



PT2060 Monitor



PVTVM, Inc. Email: sales@pvtvm.com Web: www.pvtvm.com

PVTVM-PT2060-CATALOG-E-A-1



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PT2060 Monitor

Introduction

PT2060 is PVTVM's newly released monitor that highly reliable, fully digital and modbus ready. PT2060 utilizes the advanced electronics technology and adopt the concept of programmable logic controller. PT2060 is integrated highly, with high channel density, and multiple redundancies.

There are two sorts of PT2060 rack: a standard 19" rack and a 12" rack. For a standard 19" rack, it is capable of supporting up to 48 channels. The PT2060 provides the industry's highest channel density in a standard 19" rack. For a 12" rack, it can contain 24 channels at most. PT2060 monitor system uses the standard PLC logic, it make configuration easy. With full API 670 compliance, triple channel redundancy and redundancy for power supply inputs, communications and relay outputs, the PT2060 monitor provides a level of reliability that is unsurpassed.

The newly released PT2060 has both the analog interface with 4-20mA output, Buffered output, Trip-multiply, Alarm-inhibit, and also digital interface with Modbus connection. Modbus will offer to our customer additional information such as: sensors status, alarm set-point, full-scale range, up-level controller changing set-point, gap voltage, alarm list and system event list. All these are added value to our customer. Let customer better understanding their system status and better control the system performance.

Easy to Program

The PT2060-CFG is the "easy to use" system configuration software tool used to set up and monitor the PT2060 system.

Stand Alone or Networked Rack Interconnection

The PT2060 can operate as a single rack or multiple system racks may be networked together via Modbus.



Redundancy

The PT2060 is designed for redundant power supply inputs, relay outputs and communications with an option for triple redundant channels.

PT2060 Features

- ✓ Fully digital
- ✓ Highest channel in a standard 19" rack - 48 channels
- ✓ Triple redundant channels
- ✓ Redundancy for relays, power supply inputs communications
- ✓ RS232/RS485 communication port
- ✓ Ethernet communication port
- ✓ Compatible with most sensors and probes (regardless of manufacturer)
- ✓ Intuitive and easy to configure
- ✓ Programmable 16 channel relay modules
- ✓ Optional local panel display



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PT2060 System Components

Model Number	PT2060/99	PT2060/90	PT2060/91	PT2060/96	PT2060/98	PT2060-CFG
	System Rack	Power Supply Module	System Interface Module	Comm/Phase Reference Module	Display System	Configuration Software
Required system component	•	•	•	Optional	Optional	•
There are two sorts of PT2060 rack: a standard 19" rack and a 12" rack	•					
Provides system power to the PT2060/99 system rack and all modules installed in the system rack. (2) PT2060/90 Power supply modules are required for redundancy		•				
This module provides (1) active Modbus communication port and Ethernet port, (2) phase reference channels and historical buffer for the PT2060 system rack			•			
This module provides (1) additional Modbus communication port (either RS232 or RS485) and Ethernet port, (2) phase reference channels and historical buffer for the PT2060 system rack				•		
This is a touch-panel display loaded with PCM370 vibration analysis system software					•	
System configuration software tool used to configure and monitor the PT2060 system						•

Model Number	PT2060/10	PT2060/20	PT2060/53	PT2060/40	PT2060/43
Process Signal and Relay Modules	Proximity	Seismic	Over speed	Relay	Redundant Relay
Channels per Card	4	4	1*	16	8
Type of Measurement and (Sensor)					
Radial Shaft Vibration (Proximity)	•				
Axial Thrust Position (Proximity)	•**				
Rotation Speed (Proximity) *2	•				
Differential Expansion (Proximity)	•**				
Eccentricity (Proximity) *2	•				
Low Frequency Oscillation (Proximity)	•				
Acceleration (Accelerometer)		•			
Velocity (Accelerometer, Velocity)		•			
Displacement (Velocity, Low Frequency vibration Displacement Transducer)		•			
Case Expansion (LVDT Sensor)		•			
Over Speed Protection (Proximity and/or Magnetic Sensor)			•		
Relay Output (16 SPDT Relays)				•	
Redundant Relay Output (8 DPDT)					•



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Model Number	PT2060/31	PT2060/35	PT2060/36			
Process Signal and Transmitter Modules	Temperature	Process	Transmitter			
Channels per Card	8	16	16			
Type of Measurement and (Sensor)						
Temperature (RTD)	•					
Temperature (TC)	•					
Process (Voltage Transducer)		•				
Process (Current Transducer)		•				
Transmitter (16 Output Channels)			•			

Notes:

- * 2 Indicates for this measurement there are only (2) channels per module.
- * Indicates that channel 3 and 4 of PT200/53 module can be used as PT2060/10 module channel.
- **Indicates that only with one probe option is available.

PT2060/10 PROX Proximity Module

PVTVM's PT2060/10 PROX proximity module is a 4 channels module which processes the incoming signal from the proximity probe system, compares it with the alarm set-point and outputs the appropriate status information for the following vibration measurements:

- ✓ Radial vibration: monitoring shaft vibration, single or dual XY (**4 channels**)
- ✓ Axial/ Thrust position: monitoring shaft thrust position, with 5mm, 8mm, and 11 mm proximity probes (**4 channels**)
- ✓ Eccentricity (**2 channels**)
- ✓ Differential expansion (**4 channels**)
- ✓ Low-frequency vibration (**4 channels**)
- ✓ Speed output (**2 channels**)
- ✓ Zero speed and speed (**2 channels**)
- ✓ Reverse rotational protection output (**2 channels**)

The PT2060/10 PROX module has the ability to be grouped into 2 groups. Each group can be programmed independently and used for different functions. For example, channel one and channel two can be a XY measurement for radial shaft vibration and channels three and four can be programmed to measure eccentricity.

The PT2060/10 PROX module is designed to work with virtually any proximity probe systems (including from other manufacturers). Proximity probe systems which are compatible with the PT2060/10 PROX module include: TM0105, TM0180, TM0110, TM0120, 3000, 7200, 3300 and 3300XL series of proximity probe systems with the following probe tip sizes: 5mm, 8mm, 11mm, 25mm and 50mm.

The PT2060/10 PROX module also provides additional information such as GAP voltages, module status, alarm status, alarm history and system events. This information can be accessed via Modbus or the configuration software.

The PT2060/10 PROX module is also equipped with local status indication. There are three LEDs which display the status of the monitoring channels.



- ✓ OK / IO LED indicates that both the module and the proximity probe systems in the field are working
- ✓ Alarm LED indicates the current alarm status of the module.
- ✓ Bypass LED indicates the channels have been programmed to be in the Bypass mode.

Specifications

Electrical

Power supply:

Internally converted by the rack power supply module
8.0W total typical for this module

Signal Input:

Proximity probes

Start at 1 RPM (0.0167Hz) for proximity probes

Magnetic pickup

Start at 200 RPM (3.3Hz) for magnetic pickup

Input impedance:

> 20K Ω

Sensitivity:

8mm and 5mm probes: 8.0 mV/ μ m (200mV/mil)



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11mm probe: 4.0 mV/ μ m (100mV/mil)

25mm probe: 0.8 mV/ μ m (20mV/mil)

Or any other Sensitivity according to probes chosen by customer

Radial Vibration Signal Conditioning:

Frequency Response:

240 to 240,000 RPM (4 to 4.0 kHz), -3dB

Accuracy:

< $\pm 1\%$ FS @25°C

Thrust Position Signal Conditioning:

Accuracy:

< $\pm 0.5\%$ FS @25°C

Eccentricity Signal Conditioning:

Frequency Response:

1 to 600RPM (0.0167 to 10.0Hz), -3dB

Accuracy:

< $\pm 1\%$ FS @25°C

Differential Expansion Signal Conditioning:

Accuracy:

< $\pm 0.5\%$ FS @25°C

Speed / Zero speed Signal Conditioning:

Frequency Response:

The PT2060/10 module will support 1 - 255 events per revolution with a maximum full scale range of 60000 RPM and a maximum input frequency of 10 kHz. Minimum input frequency for proximity transducers is 0.0167 Hz (1 RPM for 1 event/revolution) and for magnetic pickups (Speed signal conditioning only) is 3.3 Hz.

Accuracy:

The greater of $\pm 0.01\%$ FS or ± 2 RPM @25°C

Low Frequency Oscillation Signal Conditioning:

Frequency Response:

30 to 6,000RPM (0.5 to 100Hz), -3dB

Accuracy:

< $\pm 1\%$ FS @25°C

Reverse rotational speed Signal Conditioning:

Frequency Response:

The PT2060/10 module will support 1 - 255 events per revolution with a maximum full scale range of 60000 RPM and a maximum input frequency of 10 kHz. Minimum input frequency for proximity transducers is 0.0167 Hz (1 RPM for 1 event/revolution).

Accuracy:

± 0.1 RPM (< 100RPM)

± 1.0 RPM (> 100 and < 10,000RPM)

0.01% (> 10,000 and < 60,000RPM)

Static and Status Values:

Each of the options for this monitor module has been defined with static values. Those values can be accessed via the 4-20mA output or from the digital communication protocols.

Radial Vibration:

Direct (peak to peak), GAP, OK, Alert, Danger, Bypass, Trip-multiply

Thrust Position:

Direct (average), GAP, OK, Alert, Danger, Bypass

Differential Expansion:

Direct (average), GAP, OK, Alert, Danger, Bypass

Eccentricity:

Direct, GAP, OK, Alert, Danger, Bypass

Speed/Zero speed/ Reverse rotational speed:

Direct, Peak value, GAP, OK, Alert, Danger, Bypass

Low Frequency Oscillation:

Direct (peak to peak), GAP, OK, Alert, Danger, Bypass, Trip-multiply

Overall in 4-20mA output:

Maximum distance:

300m (1000ft)

Proportional to monitor's full-scale. Each channel has its own overall vibration output. The short of the 4-20mA will not affect system performance.

Electrical continued

Maximum load:

300 Ω

Resolution:

Less than 0.33% FS

Buffered Output:

On PT2060/10-Front panel, each channel has one BNC connector. The output is the unfiltered raw signal.

Output impedance:

550 Ω

Maximum distance:

300m (1000ft)

Transducer Power:

-24VDC, current limited. Less than 50mA each channel.

Alarm:

Alarm set-point:

Each channel has two alarm set-points which can be field adjusted from 0 to 100% FS.

Set-point accuracy:

Better than 0.5% FS

Set-point repeatability:

Within 0.5% FS



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Alarms:

Normally latching or normally non-latching

Alarm delay:

Alert delay can be set from 1 to 60 seconds with time interval of 1 second.

Danger delay can be set from 1 to 60 seconds with time interval of 1 second.

Danger delay also includes a 0.1 second option.

LED Indicators:

OK / IO: green. On, off, flash

Alarms: red

Bypass: red

Approvals:

CE;

CSA:

Non-incendive, class 1, div.2, Grps.ABCD,

T4@Ta= -40°C to +75°C

Certificate Number: 2011996

Environmental

Temperature:

Operation: -20°C to +65°C

Storage: -40°C to +85°C

Humidity:

95% non-condensing

Physical

Each module comes with two components: the front panel assembly and the back panel assembly.

Dimensions and Location:

241mm (9.5in) X 24.5mm (0.96in)

For 19" rack, they can be mounted in any slot from 1 to 12.

For 12" rack, they can be mounted in any slot from 1 to 6.

Weight:

1.0 kg (2.0 lbs)

Ordering Information

PT2060/10-AX

AX: Back-panel IO module

A0: Basic IO module

Optional Accessories:

PT2060-001000: PT2060/10 Front panel

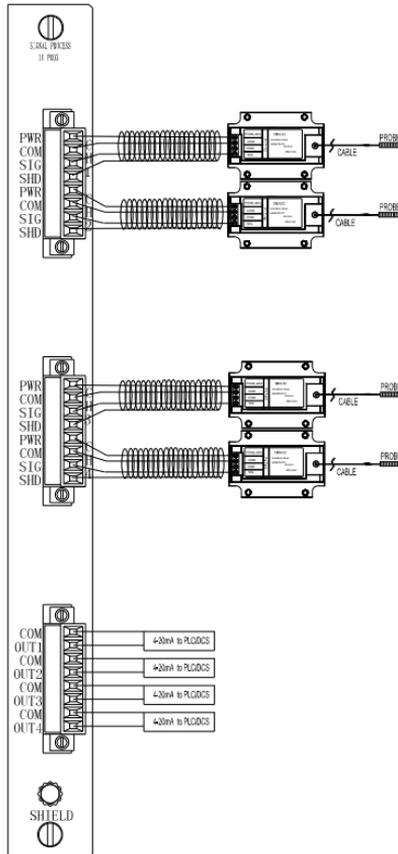
PT2060-001001: PT2060/10 Back panel

Back Panel Connectors Layout

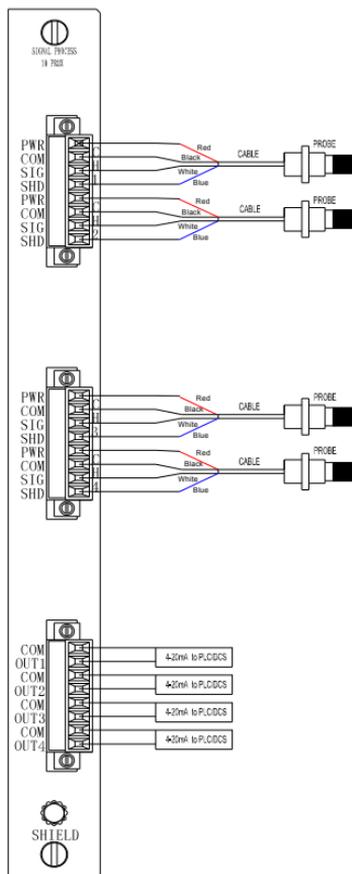


Field-wiring Diagram

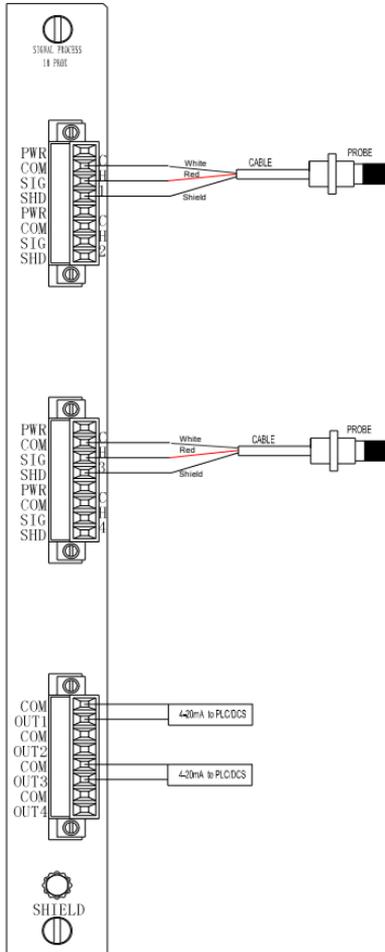
For all 5mm, 8mm and 11mm Probe Systems



For 25mm Probe System

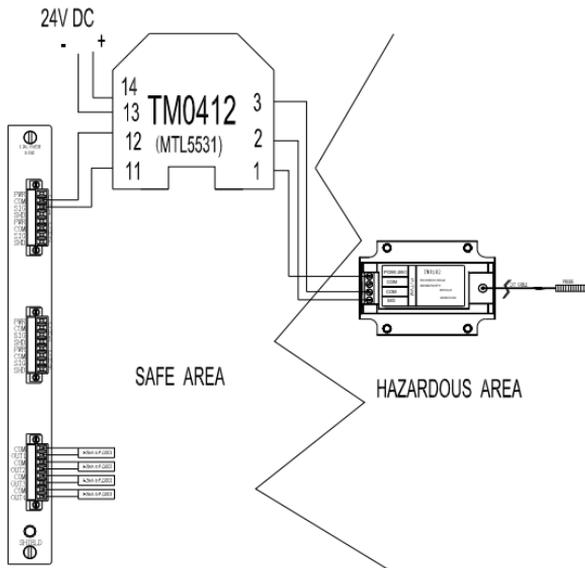


For Magnetic Pickup Systems



Field-wiring Diagram for Hazardous Area Application

TM0412 used as the barrier. For other barriers, please consult PVTVM for tech support.



PT2060/20 SEIS Seismic Module

PVTVM's PT2060/20 SEIS seismic module will process the incoming signal from the case mounted (seismic) sensors, compare it with the alarm set-point and output the appropriate status information for the following type of vibration measurements:

- ✓ Acceleration, Velocity and Displacement **(4 channels)**
- ✓ Low Frequency acceleration, Velocity or Displacement **(4 channels)**
- ✓ Case Expansion
 - Case expansion output—paired **(2 channels)**
 - Case expansion output—single **(4 channels)**

The PT2060/20 SEIS module has the ability to be grouped into 2 groups. Each group can be programmed independently and used for different functions. For example, channel one and two can be a velocity measurement and channels three and four can be programmed to measure case expansion.

The SEIS module has a built in integrator which converts an accelerometer input signal to velocity output or a velocity input into a displacement output.

Note: Integrator type can not work in low frequently condition.

The PT2060/20 SEIS module is designed to work with virtually any seismic sensor (including from other manufacturers). These sensors include: accelerometers (TM0782A), velocity transducers (TM0793V) and low frequency displacement sensors (TM079VD).

The PT2060/20 SEIS module also provides additional information such as, module status, alarm status, alarm history and system events. This information can be accessed via Modbus or the configuration software.

The PT2060/20 SEIS module is also equipped with local status indication. There are three LEDs which display the status of the monitoring channels.

- ✓ OK / IO LED indicates that both the module and the seismic sensor in the field are working.



- ✓ Alarm LED indicates the current alarm status of the module.
- ✓ Bypass LED indicates the channels have been programmed to be in the Bypass mode.

Specifications

Electrical

- Power supply:
 - Internally converted by the rack power supply module
 - 8.0W total typical for this module
- Current mode sensor power:
 - 4.0mA nominal @ 25°C
- LVDT sensor power:
 - 20VDC, current limited. Less than 50mA on each channel
- Signal Input:
 - Up to four sensors
- Input impedance:
 - > 20KΩ
- Nominal Sensitivity:
 - Accelerometer:
 - 100mV/g (TM0782A) or similar sensor



Electrical Continued

Velocity sensor:
4 mV/mm/sec (100mV/in/sec), TM0793V type or similar sensor

Displacement sensor:
4mV/ μ m (100 mV/mil), TM079VD type or similar sensor

LVDT Sensor:
0.4V/mm (10V/in): TM0602-A01
0.2V/mm (5V/in): TM0602-A02
0.1V/mm (2.5V/in): TM0602-A03
Any sensitivity specified.

Signal Conditioning:

Vibration frequency:	Frequency	Response	(normal)
Acceleration:			
	240 to 240,000RPM (4 to 4.0 kHz),	-3dB	
Velocity:			
	120 to 120,000RPM (2 to 2.0 kHz),	-3dB	
Vibration Frequency Response (low frequency for non-integral):			
Acceleration:			
	30 to 6,000RPM (0.5 to 100.0Hz),	-3dB	
Velocity:			
	30 to 6,000RPM (0.5 to 100.0Hz),	-3dB	
Displacement:			
	30 to 6,000RPM (0.5 to 100.0Hz),	-3dB	

Accuracy:
< $\pm 1\%$ FS @25°C

Signal processing:
The input signal can be processed with:
Peak
Peak to peak
RMS
DC

Static and Status Values:
Each of the options for this monitor module has been defined with static values. Those values can be accessed via the 4-20mA output or from the digital communication protocols.

Vibration:
Direct, GAP, OK, Alert, Danger, Bypass, Trip-multiply

Case Expansion:
Direct, GAP, OK, Alert, Danger, Bypass

Overall in 4-20mA output:
Max transfer distance: 300m (1000ft)

Proportion to the monitor full scale. Each channel has its own overall vibration output. The short of the 4-20mA will not affect system performance.

Maximum load:
300 Ω

Resolution:
Less than 0.33% FS

Buffered Output:
On the PT2060/20-Front panel, each channel has one BNC connector. The output is the unfiltered raw signal.
Max transfer distance:
300m (1000ft)

Output impedance:
550 Ω

Alarm:

Alarm set-point:
Each channel has two alarm set-points which can be field adjusted from 0 to 100% FS.

Set-point accuracy:
Better than 0.1% FS

Set-point repeatability:
Within 0.1% FS

Alarms:
Normally latching or normally non-latching

Alarm delay:
Alert delay can be set from 1 to 60 seconds with time interval of 1 second
Danger delay can be set from 1 to 60 seconds with time interval of 1 second
Danger delay also includes a 0.1 seconds option

LED Indicators:
OK / IO: green, on off or flash
Alarms: red
Bypass: red

Approvals:
CE;
CSA:
Non-incendive, class I, div.2, Grps.ABCD,
T4@Ta=-40°C to +75°C
Certificate Number: 2011996

Environmental

Temperature:
Operation: -20°C to +65°C
Storage: -40°C to +85°C

Humidity:



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95% non-condensing

Physical

Each module comes with two components: the front panel assembly and the back panel assembly.

Dimensions and Location:

241mm (9.5in) X 24.5mm (0.96in)

For 19" rack, they can be mounted in any slot from 1 to 12.

For 12" rack, they can be mounted in any slot from 1 to 6.

Weight:

1.0 kg (2.0 lbs)

Ordering Information

PT2060/20-AX

AX: Back-panel IO module

A0: Current mode accelerometers and velocity sensors

A3: Low frequency sensors (TM079VD)

A4: LVDTs

A5: Electro-magneticVelocitysensor (Metrix5485c)

Optional Accessories:

PT2060-002000: PT2060/20 Front panel

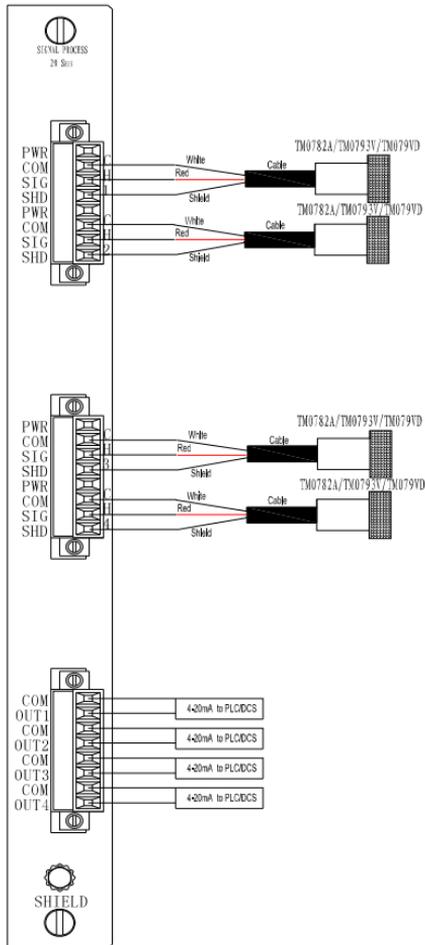
PT2060-002001: PT2060/20 Back panel

Back Panel Connectors Layout

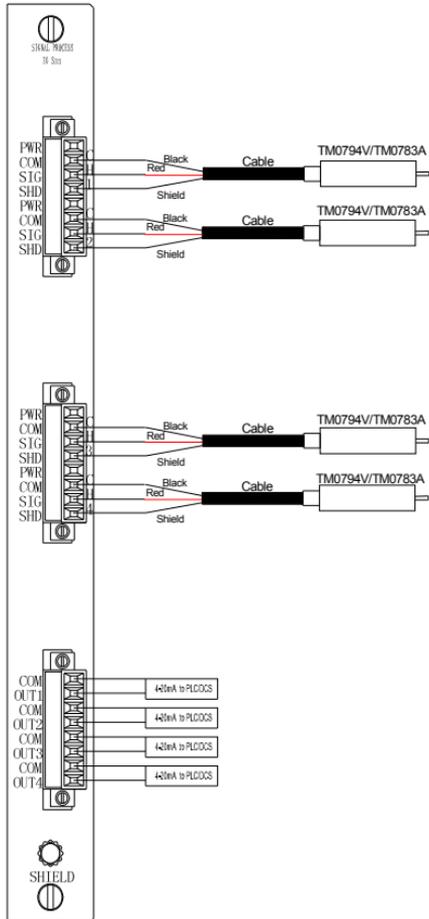


Field-wiring Diagram

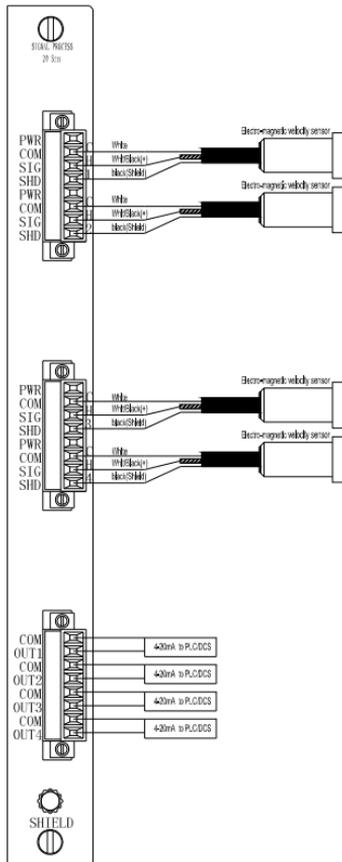
For TM0782A/TM0793V/TM079VD or Similar Sensors



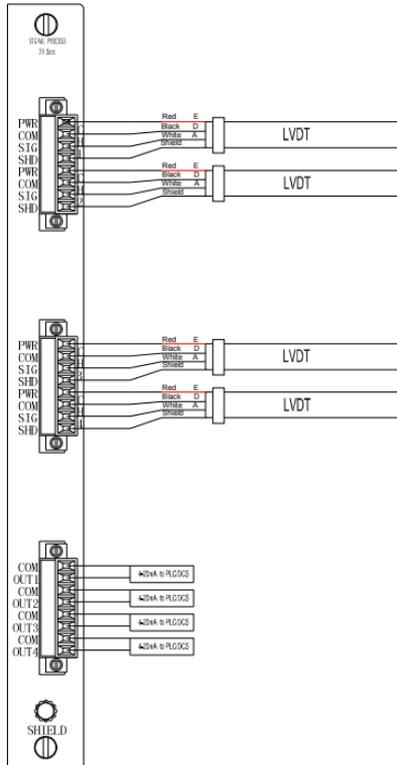
For TM0794V/TM0783A or Similar Sensors



For electro-magnetic velocity sensor



For LVDT Sensor



PT2060/31 TEMP Temperature Module

PVTVM's PT2060/31 TEMP temperature module is an 8 channels module which processes the incoming temperature sensor signals, compares them with the alarm set-point and outputs the appropriate status information. Acceptable sensor types include both RTD and TC.

The PT2060/31 TEMP module also provides much more information to the field operator and control system, such as module status, alarm status, alarm history and system events. This information can be accessed via Modbus or the configuration software. It can program alarm logic through PT2060/40 RELAY module and output 4-20mA current through PT2060 /36 TRO module.

The PT2060/31 TEMP module is also equipped with on-board status indication. There are three LEDs which display the status of the monitoring channels.

- ✓ OK / IO LED indicates that both the module and the RTD probe in the field are working
- ✓ Alarm LED indicates the current alarm status of the module.
- ✓ Bypass LED indicates the channels have been programmed to be in the Bypass mode.

Specifications

Electrical

Power supply:

Internally converted by the rack power supply module

3.5W totally typical for this module

Signal Input:

Up to 12 sensors types

RTD:

PT100 3-wire & 4-wire platinum RTD, (alpha= 0.00385): -200°C to 850°C

PT100 3-wire & 4-wire platinum RTD, (alpha= 0.00392): -200°C to 700°C

NH120 3-wire & 4-wire nickel RTD: -80°C to 260°C

CU10 3-wire & 4-wire copper RTD: -100°C to 260°C

TC:

Type E -100°C to 1000°C

Type J -18°C to 760°C

Type K -18°C to 1370°C

Type T -160°C to 400°C



Input Resistance:

>=1M ohm

Isolation:

500 Volts

RTD Current Source:

1000 ± 100µA @ 25°C (single supply for each 4-wire RTD, dual supply for each 3-wire RTD)

Signal Conditioning (@25°C):

Accuracy: ± 3°C.

Resolution: 1°C.

CJC Sensor (used for TC measurements) Accuracy:

± 0.5°C @ 25°C

CJC Error:

± 2°C

The error of the CJC is caused by proximity to heat sources. To minimize error the CJC should be located in a well-ventilated area.

Static and status Values:

Each of the options for this monitor module has been defined with static values. Those values can be accessed from the digital communication protocols. Direct temperature, OK, Alert, Danger, Bypass.

Electrical Continued

Alarm:

Alarm set-point:

Each channel has four alarm set-points which can be field adjusted from 0 to 100% FS.

Alarms:

Normally latching or normally non-latching

Alarm delay:

Alert delay can be set to from 1 to 60 seconds with time interval of 1 second

Danger delay can be set to from 1 to 60 seconds with time interval of 1 second

LED Indicators:

OK / IO: green. On, off, flash

Alarms: red

Bypass: red

Back Panel Connectors Layout



Environmental

Temperature:

Operation: -20°C to +65°C

Storage: -40°C to +85°C

Humidity:

95% non-condensing

Physical

Each module comes with two components. The front panel assembly and the back panel assembly.

Dimensions and Location:

241mm(9.5in)×24.5mm(0.96in)

For 19" rack, they can be mounted in any slot from 1 to 12.

For 12" rack, they can be mounted in any slot from 1 to 6.

Weight:

1.0kg (2.0 lbs).

Ordering Information

PT2060/31-AX

AX: Back-panel IO module

A0: Basic IO module

Optional Accessories:

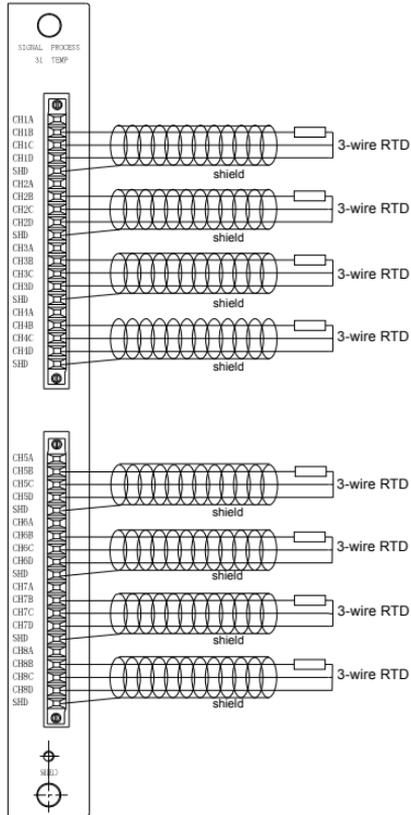
PT2060-003100: PT2060/31 Front panel



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Field-wiring Diagram

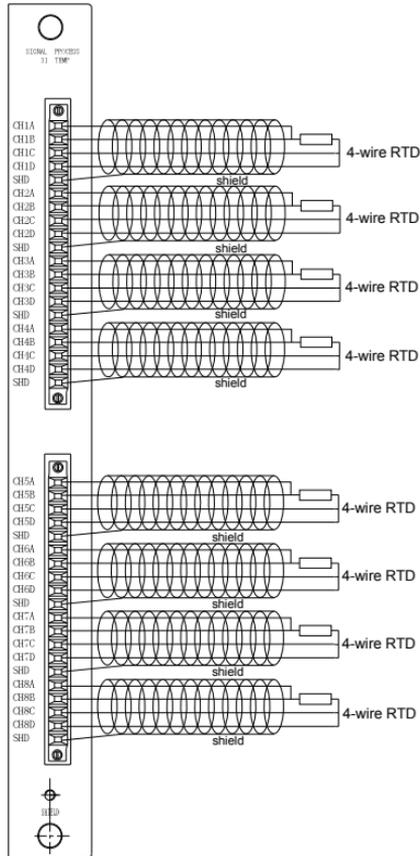
For 3-wire Thermoelectricity Resistance



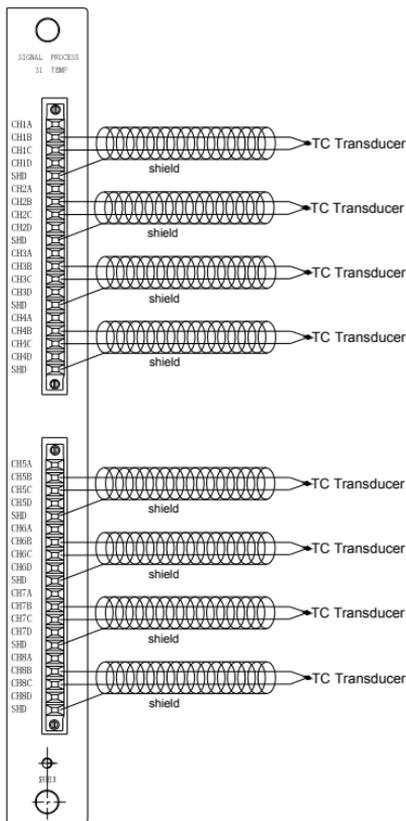


PT2060 Monitor

For 4-wire Thermoelectric Resistance



Field-wiring Diagram for Thermocouple Transducer



PT2060/35 PROC Process Module

PVTVM's PT2060/35 PROC process module is an 16 channels module which processes the incoming voltage and current sensor signals, compares them with the alarm set-point and outputs the appropriate status information. Acceptable sensor types include both voltage and current sensors.

The PT2060/35 PROC module also provides much more information to the field operator and control system, such as module status, alarm status, alarm history and system events. This information can be accessed via Modbus or the configuration software. It can program alarm logic through PT2060/40 RELAY module and output 4-20mA current through PT2060 /36 TRO module.

The PT2060/35 PROC module is also equipped with on-board status indication. There are three LEDs which display the status of the monitoring channels.

- ✓ OK / IO LED indicates that both the module and the probe in the field are working
- ✓ Alarm LED indicates the current alarm status of the module.
- ✓ Bypass LED indicates the channels have been programmed to be in the Bypass mode.

Specifications

Electrical

Power supply:

Internally converted by the rack power supply module
3.5W totally typical for this module

Signal Input:

Up to 2 sensors types

Voltage:

-10 to +10 Vdc input

Current:

4 to 20 mA input or 0 to 20mA input

Input Resistance:

Isolated voltage signal input: 1M ohm

Isolated current signal input: 50 ohm

Isolation:

500 Volts



Signal Conditioning (@25°C):

Accuracy: 0.33% of full scale.

Resolution: 1 mV for voltage input, 1 uA for current input.

Static and status Values:

Each of the options for this monitor module has been defined with static values. Those values can be accessed from the digital communication protocols. Direct, OK, Alert, Danger, Bypass.

Electrical Continued

Alarm:

Alarm set-point:

Each channel has four alarm set-points which can be field adjusted from 0 to 100% FS and can be selected Enable or Disable.

Alarms:

Normally latching or normally non-latching

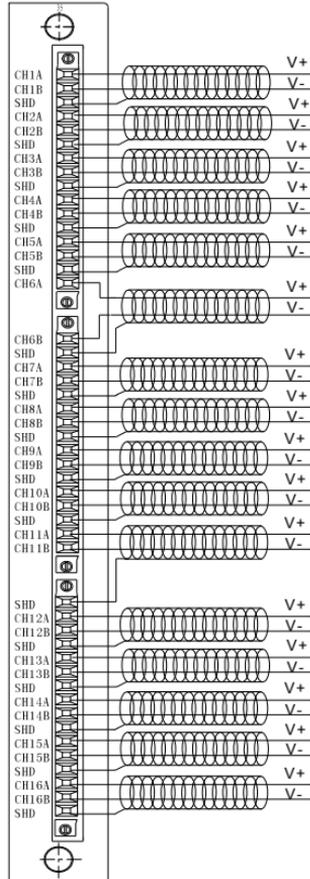
Alarm delay:

Alert delay can be set to from 1 to 60 seconds with time interval of 1 second

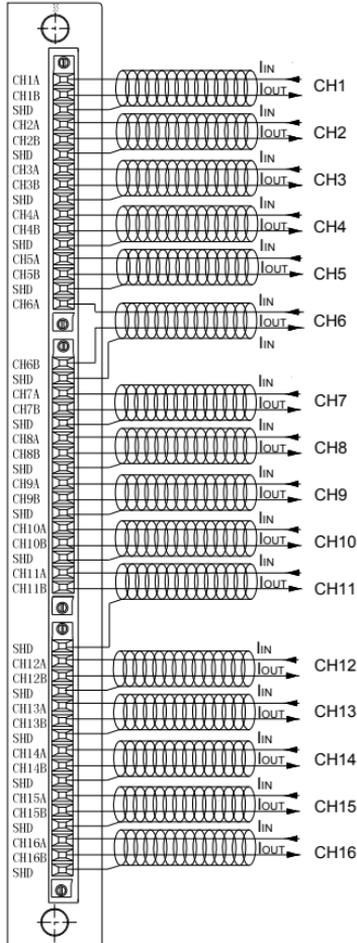
Danger delay can be set to from 1 to 60 seconds with time interval of 1 second

Field-wiring Diagram

Field-wiring Diagram for voltage signal input



Field-wiring Diagram for current signal input



PT2060/36 TRO Transmitter Module

PVTVM's PT2060/36 TRO transmitter module has 16 channels. Each channel on the PT2060/36 TRO transmitter module can be fully programmed to perform needed current output to realize 4 to 20 mA transmitter output function for other modules. PT2060/36 TRO transmitter module can receive and deal with the signal from other signal modules installed in this rack, when each channel can only output corresponding current of only one channel of other modules.

The main task for PT2060/36 TRO transmitter module is to process the incoming signal and status information, perform the logic and output the appropriate current.

PT2060/36 TRO transmitter and signal process module can realize the following functions:

- ✓ 4 to 20 mA transmitter output function of redundant or single channel.
- ✓ Signal process module Not OK detect.
- ✓ Can output 4 to 20 mA transmitter which is proportional to overall, Gap voltage, 1XAmp and 2XAmp, 1XPhase and 2XPhase, Not1XAmp and SmaxAmp of other modules.



Specifications

Electrical

Power supply:

Internally converted by the rack power supply module
2.5W total typical for this module

Signal input:

Through internal bus or direct connection

Current output:

4-20mA

Output load resistance: 300 ohm

Resolution: 0.3662 μ A per bit

Accuracy: $\pm 0.1\%$ @25 $^{\circ}$ C, load resistance 100 ohm

LED indicators:

OK / IO: green. On, Off, Flash.

Update rate:

interval of the signal module report real-time value +
2ms

Maximum distance:

1000ft

Environmental

Temperature:

Operation: -20 $^{\circ}$ C to +65 $^{\circ}$ C

Storage: -40 $^{\circ}$ C to +85 $^{\circ}$ C

Humidity:

95% non-condensing

Physical

Each module comes with two components, the PT2060/36-Front assembly and the PT2060/36-Back assembly.

Dimension:

241mm(9.5in) \times 24.5mm(0.96in)

For 19" rack, they can be mounted in any slot from 1 to 12.

For 12" rack, they can be mounted in any slot from 1 to 6.

Weight:

1.0kg (2.0 lbs).

Ordering Information

PT2060/36-AX

AX: Back-panel IO module

A0: Basic IO module

Accessories

There are several accessories for selecting:

PT2060-003600: PT2060/36 Front panel

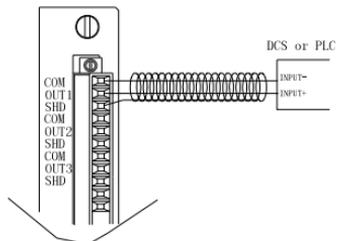
PT2060-003601: PT2060/36 Back panel

Back Panel Connectors Layout



Field-wiring Diagram

Field-wiring Diagram for PT2060/36 TRO transmitter module and controls systems like PLC or DCS:



PT2060/40 RELAY Module

PVTVM's PT2060/40 RELAY module has 16 output channels with 16 SPDT relays. Each relay channel is fully independent and easily programmable to execute the necessary functions.

Easy to Program

Programming the PT2060/40 RELAY module requires the PT2060-CFG configuration software which is very intuitive and easy to use.

Alarm Option

Relay alarm has the following options:

- ✓ Latch, non-latching
- ✓ Normally de-energized, normally energized

The PT2060/40 RELAY module is also equipped with local status indication.

- ✓ OK / IO LED indicates that both the module and the channels of this module are working properly
- ✓ 16 Alarm LEDs: indicates the current alarm status for each channel



Specifications

Electrical

Power supply:

Internally converted by the rack power supply module

8.0W total typical for this module

Signal input:

Through internal bus or direct connection

Relays:

Seal: Epoxy

Capacity:

5A/240V or 5A/30V, resistance load

Relay type:

SPDT; 16 sets

Isolation:

1000V/DC

LED indicators:

OK / IO: green

Alert: red

Approvals:

CE;

CSA:

Non-incendive, class 1, div.2, Grps.ABCD,

T4@Ta= -40°C to +75°C

Certificate Number: 2011996

Environmental

Temperature:

Operation: -20°C to +65°C

Storage: -40°C to +85°C

Humidity:

95% non-condensing

Physical

Each module comes with two components: the front panel assembly and the back panel assembly.

Dimensions and Location:

241mm(9.5in)×24.5mm(0.96in)



PT2060 Monitor

PT2060/40 RELAY module can be mounted in any one from slot 1 to slot 12 of 19" rack.

PT2060/40 RELAY module can be mounted in any one from slot 1 to slot 6 of 12" rack.

Weight:

1.0kg (2.0 lbs).

Ordering Information

PT2060/40-AX

AX: Back-panel IO module

A0: Basic IO module

Optional Accessories:

PT2060-004000: PT2060/40 Front panel

PT2060-004001: PT2060/40/43 Back panel

Back Panel Connectors Layout



PT2060/43 R-RELAY Redundant-Relay Module

PVTVM's PT2060/43 R-RELAY module has 8 output channels with 8 DPDT relays. Each relay channel is fully independent and easily programmable to execute the necessary functions.

Easy to Program

Programming the PT2060/43 R-RELAY module requires the PT2060-CFG configuration software which is very intuitive and easy to use

Alarm Option

Relay alarm can have the following options:

- ✓ Latch, non-latching
- ✓ Normally de-energized, normally energized

The PT2060/43 R-RELAY module is also equipped with local status indication.

- ✓ OK / IO LED indicates that both the module and the channels of this module are working properly
- ✓ 8 Alarm LEDs: indicates the current alarm status for each channel



Channels of Redundant Relay Module Definition

There are three work mode of PT2060/43 module, the first is PT2060/43 type, the second is PT2060/53 default type, and the third is PT2060/53 individual type. The following table shows Alarm drive logic. If you don't specify, factory default setting of PT2060/43 module of over-speed protection system is PT2060/53 default type.

Relay/LED	PT2060/43	For PT2060/53 (Default type)	For PT2060/53 (Individual type)
CH1	CHANNEL-1-ALT	NOT OK (for 43 module)	NOT OK (for 43 module)
CH2	CHANNEL-1-DNG	NOT OK (for 43 module)	ALT
CH3	CHANNEL-2-ALT	DNG	SLOT1-DNG
CH4	CHANNEL-2-DNG	DNG	SLOT2-DNG
CH5	CHANNEL-3-ALT	ALT	SLOT3-DNG
CH6	CHANNEL-3-DNG	ALT	SLOT1-NOT OK
CH7	CHANNEL-4-ALT	NO USED	SLOT2-NOT OK
CH8	CHANNEL-4-DNG	NO USED	SLOT3-NOT OK



PT2060 Monitor

Specifications

Electrical

Power supply:
Internally converted by the power supply module
8.0W total typical for this module

Signal input:
Through internal bus or direct connection

Relays:
Seal: Epoxy
Capacity:
5A/240V or 5A/30V, resistance load
Relay type:
SPDT * 2; 8 sets
Isolation:
1000V/DC

LED indicators:
OK / IO: green
ALARM: red

Approvals:
CE:
CSA:
Non-incendive, class I, div.2, Grps.ABCD,
T4@Ta= -40°C to +75°C
Certificate Number: 2011996

Environmental

Temperature:
Operation: -20°C to +65°C
Storage: -40°C to +85°C

Humidity:
95% non-condensing

Physical

Each module comes with two components- the front panel assembly and the back panel assembly.

Dimensions and Location:
241mm(9.5in)×24.5mm(0.96in)

PT2060/43 R-REALY module can be mounted in any one from slot 4, 8, 12 of 19" rack.
PT2060/43 R-REALY module can be mounted in slot 4 of 12" rack.

Weight:
1.0kg (2.0 lbs).

Ordering Information

PT2060/43-AX
AX: Back-panel IO module
A0: Basic IO module

Optional Accessories:
PT2060-004300: PT2060/43 Front panel
PT2060-004001: PT2060/40/43 Back panel

Back Panel Connectors Layout



PT2060/53 O-SPEED Over-speed Module

PVTVM's PT2060/53 O-SPEED Over-speed module processes the incoming sensor signal, compares it with the alarm set-point and outputs the appropriate status information. The PT2060/53 O-SPEED module accepts both proximity probe and magnetic sensor signal inputs. It can output the following measurements:

- ✓ Over-speed protection
The following function only for channel 3 and channel 4.
- ✓ Radial vibration: monitoring shaft vibration, single or dual XY **(2 channels)**
- ✓ Axial/ Thrust position: monitoring shaft thrust position, with 5mm, 8mm, and 11 mm proximity probes **(2 channels)**
- ✓ Eccentricity **(1 channel)**
- ✓ Differential expansion **(2 channels)**
- ✓ Low-frequency vibration **(2 channels)**
- ✓ Speed output **(1 channel)**
- ✓ zero speed **(1 channel)**
- ✓ Reverse rotational protection output **(1 channel)**

Redundancy Requirement

If redundancy is required to reach the maximum system reliability the PT2060/53 requires a redundant power supply and a redundant PT2060/43 redundant relay module.

When PT2060/53 module works as a part of redundancy system, only channel 1 is used.

The PT2060/53 O-SPEED module also provides additional information such as, module status, alarm status, alarm history and system events. This information can be accessed via Modbus or the configuration software.

Note: Channel 3 and channel 4 of PT200/53 module can be used as PT2060/10 module channel.

The PT2060/53 O-SPEED module is also equipped with local status indication. There are three LEDs which display the status of the monitoring channels.

- ✓ OK / IO LED indicates that both the module and the proximity probe systems in the field are working

- ✓ Alarm LED indicates the current alarm status of



- the module
- ✓ Bypass LED indicates the channels have been programmed to be in the hardware Bypass mode

Specifications

Electrical

Power supply:

Internally converted by the rack power supply module
8.0W total typically for each module

Signal Input:

Input impedance:
> 20K Ω

Input voltage range:

+10 to -24VDC

Input frequency:

The PT2060/53 module will support 1 - 255 events per revolution with a maximum full scale range of 60000 RPM and a maximum input frequency of 10 kHz.



PT2060 Monitor

Electrical Continued

Start at 1RPM (0.0167Hz) for proximity probes
Start at 200RPM (3.3Hz) for magnetic pickup

Sensors:

- Proximity probes
- Magnetic pickups

Overall in 4-20mA Output:

- Maximum distance:
300m (1000ft)
- Proportional to monitor full-scale; each channel has its own overall speed output. The short of the 4-20mA will not affect system performance.

Maximum Load:

- 300Ω

Accuracy:

- +/-0.1RPM (< 100RPM)
- +/-1.0RPM (> 100 and < 10,000RPM)
- 0.01% (> 10,000 and < 60,000RPM)

Threshold:

- Auto:
> 1.0 V pk-pk
- Manual:
> 0.5 V pk-pk. Trigger level can be programmed from -17VDC to -3VDC

Hysteresis:

- 0.5 - 2.5 V user selectable

Alarm Time Delay:

- < 30ms for frequency (pulses) over 300Hz

Rack Space:

- Require four slots for an over speed protection system.

Buffered Output:

- On the front panel, each channel has one BNC connector. The output is the unfiltered raw signal.
- Output impedance:
550Ω
- Maximum distance:
300m (1000ft)

Proximity Transducer Power:

- 24VDC, current limited. Less than 50mA on each channel

Alarm:

- Alarm set-point:
Each channel has single alarm set-point which can be field adjusted from 0 to 100% FS.
- Set-point accuracy:
+/-1 RPM

OK / IO: green
Alarms: red
Bypass: red

Approvals:

- CE;
- CSA:
Non-incendive, class I, div.2, Grps.ABCD,
T4@Ta= -40°C to +75°C

Certificate Number: 2011996

Environmental

Temperature:

- Operation: -20°C to +65°C
- Storage: -40°C to +85°C

Humidity:

- 95% non-condensing

Physical

Each module comes with two components: the front panel assembly and the back panel assembly.

Dimensions and Location:
241mm (9.5in) X 24.5mm (0.96in)

For 19" rack, mounts in any one of the following slots: 1-3, 5-7, 9-11.
For 12" rack, mounts in slot 1-3.

Weight:
1.0kg (2.0 lbs)

Ordering Information

PT2060/53-AX
AX: Back-panel IO module
A0: Basic IO module

Optional Accessories:
PT2060-005300: PT2060/53 Front panel
PT2060-005301: PT2060/53 Back panel

LED Indicators:



PT2060 Monitor

Back Panel Connectors Layout

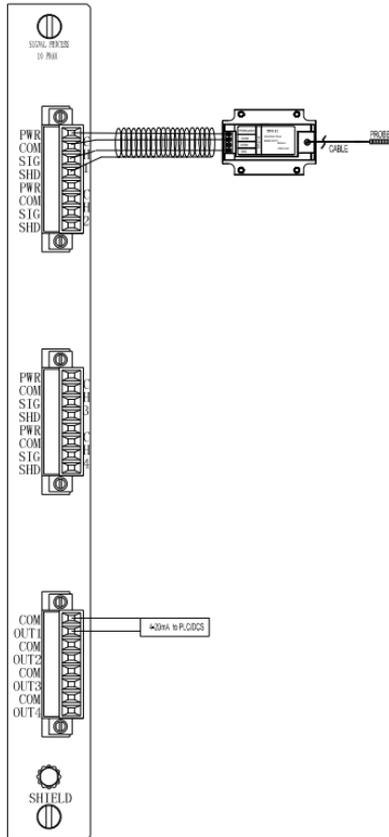




PT2060 Monitor

Field-wiring Diagram

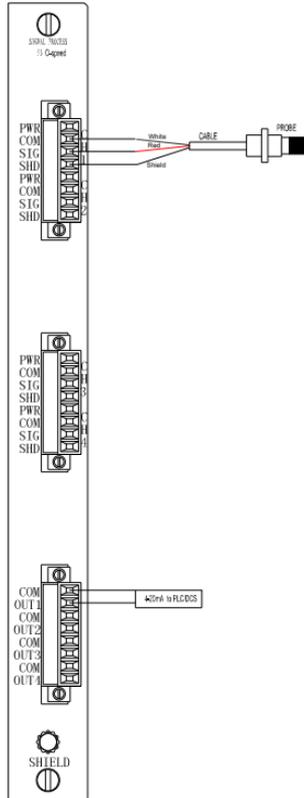
For all 5mm, 8mm and 11mm Probe Systems





PT2060 Monitor

For Magnetic Pickup Systems



PT2060/80 CM Condition Monitoring Module

PVTVM's PT2060/80 CM condition monitoring module is a 24 channels data collector and processing unit. Each of the PT2060/80 modules can accept any signal input from the corresponding signal module, analyze it, and output it.

PT2060/80 CM module can realize the following function:

- ✓ Dynamic data processing
- ✓ Transient data processing
- ✓ Interface to PCM360 condition monitoring software and database system

Each PT2060/80 CM module can process up to 24 channels of input signal and 2 channels of phase reference signal. When there is no 91 module in the PT2060 rack, the phase reference output channels of PT2060/80 CM module can not be used. A standard 19" PT2060 rack can hold up to two PT2060/80 CM modules. PT2060/80 CM module in left slot can receive the signal that come from signal module slot1-6, and the right one supports slot7-12. User can choose one PT2060/80 CM module or two as requirement. A 12" PT2060 rack can contain one PT2060/80 CM module only.

PT2060/80 receives signal through internal bus of the rack. Every Slot of the rack has 4 channels of analog signal connected to PT2060/80 CM module through internal bus. Four channels in slot 1 of the 19" rack are corresponding to 1-4 channels of PT2060/80 CM module installed in the slot 13; Four channels in slot 2 are corresponding to 5-8channels of PT2060/80 CM module installed in the slot 13, and the same, four channels in slot 6 are corresponding to channels 21-24 of PT2060/80 CM module installed in the slot 13; Four channels of slot 7 are corresponding to channels 1-4 of PT2060/80 CM module installed in the slot 14, while four channels in of slot 8 are corresponding to channels 5-8 of PT2060/80 CM module installed in the slot 14. And then, four channels of slot 12 are corresponding to channels 45-48 of PT2060/80 CM module installed in the slot 14. Four channels in slot 1 of 12" rack are corresponding to channels 1-4 of PT2060/80 CM module installed in the slot 7, while four channels in



slot 2 are corresponding to channels 5-8 of PT2060/80 CM module installed in slot 7. And then, four channels in slot 6 are corresponding to 21-24 channels of 80 CM module installed in slot 7.

One slot of the PT2060 rack will be used by PT2060/31 module, if there is a PT2060/31 module in the rack, and there is no initial signal connected to PT2060/80 module. Four channels of PT2060/80 CM module corresponding to the slot that PT2060/31 module installed in will not be used though PT2060/31 module has 8 channels. As the same to PT2060/31, four channels of PT2060/80 CM module corresponding to PT2060/35/36/40/43 module will not be used. Also, four channels of PT2060/80 CM module corresponding to PT2060/96 module will not be used too. For example, if PT2060/31 is installed in slot 5, channels 17-20 of PT2060/80 CM module in slot 13(slot 7 for 12" rack) corresponding to slot 5 will not be used.

PVTVM recommend that the modules needed for condition monitoring are put on the left of the rack near to slot 1 as possible as you can. As possible as



PT2060 Monitor

you can, put PT2060/31/35/36/40/43/96 modules on the right of the modules which need condition monitoring. This can reduce the number of PT2060/80 module.

To the maximum, the two wire terminals of every PT2060/80 CM module can output 24 channels of analog signal and 2 channels of phase reference signal. The top terminal outputs analog signals of 1-12 channels and 2 channels of phase reference signal, while the terminal below outputs analog signals of 13-24 channels and 2 channels of phase reference signal. The signal output amplitude of PT2060/80 CM module is about half of the original signal output by sensor. If sensor original signal is needed, please connect the output signal of BNC terminal on the front panel of the module.

The main purpose of GP for PT2060/80 CM module is to make users conveniently to connect other condition monitoring system. Please refer to the following wiring diagram for the definition of wire connection terminal.

Specifications

Environmental

Temperature:

Operation: -20℃ to +65℃

Storage: -40℃ to +85℃

Humidity:

95% non-condensing

Physical

PT2060/80 CM condition monitoring module has no front panel. PT2060/80 CM back panel is the only component.

Dimensions and Location:

241mm (9.5in) X 24.5mm (0.96in)

Each PT2060/80 CM module needs one slot. For a standard 19" rack, it can be mounted in slot 13, slot 14. For a 12" rack, it can be mounted in slot 7.

Weight:

0.4 kg (0.8 lb).

Ordering Information

PT2060/80-AX

AX: Back-panel IO module

A0: Basic IO module for standard 19" Rack

A1: Basic IO module for standard 12" Rack

Optional Accessories:

PT2060-008000-AXX: Cable

It connects PT2060/80 CM to PCI6013 DAQ card or GP.

A00 2 meters (6.6 feet)

A01 10 meters (32.8 feet)

PT2060-008001: GP for PT2060/80 CM module

It is a special tool of port transform. If PT2060/80 CM module can't connect with other equipment by PT2060-008000 data wire directly, GP will be used.

PT2060-008003-AXX: Cable

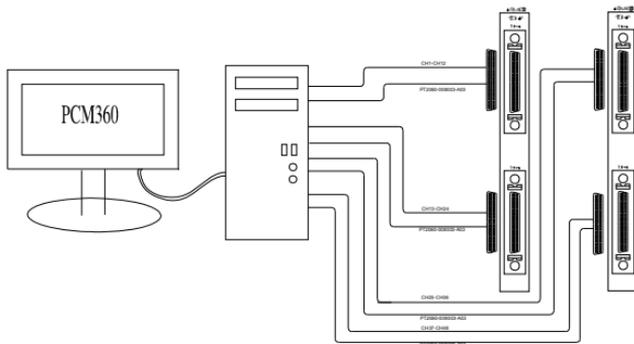
It connects PT2060/80 CM to PCI6220 or PCI6250 DAQ card.

A00 2 meters (6.6 feet)

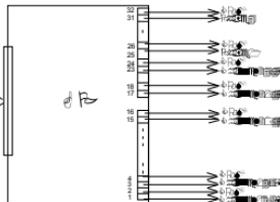
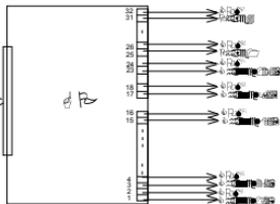
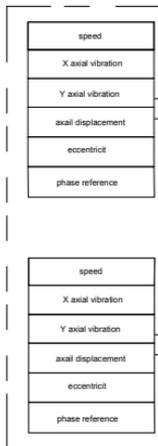
A01 10 meters (32.8 feet)

Field-wiring Diagram

Connect to PCM360 System



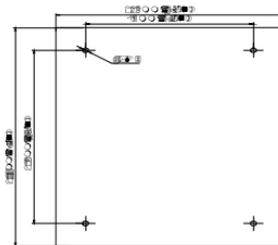
Connect to GP



Dimension of GP

GP is a general port transform tool. One port of it can connect to PT2060-008000 data wire, and the other port can connect to other system or equipment. It can be fixed on the DIN rail.

The signal come from PT2060/80 CM module enter into one GP port and go out by the other port, but it is without any changes.



Top View of GP



Bottom View of GP



PT2060/90 POWER Power Supply Module

PVTVM's PT2060/90 POWER module will provide system power to the PT2060/99 system rack and all modules installed in the system rack. The power module accepts the following power supply inputs: 24VDC, 110VDC, 110VAC and 220VAC.

If redundancy is required two PT2060/90 power modules are needed. The power supply module is a half-height module, meaning two PT2060/90 modules will fit in one slot. The PT2060/90 POWER module should be installed on the first slot from the right. If only one module is used it should be installed in the top half slot.



Specifications

Electrical

Power inputs:

24 VDC:

From 20 to 30VDC @16A

110VDC:

From 88 to 140VDC @6A

110VAC:

From 85 to 132VAC. Frequency from 47Hz to 63 Hz @6A

220VAC:

From 175 to 264VAC. Frequency from 47Hz to 63Hz @4A

LED Indicators:

OK: green

Approvals:

CE;

CSA:

Non-incendive, class I, div.2, Grps.ABCD,
T4@Ta= -40°C to +75°C

Certificate Number: 2011996

Environmental

Temperature:

Operation: -20°C to +65°C

Storage: -40°C to +85°C

Humidity:

95% non-condensing

Physical

Each module comes with two components: the front panel assembly and the back panel assembly.

Dimensions and Location:

120mm (4.7in) X 49.5mm (1.9in)

A maximum of two PT2060/90 modules can be installed per PT2060/99 System Rack. The location of these modules is the first slot on the right side of the system rack, with one module installed on the top and the other installed on the bottom of the slot.

Weight:

1.0 kg (2.0 lbs)

Ordering Information

PT2060/90-AX-BX

AX: Top-half Power Supply

A0: None

A1: 175 – 264VAC

A2: 85 – 132VAC

A3: 88 – 140VDC

A4: 20 – 30VDC

BX: Bottom-half Power Supply (Required for Redundancy)

B0: None

B1: 175 – 264VAC

B2: 85 – 132VAC

B3: 88 – 140VDC
B4: 20 – 30VDC

(20 - 30VDC)

PT2060-009011: Front blank Panel

PT2060-009012: Back blank Panel

Optional Accessories:

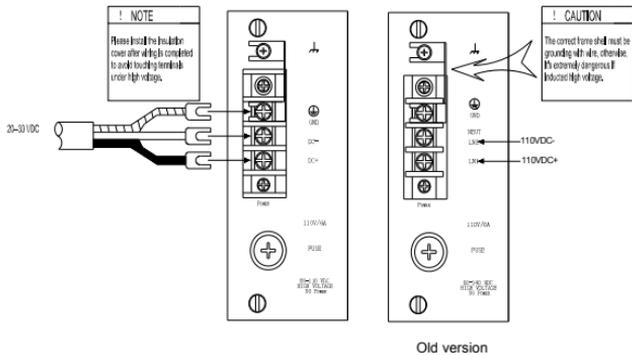
- PT2060-009000: PT2060/90 Front panel (175 - 264VAC)
PT2060-009001: PT2060/90 Back panel (175 - 264VAC)
PT2060-009002: PT2060/90 Front panel (85 - 132VAC)
PT2060-009003: PT2060/90 Back panel (85 - 132VAC)
PT2060-009004: PT2060/90 Front panel (88 - 140VDC)
PT2060-009005: PT2060/90 Back panel (88 - 140VDC)
PT2060-009006: PT2060/90 Front panel (20 - 30VDC)
PT2060-009007: PT2060/90 Back panel (20 - 30VDC)
PT2060-009008: PT2060/90 Fuse 220V/4A (175 - 264VAC)
PT2060-009009: PT2060/90 Fuse 110V/6A (85 - 132VAC, 88 - 140VDC)
PT2060-009010: PT2060/90 Fuse 24V/16A

Back Panel Connectors Layout

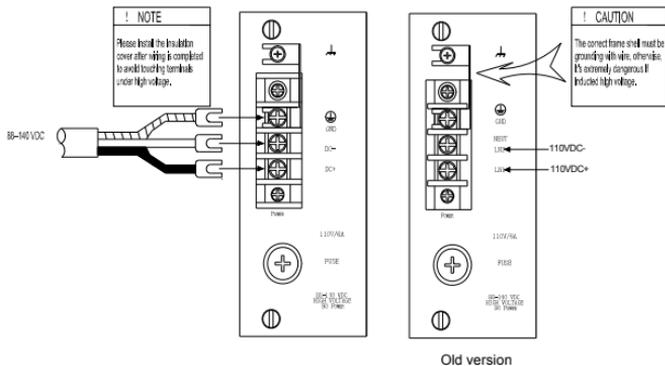


Field-wiring Diagram

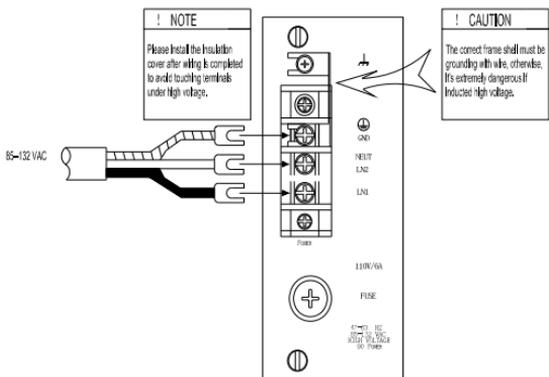
24VDC (Low Voltage DC Power Supply)



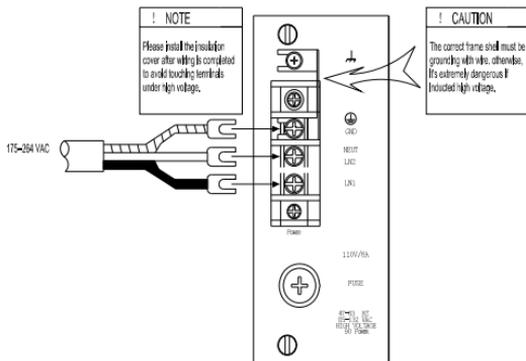
110VDC (High Voltage DC Power Supply)



110VAC (Low Voltage AC Power Supply)



220VAC (High Voltage AC Power Supply)



PT2060/91 SIM System Interface Module

PVTVM's PT2060/91 SIM module is a communication and system interface module. This module is used to:

- ✓ Connect to a configuration station
- ✓ Communicate to PT2060 system racks
- ✓ Communicate to other control systems (PLC/DCS or Historian)
- ✓ Provides two phase references channels
- ✓ Provide storage of system and alarm events
- ✓ Virtual address configuration
- ✓ Speed output
- ✓ Signal of phase reference output with peak to peak
- ✓ Gap voltage output

Communication with Modbus

The PT2060/91 has one active Modbus communication port, two RS232, one RS485 port and one Ethernet port. They are available for connection flexibility which can be used to communicate to: PT2060 system racks, control systems (PLC/DCS or historian) configuration station (PC loaded with PT2060-CFG software) and more.

Note: If redundant communication or additional Modbus ports are required the PT2060/96 communication module needs to be added to the PT2060 system.

Rack Interconnection

Multiple system racks can be networked together via Modbus through the SIM module.

System Configuration

The PT2060-CFG software connected via Modbus through the SIM module enables configuration of the system rack, modules, and channels.

System Event and Alarm Event Storage

The PT2060/91 SIM stores up to 500 system and 500 alarm events. This historical data can be accessed through one of the Modbus ports or through PT2060 system configuration software.

Phase Reference

Dual phase reference is also provided on the SIM module. The two phase reference channels can be used to provide phase information for all the channels on the system rack.



Specifications

Electrical

Power supply:

Internally converted by the rack power supply module
3.7W total typical for each module

LED Indicators:

OK / IO: green
It Indicates that the PT2060/91 Module is operating correctly When the OK/IO led is Flashing. If OK/IO LED is off, please check probe driver and cable of Phase reference.

TRIP-MLT: red

It will go on when system is in Trip-MLT

BYPASS: red

It will go on when system is in BYPASS.

CONFIG: green



PT2060 Monitor

It will go on when the system is in CONFIG, TEST, CALIBRATION. And OK/IO LED is on but not flashes.

Modbus communication:

RS-232 (2): one on front and one on back panel.
RS-485 (1): on the back panel of module. There is only one active Modbus communication port. The available baud rate values are: 1200, 2400, 4800, 9600, 19.2k, 38.4k and 115.2k baud. RS-485 cable can run up to maximum 1220 meters (4000ft).
Ethernet port (1): on the back panel of module. 10Mbps, IEEE802.3.

Electrical Continued

System Alarm:

There will be a dedicated relay for indication of system OK status. This is an energized relay; a de-energized indicates a system error for one of the system components.

Relays:

Seal: Epoxy
Capacity: 2A/240VAC or 2A/24VDC, resistive load
Relay type: SPDT
Isolation: 1000VDC

Phase reference:

Phase reference signal Input:
Input impedance: > 20K Ω
Input voltage range:
Magnetic pickup: +15VDC to -15VDC
Proximity probes: 0 to -24VDC

Input frequency:

The PT2060/91 module will support 1 - 255 events per revolution with a maximum full scale range of 60000 RPM and a maximum input frequency of 20 kHz.

Start at 1RPM (0.0167Hz) for proximity probes

Sensors:

Proximity probes

Threshold:

Auto: > 2.0 V pk-pk, 120RPM(2Hz)
Manual: > 0.6 V pk-pk, 1RPM(0.017Hz).

Trigger level can be programmed from -17VDC to -3VDC

Sensors:

Magnetic pickup
Valid frequency: >3.3Hz (least 2Vpkpk)
Hysteresis:

0.5 - 2.5 V user selectable

Phase reference Output:

On the front panel, each channel has one BNC connector. The output is the original signal, the output is the phase reference signal for previous vision.

Speed output:

The PT2060/91 module provides the function to measure machine speed in RPM from the two transducers. Input range of 1 to 1,200,000 RPM (0.017 Hz to 20 kHz). The measurable RPM scale is from 1 to 60000 RPM (0.017 Hz to 1000 Hz). The real-time updating RPM can be observed from the PT2060 Configuration software.

Accuracy:

± 1 RPM

Display the Pk to Pk value:

When the input frequency of transducer is more than 0.1Hz, the PT2060/91 module will automatically calculate the peak-to-peak swing of the sensor's signal, and display the Pk to Pk Value via PT2060-CFG.

Display the Gap voltage:

When frequency of the input Proximity transducer's signal is more than 0.5 Hz, the PT2060/91 module will display the gap voltage of the Proximity transducer via PT2060-CFG., otherwise, display the real time Value when frequency of the input Proximity sensor's signal is less than 0.5 Hz

Output Impedance:

150 Ω

Proximity Transducer Power:

-24VDC, current limited. Less than 50mA on each channel.

Approvals:

CE;

CSA:

Non-incendive, class I, div.2, Grps.ABCD,

T4@Ta= -40 $^{\circ}$ C to +75 $^{\circ}$ C

Certificate Number: 2011996

Environmental

Temperature:

Operation: -20 $^{\circ}$ C to +65 $^{\circ}$ C

Storage: -40 $^{\circ}$ C to +85 $^{\circ}$ C

Humidity:



PT2060 Monitor

95% non-condensing

Physical

Each module comes with two components- the front panel assembly and the back panel assembly.

Dimensions and Location:

241mm (9.5in) X 24.5mm (0.96in)

This module has to be located in the second slot from the right hand side of the rack. Note: there is only one SIM module per system rack.

Weight:

1.2 kg (2.6 lbs)

Ordering Information

PT2060/91-AX

AX: System IO Type

A0: Modbus RTU RS-485/ RS-232 module (with PT2060-009102)

A1: Modbus TCP module (with PT2060-009105 -A00)

Optional Accessories:

PT2060-009100

SCALANCE X-108: 8-port industrial unmanaged Ethernet switch, wide temp. Produced by Siemens Co., Ltd. The switch is used to connect many computers and other network device. It can provide 8 Ethernet ports, and support 10/100M. PVTVM suggests that user should choose two TM900 which provide redundancy 24VDC power for PT2060-009100(SCALANCE X-108).

Feature:

Provides 8 Fast Ethernet ports with Auto MDI/MDI-X

Supports 10/100Mbps Auto Negotiation

Provides compact size with DIN-rail/Wallmount

Supports redundant 18~32 VDC power input
Diagnosis on device by means of LEDs (power, link status, data traffic) and signal contact

Simple fault signal contact set-up using the SET button

Supports wide operating temperatures from -20~70 °C

PT2060-009101

USB to RS-485 Converter with PT2060-009106-A00 communication Cable.

PT2060-009102

USB to RS-232 Converter with PT2060-009107 -A00 cross communication cable.

PT2060-009103

RS-485 HUB

PT2060-009104-AXX

Hub to PT2060/91/96 Ethernet internet Cable RJ45

AXX: Cable length

A00 3 meters (9.8 feet)

A01 15 meters (49.2 feet)

A02 75 meters (246 feet)

PT2060-009105-AXX

PLC, DCS to Pt2060/91/96 Ethernet direct communication Cable RJ45 Port

AXX: Cable length

A00 3 meters (9.8 feet)

A01 15 meters (49.2 feet)

A02 75 meters (246 feet)

PT2060-009106-AXX

USB to RS-485 Converter to PT2060/91/96 serial communication Cable RS-485

AXX: Cable length

A00 3 meters (9.8 feet)

A01 15 meters (49.2 feet)

A02 100 meters (328 feet)

PT2060-009107-AXX

PC to PT2060/91/96 cross serial communication Cable RS-232

AXX: Cable length

A00 1.5 meters (5 feet)

PT2060-009108-AXX

PT2060/91/96 to RS485 HUB cable RS-485

AXX: Cable length

A00 3 meters (9.8 feet)

A01 15 meters (49.2 feet)

A02 100 meters (328 feet)

PT2060-009109-AX

AX: Panel type

A0: PT2060/91 Modbus RTU RS-485/RS-232 Front panel

A1: PT2060/91 Modbus TCP Front panel

PT2060-009110-AX

AX: Panel type

A0: PT2060/91 Modbus RTU RS-485/RS-232 back panel

A1: PT2060/91 Modbus TCP back panel
TM900-GX

TM900 is used to provide 24VDC power with
PT2060-009100(SCALANCE X-108), please
refer to appendix for detail.

GX: Mount

G0: 35mm DIN-rail mount

G1: Plate mount

Back Panel Connectors Layout



RS485 HUB



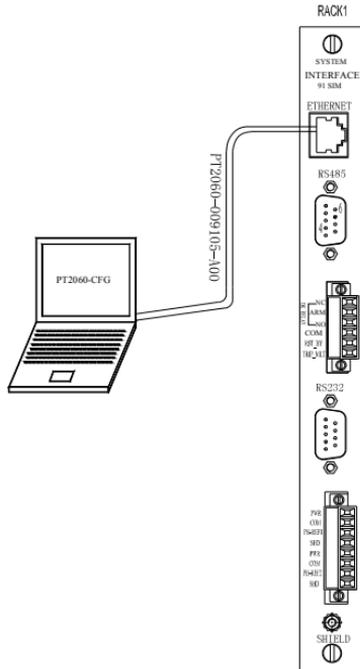
Previous version



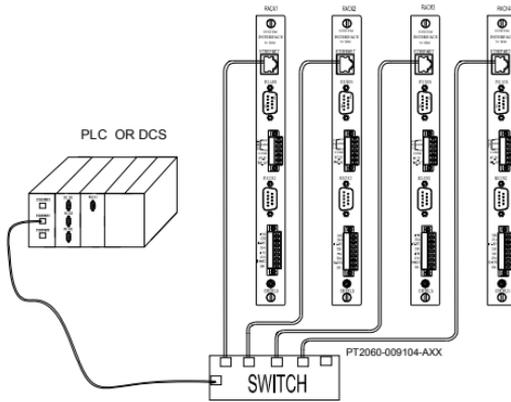
PT2060 Monitor

Field-wiring Diagram

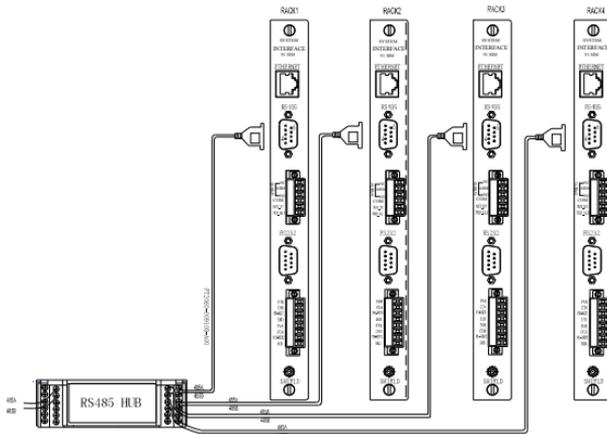
Modbus TCP for System Configuration



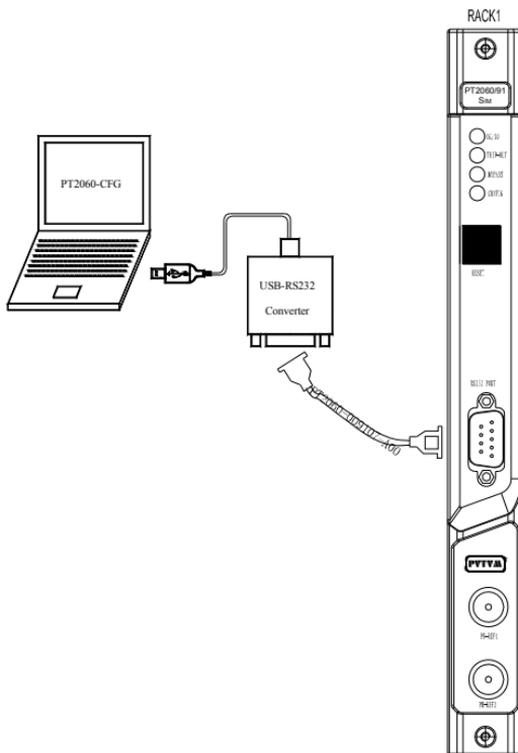
Modbus TCP for DCS, PLC Communication



Modbus RS-485 for DCS, PLC Communication



Modbus RS-232 for System Configuration



PT2060/96 COMM Communication/ Phase Reference Module

PVTVM's PT2060/96 COMM communication/ Phase Reference module is a Modbus communication and phase reference module. The PT2060/96 provides one additional Modbus communication port (either RS232 or RS485) and (2) additional phase references.

For PT2060 System, if require redundant communications, an additional Modbus port or 3 or more phase references, you need to select this module.

- ✓ **Provides additional Modbus communication port either (RS232 or RS485 or Ethernet)**
- ✓ **Provides two additional phase references**

Redundancy in communication

Coupled together with the PT2060/ 91 SIM module the PT2060/96 COMM module provides redundant Modbus communications for the PT2060 system.

Additional communication ports

If additional digital communication ports are required to communicate to other devices (PT2060 system racks, configuration PC, control systems (PLC/DCS) or the PT2060/98 System Display) the PT2060/96 COMM module would be needed.

Additional phase references

(2) Additional are provided on module. A total references are PT2060 system PT2060/96 PT2060/91 SIM installed.



phase references the PT2060/96 of (4) phase available for the when the COMM and the module are both

Specifications

Electrical

Power supply:

Internally converted by the rack power supply module

3.7W total typical for each module

Phase reference signal Input:

Input impedance: > 20KΩ

Input voltage range:

magnetic pickup: +15VDC ~ -15VDC

Proximity probes: 0 ~ -24VDC

Input signal frequency: 0~20kHz

Sensors for Phase reference:

Proximity probes; magnetic pickup sensor

Parameters for Proximity probes:

Input frequency: The PT2060/96 module supports

1 - 255 events per revolution with a maximum full scale range of 60000 rpm.

Valid frequency: >0.0167Hz



Threshold:

Auto: > 2.0V pk-pk signal amplitude (at least 2Hz), Trigger level is calculate automatically.

Manual: > 0.6V pk-pk signal amplitude (at least 0.017Hz). Trigger level programmable from -17VDC to -3VDC.

Hysteresis: 0.5 - 2.5 V user selectable

Power supply: -24VDC for proximity probe driver. Current limited. Less than 50mA on each channel

Parameters for magnetic pickup:

Input frequency: The PT2060/96 module supports 1 - 255 events per revolution with a maximum full scale range of 60000 RPM.

Valid frequency: >3.3Hz (least 2Vpkpk)

Hysteresis: 0.5 - 2.5 V user selectable

Power supply: Need no power.

Phase Reference buffer:

On the front panel, each channel has one BNC connector. Original phase reference signal can be selected to output. Modulated square wave can be selected to output. Meanwhile, original phase reference signal can be output via PT2060-80 module.

amplitude of signal: -23V~14V

Output Impedance: 150Ω

Speed output:

The PT2060/96 module provides the function to measure machine speed in RPM from the two transducers. Input range of 1 to 1,200,000 RPM (0.017 Hz to 20 kHz), the measurable RPM scale is from 1 to 60000 RPM (0.017 Hz to 1000 Hz). The real-time updating RPM can be observed from the PT2060 Configuration software.

Accuracy: ± 1 RPM

Display the Pk to Pk value:

When the input frequency of transducer is more than 0.1 Hz, the PT2060/96 module will automatically calculate the peak-to-peak swing of the sensor's signal, and display the Pk to Pk Value via PT2060-CFG.

Display the Gap voltage:

When frequency of the input Proximity transducer's signal is more than 0.5 Hz, the PT2060/96 module will display the gap voltage of

the Proximity transducer via PT2060-CFG., otherwise, display the real time Value when frequency of the input Proximity sensor's signal is less than 0.5 Hz.

LED Indicators:

OK: green

Modbus communication:

RS-232 (2): on back panel of module.

RS-485 (1): on the back panel of module. There is only one active Modbus communication port. The available baud rate values are: 1200, 2400, 4800, 9600, 19.2k, 38.4k and 115.2k baud. RS-485 cable can run up to maximum 1220 meters (4000ft).

Ethernet port (1): on the back panel of module. 10Mbps, IEEE802.3.

Approvals:

CE;

CSA:

Non-incendive, class I, div.2, Grps.ABCD,

T4@Ta= -40°C to +75°C

Certificate Number: 2011996

Environmental

Temperature:

Operation: -20°C to +65°C

Storage: -40°C to +85°C

Humidity:

95% non-condensing

Physical

Each module comes with two components- the front panel assembly and the back panel assembly.

Dimensions and Location:

241mm (9.5in) X 24.5mm (0.96in)

For 19" rack, they can be mounted in any one slot from 1 to 12.

For 12" rack, they can be mounted in any one slot from 1 to 6.

Weight:

1.2kg (2.6 lbs)



Ordering Information

PT2060/96-AX-BX

AX: System IO Type

A0: Modbus RTU RS-485/ RS-232 module with
PT2060-009108-A00

A1: Modbus TCP module

BX: Phase Reference Type

B0: Without Phase Reference

B1: With Phase Reference 1 (configured with 1 ~ 2
channels)

B2: With Phase Reference 2 (configured with 3 ~ 4
channels)

Optional Accessories:

PT2060-009100

SCALANCE X-108: 8-port industrial unmanaged Ethernet switch, wide temp. Produced by Siemens Co., Ltd. The switch is used to connect many computers and other network device. It can provide 8 Ethernet ports, and support 10/100M. PVTVM suggests that user should choose two TM900 which provide redundancy 24VDC power for PT2060-009100(SCALANCE X-108).

Feature:

Provides 8 Fast Ethernet ports with Auto MDI/MDI-X

Supports 10/100Mbps Auto Negotiation

Provides compact size with DIN-rail/ Wallmount

Supports redundant 18~32 VDC power input

Diagnosis on device by means of LEDs (power, link status, data traffic) and signal contact

Simple fault signal contact set-up using the SET button

Supports wide operating temperatures from -20~70℃

PT2060-009101

USB to RS-485 Converter with PT2060-009106-A00 communication Cable.

PT2060-009102

USB to RS-232 Converter with PT2060-009107-A00 cross communication cable.

PT2060-009103

RS-485 HUB.

PT2060-009104-AXX

Hub to PT2060/91/96 Ethernet internet Cable RJ45

AXX: Cable length

A00: 3 meters (9.8 feet)

A01: 15 meters (49.2 feet)

A02: 75 meters (246 feet)

PT2060-009105-AXX

PLC, DCS to PT2060/91/96 Ethernet direct communication Cable RJ45 Port

AXX: Cable length

A00: 3 meters (9.8 feet)

A01: 15 meters (49.2 feet)

A02: 75 meters (246 feet)

PT2060-009106-AXX

USB to RS-485 Converter to PT2060/91/96 serial communication Cable RS-485

AXX: Cable length

A00: 3 meters (9.8 feet)

A01: 15 meters (49.2 feet)

A02: 100 meters (328 feet)

PT2060-009107-AXX

PC to PT2060/91/96 cross serial communication Cable RS-232

AXX: Cable length

A00: 1.5 meters (5 feet)

PT2060-009108-AXX

PT2060/91/96 to RS485 HUB cable RS-485

AXX: Cable length

A00: 3 meters (9.8 feet)

A01: 15 meters (49.2 feet)

A02: 100 meters (328 feet)

PT2060-009600-AX

AX: Panel type

A0: PT2060/96 Modbus RTU RS-485/ RS-232 Front panel

A1: PT2060/96 Modbus TCP Front panel

PT2060-009601-AX

AX: Panel type

A0: PT2060/96 Modbus RTU RS-485/ RS-232 back panel

A1: PT2060/96 Modbus TCP back panel

TM900-GX

TM900 is used to provide 24VDC power with PT2060-009100(SCALANCE X-108), please refer to appendix for detail.

GX: Mount

G0: 35mm DIN-rail mount

G1: Plate mount

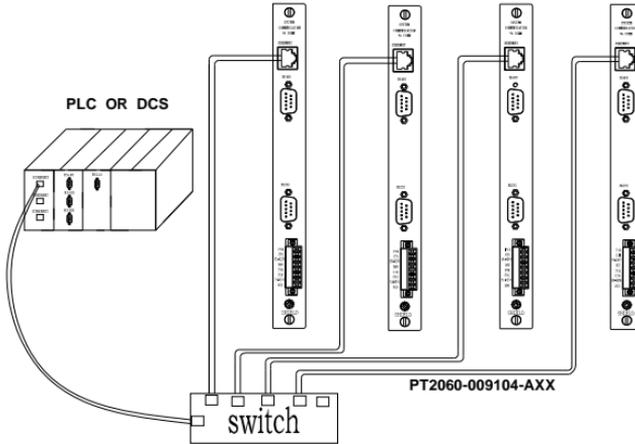


Back Panel Connectors Layout

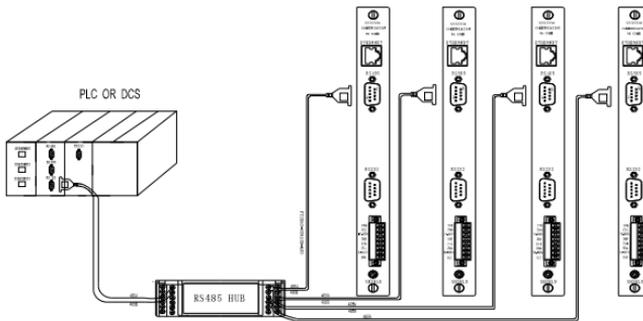


Field-wiring Diagram

Modbus TCP for DCS, PLC Communication



Modbus RS485 for PLC, DCS Communication



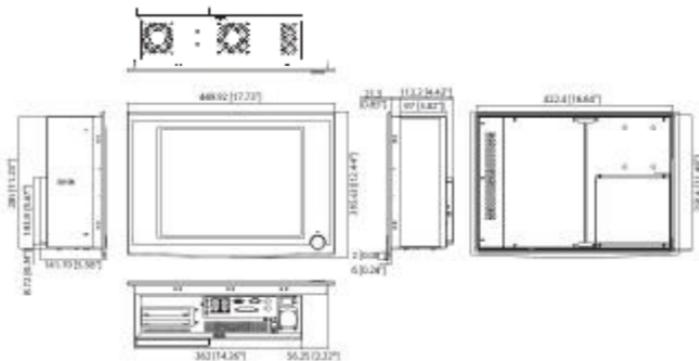
PT2060/98 DISP Display System

PVTVM's PT2060/98 DISP display system is a powerful touch-panel display loaded with PCM370 vibration analysis system software. The PT2060/98 DISP connects to the PT2060 system via Modbus. The PCM370 software will collect, store, analyze and display the machinery status data locally or to a wide area network.

The figure below gives an interface of PCM370 For PT2060 software.



- ✓ ID each channel, and arrange the routing
- ✓ Setup data collection strategy
- ✓ Display machine photo and real-time data and status on top of the photo
- ✓ Real-time bar graph/ status list/ alarm status of each channel
- ✓ Alarm events
- ✓ Trend plot on each channel
- ✓ Touch-panel for easy operation
- ✓ Network to control systems (PLC/DCS or Historian) via Modbus



Panel Cut-out Dimensions: 428×297mm



Specifications

Electrical

Touch Screen PC power supply:
100 - 240 VAC @ 50 ~ 60 Hz, 4 - 2 A

Environmental

Temperature:
Operation: 0 °C to +50 °C
Storage: -20 °C to +60 °C
Humidity:
10 ~ 90% @ 40 °C (non-condensing)

Physical

Touch panel, color 15" PC
Dimensions (W x H x D):
Front Panel: 450 x 315.6 x 6 mm
Control Box: 422.4 x 219.4 x 97/112.2 mm
Cut out Dimensions: 428 x 297 mm

Ordering Information

Warning: only work with PT2060/91 or PT2060/96 module

PT2060/98-BX

BX: Touch panel with PCM370 for PT2060 software

B0: No touch panel (only include PCM370 for PT2060 software)

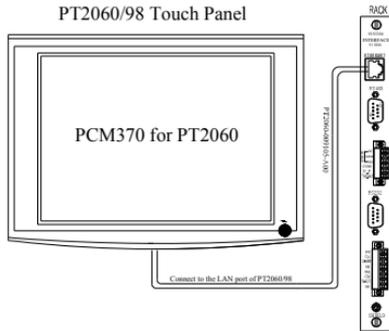
B1: IPPC-6152A-ROAE 15" Touch panel with 100 ~ 240 VAC power (include two power cables, a RS232 cross cable PT2060-009107 and a cross Ethernet cable PT2060-009105)

Optional Accessories:

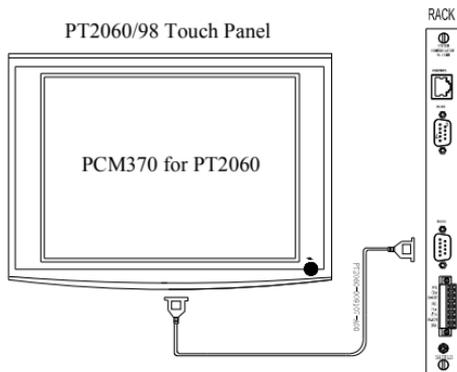
PT2060-009800: HP dvd1040e external DVD writer.

PT2060-009801: Windows XP English version

Connect PT2060/98 with PT2060/91 via Ethernet



Connect PT2060/98 with PT2060/96 via USB to RS232 Converter



PT2060/99 System Rack

There are two sorts of PT2060 rack: a standard 19" rack and a 12" rack. The standard 19" rack is a rack with the same dimensions as a standard 19" industrial rack.

One standard 19" rack contains a total of 16 slots. Two slots in the PT2060/99 are designated for system power (PT2060/90) modules and communication (PT2060/91) module. Two slots in the PT2060/99 are designated for PT2060-80 modules. The remaining 12 slots may be used for any combination of signal processing modules, relay modules and communication modules. The rack can process channels up to 48.

One 12" rack can contain 9 slots at most. The first slot from right is designated for system power (PT2060/90) module. The second slot from right is designated for communication (PT2060/91) module. The third slot from right is designated for PT2060-80 module. The remaining 6 slots may be used for any combination of signal processing modules, relay modules and communication modules. The rack can process channels up to 24.

Each PT2060/99 contains a data highway communication backplane which is located in the middle of the system rack. All modules plug into this backplane which enables communication and power to the individual modules.

For triple redundancy or over speed applications the standard 19" rack has the flexibility to be segregated into three groups: slot 1-4, slot 5-8 and slot 9-12. The 12" rack has one group only: slot 1-4.

Note: For each group, the relay module has to be mounted in the first slot on the right.

Specifications

Environmental

Temperature:

Operation: -20°C to +65°C

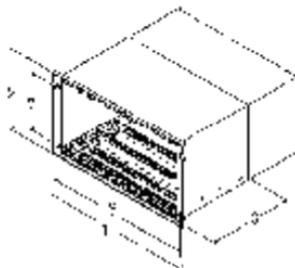
Storage: -40°C to +85°C

Humidity:

95% non-condensing



Physical



Dimensions for the standard 19" rack

1. 483mm (19.0")
2. 266mm (10.5")
3. 355mm (14.0")
4. 246mm (9.7")
5. 442mm (17.4")
6. 465mm (18.3")
7. 190mm (7.5")

Dimensions for the 12" rack

1. 305 mm (12.0")
2. 266mm (10.5")
3. 355mm (14.0")
4. 246mm (9.7")
5. 264mm (10.4")
6. 287mm (11.3")
7. 190mm (7.5")



Ordering Information

PT2060/99-AX

AX:

A0: Standard 19" rack

A1: Standard 12" rack

Optional Accessories:

PT2060-009900: Plastic frame for 19" Rack

PT2060-009901: Plastic frame for 12" Rack

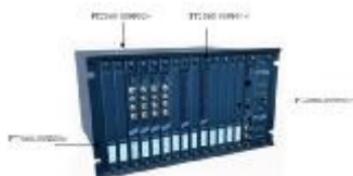
PT2060-009902: Rack cover for 19" Rack

PT2060-009903: Rack cover for 12" Rack

PT2060-009904: Bolt for all front panel

PT2060-009905: Front blank panel

PT2060-009906: Back blank panel





PT2060-CFG System Configuration Software

General Information

PT2060-CFG is the "easy to use" system configuration software tool used to set up and monitor the PT2060 system. The software requires Windows XP or Windows 2000 operating system. PT2060- CFG provides the following functions:

System Configuration

- ✓ System Setup
- ✓ Rack Communication
- ✓ Modbus Communication
- ✓ Calibration of the system, module and channels

Module Configuration

- ✓ Trip Multiply
- ✓ Bypass
- ✓ Alarm Reset

Channel Configuration

- ✓ Full Scale Range
- ✓ Alarm Set- Point
- ✓ Calibration of the System

Reporting

- ✓ Alarm and System Events
- ✓ Real-Time Values
- ✓ Channel, Module and Rack Status



Ordering Information

PT2060-CFG-AX

A0:

Configuration software CD include USB to RS232 converter driver
User Manual

Optional Accessories:

PT2060-009100

SCALANCE X-108: 8-port industrial unmanaged Ethernet switch, wide temp. Produced by Siemens Co., Ltd. The switch is used to connect many computers and other network device. It can provide 8 Ethernet ports, and support 10/100M. PVTVM suggests that user should choose two TM900 which provide redundancy 24VDC power for PT2060-009100(SCALANCE X-108).

Feature:

Provides 8 Fast Ethernet ports with Auto MDI/MDI-X
Supports 10/100Mbps Auto Negotiation
Provides compact size with DIN-rail/ Wallmount
Supports redundant 18-32 VDC power input
Diagnosis on device by means of LEDs (power, link status, data traffic) and signal contact
Simple fault signal contact set-up using the SET button
Supports wide operating temperatures from -20~70 °C

PT2060-009101

USB to RS-485 Converter with PT2060-009106-A00 communication Cable.

PT2060-009102

USB to RS-232 Converter with PT2060-009107-A00 cross communication cable.

PT2060-009103

RS-485 HUB

PT2060-009104-AXX

Hub to PT2060/91/96 Ethernet internet Cable RJ45

AXX: Cable length

A00: 3 meters (9.8 feet)

A01: 15 meters (49.2 feet)

A02: 75 meters (246 feet)

PT2060-009105-AXX



PT2060 Monitor

PLC, DCS to Pt2060/91/96 Ethernet direct communication Cable RJ45 Port

AXX: Cable length

A00:	3 meters	(9.8 feet)
A01:	15 meters	(49.2 feet)
A02:	75 meters	(246 feet)

PT2060-009106-AXX

USB to RS-485 Converter to PT2060/91/96 serial communication Cable RS-485

AXX: Cable length

A00:	3 meters	(9.8 feet)
A01:	15 meters	(49.2 feet)
A02:	100 meters	(328 feet)

PT2060-009107-AXX

PC to PT2060/91/96 cross serial communication Cable RS-232

AXX: Cable length

A00:	1.5 meters	(5 feet)
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PT2060-009108-AXX

PT2060/91/96 to RS485 HUB cable RS-485

AXX: Cable length

A00:	3 meters	(9.8 feet)
A01:	15 meters	(49.2 feet)
A02:	100 meters	(328 feet)

TM900-GX

TM900 is used to provide 24VDC power with PT2060-009100(EKI-2528I), please refer to appendix for detail.

GX: Mount

G0:	35mm DIN-rail mount
G1:	Plate mount

Appendix: TM900A Power Converter

The TM900A is 75W high efficiency slim DIN Rail Power Converter. Standard functions include front panel LED indicator and DC voltage adjustment, as well as protections for short-circuit, overload (constant current mode), over voltage, and over temperature.

Features

- ✓ 32mm slim design
- ✓ 89% high efficiency and low power dissipation.
- ✓ Protection: Short circuit / Overload / Over voltage/Over temperature
- ✓ Cooling by free air convection
- ✓ Installed on DIN rail TS-35/7.5 or TS-35/15
- ✓ UL508 (industrial control equipment) compliance
- ✓ Certificate: UL / CUL / TUV / CB / CE

Specifications

Electrical

AC Power Input: 100~240VAC. 47~63Hz
 Power Output:
 Voltage: 24VDC
 Rated Current: 3.2A
 Voltage ADJ.Range: 24~28VDC
 Voltage Tolerance: ± 1.0%
 Ripple & Noise: 100mVp-p

Physical

Dimension: 32*125.2*102mm (W*H*D)
 Weight: 0.5kg (1.0 lb)

Environmental

Temperature:
 Operation: -30°C ~ +70°C.
 Storage: -40°C ~ +85°C.
 Humidity:
 Operation: 20 ~ 95% non-condensing.
 Storage: 10 ~ 95% non-condensing.

Safety & EMC

Safety Standard:
 UL508, TUV EN60950-1 approved, design refer to GL
 Withstand Voltage:
 I/P-O/P:3KVAC I/P-FG:2KVAC O/P-FG:0.5KVAC



Isolation Resistance:
 I/P-O/P, I/P-FG, O/P-FG:>100M Ohms/ 500VDC/ 25°C/
 70% RH
 EMC Emission:
 Compliance to EN55022(CISPR22). EN61204-3 Class
 B, EN61000-3-2, -3
 EMC Immunity:
 Compliance to EN61000-4-2,3,4,5,6,8,11, EN55024,
 EN61000-6-2 (EN50082-2), EN61204-3, heavy industry
 level, critical A, SEMI F47 approved.

