

技术规格书 Datasheet

RS PM160 系列 采用 MEMS 技术
 带诊断功能高精度智能压力变送器
 RS PM160 Pressure Transmitter
 High Performance with Diagnostics



RS PM160 系列是一款带智能诊断的高精度、高性能传感器，产品采用模块化、小型化设计，精选进口 MEMS 压力芯片，利用自主研发具有国际领先水平的封装工艺和专利结构设计制造。

测量压力范围 0-2bar...160bar, 有相对表压、密封表压和绝压可选。

RS PM160

Pressure transmitter with diagnostics and compact designed, use silicon piezoresistive technology, products exhibit very high TEB accuracy and long-term stability.

Pressure Range, 0-2bar ... 160 bar, Gauge (relative), Gauge (sealed) and Absolute available.

功能和应用
Features & Applications

PM160 系列产品采用数字运算补偿标定，利用自主研发的算法和软件达到：

TEB* 总精度：在 -30°C~100°C 温度区间内 TEB ≤ ±0.30%。

输出模式：0.5-4.5V 比例电压, 1-5V, 0-10V, 1-10V 绝对电压, 4-20mA 电流等；

产品具有故障诊断和现场零点调节功能¹⁾，经过严苛测试反复验证，满足大多数的行业标准要求，产品具有长期可靠的稳定性。

产品压力介质接触部分采用 SUS316L 不锈钢焊接密封设计, 有内置脉冲压力缓冲器设计可选，保证压力传感器的可靠性和耐用性，该系列产品具有 IP67 或 IP68 等级防护，以及极强的 EMI 防护能力，能满足大多数应用环境。

PM160 pressure transmitter are digital compensated with patented algorithm, exhibit a very high accuracy:

TEB* ≤ ±0.30% between -30°C ~100 °C.

Output: 0.5-4.5V Ratio Voltage; 1-5V, 0-10V, 1-10V Abs. voltage, 4-20mA current, etc.

Products are with diagnostics and Zero Offset Programmable¹⁾, also with the long-term stabilities.

Material contacts with Media are SUS316L S. steel, and welded together. Pressure buffer are available for enhancing the product reliability and durability; IP67 or IP68 and high degree of EMI protection, products can be used in most applications.

1). 应用零点调节功能需选购罗迪专用零点调节工具套装。

1). To remove the zero offset, need to order the Zero Programing Tool from Rodee Sensors separately.

**产品特点:
 Product Highlights:**

- ✓ 采用数字补偿校准技术, -30°C~100°C 温区内 TEB 达到 $\leq \pm 0.2\%$ FS (典型值);
 - ✓ IP68 防护等级¹⁾;
 - ✓ 产品小型化设计, 产品最大尺寸小至 19A/F;
 - ✓ 具有故障诊断功能;
 - ✓ 高过载, 全系列 $\geq 3x$ 过载设计;
 - ✓ 产品通过 CE 认证。
- ✓ Digital compensated, typical TEB $\leq \pm 0.2\%$ FS within temperature range -30°C~100°C
 - ✓ IP68 Enclosure¹⁾;
 - ✓ Compact designed, size down to 19 A/F
 - ✓ Diagnostics Functions;
 - ✓ $\geq 3x$ FS Pressure Overload;
 - ✓ CE certified.

1). 绝压和密封表压输出型, 防护等级可达 IP68; 其他型号防护等级为 IP67;

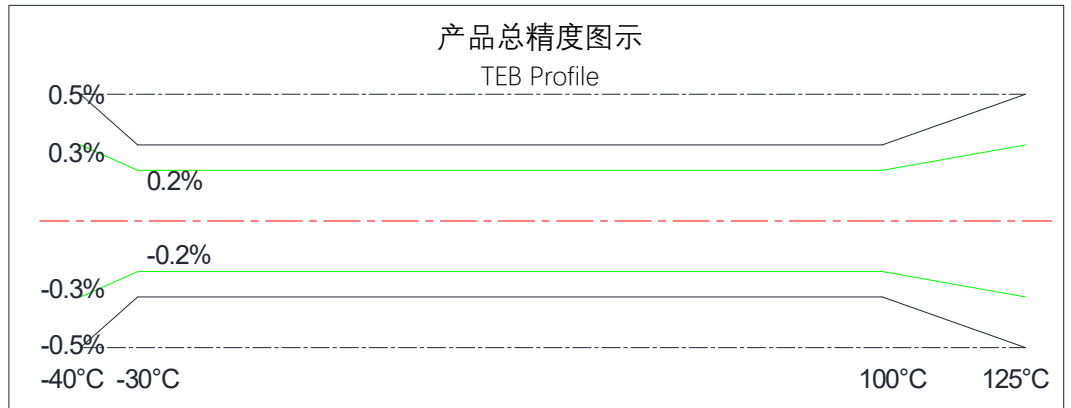
1). IP68 enclosure for Absolute and Gauge(sealed) mode, IP67 enclosure for Gauge(relative)

**技术参数
 Technical Data**

性能指标 Performance

| | |
|---|------------------------------|
| 产品总精度, TEB (Total Error Band) ¹⁾ | |
| TEB, Typical 典型值, -30°C-100°C | $\leq \pm 0.20\%$ FS |
| TEB, Max. 最大值, -30°C-100°C | $\leq \pm 0.30\%$ FS |
| TEB, Typical 典型值, -40°C-125°C | $\leq \pm 0.30\%$ FS |
| TEB, Max. 最大值, -40°C-125°C | $\leq \pm 0.50\%$ FS |
| 响应时间 Response Time | 1.5 ms |
| 耐用性 Durability, 压力 P: 10-90% FS | $>10 \times 10^6$ 次循环 cycles |
| 长期稳定性 Long term stability | $\leq 0.10\%$ FS/年 year |
| MTTF(平均故障时间) | >100 年 year |

¹⁾ TEB (Total Error Band), 包括准确性、线性度、迟滞性、重复性和热影响误差。
 TEB includes accuracy, Linearity, Hysteresis, Repeat and Thermal affects;



过载与爆裂压力(静态) Overload and Burst Pressure (Static)

| | | | | | | | | | | | |
|---------------------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 标定压力 (bar) Pressure Range | 1 | 2 | 5 | 10 | 16 | 20 | 30 | 40 | 60 | 100 | 160 |
| 过载压力 (bar) Overload Pressure | 5 | 10 | 25 | 40 | 60 | 60 | 120 | 160 | 180 | 300 | 480 |
| 过载倍数 (times) Overload (x) | 5x | 5x | 5x | 4x | 3x | 3x | 4x | 4x | 3x | 3x | 3x |
| 爆裂压力 (bar) Burst Pressure | 50 | 100 | 100 | 100 | 100 | 300 | 300 | 300 | 300 | 400 | 700 |

*其他压力类型或更大过载需求, 请联系罗迪传感销售。
 Other pressure range or more pressure overload requirement, please contact Rodee Sensors.

环境条件 Environment

| | | |
|---------------|--|---|
| 测量介质温度范围 | Temperature range (Media) | -40 – 125 °C |
| 工作环境温度范围 | Temperature range (ambient) | -40 – 125 °C |
| 补偿温度范围 | Compensated temperature range | -40 – 125 °C |
| 运输储存温度范围 | Storage temperature range | -40 – 125 °C |
| EMC – 发射 | Emission | EN55032 Class A & B |
| EMC – 静电防护 | ESD | Contact Discharge: 8KV, Air Discharge 15KV |
| EMC- 射频干扰度 | EM Filed | IEC 61000-4-3, 80-100MHz – 30V/m 110-2000MHz – 100V/m |
| EMC- 快速脉冲群抗扰度 | Electrical Fast Transient | IEC 61000-4-4, 4KV, Class B |
| EMC – 脉冲磁场抗干扰 | Pulse Magnetic Field | IEC 61000-4-9, 300A/m |
| 输入过电压保护 | Over and reverse | 有保护 Protected |
| 错接线保护 | Miswiring | 有保护 Protected |
| 机械冲击 | Shock IEC 60068-2-27 | 峰值 Peak: 100G |
| 机械震动 | IEC 60068-2-6 (正弦, Sinus) Vibration IEC 60068-2-64 (随机, Random) | 正弦 Sinus: 20G, 10-2000Hz 随机 Random: 7.5G rms, 5-1000Hz |

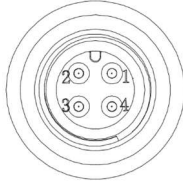
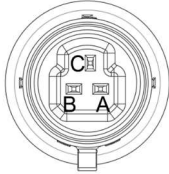
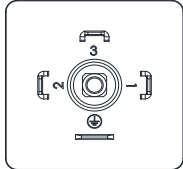
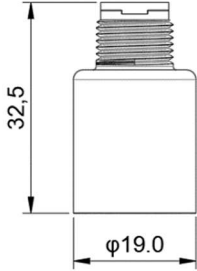
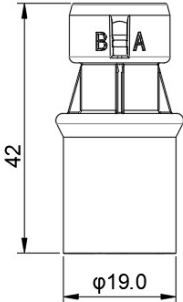
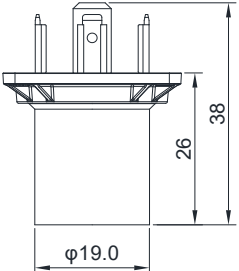
电气规格 Electrical Specification

| | | | | | | |
|------------|--------------------------------|------------------------------------|------------------------------|--|---|---------------------------------------|
| 标定输出信号 | Output Signal | 0.5-4.5V 比例电压, Ratio Voltage | 0.5-2.5V 绝对电压, Voltage | 0-5, 1-5 V 绝对电压, Abs. Voltage | 0-10V, 1-10 V 绝对电压, Abs. Voltage | 4-20 mA 电流输出, Current Output |
| 供电电压 | Supply Voltage(SV) | 5.0±5% VDC | 3.3±5% VDC | 10-32VDC | 10-32VDC 推荐 24V | 10-32VDC 推荐 24V |
| 供电 - 电流 | Supply- current consumption | 2.9 mA | 2.9 mA | ≤5 mA | ≤8 mA | - |
| 电源依赖度 | Supply Voltage Dependency | - | - | < 0.1% FS / 10 V | | < 0.1% FS / 10 V |
| 输出限制 | Output Limitation | ≈ 输入电压 ≈ Supply Volt. | 2.7V | 5.4V | 10.8V | 21.4mA |
| 负载(连接至 0V) | Max. Load Resistor(RL) | ≥ 2 KΩ | ≥ 5 KΩ | ≥ 10 KΩ | ≥ 10 KΩ | RL ≤ (SV- 10V)/0.022A |

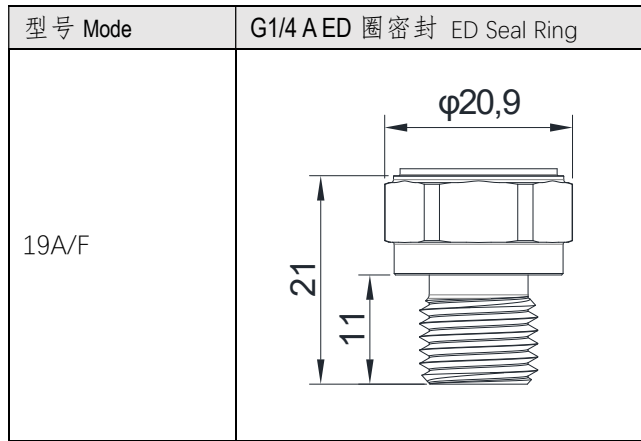
机械条件 Mechanical Data

| | | |
|----------------|----------------------------|---|
| 材料 Material | 接触测量液体部件 Media Contact | SUS 316L 不锈钢 SUS 316L S. Steel |
| | 外壳防护 Enclosure Material | SUS 304L 不锈钢, PBT+30% 玻纤 SUS 304L S. Steel, PB T+30% GR |

电气连接
Electrical
Connection

| 型号 Connector Type | M12x1, EN60947-5-2 | Ronde Metri-Pack Packard | 赫斯曼 A 型 EN175301-803-A |
|--|---|--|---|
| 接线图示 Connection Figure |  |  |  |
| 比例电压/ 绝对电压输出 Ratio/Abs. Voltage | 针脚/Pin 1: 电源+/V+ 针脚/Pin 2: 输出+/Vout 针脚/Pin 3: 电源-/V- 针脚/Pin 4: 不接/NC | 针脚/Pin A: 电源-/V- 针脚/Pin B: 电源+/V+ 针脚/Pin C: 输出+/Vout | 针脚/Pin 1: 电源+/V+ 针脚/Pin 2: 电源-/V- 针脚/Pin 3: 输出+/Vout 针脚/Pin 4: 不接/NC |
| 电流输出 Current Output | 针脚/Pin 1: 电源+/V+ 针脚/Pin 2: 不接/NC 针脚/Pin 3: 电源-/V- 针脚/Pin 4: 不接/NC | 针脚/Pin A: 电源-/V- 针脚/Pin B: 电源+/V+ 针脚/Pin C: 不接/NC | 针脚/Pin 1: 电源+/V+ 针脚/Pin 2: 电源-/V- 针脚/Pin 3: 不接/NC 针脚/Pin 4: 不接/NC |
| 材料 Material | 304L 不锈钢 SUS304 S. Steel PBT+30%玻纤 PBT+30%GR 针镀金 Gold Plated Pins | 304L 不锈钢 SUS304 S. Steel PBT+30%玻纤 PBT+30%GR 针镀锡 Tin Plated Pins | 304L 不锈钢 SUS304 S. Steel PBT+30%玻纤 PBT+30%GR 针镀锡 Tin Plated Pins |
| 防护等级 Enclosure | IP67(表压), IP67 for Gauge IP68(绝压和密封表压) IP68 for Abs. and Sealed Gauge | IP67(表压), IP67 for Gauge IP68(绝压和密封表压) IP68 for Abs. and Sealed Gauge | IP67(表压), IP67 for Gauge IP68(绝压和密封表压) IP68 for Abs. and Sealed Gauge |
| 外形尺寸 Dimensions |  |  |  |

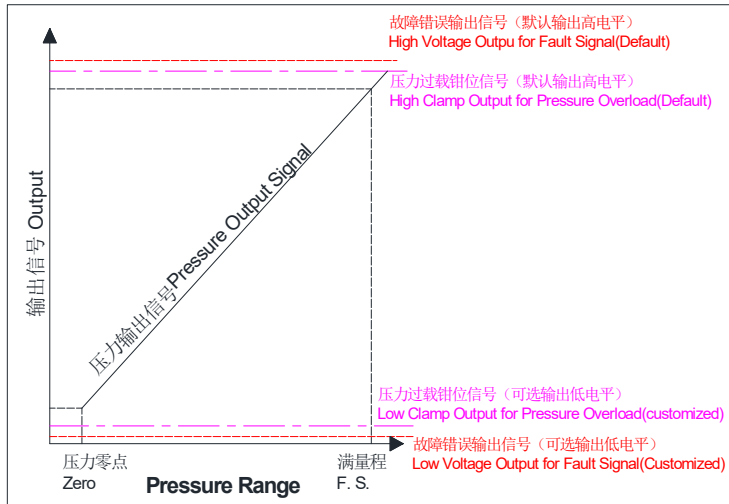
压力连接
 外形尺寸
**Pressure
 Connection**



*其他螺纹规格压力连接头, 请联系罗迪传感销售。
 Other pressure connectors, please contact **Rodee Sensors**.

输出与故障诊断
**Output Singal &
 Fault Diagnostics**

(以电压输出为例)
 Take 0.5-4.5VDC
 output as a sample
 for Explanation



零点调节

-压力零点归零调节¹⁾

过载信号输出钳位

-压力超出传感器量程时, 钳制输出信号到一个固定值;

Zero Offset

Zero offset can be adjustable¹⁾.

Output Clamp Levels

If pressure overloaded, limits output signal to a setting value;

1). 应用零点调节功能需选购罗迪专用零点调节工具套装。

1). To remove the zero offset, need to order the Zero Programing Tool from **Rodee Sensors** separately.

故障信号输出

-当压力传感器故障时, 输出一个故障信号, 压力恢复正常时, 故障信号不会消失;

故障信号输出可设为高电平或低电平, 产品默认输出高电平, 具体细节请联系罗迪传感获取更多信息。

Fault Singal Output

Once Pressure Sensor is broken, output a fault signal;

Fault signal can be set to high or low, default setting is high, more details please contact **Rodee Sensors**.

| 标定输出信号 Output Signal | 比例电压, Ratio Voltage | 0-5V | 1-5V | 0-10V | 1-10 V | 4-20 mA |
|------------------------------------|------------------------|-------|-------|-------|--------|---------|
| 压力零点 Zero | 10% | 0V | 1V | 0V | 1V | 4mA |
| 满量程 FS | 90% | 5V | 5V | 10V | 10V | 20mA |
| 幅度 Span | 80% | 5V | 4V | 10V | 9V | 16mA |
| 输出钳位-高电平 Output Clamp Level -Hi | 95% | 5.25V | 5.25V | 10.6V | 10.6V | 21mA |
| 故障信号 -高电平 Fault Singal -Hi | 97% | 5.35V | 5.35V | 10.7V | 10.7V | 21.4mA |

产品订购指南 Ordering Guides

例如:
 RS PM160 30GN-R01-G11
代表:
 测量压力范围 0-30 bar,
 表压,
 无压力缓冲器,
 0.5-4.5VDC 比例电压输出,
 4 针 M12 连接器公头,
 G1/4AED 圈密封,带 NBR 密封垫片。

Order Example:
 RS PM160 30GN-R01-G11
Represented;
 Pressure range 0-30 bar,
 Gauge (Relative),
 No pressure buffer,
 Output 0.5-4.5VDC, Ratio,
 4 pins M12 male connector,
 G1/4 A connector with NBR ED seal;

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|----|--|
| 产品系列 Product Series | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| RS PM160 | | | | | | | | | | | |
| 测量压力范围 Pressure Range | | | | | | | | | | | |
| 0- 1 bar | 0 | 1 | | | | | | | | | |
| 0- 2 bar | 0 | 2 | | | | | | | | | |
| 0- 5 bar | 0 | 5 | | | | | | | | | |
| 0- 10 bar | 1 | 0 | | | | | | | | | |
| 0- 16 bar | 1 | 6 | | | | | | | | | |
| 0- 20 bar | 2 | 0 | | | | | | | | | |
| 0- 30 bar | 3 | 0 | | | | | | | | | |
| 0- 40 bar | 4 | 0 | | | | | | | | | |
| 0- 60 bar | 6 | 0 | | | | | | | | | |
| 0- 100 bar | A | 0 | | | | | | | | | |
| 0- 160 bar | A | 6 | | | | | | | | | |
| 压力参考系 Pressure Reference | | | | | | | | | | | |
| 表压 Gauge | | | G | | | | | | | | |
| 绝对压力 Absolute | | | A | | | | | | | | |
| 密封表压 Sealed Gauge | | | S | | | | | | | | |
| 压力缓冲器 Pressure Buffer | | | | | | | | | | | |
| 有 With | | | W | | | | | | | | |
| 无 No | | | N | | | | | | | | |
| 垫片/O圈材料 Sealing Material | | | | | | | | | | | |
| 0 无垫片或O圈, No Seal, No O-Ring | | | | | | | | | | | |
| 1 丁腈胶NBR -40 - 85°C | | | | | | | | | | | |
| 2 氟胶FKM -20 - 125°C, | | | | | | | | | | | |
| 压力连接 Pressure Connector | | | | | | | | | | | |
| G 1 G1/4 A ED 圈密封 with ED Seal | | | | | | | | | | | |
| G 2 G1/4 O 型圈密封 with O-Ring | | | | | | | | | | | |
| G 3 G3/8 ED 圈密封 with ED Seal | | | | | | | | | | | |
| N 1 1/4 -18 NPT | | | | | | | | | | | |
| N 2 1/8 -27 NPT | | | | | | | | | | | |
| U 1 7/16 -20 UNF | | | | | | | | | | | |
| M 1 M12 x 1.5 | | | | | | | | | | | |
| M 2 M10 x 1.0 | | | | | | | | | | | |
| 电气连接 Electrical Connection | | | | | | | | | | | |
| 1 4 针 M12 连接器(公头), 4 pin M12 connector(Male) | | | | | | | | | | | |
| 2 Metri Pack T 3针, Metri Pack T 3 pins | | | | | | | | | | | |
| 3 赫斯曼 A 型连接器(公头), EN175301-803-A(Male) | | | | | | | | | | | |
| 4 带电缆输出(长度可定), Output with cables(length TBC) | | | | | | | | | | | |
| X 客户定制, Customized | | | | | | | | | | | |
| 输出信号 Output Signal | | | | | | | | | | | |
| R0 0.5-4.5V 比例电压输出 Ratio Voltage | | | | | | | | | | | |
| V1 0-5V 电压输出 Abs. Voltage | | | | | | | | | | | |
| V2 1-5V 电压输出 Abs. Voltage | | | | | | | | | | | |
| V3 0-10V 电压输出 Abs. Voltage | | | | | | | | | | | |
| V4 1-10V 电压输出 Abs. Voltage | | | | | | | | | | | |
| C0 4-20mA 电流输出 Current | | | | | | | | | | | |

* 其它测量压力量程、压力连接器和信号连接型号;
 * 其它温度范围密封垫片;
 * 数字输出,以及其它电压输出范围;
 请联系罗迪传感销售

* Other pressure ranges, pressure connectors and electrical connections;
 * Other pressure sealing material;
 * Digital output and other voltage modes requested, please contact **Rodee Sensors**.

销售联系方式

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