Rodee Sensors Today, Sensing Tomorrow 专注传感，感知未来

技术规格书 Datasheet

RS PM160-DVL 低功耗数字型压力和温度双输出智能传感器

RS PM160-DVL Low Power Digital Pressure and Temp. Dual Output Sensor





RS PM160-DVL 系列是一款超低功耗的数字(I^2C)型压力和温度双输出高稳定性智能传感器，产品采用模块化、小型化设计及专利结构设计制造。

测量压力范围 0-10Kpa …160bar，有相对表压、密封表压和绝压可选。

RS PM160-DVL

It's an extreme Low Power digital (I^2C) pressure and temperature Dual output Sensor, use silicon piezoresistive technology with compact designed.

Pressure Range, 0-10 Kpa … 160 bar, Gauge (relative), Gauge (sealed) and Absolute available.

功能和应用 Features & Applications

PM160-DVL 系列产品采用数字运算补偿标定，I^2C 数字压力和温度双输出：

在-10°C~60°C 温度区间内产品总精度 TEB≤ ±0.25%(典型值)。

产品经过严苛测试反复验证，专为物联网时代超低待机功耗的数据采集应用需求设计，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 不锈钢密封焊接设计,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，该系列产品设计有 EMI 防护能力，能满足大多数应用环境。

PM160-DVL pressure transmitter are digital compensated and with I^2C digital output for pressure and temperature;

TEB ≤±0.25%(Typical) between -10°C ~60 °C.

Products are designed for lower power consumption applications and with 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, also EMI protection integrated.

产品特点：
Product Highlights:

- ✓ 压力和温度双信号数字输出(I^2C)；
- ✓ 温度输出为被测介质温度
- ✓ 高精度，TEB≤±0.25%FS（典型值）
- ✓ uA 级待机功耗
- ✓ 支持 I^2C 地址改写
- ✓ 高过载，全系列≥3x 过载设计
- ✓ 支持低电压，最低电压至 2.5Vdc

- ✓ Digital Interface (I^2C), dual output for pressure and temperature;
- ✓ Temperature output Measured on Media
- ✓ TEB≤±0.25%FS(Typical)
- ✓ Super Low power consumption
- ✓ Name I^2C Address function
- ✓ ≥3x FS Pressure Overload
- ✓ Voltage supply lower to 2.5Vdc

技术参数
Technical Data

参数指标 Parameters

除非另有说明，电压 3.3VDC,环境温度 25°C;
Unless otherwise stated: Supply Voltage: 3.3VDC, Ambient Temperature 25°C.

参数表 Parameter	最小 Min	典型值 TYP.	最大 Max	单位 Units	备注 Notes
25°C 时精度 Accuracy @25°C		±0.15		% FS	
总误差（压力量程>35Kpa) Total Error Band (P>35Kpa) (-10°C ~ 60°C)	-0.5	±0.25	0.5	% FS	1
压力分辨率 Pressure Resolution		0.001		% FS	
温度测量范围 Temperature Measurement Range	-10		60	°C	2
温度测量精度 Temperature Accuracy	-1.5		1.5	°C	3
温度分辨率 Temperature Resolution		0.0075		°C	
工作电压范围 Input Voltage Range	2.5	3.3	5.5	V_{DC}	4
供电电流 – 连续工作模式/50Hz Supply Current – Continuous Mode/50Hz		1.95		mA	
供电电流 – 单次工作模式/50Hz Supply Current – Single Mode/50Hz		0.5		mA	
供电电流 – 睡眠工作模式 Supply Current – Sleep Mode		0.3	30	uA	
绝缘电阻 Insulation Resistance (500Vdc)	100			MΩ	5
负载电阻 Load Resistance (RL)	2			KΩ	
上拉电阻推荐值 Pull-up on SDA and SCL		10		KΩ	R_{PU}
长期稳定性（零点和满量程） Long Term Stability (Offset & Span)		±0.15		%FS/Year	
补偿温度范围 Compensated Temperature	-10		60	°C	
工作温度范围 Operating Temperature	-40		105	°C	
存储运输温度 Storage Temperature	-40		105	°C	
输出压力分辨率 Output Pressure Resolution	16		24	Bits	
输出温度分辨率 Output Temperature Resolution			16	Bits	
响应时间 Response Time		15		ms	
加电后数据准备时间 Start Time to Data Ready		15		mS	6

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Continuous

耐用性 Durability, 压力 P: 10~90% FS	>10 x 10^6 次循环 cycles	
输出类型 Output Type	10%-90% or 5%-95%	
连接方式 Interface Type	I^2C (ADDR,0x7FH,7Bits) (WRITE:0xFEH;READ:0xFFH)	
压力适用媒介 Media – Pressure Contact	适合对 316/316L 无腐蚀的液体或者气体 Liquids and gases compatible with 316/316L Stainless Steel	

1. TEB 总误差包括补偿范围内的校准误差和温度影响，细节见“压力总精度图示”。压力量程小于 35Kpa 的产品，TEB 精度为+/-1.0%FS.
Total Error Band: includes calibration errors and temperature effects over the compensated range. See “TEB Profile”. TEB +/-1.0%FS for Pressure ranges ≤35 Kpa

2. 此温度为检测媒介介质的温度，超出该温度范围，温度精度误差会很大。
Temperature measured on media, temperature data will not be accurate if it’s out of range -10°C to 60°C.

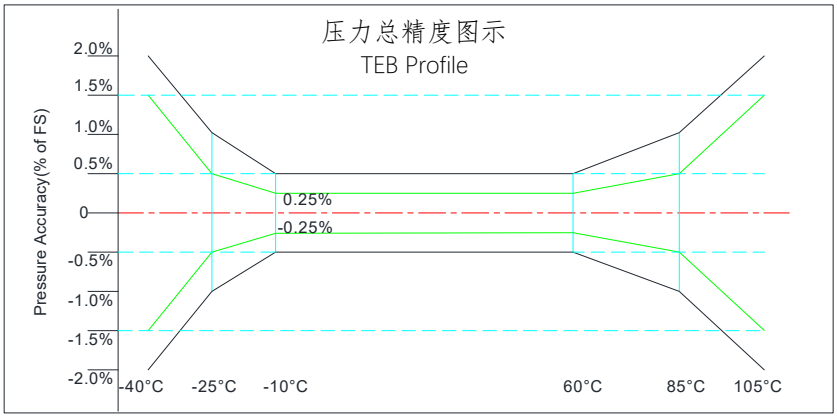
3. 在补偿范围内，温度偏差依据最优线性直线比计算出来，补偿范围外温度精度，见“温度精度图示”。如有更高温度精度需求，请联系罗迪传感销售。
Within the compensated temperature range, the deviation is measured from a best fit straight line (BFSL) fitted to the output. For errors beyond the compensated temperature range, See “Temperature Accuracy” Profile.
More Temperature Accuracy version is available upon request.

4. 为了保证产品精度，建议选用 3.3Vdc 供电。**特别注意，传感器不支持电平转换功能，需要 VDD 和 SDA,SCL 的上拉电平一致，否则有可能导致故障。**
For product accuracy purpose, recommend supply is 3.3Vdc. **Notes: The sensor does not support level-shifting functionality, and the pull-up levels for VDD, SDA, and SCL must be consistent. otherwise, it may lead to malfunctions.**

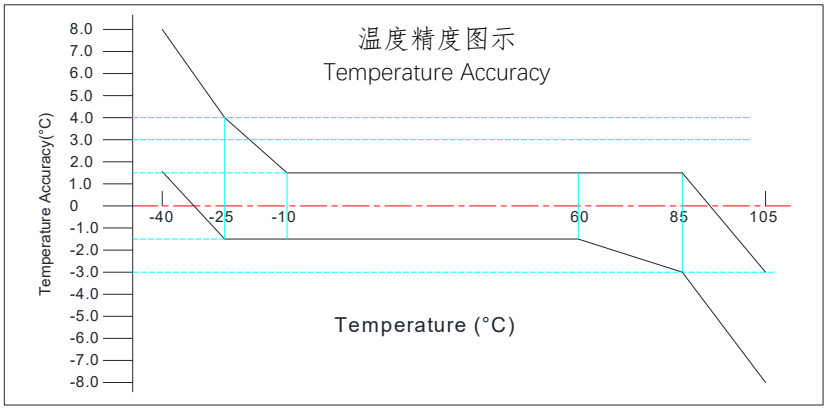
5. 芯体引线和外壳之间的电阻值。
Resistance measured between case and sensing element.

6. 加电后数据准备时间为断电再加电后第 1 次运行的时间，后续持续工作的数据准备时间见传感器响应时间。
Start time to data ready is the time to get valid data after POR (Power on Reset). The time to get subsequent valid data is then specified by the response time specification.

7. 避免硬接触压力膜片，防止膜片在操作或者运输过程中碰伤或损坏，影响产品工作性能。
Don’t direct mechanical contact with Diaphragm, Diaphragm surface must remain free of defects (scratches, punctures, dents, fingerprints, etc.) for device to operate properly. Caution is advised Always protect diaphragm not be damaged during handing or transportation.



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)

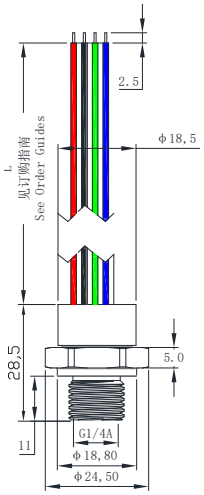
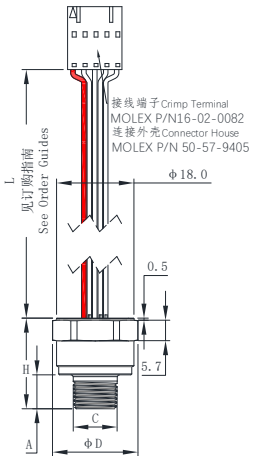
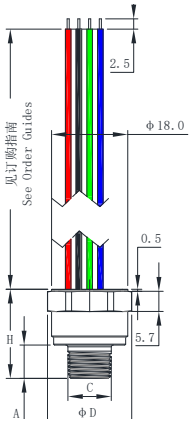
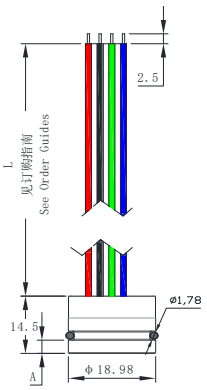
标定压力 Pressure Range（bar）	0.1	0.35	1	2	5	10	16	25	40	60	100	160
过载压力 Overload Pressure(bar)	0.3	1	5	10	25	40	60	120	160	180	300	480
过载倍数 Overload (times of FS)	3x	3x	5x	5x	5x	4x	3x	4x	4x	3x	3x	3x
爆裂压力 Burst Pressure(bar)	5	5	50	100	100	100	100	300	300	300	400	700
压力连接器选择 Fitting Selection	1/8-27NPT, 1/4-18NPT, G1/4, M10x1.0									1/4-18 NPT, G1/4		

*可以定制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 are available upon request.

环境条件 Environment

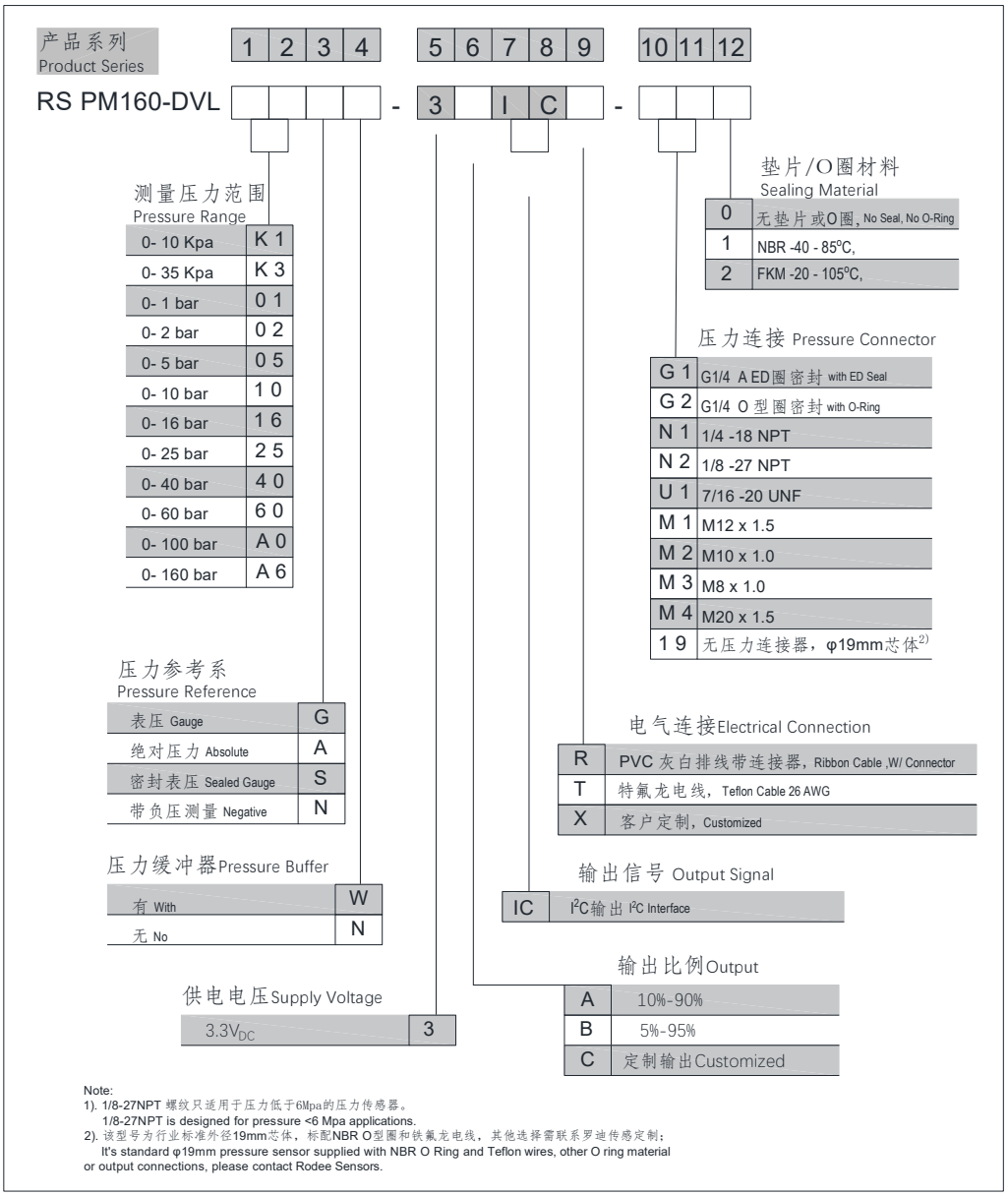
EMC – 发射 Emission	EN55032 Class A & B
EMC – 静电防护 ESD	IEC 61000-4-2, Contact: 8KV, Air 15KV
EMC- 射频干扰度 EM Filed	IEC 61000-4-3, 3V/m - 80 MHz-1GHz 10V/m – 1 GHz – 6 GHz （测试线长 Test Wire Length: 30cm)
EMC - 浪涌 Surge	IEC 61000-4-5, V+ to V-: ±500V/42Ω;（1.2/50us） V+ to Case: ±1 KV/12Ω; (1.2/50us) V- to Case: ±1KV/12Ω; (1.2/50us) SDA to Case: ±1KV/40Ω(10/700us) SCL to Case: ±1KV/40Ω(10/700us)
EMC- 传导抗扰度 Conducted RF	IEC 61000-4-6，3V (150KHz – 80MHz)
过电压保护 Over voltage	最大保护至 Protected to 6.5V
错接线保护 Miswiring	电源+/-接错有保护 Protected(V+ and V-）
机械冲击 Shock IEC 60068-2-27	峰值 Peak: 100G
机械震动 Vibration IEC 60068-2-64 (随机,Random)	正弦 Sinus：20G, 10-2000Hz 随机 Random：7.5G rms, 5-1000Hz

电气连接 Electrical Connection

型号 Connections	特氟龙 26 AWG Teflon Cable	灰白排线 PVC 26 AWG PVC Ribbon Cable	特氟龙 26 AWG Teflon Cable	φ19mm 标准芯体，带 26AWG Teflon 线
接线图示及外形 Connection Figure & Profile				
尺寸 Dimensions	标配螺纹: G1/4 平垫密封 Standard Fitting G1/4 ED Seal 适用压力： P. Applicable: ≤1.0 Mpa	C 螺纹类型 Fitting / D / A / H / 六角 HEX / 适用压力 Pressure Applicable 1/8-27 NPT / 19.9 / 8.2 / 23.0 / 18 A/F / ≤4 Mpa 1/4-18 NPT / 20.9 / 11 / 24.9 / 19 A/F / ≤16 Mpa		P <0.2 Mpa A: 2.90 P >0.2 Mpa, < 40 Mpa A:2.85 P≥ 4 Mpa A:3.35
适用压力量程 Pressure Range	≥10 Kpa, ≤1.0 Mpa	≥0.2 Mpa, ≤16 Mpa		≥10 Kpa, ≤16 Mpa
I^2C 输出 I^2C Interface	#1 红色 Red: 电源 V+ #2: 电源 V- #3: SDA #4: SCL #5: N/C	#1 红色 Red: 电源 V+ #2: 电源 V- #3: SDA #4: SCL #5: N/C	红色 Red: 电源 V+ 黑色 Black: 电源 V- 绿色 Green: SDA 蓝色 Blue: SCL	红色 Red: 电源 V+ 黑色 Black: 电源 V- 绿色 Green: SDA 蓝色 Blue: SCL
材料 Material	316L 不锈钢 S. Steel 304L 不锈钢 S. Steel PBT+30%玻纤 PBT+30%GR 针镀金 Gold Plated Pins	316L 不锈钢 S. Steel PVC Cable 塑料连接器 Plastics House	316L 不锈钢 S. Steel Teflon Cable 线头镀锡 Tin Plated Ends	316L 不锈钢 S. Steel Teflon Cable 线头镀锡 Tin Plated Ends NBR O Ring
防护等级 Enclosure	IP67	IP67	IP67	IP67
工作温度 1) Operating Temperature	-40°C ~ 105°C	-20°C ~ 85°C	-40°C ~ 105°C	-40°C ~ 105°C

1) 除了工作温度限制外，温度测量范围为-10°C-60°C。Temperature measurement range is -10°C to 60°C.
2) 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.

产品订购指南
Ordering Guides



Note:
1). 1/8-27NPT 螺纹只适用于压力低于6Mpa的压力传感器。
1/8-27NPT is designed for pressure <6 Mpa applications.
2). 该型号为行业标准外径19mm芯体，标配NBR O型圈和铁氟龙电线，其他选择需联系罗迪传感定制；
It's standard φ19mm pressure sensor supplied with NBR O Ring and Teflon wires, other O ring material or output connections, please contact Rodee Sensors.

例如：
PM160-DVL 16GN-3AICR-N20
代表：
测量压力范围 0-16 bar,
表压,
无压力缓冲器,
3.3V 供电版本,
10%-90%输出
I2C 数字输出,
灰白排线带连接器,
1/8-27NPT 螺纹,
无密封圈。

Order Example:
PM160-DVL 16GN-3AICR-N20
Represented;
Pressure range 0-16 bar,
Gauge (Relative),
No pressure buffer,
3.3V Supply Voltage,
10%-90% output
I²C Interface
Ribbon Cable with connector
1/8-27NPT Fitting,
No rubber seal;

* 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；
* 其它电压输出范围；
* 以及带负压测量版本，只适合常温状态下不低于-70Kpa 环境下使用，若需高真空长期使用版本；
请联系罗迪传感销售

* Other pressure ranges, pressure connectors and electrical connections;
* Other pressure sealing material;
* Other voltage modes requested,
* And High vacuum applications,
Please contact **Rodee Sensors.**

销售联系方式

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