
	（UN2）（green）	The second unit indicator lamp		
List 3.0.0 NS-YB05C-A panel definition				

4. Parameter setting and introduction

4.1 How to enter into the state of the parameter setting

● Under the nonparametric setting state, press SET key holding for 3 seconds, the display value becomes CLK symbol.

● Then press SET key to display CLK parameter 00001

● Press setting value increase or reduce key to change CLK parameter value. For CLK parameter meaning, please see list 4.1.0.

CLK	Parameter meaning
00000	Can enter into the first level parameter
00005	Can enter into the second level parameter
00050	Can enter into the third level parameter (Please see Chapter six instrument calibration)

List 4.1.0 CLK parameter meaning

● After setting CLK parameter value, press SET key to enter into the corresponding parameter level. When pressing SET once each time, the instrument is in order displaying the parameter names and its parameter value. Until the last one parameter value, then press SET key to return the first one parameter.

● Under the setting state, press SET key holding for 3 seconds or 30 seconds with not press any key, the instrument can exit the setting state.

Warning! Those who are not engineering design personnel shall not enter into the second and three level parameter, otherwise, it will cause instrument control error! If the weighting instrument needs modifying parameters, it should have the corresponding checking equipment!

4.2 First level parameter

For the display order and meaning, please see list 4.2.0

Display symbol	Para meter Name	Parameter meaning	Numerical value setting range	Instruction	Factory value
ᴨRᴸᴵ	AL1	The first alarm value	-19999～99999	The first alarm limit value (For the first alarm mode setting, please refer the following second level parameter SL2)	0
RᴸZ	AL2	The second alarm value	-19999～99999	The second alarm limit value (For the first alarm mode setting, please refer the following second level parameter SL3)	0
RᴸƷ	AL3	The third alarm value	-19999～99999	The third alarm limit value (For the first alarm mode setting, please refer the following second level parameter SL2)	0
RᴸЧ	AL4	The fourth alarm value	-19999～99999	The fourth alarm limit value (For the first alarm mode setting, please refer the following second level parameter SL3)	0
RHI	AH1	The first alarm value return difference	0～99999	The first alarm return difference value	0
RHZ	AH2	The second alarm value return difference	0～99999	The second alarm return difference value	0
RHƷ	AH3	The third alarm value return difference	0～99999	The third alarm return difference value	0
RHЧ	AH4	The fourth alarm value return difference	0～99999	The fourth alarm return difference value	0
dIᴝ	DIS	The second display control	0～6	0: Forbidden use 1: Display peak value(this time PEAK key is un-useful) 2: Display transmission output Streamer. 3～6：Display AL1～AL4 value	0

List 4.2.0 First level parameter display order and meaning

4.2 The second level parameter

For display order and meaning, please see list 4.3.0

Display symbol	Parameters Name	Parameters Name	Numerical value setting range	Instruction	Factory value
5L0	SL0	Input graduation	0	4～20mA input	1
			1	0～5V or mV input	
5L1	SL1	Decimal point	0	No decimal point	0
			1	Decimal point in ten's place (display xxxxx)	
			2	Decimal point in hundred's place (display xxxxx)	
			3	Decimal point in thousand 's place (display xxxxx)	
			4	Decimal point in ten thousands' place (display xxxxx)	
5L2	SL2	The first alarm mode	0	No alarm	0
			1	The first alarm is lower limit alarm	
			2	The first alarm is upper limit alarm	
			3	The first alarm is intra-area alarm	
			4	The first alarm is external-area alarm	
5L3	SL3	The second alarm mode	0	No alarm	0
			1	The second alarm is lower limit alarm	
			2	The second alarm is upper limit alarm	
			3	The first alarm is intra-area alarm	
			4	The first alarm is external-area alarm	
5L2.	SL2.	The third alarm mode	0	No alarm	0
			1	The third alarm is lower limit alarm	
			2	The third alarm is upper limit alarm	
			3	The first alarm is intra-area alarm	
			4	The first alarm is external-area alarm	
5L3.	SL3.	The fourth alarm mode	0	No alarm	0
			1	The fourth alarm is lower limit alarm	
			2	The fourth alarm is upper alarm	
			3	The first alarm is intra-area alarm	

			4	The first alarm is external-area alarm	
�	SL4	Zero clearing mode control	0	Forbidden use	1
			1	Common mode, press once zero clearing key measured value to make zero clearing, then press once again to recover	
			2	Triggered mode, it has effect to press the zero clearing key each time	
			3	Automatic mode, when measured value is less than SLU setting value automatic zero clearing	
�05	SL5	Peak value mode control	0	Forbidden use	1
			1	Common mode, press once peak value key to begin to capture peak value, then press once again to recover	
			2	Triggered mode, it has effect to press the peak value key each time	
			3	Automatic mode, when measured value is larger than PUL, it begins to capture, when measured value is less than PUH, it ends the capture.	
�06	SL6	Wave filtering level	0～6	Wave filtering level, the large the value is the more smooth	2
�07	SL7	Sampling rate	0～6	Sampling rate, The less the value is the larger speed	6
⠠dE	DE.	Device number	0～250	Set the device number of this instrument when setting the communication	0
⠠bn	BT	Communication baud rate	z	Communication baud rate is 300bps	5
			1	Communication baud rate is 600bps	
			2	Communication baud rate is1200bps	
			3	Communication baud rate is 2400bps 1200bps	
			4	Communication baud rate is 3600bps	
			5	Communication baud rate is 9600bps	

				6	The baud rate is 9600bps and automatically report	
				7	The baud rate is 9600bps and can be printed	
P61	Pb1	Display input zero transfer	Full scale		Set the display input zero transfer amount	0
KK1	KK1	Displayinput measuring range proportion	0.4000~1.9999		Set the display the magnified proportion of the measuring range	1.0000
Un1	Un1	Unit conversion factor 1	0~99999		the proportion coefficients of two types of units	
Un2	Un2	Unit conversion factor 2	0~99999		As the same as the above	
P63	Pb3	Transmission input zero transfer	-100.0%~100.0%		Set the transmission output zero transfer amount	0
KK3	KK3	Transmission input measuring range proportion	0~1.9999 times		Set the mollified proportion of the transmission output measuring range	1.0000
OUL	OUL	Transmission input measuring range lower limit	Full scale		Set the lower limit measuring range of the transmission output	0
OUH	OUH	Transmission input measuring range Upper limit	Full scale		Set the upper limit measuring range of the transmission output	50000
PUL	PUL	Startup peak value capture threshold value	Full scale		When the peak value is automatic mode, the value larger that begins to capture	1000
PUH	PUH	End peak value capture threshold value	Full scale		When the peak value is automatic mode, the value less that ends to capture	1000
SLL	SLL	Measurement measuring range lower limit	Full scale		Set the measurement lower limit measuring range of the input signal	0
SLH	SLH	Measurement measuring range upper limit	Full scale		Set the measurement upper limit measuring range of the input signal	500000
SLU	SLU	Zero clearing range	0~99999		When zero clearing is automatic mode, the measured value is less than this value that shall be automatic zero clearing. Other zero clearing mode, the measured value	5

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				is less than the measuring range setting percentage ratio that is zero clearing.	

List 4.3.0 The order and meaning of the second level parameter

5 Function setting and instruction

5.1. Alarm Control

This function is the option function; the instrument can be configured up to 4 alarm points. Each alarm point has 3 parameters as follows

 (1) Alarm mode （SL2，SL3，SL2.，SL3.）. For their setting value, please see the lists 4.3.0。SL2，SL3，SL2.，SL3. The corresponding alarm setting value and the return difference values are respectively （AL1,AH1）,（AL2,AH2）,（AL3,AH3）,（AL4,AH4）. For their setting value, please see the list 4.2.0

Lower limit alarm means when the measured value is lower than the alarm setting value ALX, it shall alarm

Upper limit alarm means when the measured value is higher than the alarm setting value ALX, it shall alarm

Intra-area alarm means when the measured value is between ALX+AHX 与 ALX-AHX that shall alarm

External-area alarm means when the measured value is larger than ALX+AHX or less than ALX-AHX, it shall alarm

2) Alarm setting value (AL1, AL2, AL3, AL4). Their value can be set according to the needs.

3) Alarm return difference （AH1，AH2，AH3，AH4,）, in the upper limit and lower limit alarm, in order to prevent that the measured value near the alarm setting fluctuation causes alarm relay frequent move, when making the actual control, add the return difference value. Through return difference value can set an extension region of the alarm relieving. In the Intra-area and outer-area alarm, through alarm return difference can adjust the peak width.
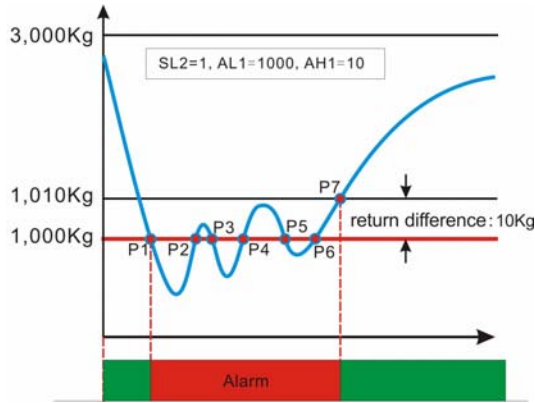
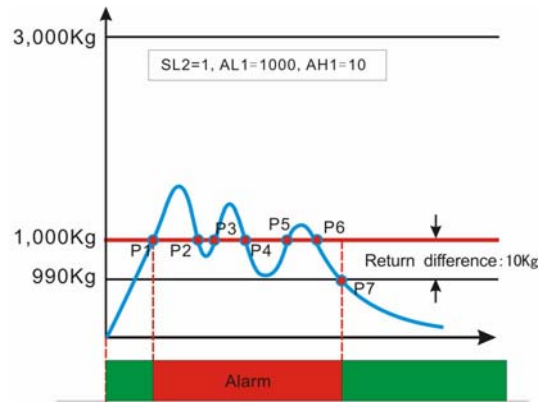14

Chart 5.1.0   lower limit alarm

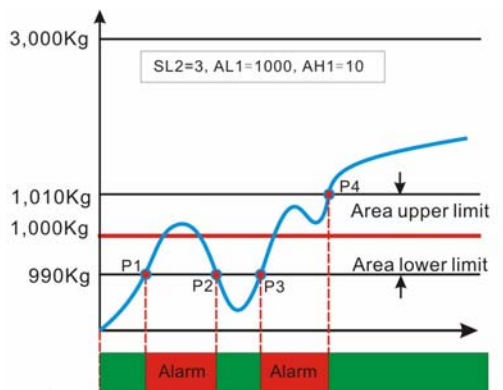**Chart 5.1.1 upper limit alarm**
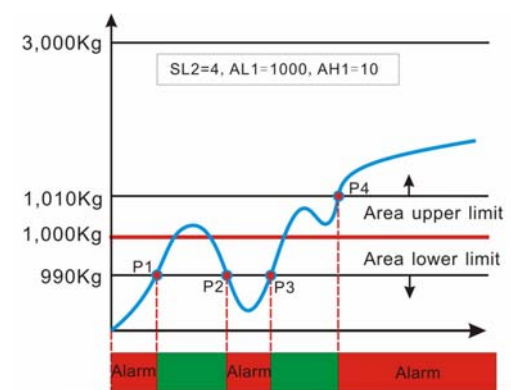

Chart 5.1.2   Intra-area alarm

Chart 5.1.3 External-area alarm

5.2 Zero clearing setting

Please see the setting of SL4 and SLU in list 4.3.0

Under the common mode (that is SL4=1），press once zero clearing to make zero clearing, then press once to recover the original value. The zero clearing range is:
-(SLH-SLL)*SLU/100 ～ (SLH-SLL)*SLU/100. If the measured value is out of scope of zero clearing, it is ineffective to press the zero clearing key.

Under the trigger mode (that is, SL4 = 2), press once zero clearing to make once zero clearing. Successively press to continually make zero clearing. The range of zero clearing is the same as the common mode.

Under the automatic mode (that is, SL4 = 3), when measured value is <SLU, it is no need to press key, the system is automatically zero clearing.

5.3 Peak value setting

Please see SL5 setting in list 4.3.0. For the automatic mode, please see PUL and PUH in list 4.3.0

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Under the common mode (that is SL5=1, press once peak value key, to begin capturing the peak value, the peak value indicator lamp is bright, PV displays the peak value of the current capture process. Press PEAK key once again, the capture stops, PEAK indicator lamp is off, return to the common measurement state.

Under the trigger mode (that is, SL5 = 2), press once the peak value key, to begin capturing the peak value, then press PEAK key, restart capturing the peak value

Under the automatic mode (that is, SL5 = 3), it is no need to press peak value key, when the measured value is large than PUL, the system automatically starts capturing. when the measured value is less than PUH, it ends the capture.

5.4 Unit switch

Firstly, according to the two types of the unit ratios to set the parameters UN1 and UN2, those two parameters must be integer

For example, the original unit is kilogram, if the unit needed to be set is pound, 1 kg = 2.205 pounds, then UN1/UN2 = 2.205 / 1 = 2205/1000, and then set UN1 = 2205, UN2 = 1000. Then press unit switching key, the unit of the numerical value of measured value displayed in the display window is pound.

5.5 Holding and print

When the parameter is BT <7, under the state of non-setting, FUNC key is used for freezing the current displayed value, press once is effective, then press once to unfreeze. If no pressing the key to unfreeze in 30 seconds, then the instrument automatically unfreeze

When BT = 7, under the state of non-setting, FUNC function key has print function, but no freezing function. At that time, if it has connected the printer, it can print the current measured value. For the connection mode, please refer RS232 communication interface.

6. Instrument calibration (third level parameter setting)

After setting CLK = 50, press SET key, the instrument enters into third level parameter setting state, that is instrument calibration. The step of the calibration is: when display AAL value, input the single setting to zero or near zero, adjust AAL value as the instrument expected displayed value, press SET key to save it in the instrument and enter into AAH setting, then input the signal setting to the full range or near the full range, adjust AAH value to the instrument expected value at that time, after pressing SET key, exit setting then finish the calibration.

For example: a set of sensor instrument with allocation measuring range is 0~3000Kg, the

calibration methods are as follows:

(1) Add the pressure 0 or 50Kg to sensors, here is assumed to be 50Kg. This value can be set arbitrarily, to near zero. The low point is called low calibration point.

(2) When the instrument displays the measured value, long press SET key for 3 seconds, PV displays CLK.

(3) Press SET key, then PV display is the value of CLK. Press numerical value adjustment key ↑↓ to set this value to 50.

(4) Press SET key, then can enter into third level parameter, that is the calibration state. Then PV displays AAL.

(5) Press SET key, PV displays the value of AAL, set this value to be the low calibration value in（1）, such as   50

(6) Press SET key, the value of AAL is saved in the EMS memory of the instrument, at the same time PV displays AAH

(7) Adjust the sensor pressure to be 3000Kg or 2800Kg, here is assumed to be 2800Kg. This point is called high calibration point.

(8) Press SET key, PV displays the value of AAH, adjust this value to high calibration point value set by（7, such as 2800.

(9) Press SET key, AAH and other calibration value are saved.

(10) Press SET key, exit and finish the calibration. PV begin displaying real-time measured value

(11) If the deviation is still founded when it is at zero, can directly press CLR key to recover it to the normal zero.