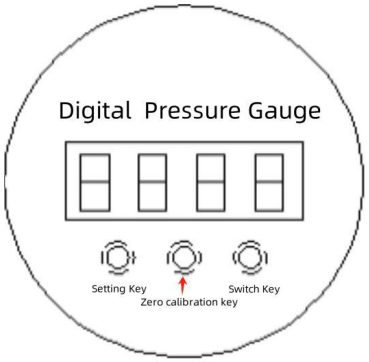
P18 Operating Manual

Operating Instructions



Zero Calibration Key: data left shift left

Setting Key: function selection

Adjustment Key: data adjustment increase key

I. Communication Parameter Setting - - Password: 0485

1) Entering the password:

Press Setting Key in the measurement state, and the screen displays "-CD-"; after pressing Setting Key to confirm, the screen displays "0000", and the rightmost light flashes; press Switch Key (data increase key) 5 times, and the screen displays "0005"; press Zero Calibration Key (data left shift key), and the screen displays "0005"and the tens digit flashes; press Switch Key (data increase key) 8 times, and the screen displays "0085"; press Zero Calibration Key (data left shift key), and the screen displays "0085" and the hundreds digit flashes; press Switch Key (data increase key) 4 times, and the screen displays "0485"; press Setting Key to confirm and then enter the communication parameter setting interface.

2) Selecting the address number - the range is 0.001~255:

The screen displays "addr", press Setting Key to display "001" (the last setting value, here it is 001, or it may be another value between 1 and 255); set the address value (range 1--255) by Zero Calibration Key (data left shift key) and Switch Key (data increase key), and after setting, press Setting Key to display "bps".

3) Selecting the baud rate:

Press Setting Key to display "1200", adjust the baud rate by Zero Calibration Key (data left shift key) and Switch Key (data increase key); after adjustment, press Setting Key. The set parameters are written into the EEPROM and the system returns to the measurement mode.

4) The last item of the 485 menu bi_x (check bit selection) - x can be selected from n, o, E
n = no check
o = odd check
E = even check

II. Basic Parameter Setting of the Instrument - - Password: 0101

a. YC Select the instrument unit 'C KPa MPa
b. Yd Select the decimal point: 0 1 2 3 (Note: 0 = no decimal point, 3 = 3 decimal points)
c. Select the system sampling point CY--X (X is 2.3.5)
d. YP1 Display point 1 (zero point) Range -1999--9999
e. YP2 Display point 2 Range -1999--9999
f. YP3 Display point 3 Range -1999--9999
g. YP4 Display point 4 Range -1999--9999
h. YP5 Display point 5 (full span) Range -1999--9999

The automatic zeroing setting (i.e. small signal cutting) is added; the gauge head displays lin o, and the screen displays 00.00; press Setting Key, the last decimal place displayed can increase the cutting value as needed.

Example: Press Adjustment Key to adjust to 00.05, and then, when the sensor senses the pressure between -00.05 and 00.05, the gauge head always displays 00.00, which increases the stability of the gauge head display.

Note: The 5 display points must be set at equal intervals.

Example: If the sensor is a pressure sensor of 0-50MPa, select MPa for YC, select 2 for Yd, select 00.00 for YP1, select 12.50 for YP2, select 25.00 for YP3, select 37.50 for YP4, select 50.00 for YP5.

Example: If the sensor is a temperature sensor of -100-600'C, select 'C for YC, select 1 for Yd (of course, 0 can also be selected, and this selection is to improve the display resolution), select -100.0 for YP1, select 75.00 for YP2, select 250.0 for YP3, select 425.0 for YP4, and select 600.0 for YP5.

III. Sampling Calibration - - Password: 0022

1. CY_X, X is 2, 3, 5
Select 2, the system sample is based on 2-point calibration; Select 3, the system sample is based on 3- point calibration; select 5, the system sample is based on 5-point calibration.
2. C1_x (x is n or y. Select n for no calibration. Select y for calibration. Press Setting Key: The calibration starts, "C1--" is displayed, and "--" flashes, indicating calibration is in progress.
3. C2_x (x is n or y. Select n for no calibration. Select y for calibration. Press Setting Key: The calibration starts, "C2--" is displayed, and "--" flashes, indicating calibration is in progress.
4. C3_x (x is n or y. Select n for no calibration. Select y for calibration. Press Setting Key: The calibration starts, "C3--" is displayed, and "--" flashes, indicating calibration is in progress.
5. C4_x (x is n or y. Select n for no calibration. Select y for calibration. Press Setting Key: The calibration starts, "C4--" is displayed, and "--" flashes, indicating calibration is in progress.
6. C5_x (x is n or y. Select n for no calibration. Select y for calibration. Press Setting Key: The calibration starts, "C5--" is displayed, and "--" flashes, indicating calibration is in progress.

Example:
The sensor is 0-10MPa, 5-point calibration.
Enter the password 0022 CY_X, (Select 5 for X) Press Setting Key

C1_x (Select Y for x) Pressurize to 0MPa. After the pressure stabilizes, press Setting Key to display "C1--"; "--" flashes, and the instrument automatically collects the output voltage of the sensor at 0MPa and automatically records it.
After completion, enter the 2nd point calibration selection interface to display "C2_X"

C2_x (Select Y for x) Pressurize to 2.5MPa. After the pressure stabilizes, press Setting Key to display "C2--"; "--" flashes, and the instrument automatically collects the output voltage of the sensor at 2.5MPa and automatically records it.
After completion, enter the 3rd point calibration selection interface to display "C3_X"

C3_x (Select Y for x) Pressurize to 5MPa. After the pressure stabilizes, press Setting Key to display "C3--"; "--" flashes, and the instrument automatically collects the output voltage of the sensor at 5MPa and automatically records it.
After completion, enter the 4th point calibration selection interface to display "C4_X"

C4_x (Select Y for x) Pressurize to 7.5MPa After the pressure stabilizes, press Setting Key to display "C4--"; "--" flashes, and the instrument automatically collects the output voltage of the sensor at 7.5MPa, and automatically records it.
After completion, enter the 5th point calibration selection interface to display "C5_X"

C5_x (Select Y for x) Pressurize to 10MPa After the pressure stabilizes, press Setting Key to display "C5--"; "--" flashes, and the instrument automatically collects the output voltage of the sensor at 10MPa, and automatically records it.
After completion, press Setting Key; the voltages of all the points are stored in the EEPROM, and the instrument returns to the measurement state.

Note: The collection point is actually the setting display point

IV. 4-20mA Output Calibration - - Password: 4020

The 4-20mA output of this instrument is controlled by PWM. The pulse width of PWM is nonlinear with the output voltage. The PWM output is calibrated at most 5points. The resolution of PWM for width is 32768. For 4-20mA, the resolution is less than 1u A.

1. OU_X (X is 2, 3, 5).
   Select 2: 2-point calibration of 4-20mA output.
   Select 3: 3-point calibration of 4-20mA output.
   Select 5: 5-point calibration of 4-20mA output

2. OU04 4mA calibration point
3. OU08 8mA calibration point
4. OU12 12mA calibration point
5. OU16 16mA calibration point
6. OU20 20mA calibration point
   For 2-point calibration, calibrating 4mA and 20mA
   For 3-point calibration, calibrating 4mA, 12mA, and 20mA
   For 5-point calibration, calibrating 4mA, 8mA, 12mA, 16mA, and 20mA

For the 2-point calibration:
Enter the password 4020, press Setting Key, and the screen displays "OU_X".

Adjust the display to "OU_2"(That means 2-point calibration) by Zero Calibration Key (data left shift key) and Switch Key (data increase key); press Setting Key to display "OU04"; press Setting Key to display "1300"; press Zero Calibration Key (data left shift key), the data is reduced one by one; press and hold, the data is reduced rapidly; press Switch Key (data increase key), the data is increased one by one; press and hold, the data is increased rapidly.

Adjust the value until the loop current is 4mA. Press Setting Key to display "OU20", display "5000".
Adjust the value until the loop current is 20mA. Press Setting Key, the calibration value is written to the EEPROM, and the instrument returns to the measurement state.

V. 4-20mA Output Migration Setting - - Password: 1212

1. LCL 4mA corresponds to the range point
2. LCH 20mA corresponds to the range point

The setting for LCL cannot be less than the lower limit of the instrument range.
The setting for LCH cannot be greater than the upper limit of the instrument range.

The instrument has been designed for fault tolerant; if you enter an illegal value the instrument will display "Erro"

Example: The instrument range is 0-10MPa, and the default setting is that 0MPa = 4mA and 10MPa = 20mA. You want to change it to 2MPa = 4mA and 8MPa = 20mA.

Enter the password 1212, press Setting Key, and the screen displays "LCL"; press Setting Key, and the screen displays "00.00"; adjust the screen display to "02.00"; press Setting Key, and the screen displays "LCH"; press Setting Key, and the screen displays "10.00".

Adjust the screen display to "08.00"; press Setting Key, the set value is written into the EEPROM, and the instrument returns to the measurement state.

VI. Instrument Key Zero Calibration

In the measurement state, the instrument is at zero point, but the display is not 0, so the instrument has a zero drift.

Press Zero Calibration Key (to prevent the false zero calibration, press this key for more than 3 seconds), the instrument displays "-00-", and the instrument zero point is calibrated.

Serial Port Communication Parameter Setting

Serial port communication:
Check bit: None
Data bit: 8
Stop bit: 1
﹀Auto clear
﹀Hexadecimal display
﹀Hexadecimal sending
Sending period: 1000 seconds
Sensing content: No. 1 Machine Address: 01 03 00 00 00 01 84 0A
No. 2 Machine Address: 02 03 00 00 00 01 84 39

Notes: The gauge head is usually set at No. 1 Machine address bit
Computer serial port: When 2-3 short-circuited, self-sending and self-receiving
Serial port location: Actual serial port location of the computer
Baud rate: Should be the same with the gauge head setting

MODBUS-RTU

This instrument communication protocol complies with MODBUS-RTU communication protocol.

Supposed that the instrument parameters are:
Setting the instrument address as 1 Communication baud rate 9600
No check bit
1 decimal place
Unit MPa
Instrument display value 500.0MPa

The following is a detailed explanation of the host computer (PC) command and instrument return command.
//The command is hexadecimal.

Reading instrument address command: 01 03 00 00 00 01 84 0A
01 (instrument address)
03 (reading command)
00 00 (instrument communication address)
00 01 (reading a parameter)
84 0A (CRC16 check code)

Instrument return data: 01 03 02 00 01 79 84
01 (instrument address)
03 (reading command)
02 (the number of bytes read, 2 for 1 parameter, 4 for 2 parameters)
00 01 (the instrument address is 1)
79 84 (CRC16 check code)

Reading instrument baud rate command: 01 03 00 01 00 01 D5 CA
01 (instrument address)
03 (reading command)
00 01 (instrument communication baud rate)
00 01 (reading a parameter)
D5 CA (CRC16 check code)

Instrument return data: 01 03 02 00 04 B9 87
01 (instrument address)
03 (reading command)
02 (the number of bytes read, 2 for 1 parameter, 4 for 2 parameters)
00 04 (looking up MODBUS table, representing the baud rate 9600)
B9 87 (CRC16 check code)

Reading instrument unit command: 01 03 00 02 00 01 25 CA
01 (instrument address)
03 (reading command)
00 02 (instrument unit)
00 01 (reading a parameter)
25 CA (CRC16 check code)

Instrument return data: 01 03 02 00 02 39 85
01 (instrument address)
03 (reading command)
02 (the number of bytes read, 2 for 1 parameter, 4 for 2 parameters)
00 02 (looking up MODBUS table, representing the unit MPa)
39 85 (CRC16 check code)

Reading instrument decimal point command: 01 03 00 03 00 01 74 0A
01 (instrument address)
03 (reading command)
00 03 (instrument decimal point)
00 01 (reading a parameter)
74 0A (CRC16 check code)

Instrument return data: 01 03 02 00 01 79 84
01 (instrument address)
03 (reading command)
02 (the number of bytes read, 2 for 1 parameter, 4 for 2 parameters)
00 01 (looking up MODBUS table, representing 1 decimal place)
79 84 (CRC16 check code)

Reading instrument display value command: 01 03 00 04 00 01 C5 CB
01 (instrument address)
03 (reading command)
00 04 (instrument display value)
00 01 (reading a parameter)
C5 CB (CRC16 check code)

Instrument return data: 01 03 02 13 88 B5 12

01 (instrument address)

03 (reading command)

02 (the number of bytes read, 2 for 1 parameter, 4 for 2 parameters)

13 88 (13 88 is a hexadecimal number, 13 is the high type, 88 is the low byte,
converting to a decimal number: it's 5000 exactly)

B5 12 (CRC16 check code)

MODBUS-RTU Address Allocation

Reading Command Address

No.	Address	Command	Value range	Description
1	0X00	0X03	0–255	Instrument communication address
2	0X01	0X03	1–1200 2–2400 3–4800 4–9600	Instrument communication Baud rate
3	0X02	0X03	0–m 1–kPa 2–MPa 3–*C 7–Pa	Instrument unit
4	0X03	0X03	0–Decimal-free 1–1 decimal place 2–2 decimal places 3–3 decimal places	Instrument decimal places
5	0X04	0X03	0–9999	Instrument show value

Writing Command Address

No.	Address	Command	Value range	Description
1	0X00	0X06	0--255	Instrument communication address
2	0X01	0X06	1–1200 2–2400 3–4800 4–9600	Instrument communication Baud rate
3	0X04	0X06	0	Instrument zero calibration

Example:

Changing No.1 Address into No. 2 Address: Just send 01 06 00 00 00 02 08 0B.

Changing No.1 Machine baud rate 9600 into 2400: Just send 01 06 00 01 00 02 59 CB.

Zero calibration for No.1 Machine Instrument: Just send 01 06 00 04 00 00 C8 0B.