

EM2000H differential pressure controller

Installation, alarm settings and Modbus RTU | English edition

1. Product overview

The EM2000H measures differential pressure in air and compatible nonflammable gases. An LCD shows the measurement and engineering unit. Adjustable upper and lower alarms operate relay contacts and a built-in audible alarm. RS485 communication supports remote readings. Mounting follows the standard EM2000-size differential-pressure gauge arrangement; several calibrated ranges are available.

2. Dedicated manual specification

Parameter	Specification
Medium	Air and compatible nonflammable gases
Housing	Cast aluminum, as described in this manual
Accuracy / stability	±1%FS / ±1%FS/year
Installation temperature	−7°C to 60°C
Pressure resistance	10psig, approximately 0.69bar
Supply	24VDC, separate positive and negative power terminals
Outputs	Upper- and lower-limit relay dry contacts; RS485 Modbus RTU
Relay contacts	Normally open; 5A stated for each contact pair. Switching voltage and load category are not specified.
Display / adjustment	LCD; digital zero, range and parameter adjustment
Electrical connection	Eight-position screw terminal block
Process connection	1/8in NPT female ports; supplied fittings for 1/8in inside-diameter hose
Orientation	Vertical

3. Supplied mounting parts

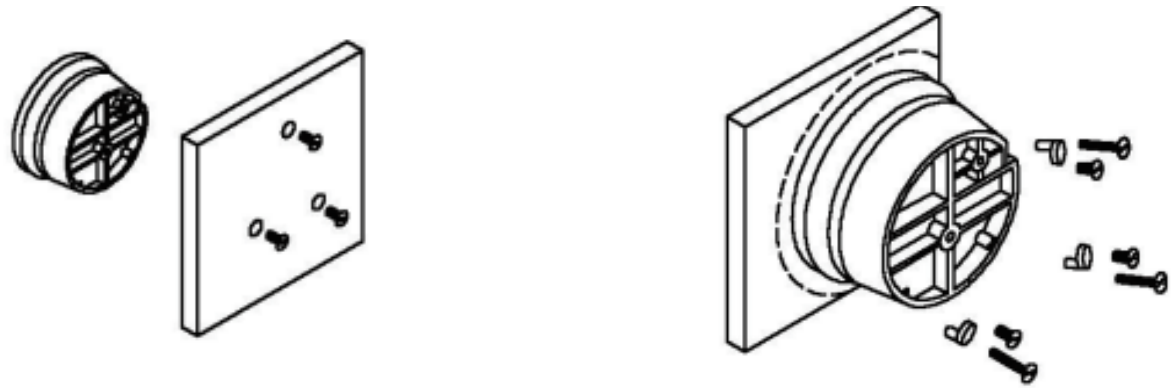
Two 1/8in male-thread hose-barb fittings, two 1/8in male-thread port plugs, and three surface-mounting adapters with screws. Pipe mounting requires an additional kit.

The Chinese product listing describes a ±3000Pa configuration, PA6 + aluminum + PC construction, 120.65mm × 46.32mm size, approximately 211.6g, Ø8×5mm tubing and a 10–35VDC product supply range. The illustrated relay/RS485 wiring in this manual is explicitly marked 24VDC. Further revision differences are identified on the final page.

Installation and terminal assignments

4. Position and mounting

Select a clean, dry, vibration-free location between -7°C and 60°C for the installation described in this manual. Mount vertically: factory zero and span calibration use this orientation. Long pressure tubing increases response time. Keep electrical connections within the permitted receiving-circuit limits.



Surface mounting, left; flush mounting, right. For surface mounting, secure three mounting positions at 120° intervals with suitable screws. For flush mounting, prepare the matching panel opening, insert the gauge and secure the mounting lugs. Use an additional kit for pipe mounting.

5. Pressure connections

The housing has two HIGH/LOW port pairs with 1/8in NPT female threads. Use one pair and seal the unused duplicate pair with the supplied plugs. Fit the brass hose barbs and tubing without leaks. Keep damp or contaminated gas from entering the sensor by suitable pressure-tap and tubing orientation. The source mentions free placement for clean gas, but also explicitly requires vertical instrument mounting; retain the vertical calibration orientation.

Measurement	Port connection
Differential pressure	Higher pressure $\rightarrow$ HIGH; lower pressure $\rightarrow$ LOW.
Positive or signed negative gauge pressure	Pressure or vacuum source $\rightarrow$ HIGH; LOW remains open to atmosphere. A vacuum gives a negative differential reading.

6. Eight-terminal wiring

Terminals	Assignment
1 / 2	1 = +24VDC; 2 = DC supply negative
3 / 4	Upper-alarm normally-open dry contact, 5A stated
5 / 6	Lower-alarm normally-open dry contact, 5A stated
7 / 8	7 = RS485 A; 8 = RS485 B

Above the upper alarm threshold, terminals 3-4 close. Below the lower alarm threshold, terminals 5-6 close. These contacts do not supply power to the controlled circuit. The two power conductors are not a documented two-wire 4-20mA loop. No analog-output terminal is assigned in this eight-terminal diagram.

Keys and complete menu

7. Front-panel operation

The four keys are ▼, SET, ▲ and return/mute. After startup the LCD displays measured pressure. Press SET to open the parameter menu, use ▲/▼ to select a menu item, and press SET to display its value. Adjust with ▲/▼, then press SET to save and return to measurement. The return/mute key exits the setting screen and provides the mute function.

Hold ▼ for more than six seconds for the display-reset shortcut. The FDS procedure restores all factory parameters and is a separate operation.

Code	Function / setting	Factory value
ADR	Communication address, 1-128	1
BOUD	Baud rate: 9600, 4800 or 2400	9600
CHK	Parity: 0 = none; 1 = odd; 2 = even	0
HI	Maximum measurement value	Range dependent
LO	Minimum measurement value	Range dependent
Sn	Internal system parameter; do not modify	—
DOT	Decimal-point setting	5
UNIT	Menu table: 5 = Pa; 4 = kPa; 3 = mbar; 2 = in.WC; 1 = mmWC	5
CS	Small-signal cutoff: 0-5 corresponds to 0-5%FS; values below the selected threshold display zero	—
AL H	Upper alarm setting; terminals 3-4 close above this value	—
AL L	Lower alarm setting; terminals 5-6 close below this value	—
HC-D	Internal system parameter; do not modify	—
SOF	Zero-offset calibration	—
sue	Save data: change 88880 to 88888	88880
fds	Restore factory settings: change 55550 to 55555	55550

A dash means that the source gives no default. The save code is printed “sue” in the source. Restoring factory settings resets all parameters, including factory-calibrated range values; avoid this operation unless the correct calibration and configuration can be restored.

The UNIT menu and the communications register table assign different numeric codes to mbar, in.WC and mmWC. Both source mappings are reproduced separately. Check the displayed unit and returned code on the actual firmware before using these three unit codes; Pa = 5 and kPa = 4 agree in both tables.

RS485 Modbus RTU protocol

8. Serial settings and frame format

Asynchronous RS485: one start bit, eight data bits and one stop bit. CHK selects no parity (0), odd parity (1) or even parity (2). Baud rate is 9600 by default, with 4800 and 2400 available. Device addresses are 1-128; default address 01.

Function 03 reads holding registers. A request contains device address, function, two-byte start address, two-byte register count and CRC16. A response contains device address, function, byte count, register data and CRC16. Response byte count is twice the requested register count. CRC16 covers the address byte through the final data byte; the CRC low byte is transmitted first.

9. Complete register map

Address (hex)	Meaning	Type / encoding
00	Decimal/scaling position	INT16; source maps values 1-5 to 1-5 displayed decimal places
02	Pressure unit	INT16; 1 = mbar, 2 = mmWC, 3 = in.WC, 4 = kPa, 5 = Pa
03	Sn	INT16; internal sensor parameter
05	Parity	INT16; 0 = none, 1 = odd, 2 = even
07	Device address	INT16; 1-128
08	Baud rate	INT16; 0 = 2400, 1 = 4800, 2 = 9600
0A	Maximum instrument range	FLOAT
0C	Minimum instrument range	FLOAT
0E	Zero value	FLOAT
10	HLFS, high alarm setting	FLOAT
12	LLFS, low alarm setting	FLOAT
14	Current pressure measurement	FLOAT
16	Current temperature	FLOAT

INT16 occupies one 16-bit register. FLOAT occupies two consecutive 16-bit registers. The examples use a 32-bit IEEE 754 floating-point value with the most significant byte first. The manual specifies read function 03; it does not supply a write-command procedure.

10. Read one integer register

Read register 0x0000, quantity 1:

Request: 01 03 00 00 00 01 84 0A

Response: 01 03 02 00 05 78 47

Data 00 05 represents decimal integer 5.

Transmit the CRC low byte first, followed by the high byte, as shown in the example frames.

Protocol examples and document notes

11. Read the current pressure

Request: 01 03 00 14 00 02 84 0F

Response: 01 03 04 C0 EB 3D 9A 26 FC

Value: C0 EB 3D 9A = approximately -7.351270 . The source illustrates a rounded display of -7Pa .

12. Read the high alarm setting

Request: 01 03 00 10 00 02 C5 CE

Response: 01 03 04 43 FA 00 00 CF 86

Value: 43 FA 00 00 = 500.0.

13. Read the low alarm setting

Request: 01 03 00 12 00 02 64 0E

Response: 01 03 04 C2 C8 00 00 46 75

Value: C2 C8 00 00 = -100.0 .

14. Inspection-certificate template

The Chinese certificate block identifies the product as a digital differential-pressure controller, model EM2000H, standard GB/T 27505-2011, inspector 05. Its manufacturing-date field is blank. It states: “This product has passed inspection and is approved for shipment.” This reproduces the source template; it is not a new inspection or certification of any individual unit.

15. Configuration and communication notes

These instructions apply to the electronic differential-pressure controller with separate power, relay and RS485 terminals.

The described installation uses a -7 – 60°C envelope. Additional product configurations specify -20 – 85°C , 10–35VDC, maximum 38mA and temperature stability of $\pm 0.055\%\text{FS}/^{\circ}\text{F}$. The terminal-defined controller requires nominal 24VDC; apply the wiring and ratings of the supplied configuration.

The illustrated eight-terminal controller uses separate power, two relay pairs and RS485. A 4–20mA option requires its corresponding connection diagram. The maximum pressure is 10psig, approximately 0.69bar.

LCD arrangements can vary by configuration. Use the separate unit-code tables for front-panel menus and Modbus registers. The pressure example decodes to -7.3512697 . All eight communication examples include their Modbus CRC16 bytes.

Source publisher

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