

说明书

User Manual



ZMJ100XDR
远传密度继电器

ZMJ100XDR
Remote Density Monitor

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产品特点:

Product features

本产品属于机电一体化产品。机械部分采用补偿系统, 表针指示采用双金属片补偿, 接点采用参比气室补偿, 确保了全温度全量程区间下表计指示和接点动作更加准确。电子部分采用高精度压力和温度传感器实现密闭容器内SF6气体的压力、温度采集, 并通过复杂的Beattie-Bridgeman方程计算当前气体密度, 同时具有485通讯远传功能。本产品满足国网《智慧变电站技术规范 第4部分: 数字化远传表计》的相关要求。

This product belongs to electromechanical integration product. The mechanical part adopts compensation system, the needle indication adopts bimetallic sheet compensation, and the contact adopts reference air chamber compensation to ensure more accurate meter indication and contact action under the full temperature and full range range. In the electronic part, high-precision pressure and temperature sensors are used to collect the pressure and temperature of SF6 gas in the closed container, and the current gas density is calculated through the complex Beattie Bridgeman equation. At the same time, it has 485 communication remote transmission function. This product meets the relevant requirements of the State Grid Technical Specification for Smart Substation Part 4: Digital Telemeter.

1. 安全提示 Safety tips



在安装、启动和操作此仪表时，必须遵守相应国际安全规范，所有的工作必须在无电压状态进行。如果不按规程序操作，会造成严重的人身伤害或财产损失。只有经过专业培训的人员可以调装此仪表。

During installation, startup and operation of this instrument, all relevant international safety codes must be obeyed and all the work must be conducted under the voltage-free status. Failure to comply with specific instructions may cause severe injury or property damage. Only professionally trained personnel can debug or install this instrument.

2. 一般性提示 Common tips

A. 功能原理

Working principle

微动开关式气体密度继电器是改型的带信号输出的压力表。气体密度继电器实现了测量和开关功能的一体化。温度对气体密度的影响由一个补偿系统平衡。气体密度继电器是针对每一个设备特殊设计的（气体的纯度，校验压力，开关点...）。

Micro switch gas density monitor is a modified pressure gauge with signal output. Gas density monitor integrates measurement and switching functions. The impact of temperature on gas density is balanced by a compensation system. Gas density monitor is specially designed for each device (Gas purity, calibration pressure, switch points ...).

远传密度继电器既有传统的报警、闭锁接点输出，又有电子式数字信号输出。

Remote density monitor has not only traditional alarm and locking contact output but also digital signal output.

B. 使用前检测

Pre-use inspection

在运输或仓储过程中，可能使远传密度继电器变冷或变热。当温度不等于参考温度(20℃)时指针会动。这种现象是正常的，因为温度补偿系统在工作。

During transportation or warehousing, remote density monitor may become cold or hot. When the temperature is not equal to reference temperature (20°C), the pointer will move, which shows the temperature compensation system is working.

为确定远传密度继电器与周围温度是否适应, 必须在温度 $20\pm 1^{\circ}\text{C}$ 环境下恒温至少 2 小时指针才能指示到允许的误差范围内。

In order to determine whether remote gas density monitor adapts to ambient temperature, the temperature of $20\pm 1^{\circ}\text{C}$ must be maintained for at least 2 hours so that the pointer can work within the allowable error range.

C. 零位补偿区域

Zero compensation area

远传密度继电器带有零位补偿区域。仪表指针在无压力状态下, 因为温度的升高或降低, 会在零位补偿区域摆动, 例如: 60°C 指针指示在低于零位的零位补偿区域下边缘, 从而简单的测量出温度补偿值, 当仪表温度降低, 指针将移向零位补偿区域的正值区域。

Remote density monitor of this model has a zero compensation area. In the pressure-free state, the pointer swings within the zero compensation area due to temperature rise or fall. For instance, 60°C pointer stays at the lower edge of zero compensation area below zero position and the temperature compensation value can be calculated in a simple way. When the instrument temperature falls, the pointer will move to a positive value of zero compensation area.

3. 报警功能点 Alarm functional points

微动开关电接点开关也就是辅助电源开关, 整个电源回路的开断是通过内部的机械结构达到预先设定的极限值时触发微动开关。

Micro switch is also auxiliary power switch. The entire power circuit is disconnected or connected by activating the contact when the preset limit value is reached through internal mechanical mechanism.

4. 安装 Installation

A. 机械接口

Mechanical interface

一般仪表常用的技术性规范这里也适用(如:En837-2)，旋转安装时所用的力不允许直接作用到表壳或接线盒上，而是通过合适的工具作用到扳手面上。

Technical codes (e.g., En837-2) applicable to ordinary instrumentation also apply here. The force applied for rotation installation shall not directly act upon the instrument housing or terminal box but act upon the wrenching face through a suitable tool.



B. 电气接口

Electrical interface

接线必须由经过专业培训的人员操作。接线分布和开关功能都在仪表型号牌上给出，并注明了接线柱和接地柱。规定供电电线必须考虑仪表的上限电流需求量并符合 IEC227 或 IEC245 标准。

The wirings shall be performed by professionally trained personnel. Wiring distribution and switching functions are displayed on the instrument type plate with terminal binding posts and ground pole also indicated. The specifications of power line must allow for the upper limit current requirement of the instrument and comply with IEC227 or IEC245.

5. 使用和维护 Use and maintenance

远传密度继电器应垂直安装，用在室外的密度继电器应避免阳光直射到仪表上，考虑在仪表上加装防护罩。

Remote density monitor shall be installed upright. For a gas density monitor used outdoors, direct exposure to sunlight is not allowed, and it is advisable to use a shield.

远传密度继电器安装部位应能较真实地反映设备内气体的温度。

Remote density monitor shall be erected at a proper position to reflect the temperature of gas in relevant equipment.

用肥皂水浸湿的擦布清洁仪表，要清洁接线盒或插头时要先把电源断开，再接通电源前确保所有部件不潮湿。

Clean the instrument with a wiping cloth soaked in soap water. Cut off the power supply before cleaning the terminal box or plugs. Make sure that all components are dry before turning on the power again.

6. 技术参数 Technical parameters

A. 一般参数

General parameters

外形尺寸 External dimension	Φ100mm
量程范围 Measuring range	依据用户要求定制 Customized
测量介质 Measuring medium	SF ₆ 、Air、N ₂ 、SF ₆ +N ₂ 、SF ₆ +CF ₄ 等气体 SF ₆ 、Air、N ₂ 、SF ₆ +N ₂ 、SF ₆ +CF ₄ etc.
设定点精度 Set point accuracy	±1.0%FS (+20±1℃) ±1.8%FS (-20℃~+60℃) (气态) (gas phase) ; ±2.3%FS (-30℃~-20℃、+60℃~+70℃) (气态) (gas phase) ±2.8%FS (-40℃~-30℃) (气态) (gas phase)
指示精度 Indicating accuracy	额定压力 (Rated pressure) : ±1.0%FS (+20±1℃) ±1.8%FS (-20℃~+60℃) (气态) (gas phase) ±2.3%FS (-30℃~-20℃、+60℃~+70℃) (气态) (gas phase) ±2.8%FS (-40℃~-30℃) (气态) (gas phase)
额定、设定点现场显示与远传数据一致性 The field display of rated and set points is consistent with remote data	±1.0%FS (+20±1℃) 其他温度 (Other temperature) , ±1.6%FS
抗振性能 Vibration resistance	20m/s ²
抗冲击性能 Shock performance	50g
接点电气参数 Contact electrical parameters	10 (1.5) A, 250V AC 0.1 (0.05) A, 250V AC
接点类型 Contact type	微动开关式 MicroSwitch ytpre
工作环境 Working environment	-40℃~+70℃, 相对湿度 (Relative humidity) ≤95 %RH
防护等级 Protection grade	IP 65
密封性能 Sealing performance	气路(Measuring system): ≤1X10 ⁻³ Pa·m ³ /s
开关点数量 Quantity of switch points	上限4组 Upper 4 groups

开关动作点 Switch action points	依据用户要求定制 Customized
外壳材质 Casing material	304不锈钢 SUS304
感压元件 Pressure sensing element	波登管和波纹管 Bourdon tube and bellows
压力接口 Pressure interface	依据用户要求定制 Customized
电气连接 Electrical connection	插接式连接器 Plug in connector
安装方式 Installation method	依据用户要求定制 Customized

B. 电子部分

Electronic part

远传工作电源 Remote Operational power supply	DC24V
整机功耗 Overall power consumption	≤0.5W
工作环境 work environment	-40℃~+70℃
压力测量范围 Pressure measuring range	-0.1MPa~+0.9MPa
温度测量范围 Temperature measurement range	-40℃~+70℃
压力测量精度 Pressure measurement accuracy	±0.5%FS
温度测量精度 Temperature measurement accuracy	±1℃
P20	±1.0%FS (0MPa~1MPa abs.)
通讯协议 Communication protocol	RS485 (Modbus RTU)

C. 电气性能

Electrical properties

绝缘电阻 Insulation resistance	>100MΩ(DC500 V)
绝缘耐压 Insulation& withstand voltage	2000V, 50/ 60 Hz 1 min 接线端子间耐压 2000V, 50/60 Hz 1min connecting terminal's withstand voltage 2000V, 50/ 60 Hz 1 min 接线端子对地耐压 2000V, 50/60 Hz 1min connecting terminal's withstand voltage to earth

7. 通讯协议 Communication protocol

I. 串行通信参数:

Serial communication parameters:

Baud: 9600bps (默认default)

Data: 8bit

Parity: No (默认default)

Stop: 1

II. 通讯规约(详见《智慧变电站技术规范 第4部分: 数字化远传表计》附录C)

Communication protocol (see Appendix C of Technical Specification for Smart Substation Part 4: Digital Telemeter)

C.1.10 APDU结构域 (扩展) APDU domain (extended)

C.1.10.1 LEN

数据区的长度, 1 字节。定义为{子功能码+数据标识+数据体 DATA} 的长度, 其中{数据标识+数据体 DATA}可以为多项, 子功能 SFUN 为读取时的下行报文仅含数据标识 OI 而没有数据体 DATA。

The length of the data area, 1 byte. It is defined as the length of {subfunction code+data ID+data body DATA}, where {data ID+data body DATA} can be multiple, and the subfunction SFUN is that the downlink message during reading only contains data ID OI and no data body DATA.

C.1.10.2 SFUN

子功能码定义如下:

The sub function codes are defined as follows:

- a) 子功能码 1 字节, 用于定义在本扩展功能码协议中的具体操作行为, 定义应符合表 C.4;

One byte sub function code is used to define the specific operation behavior in this extended function code protocol, and the definition shall comply with Table C.4;

- b) 常用的子功能码定义表 C.5。

Table C.5 Definition of Common Sub function Codes.

表 C.1 子功能码 1 字节定义
Table C 1 Subfunction code 1 byte definition

D7	D6	D5~D0
方向位 Directional position	后续标识 Subsequent identification	具体行为功能定义 Specific behavior function definition
0: 表示请求帧 0: Indicates the request frame 1: 表示响应帧 1: Indicates the response frame	0: -- 1: 表示后续帧 1: Indicates subsequent frames	01: 读取、02: 写入 01: Read, 02: Write 33: 广播对时等 33: Broadcast timing, etc

表 C.2 常用的子功能码定义
Table C 2 Definition of common sub function codes

功能码 Function code		子功能码		功能定义 Function definition	描述 describe
十进制编码 Decimal coding	HEX	十进制编码 Decimal coding	HEX		
102	66	01	01	读取请求 Read Request	主站发起 Initiated by master station
		02	02	写入请求 Write request	主站发起 Initiated by master station
		51	33	广播对时 Broadcast time synchronization	主站发起, 从机不应答 Initiated by master station, but not answered by slave
		65	41	读后续帧请求 Read subsequent frame request	主站发起 Initiated by master station
		...	...	...	...
		129	81	读取应答 Read reply	从机响应 Slave response
		130	82	写入应答 Write Answer	从机响应 Slave response
		193	C1	读取有后续应答 Read with subsequent replies	从机响应, 有后续 Slave response, with follow-up
		...	...	...	...

C.1.10.3 OI

对象标识 2 字节。见 C.2.1。

Object ID 2 bytes. See C.2.1.

C.1.10.4 DATA

数据体，用 TLV 数据类型标识，包含数据标记+长度+值。数据体的值域，按先低后高的字节顺序传输。

Data body, identified by TLV data type, contains data mark+length+value. The value field of the data body is transmitted in the order of bytes from low to high.

C.1.11 分帧处理 Framing processing

C.1.11.1 分帧处理流程 Frame processing flow

通过子功能码 SFUN 的 D6 实现分帧处理。其中主站发送报文 D6 置 1 表示请求后续帧，从机响应报文 D6 置 1 表示有后续帧。如果从机响应报文的 SFUN.D6 置 1，即通知主站还有后续帧，但主站忽视此信息仍以 SUNF.D6 置 0 发起请求，则从机丢弃之前的后续帧开始响应主站新的请求帧。如果主站错误地以 SFUN.D6 置 1 发起首次请求，从机回复功能码 FUN 最高位置 1 即 FUN=0xE6H 和错误码 01。即主站如果首次就请求后续帧，从机将报错误码。分帧处理的交互流程应符合图 C.2。

The sub function code SFUN D6 is used to realize framing processing. The master station sends a message D6 to set 1 to indicate the request for subsequent frames, and the slave response message D6 to set 1 to indicate that there are subsequent frames. If the SFUN.D6 of the slave response message is set to 1, the master station is notified that there are still subsequent frames, but the master station ignores this information and still uses SUNF If D6 is set to 0 to initiate a request, the slave will discard the previous subsequent frames and start responding to the master station's new request frame. If the master station incorrectly uses SFUN D6 sets 1 to initiate the first request, and the slave replies to the highest position 1 of the function code FUN, that is, FUN=0xE6H and error code 01. That is, if the master station requests subsequent frames for the first time, the slave will report an error code. The interaction flow of framing processing shall conform to Figure C.2.

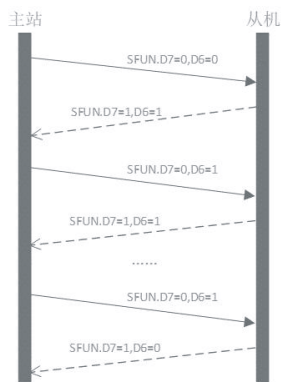


图 C.2 分帧处理的交互流程

Figure C.2 Interactive flow of framing processing

分帧处理的交互步骤如下：

The interaction steps of framing processing are as follows:

- a) 主站使用 SFUN.D7=0, D6=0, D5~D0=xx 发起请求。首次请求 SFUN.D6 必须置 0，否则从机将报错；

The master station sends a request using SFUN. D7=0, D6=0, D5-D0=xx. The first request for SFUN.D6 must be set to 0, otherwise the slave will report an error;

- b) 从机判断响应报文的长度是否超过最大 APDU 允许字节：

Slave judges whether the length of response message exceeds the maximum APDU allowed bytes:

- 1) 若超过则需分帧处理：分帧传输时从机使用 SFUN.D6 置 1 的响应报文表示还有后续帧，本帧报文长度为 255+5 字节；

If it exceeds the limit, it needs to be processed by frames: during frame splitting transmission, the slave uses the response message of SFUN.D6 setting 1 to indicate that there are still subsequent frames, and the message length of this frame is 255+5 bytes;

- 2) 若不超过则无需分帧，从机使用 SFUN.D6 置 0 的响应报文，并携带剩余的数据。

If it does not exceed, no framing is required. The slave uses the response message with SFUN.D6 set to 0 and carries the remaining data.

- c) 主站收到从机 SFUN.D6 置 1 的响应报文时，先将已接收到的报文暂存在缓冲区中。然后主站使用 SFUN.D7=0,D6=1,D5~D0=xx 继续请求后续帧，重复步骤 b)；

The master station receives the slave SFUN When D6 sets the response message of 1, it first stores the received message in the buffer. Then the master station uses SFUN. D7=0, D6=1, D5-D0=xx to continue requesting subsequent frames, and repeat step b);

- d) 主站收到从机 SFUN.D6 置 0 的响应报文时，表示报文数据已全部接收完毕，开始数据分析处理；

When the master station receives the response message of slave SFUN.D6 set to 0, it indicates that all message data have been received and data analysis and processing have started;

- e) 分帧响应的异常情况交互流程应符合图 C.3，当主站请求后续帧时，从机不响应或响应报文丢失，超过上限响应时间 T，则主站以 SFUN.D6 置 0 重新发起请求，直到响应报文被主站完整接收，其中上限响应时间 T 宜取 3~5 秒；

The interaction flow of abnormal situations of framing response shall conform to Figure C 3. When the master station requests subsequent frames, the slave does not respond or the response message is lost. If the Upper limit response time T is exceeded, the master station uses SFUN D6 sets 0 to re initiate the request until the response message is completely received by the master station. The Upper limit response time T should be 3-5 seconds;

- f) 如果主站发起 3 次请求仍不能完成正常的数据交互，本召唤周期停止对从机的请求，下个召唤周期主站重新开始。

If the master station sends three requests and still cannot complete the normal data interaction, this call cycle stops the request to the slave, and the master station starts again in the next call cycle.

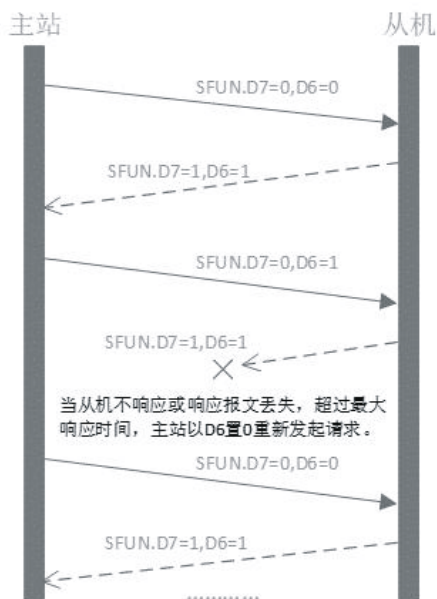


图 C.3 分帧响应的异常情况交互流程

Figure C.3 Interaction Flow of Abnormal Conditions in Framing Response

C.1.11.2 分帧处理流程示例 Example of framing processing flow

以读取全部对象数据为例，说明分帧处理的流程：

Take reading all object data as an example to illustrate the process of framing:

a) 主站发起使用 SFUN=01H “读取请求”。

The master station initiates a "read request" using SFUN=01H.

b) 从机判断响应报文的长度是否超过上限 APDU 允许字节：

Slave judges whether the length of response message exceeds the upper limit APDU allowed bytes:

c) 若超过则需分帧处理。分帧传输时从机使用 SFUN=C1H “读取有后续应答” 响应，本帧报文长度为 255+5 字节。

If it exceeds, it shall be processed by frames. During framing transmission, the slave uses SFUN=C1H "read with subsequent response" to respond. The length of this frame message is 255+5 bytes.

d) 若不超过则无需分帧，从机使用 SFUN=81H “读取应答” 响应,并携带剩余数据。

If it does not exceed, no framing is required. The slave uses SFUN=81H "read response" to respond, and carries the remaining data.

e) 主站接收到 SFUN=C1H “读取有后续应答” 的从机响应报文时，先将已接收到的报文暂存在缓冲区中。然后主站发起 SFUN=41H “读取后续帧请求”，重复步骤 2。

When the master station receives the slave response message of SFUN=C1H "read with subsequent response", it first stores the received message in the buffer. Then the master station sends SFUN=41H "read subsequent frame request" and repeats step 2.

f) 主站收到从机的 SFUN=81H “读取应答” 响应报文时，表示报文数据已全部接收完毕，开始数据分析处理。

When the master station receives the SFUN=81H "read response" response message from the slave, it indicates that the message data has been received completely and data analysis and processing is started.

C.1.12 广播定时 Broadcast time synchronization

当主站发起广播定时请求时，需要将地址域设为广播地址。从机收到广播定时帧后，将自己的时钟改为应用报文中的时间，从机不应答。

When the master station sends a broadcast time synchronization request, it needs to set the address field as the broadcast address. After receiving the broadcast time synchronization frame, the slave will change its own clock to the time in the application message, and the slave will not respond.

C.2 对象标识 Object ID

C.2.1 对象标识定义 Object identification definition

一个对象对应于一个单独的标识，即对象标识 (OI)；对象可以是电压量、温度值、压力值等，也可以一个集合 (Struct)；设备的所有信息集合也可以看作是一个对象；在读取请求报文中，对象标识=0000 时，表示读取数据终端中的所有对象信息。

An object corresponds to a single identity, that is, object identifier (OI); The object can be voltage, temperature, pressure,

etc., or a set (Struct); All information sets of equipment can also be regarded as an object; In the read request message, when object ID=0000, all object information in the data terminal is read.

C.2.2 对象标识表 Object Identification Table

C.2.2.1 表计通信标识 Meter communication mark

表计通信标识应符合表C.6。

The meter communication identification shall conform to Table C.6.

表 C.3 表计通信标识表

Table C 3 Meter communication identification table

序号 SerialNo	对象标识 OI Object ID OI	名称 name	数据类型 data type	长度 length (Byte)	备注 remarks
1	2000	数据结构体 Data structure	Struct	10	读写 Reading and writing
2	2001	通信地址 mailing address	UTiny	1	取值范围 1~247 可读写 Value range 1~247 read-write
3	2002	波特率 Baud rate	Utiny	1	0:2400; 1:4800; 2:9600; 3:19200。 可读写 read-write
4	2003	奇偶校验位 Parity bit	Utiny	1	0:无校验; 1:奇校验; 2:偶校验 可读写 0: No verification; 1: Odd parity check; 2: Even check read-write
5	2004	日期时间 Date Time	DateTime	7	可读写 read-write

C.2.2.2 设备基本信息标识表

Equipment Basic Information Identification Table

设备基本信息标识应符合表C.7。

Basic information identification of equipment shall conform to Table C.7.

表 C.4 设备基本信息标识表
Table C 4 Equipment Basic Information Identification Table

序号 Serial No	对象标识 OI Object ID OI	名称 name	数据类型 datatype	长度 length (Byte)	备注 remarks
1	2100	数据结构体 Data structure	Struct	可变 variable	只读 read-only
2	2101	设备型号 Equipmen tmodel	String	可变 variable	只读 read-only
3	2102	数字化表计 ID Digital meter ID	OcterS tring	6	组成：厂商代码+版本标签+版本号+产品序列号 Digital meter ID composition: manufacturer code+version label+version number+product serialnumber 厂商代码：16 比特 Manufacturer code: 16 bits 版本标签：5 比特 Version label: 5 bits 版本号：6 比特 Version No.: 6 bits 产品序列号：21 比特 Product serial number: 21 bits 只读 read-only
4	2103	传感器类型 标识 Sensor type identification	Utiny	1	01：SF ₆ 数字化密度表 SF ₆ digital density meter 02：避雷器数字化泄漏电流 Digital leakage current of arrester 03：变压器数字化油面温度表计 Transformer digital oil level thermometer 04：变压器数字化绕组温度表计 Transformer digital winding thermometer 05：变压器数字化油位计 Digital oil level gauge of transformer 06：变压器数字化气体继电器 Transformer digital gas relay 只读 read-only
5	2104~ 210B	预留 reserve	Utiny	8	只读 read-only
6	210C~ 2114	预留 reserve	String	可变 variable	只读 read-only

C.2.2.3 SF6数字化密度表计数据标识表
SF6 Digital Density Meter Data Identification Table

SF6 数字化密度表计数据标识应符合表 C.8。
Data identification of SF6 digital densimeter shall conform to Table C.8.

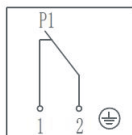
表 C.5 SF₆ 数字化密度表计数据标识表
Table C 5 SF6 Digital Density Meter Data Identification Table

序号 Serial No	对象标识 Object ID	名称 name	数据类型 data type	长度 length (Byte)	单位 Com pany	备注 remarks
1	2200	数据结构体 Data structure	Struct	130		只读 read-only
2	2201	传感器状态 Sensor Status	OcterString		2	Bit0: 传感器状态 Sensor Status Bit1: 泄漏报警 Leakage alarm Bit2: 液化报警 Liquefaction alarm Bit3: 闭锁 2 节点接线故障状态 Blocking 2 node wiring fault state Bit4: 闭锁 1 节点接线故障状态 Blocking 1 node wiring fault state Bit5: 报警节点接线故障状态 Alarm node wiring fault state Bit6: 闭锁 2 信号节点动作状态 Action status of locking 2 signal node Bit7: 闭锁 1 信号节点动作状态 Action status of locking 1 signal node Bit8: 报警信号节点动作状态 Action status of alarm signal node Bit9: 超压报警。 Overpressure alarm. 0 表示正常; 0 means normal; 1 表示故障/动作。 1 indicates fault/action.

3	2202	SF ₆ 气体密度值 (P20) SF6 gas density value (P20)	Float	4	MPa	只读 read-only
4	2203	温度 temperature	Float	4	°C	只读 read-only
5	2204	相对压力 Relative pressure	Float	4	MPa	只读 read-only
6	2205	微水 Micro water	Float	4	μL/L	只读（如无，则上传 FFFFFFFF）
7	2206	密度报警节点阈值 Density Alarm Node Threshold	Float	4	MPa	读写 Reading and writing
8	2207	密度闭锁节点 1 阈值 Density lockout node 1 threshold	Float	4	MPa	读写 Reading and writing
9	2208	密度闭锁节点 2 阈值 Density lockout node 2 threshold	Float	4	MPa	读写（如无，则上传 FFFFFFFF） Read/write (if not, upload FFFFFFFF)
10	2209	密度超压节点阈值 Density overpressure node threshold	Float	4	MPa	读写（如无，则上传 FFFFFFFF） Read/write (if not, upload FFFFFFFF)
11	220A ~ 2219	预留 reserve	Float	4×16		自定义 custom
12	221A ~ 2229	预留 reserve	Short	2×16		自定义 custom

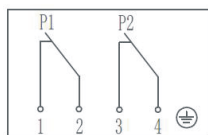
8. 接线图 Wiring diagram

A. 接点回路 (P=0) Contact circuit (P=0)



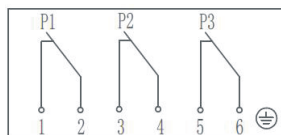
单接点

Single contact



双接点

Double contacts

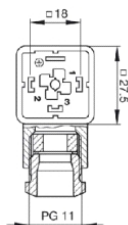


三接点

Three contacts

B. 通讯端口

Communication ports



远传接线

1. 24V(电源正)

2. A(RS485+)

3. B(RS485-)

⏏(电源负)

9. 投诉/更换/修理 Complaint/replacement/repair

售后服务时请给出生产编号和产品型号，生产编号印在表盘上，产品型号印在标牌上。

At customer service, please provide with the production number and product model. The production number is printed on the dial, while the product model is printed on the nameplate.

远传密度继电器必须长时间恒温才能达到温度补偿作用(至少两小时)。

Remote density monitor must be kept in constant temperature for a long time (at least two hours) so as to achieve temperature compensation.

只有厂家可以进行维修，不允许随便打开仪表，否则会使显示和开关点产生误差。

No one other than the manufacturer is allowed to disassemble the instrument for fear that any error may occur to the display and switch point.

10. 订货说明 Order instructions

型号/数量/量程/开关动作点/接口尺寸/其它特殊事项

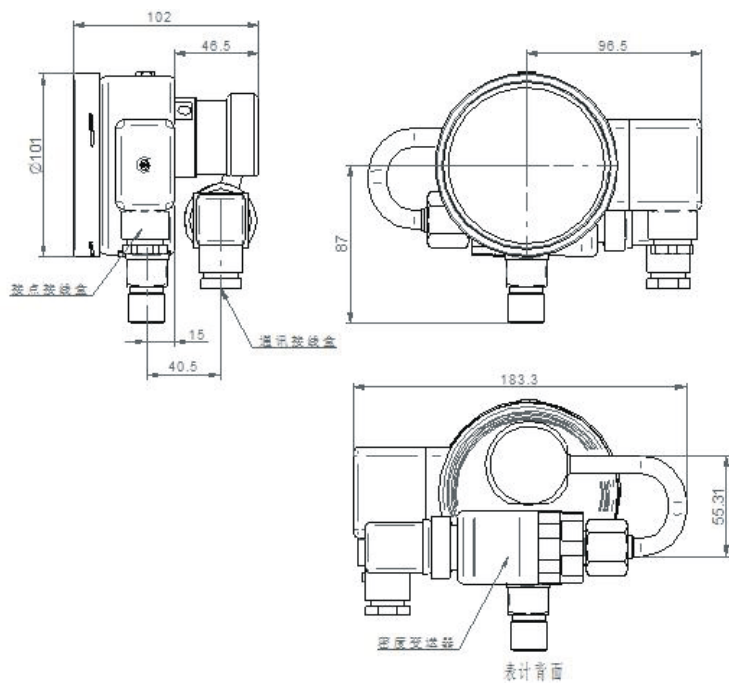
Model/quantity/measuring range/switch action point/interface size/other special issues

注：说明书中为基础配置，其余定制化需求见客户图。

Note: Basic type is included in the manual, and other customized requirements are shown in the customer's drawing.

附图一：外形尺寸

Attached Drawing 1: External Dimensions





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