

ZHYQ Digital Controller Operation Manual



PD9001

1. Functional and Technical Index

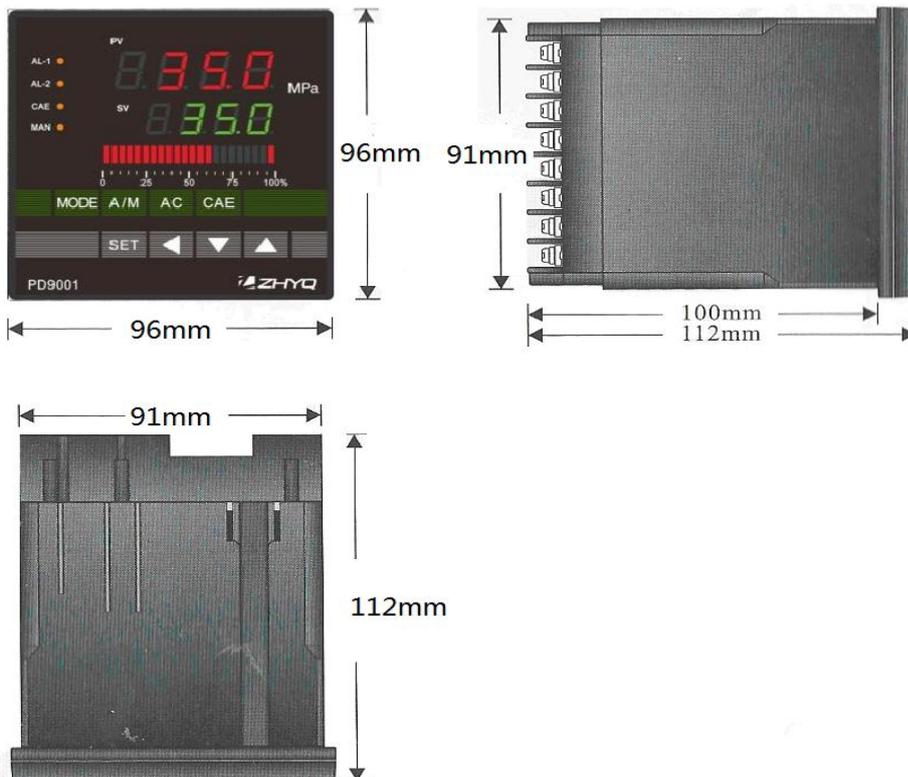
PD9001 is PID intelligent pressure controller integrate a number of international advanced electronic & Single-chip computer technology ,meanwhile with high cost performance and adaptability of the fluctuate conditions of power grid can completely replace the same imported high-grade pressure controllers or controllers overseas. the beautiful shape , complete functions & excellent anti-interference performance to ensure the stability and reliability of the system.

The instrument technical indicators are as follows:

- ☆ Digital Display : Double layer double color four digital display (green and red)
- ☆ Electronic bar display: 20 segments electronical bar indicate the output power
- ☆ The range of display : 0000~9999 (radix point alterable)
- ☆ Accuracy: 0.2%FS±1
- ☆ the display of indicator light : AL-1, AL-2, CAE, MAN
- ☆ Pressure range : programmable setting
- ☆ Sampling frequency : 50times/s
- ☆ Alarm output : two circuits with programmable alarm Settings
- ☆ Input : 2mV/V、3.3mV/V、0~10mA、0~20mA、4~20mA、0~5V、1~5V、0~10V (order stated)
- ☆ PID output : 0~5V、0~10V、4~20mA (order stated)
- ☆ work environment : 0~55℃ & ≤80%RH
- ☆ Working power supply : 85~265VAC, 50~60Hz;
- ☆ Controller size : 96×96mm , Hole size : 92×92mm

2. Instrument panel and terminals diagram instruction

2.1) Controller size



2.2) Panel & buttons instruction

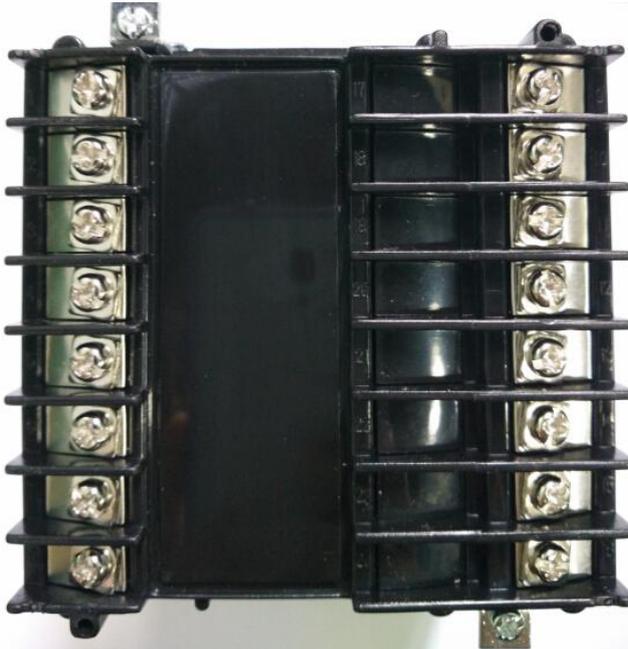
- a) PV display window:
 - 1. set status: parameter code display settings
 - 2. measuring status: display real-time pressure value
- b) SV display window:
 - 1. set status: display setting values
 - 2. measuring status: display controller pressure value
- c) MPa: pressure unit
- d) 0-100% : output power display bar
- e) AL-1: first alarm indicator
- f) AL-2 : second alarm indicator
- g) CAE: calibration indicator
- h) MAN: manual operation indicator
- i) MODE: mode key (empty) , Complete withdrawal from the main Menu
- j) A/M: Auto/Manual switch operation key
- k) AC: reset key
- l) CAE: calibration key
- m) SET: Function key : the pressure value would be zero clearing , if you press the function key and AC reset key at the same time .
- n) < : Shift key : if you mistake the zero clearing operation , now you need to press function key and the shift key for 5 seconds to restore the calibration value .
- o) ∨: Moving down key
- p) ∧: moving up key



2.3) Lights Instruction

- a) The first alarm indicator light AL-1, when it alarms , the indicator light is on , when it doesn't , the indicator light is off .
- b) The second alarm indicator light AL-2, when it alarms , the indicator light is on , when it doesn't , the indicator light is off .
- c) The calibration indicator light CAE , when the instrument do the automatic calibration operation , the indicator light starts flickering , otherwise it will be off .
- d) The manual status indicator light MAN ,when the manual status selected , the light is on , when the automatic state selected , it will be off .

2.4) Wiring terminals diagram instruction



2.4.1) transducer input (mV/V)

terminal	Function (transducer wiring diagram)		terminal	Function
	5pins	6pins		
1	S+ (blue)	S+ (blue)	9	AL-2 relay common (C)
2	E+ (red)	E+ (red)	10	AL-2 relay Normal Open (NO)
3	S – (white)	S – (white)	11	AL-1 relay Normal Close (NC)
4	E- (yellow)	E- (yellow)	12	AL-1 relay common (C)
5	CAL(black)	CAL(brown/black)	13	AL-1 relay Normal Open (NO)
6	shielded	shielded	14	220V power supply input L
7	PID output +	PID output +	15	220V power supply input N
8	PID output-	PID output-	16	Ground

2.4.2) transducer input (4-20mA, 0-5V ,0-10V)

terminal	Function (transducer wiring diagram)			terminal	Function
	5pins (0-5V ,0-10V)	6pins (0-5V ,0-10V)	5pins, 6pins (4-20mA)		
1	S+ (blue)	S+ (blue)	S+ (blue)	9	AL-2 relay common (C)
2	E+ (red)	E+ (red)	E+ (red)	10	AL-2 relay Normal Open (NO)
3	blank	blank	blank	11	AL-1 relay Normal Close (NC)
4	E- (yellow)	E- (yellow)	blank	12	AL-1 relay common
5	blank	blank	blank	13	AL-1 relay Normal Open (NO)
6	shielded	shielded	shielded	14	220V power supply input L
7	PID output +	PID output +	PID output +	15	220V power supply input N
8	PID output-	PID output-	PID output-	16	Ground

3. Parameter table instruction

Symbol	Name	Setting Range	Explain	Initial value
Fast setting state				
SV	Setting value	1~9999	pressure control target value setting	random
P	Proportional Band	0.1~99.9	PID parameter : P	60.0
I	Integral Time	0.0~99.9	PID parameter : I	10.0
D	Differential Time	0.0~99.9	PID parameter : D	0.0
AL-1	First pressure alarm value setting	0~9999	Alarm value can be setting according to process requirements	ED 80%
AL-2	second pressure alarm value setting	0~9999	Alarm value can be setting according to process requirements	ED 20%
Systematic setting state				
OL-U	Output amplitude high limited	0.0~100%	The maximum amplitude of PID control output (Auto/Manual available)	80.0%
OL-L	Output amplitude low limited	0~high limited	The minximum amplitude of PID control output (Auto available)	0.0
ED	Transducer pressure range	1~9999	According to the transducer full range	1000
DOT	Decimal point location selection	0000 000.1 00.01 0.0001	dddd: no decimal ddd.d : 1 decimal dd.dd : 2 decimal d.ddd : 3 decimal	00.01
ESCL	Zero/span value setting	Base on the transducer	Make sure the transducer output no load (pressure)	
LOAD	Signal loading value	Base on the transducer	When loaded into the external signal after a certain amount, press the "<" button, enter the full value reduced.	
CNFN	Full value conversion	1~9999	Compared with range value, reduced full pressure corresponding to the code	
SEL1	First pressure alarm function setting	HJ LJ	HJ: alarming the measured value exceeds the setting value LJ: alarming the measured value lower than the setting value	HJ
HC-1	First pressure alarm hysteresis zone setting	0~250	Hysteresis zone can be set according to process requirement	0
SEL2	second pressure alarm function setting	HJ LJ	HJ: alarming the measured value exceeds the setting value LJ: alarming the measured value lower than the setting value	HJ
HC-2	second pressure alarm hysteresis zone setting	0~250	Hysteresis zone can be set according to process requirement	0



DP	Pressure division value	0001 0002 0005	0001: last one digital display : 0-9 0002: last one digital display :even 0005: last one digital display : 0 、 5	0001
FUCT	fuzzy control type	0、 1	0: fast adjust type 1: amplitude adjust type	1
LOCK	parameters lock	0、 1	0: parameters are not locked the parameter are available 1: parameters are locked . the parameters are unavailable but conversion key	001
TS	Output adjustment cycle	0.2、 0.4~10		0.2

4. Parameter settings instruction

4.1) auto control / manual control state shift

in the working state , press the "A/M" , observation "MAN" and "SV" light data.
 "MAN" light: manual control state, "SV" shows the actual output percentage;
 "MAN" dark, automatic control state, "SV" shows that pressure control target.

4.2) manual adjust output

In working state, instrument according to the instructions by 4.1 first, adjust to manual control status ;
 "SV" shows the percentage of the actual output value;
 (for example: if output type 4 ~ 20 mA, SV shows a value of 80.0, the actual output value of 16.8 mA)
 Press "∨", reduce output;
 Press "∧", increase the output.

4.3) Sampling data reset

make sure connected with pressure transducer or transmitter, and the current no pressure ;
 In working state, instrument according to the instructions by 4.1 first, adjust to manual control status ;
 press the "MODE" and "AC" keys at the same time , "SV" will shows "0005" , then loosen the button
 "SV" shows a digital countdown, timing to zero, "PV" data record reset.

4.4) sampling data reset recovery

In working state, instrument according to the instructions by 4.1 first, adjust to manual control status ;
 press "AC" key once, it will return to the result of a reset operation before.
 For example: if "PV" shows the result "- 0.02";
 According to 4.3 operation, display the results into a "00.00".
 Again according to 4.4 operation, display the results for the "-0.02" .

4.5) CAE calibration (only applicable to pressure sensor with a calibration line)

Sure has been properly connected pressure sensor, and the current no pressure status;
 In working state, instrument according to the instructions by 4.1 first, adjust to manual control status ;
 Press "CAE", CAE lights;

"PV" should be show 80% of full pressure range .

For example: the current "PV" shows "00.00", full pressure range set to "10.00"

Press "CAE", the "PV" shows "8.00".

The functional role : if "PV" shows deviation is too much , the instrument need to calibration;

If "PV" no change, can be initially determined sensor is faulty.

4.6) Using CAE calibration the instrument zero / span (only applicable to pressure sensor with a calibration line)

Sure has been properly connected pressure sensor, and the current no pressure status;

In working state, instrument according to the instructions by 4.1 first, adjust to manual control status ;

press the "MODE" and "CAE" button at the same time, until the "SV" shows "0028", then loosen the button;

"SV" shows a digital countdown, timing to zero, zero span end of calibration.

4.7) Modify the user password

In working state, instrument according to the instructions by 4.1 first, adjust to manual control status ;

press the "MODE" and "A/M" button at the same time, "PV" shows "PASS";

Press the "<" adjust "SV" Numbers flashing, flashing a is modified;

press " ^ " or " v " adjust the flashing value up to down ;

After enter the password, press "SET" to validate (initial password: "0000");

Password authentication is passed, enter into new password Settings, "PV" shows "NPAS";

Press the "<" adjust "SV" Numbers flashing, flashing a is modified;

press " ^ " or " v " adjust the flashing value up to down ;

After setting the new password, click "MODE" button to return to work.

Notice : in order to protect the parameters of the instrument user privacy, the meter no backdoor password. So once the user changed the initial password, please your new password . If lost the new password and cause parameters can be setting problem, the user need to ship back the instrument to the manufacturer to unlock. All fees by the user.

4.8) pressure control target value setting (SV setting)

In working state, press "SET" once, "PV" shows "SV" ;

Press "<" to adjust "SV" Numbers flashing, flashing a is modified;

press " ^ " or " v " adjust the flashing value up to down ;

Setup completed, press "MODE" button to return to work, or press the "SET" button enter into proportional band (P) parameter Settings.

4.9) proportional band parameter "P" settings :

In working state, press the "SET" twice, "PV" shows "P";

Press "<" to adjust "SV" Numbers flashing, flashing a is modified;

press " ^ " or " v " adjust the flashing value up to down ;

Setup completed, press "MODE" button to return to work, or press the "SET" button enter into Integral Time (I) parameter Settings.

4.10) Integral time parameter “I” settings

In working state, press the "SET" three times , "PV" shows " I ";
Press "<" to adjust "SV" Numbers flashing, flashing a is modified;
press " ^ " or " \ " adjust the flashing value up to down ;
Setup completed, press "MODE" button to return to work, or press the "SET" button enter into differential time (D) parameter Settings.

4.11) Differential time parameter “D” settings

In working state, press the "SET" four times , "PV" shows " D ";
Press "<" to adjust "SV" Numbers flashing, flashing a is modified;
press " ^ " or " \ " adjust the flashing value up to down ;
Setup completed, press "MODE" button to return to work, or press the "SET" button enter into AL-1 parameter Settings.

4.12) The first pressure alarm (AL-1) value settings :

In working state, press the "SET" five times , "PV" shows " AL-1 ";
Press "<" to adjust "SV" Numbers flashing, flashing a is modified;
press " ^ " or " \ " adjust the flashing value up to down ;
Setup completed, press "MODE" button to return to work, or press the "SET" button enter into AL-2 parameter Settings.

4.13) The second pressure alarm (AL-2) value settings :

In working state, press the "SET" six times , "PV" shows " AL-2 ";
Press "<" to adjust "SV" Numbers flashing, flashing a is modified;
press " ^ " or " \ " adjust the flashing value up to down ;
Setup completed, press "MODE" button to return to work, or press the "SET" button enter into pressure control target value setting .

4.14) Output amplitude high limited value settings

In working state, press the "SET" once , " PV " shows " SV " , then loosen the button
Press " SET " again for 5 seconds , it will enter into output amplitude high limited value setting , " PV " shows " OL-U "
Press "<" to adjust "SV" Numbers flashing, flashing a is modified;
press " ^ " or " \ " adjust the flashing value up to down ;
Setup completed, press "MODE" button to return to work, or press the "SET" button enter into output amplitude low limited value settings .

For example : if the controller output is 0-10v , Output amplitude high limited value setting " 80.0 " ; then the controller output maximum value will be 8V , no matter manual or automatic adjust , the controller output value is not more than 8V .

The functional role: to prevent poor feeding, collection the coasters phenomenon caused by pressure drop.The exact value setting , need users according to the actual usage Settings.

4.15) Output amplitude low limited value settings

In working state, press the "SET" once , "PV" shows "SV" , then loosen the button

Press " SET " again for 5 seconds , it will enter into output amplitude high limited value setting , " PV " shows " OL-U " , then loosen the button .

Press " SET " once again , enter into output amplitude low limited value settings , " PV " shows " OL-L " .

Press "<" to adjust "SV" Numbers flashing, flashing a is modified;

press " ^ " or " \ " adjust the flashing value up to down ;

Setup completed, press "MODE" button to return to work, or press the "SET" button enter into Transducer pressure range value settings .

For example : if the controller output is 0-10v , Output amplitude high limited value setting " 10.0 " ; then the controller output maximum value will be 1V , no matter manual or automatic adjust , the controller output value is not less than 1V .

In the manual control , is not subject to this value, the lowest drops to zero.

The functional role: to prevent discharging stuck, instantaneous pressure caused by the phenomenon of downtime. The exact value setting , need users according to the actual usage Settings.

4.16) Transducer pressure range value settings .

Instrument range should be match with the instrument range setting value , then it will display the properly pressure value . so firstly check the transducer range, if such ranges does not match, follow these steps.

In working state, press the "SET" once , "PV" shows "SV" , then loosen the button .

Press " SET " again for 5 seconds , it will enter into output amplitude high limited value setting , " PV " shows " OL-U " , then loosen the button .

Then Press " SET " twice , enter into transducer pressure range value settings , " PV " shows " ED " .

Press "<" to adjust "SV" Numbers flashing, flashing a is modified;

press " ^ " or " \ " adjust the flashing value up to down ;

Setup completed, press "MODE" button to return to work, or press the "SET" button enter into Decimal point location settings .

For example : if the controller current range is " 10.00 " , and transducer pressure range is 15MPa , according to the above steps, and setting the controller range to "15.00".

4.17) The decimal point location settings

In working state, press the "SET" once , "PV" shows "SV" , then loosen the button .

Press " SET " again for 5 seconds , it will enter into output amplitude high limited value setting , " PV " shows " OL-U " , then loosen the button .

Then Press " SET " three times , enter into decimal point location settings , " PV " shows " DOT " .

Press "<" to adjust the decimal point location ;

Setup completed, press "MODE" button to return to work, or press the "SET" button enter zero/ span value settings .

4.18) zero/ span value settings .

This operation will cause the collect data is not accurate, please strictly according to the following instructions:

Make sure the transducer connection is correct, and the current for no pressure status ;

In working state, press the "SET" once , " PV" shows " SV " , then loosen the button .

Press " SET " again for 5 seconds , it will enter into output amplitude high limited value setting , " PV " shows " OL-U " , then loosen the button .

Then Press " SET " four times , enter into zero/span value settings , " PV " shows " ESCL " .

Press "<" to calibration zero , controller enter into signal load status , " PV" shows " LOAD " .

Load the signal , " SV " shows value will be changed (you through add pressure to load the signal)

After load signal finished , press "<" enter into full value conversion settings , " PV " shows "CNFN " .

Press "<" to adjust "SV" Numbers flashing, flashing a is modified;

press "^" or "∨" adjust the flashing value up to down ;

Setup completed, press "MODE" button to return to work, or press the "SET" button enter into the first pressure alarm function settings .

4.19) the first pressure alarm function settings (SEL1)

In working state, press the "SET" once , " PV" shows " SV " , then loosen the button .

Press " SET " again for 5 seconds , it will enter into output amplitude high limited value setting , " PV " shows " OL-U " , then loosen the button .

Then Press " SET " five times , enter into the first pressure alarm function settings , " PV " shows " SEL1" .

Press "^" or "∨" to shift the first pressure alarm function (HJ or LJ) status .

Setup completed, press "MODE" button to return to work, or press the "SET" button enter into the first pressure alarm hysteresis zone setting .

4.20) the first pressure alarm hysteresis zone setting (HC-1) .

In working state, press the "SET" once , " PV" shows " SV " , then loosen the button .

Press " SET " again for 5 seconds , it will enter into output amplitude high limited value setting , " PV " shows " OL-U " , then loosen the button .

Then Press " SET " six times , enter into the first pressure alarm hysteresis zone setting , " PV " shows " HC-1 " .

Press "<" to adjust "SV" Numbers flashing, flashing a is modified;

press "^" or "∨" adjust the flashing value up to down ;

Setup completed, press "MODE" button to return to work, or press the "SET" button enter into the second pressure alarm function settings .

For example : according to the 3 settings different value , The first pressure alarm (AL-1) value, the first pressure alarm function (SEL1) and the first pressure alarm hysteresis zone (HC-1)

Example 1 :

if setting the AL-1 as "5.00 " , setting the SEL-1 as "HJ" , setting the HC-1 as " 0.20 " .

In working state, AL-1 relay working status as following :



"PV" collect data	AL-1 NC terminal	AL-1 NO terminal	AL-1 indicator
More than 5.20	open	close	light
Between 4.8 and 5.2	maintain the previous state		
Less than 4.8	close	open	dark

Example 2 :

if setting the AL-1 as "5.00 " , setting the SEL1 as "LJ" , setting the HC-1 as " 0.20 " .
In working state, AL-1 relay working status as following :

"PV" collect data	AL-1 NC terminal	AL-1 NO terminal	AL-1 indicator
More than 5.20	close	open	dark
Between 4.8 and 5.2	maintain the previous state		
Less than 4.8	open	close	light

4.21) the second pressure alarm function settings (SEL2)

In working state, press the "SET" once , " PV" shows " SV " , then loosen the button .
Press " SET " again for 5 seconds , it will enter into output amplitude high limited value setting , " PV " shows " OL-U " , then loosen the button .
Then Press " SET " seven times , enter into the second pressure alarm function settings , " PV " shows " SEL2" .
Pressure " ^ " or " \ " to shift the second pressure alarm function (HJ or LJ) status .
Setup completed, press "MODE" button to return to work, or press the "SET" button enter into the scnd pressure alarm hysteresis zone setting .

4.22) the second pressure alarm hysteresis zone setting .(HC-2)

In working state, press the "SET" once , " PV" shows " SV " , then loosen the button .
Press " SET " again for 5 seconds , it will enter into output amplitude high limited value setting , " PV " shows " OL-U " , then loosen the button .
Then Press " SET " eight times , enter into the second pressure alarm hysteresis zone setting , " PV " shows " HC-2 " .
Press "<" to adjust "SV" Numbers flashing, flashing a is modified;
press " ^ " or " \ " adjust the flashing value up to down ;
Setup completed, press "MODE" button to return to work, or press the "SET" button enter into the pressure division value settings .

The functional role: the AL-2 is similar as AL-1 , but AL-2 no NC terminal , we just supply the NO terminal .

4.23) the pressure division value settings

In working state, press the "SET" once , " PV" shows " SV " , then loosen the button .
Press " SET " again for 5 seconds , it will enter into output amplitude high limited value setting , " PV " shows " OL-U " , then loosen the button .
Then Press " SET " nine times , enter into the pressure division value settings . " PV " shows " DP " .

press " \wedge " or " \vee " to adjust "SV" value .

Setup completed, press "MODE" button to return to work, or press the "SET" button enter into the fuzzy control type settings .

4.24) the fuzzy control type settings .

In working state, press the "SET" once , "PV" shows "SV" , then loosen the button .

Press "SET" again for 5 seconds , it will enter into output amplitude high limited value setting , "PV" shows "OL-U" , then loosen the button .

Then Press "SET" ten times , enter into the fuzzy control type settings , "PV" shows "FUCT" .

press " \wedge " or " \vee " to adjust "SV" value .

Setup completed, press "MODE" button to return to work, or press the "SET" button enter into output adjustment cycle settings .

The functional role: type 0 adjustment range is big, is suitable for the plate making industry .
type 1 adjustment range is small, be applicable to the silk industry .

4.25) output adjustment cycle settings .

In working state, press the "SET" once , "PV" shows "SV" , then loosen the button .

Press "SET" again for 5 seconds , it will enter into output amplitude high limited value setting , "PV" shows "OL-U" , then loosen the button .

Then Press "SET" eleven times , enter into the output adjustment cycle settings , "PV" shows "TS" .

press " \wedge " or " \vee " to adjust "SV" value .

Setup completed, press "MODE" button to return to work, or press the "SET" button enter into parameters lock setting .

4.26) the parameters lock setting .

In working state, press the "SET" once , "PV" shows "SV" , then loosen the button .

Press "SET" again for 5 seconds , it will enter into output amplitude high limited value setting , "PV" shows "OL-U" , then loosen the button .

Then Press "SET" twelve times , enter into the parameters lock setting , "PV" shows "LOCK" .

press " \wedge " or " \vee " to adjust "SV" value .

Setup completed, press "MODE" button to return to work, or press the "SET" button enter into the output amplitude high limited setting .

The functional role: if lock parameters setting 1 , next time the user enter menu setting need to input the password .

5. Safety warning

5.1) the controller terminal for the bare installation, when the controller connected with the power , the body any parts contact the terminal is not allowed

5.2) the controller is an open device, please avoid dust, corrosive liquid, high humidity too much or strong vibration environment use.

5.3) when the instrument malfunction, please do not open the instrument without authorization.



6. Order Guide: with "*" are required , with "---" is optional

Model	Range (bar)	Input	Output	Power Supply	Alarm	Other requirement
PD9001	*	*	*	*	*	---
Example: PD9001-350BAR-4-20mA-0-10V-220V-2						

7. ZHYQ contacts :

Company Name: Shanghai Zhaohui Pressure Apparatus Co.,Ltd.

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Tel: 86-21-51691919

Fax: 86-21-67755185

Email: info@zhygsensor.com

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