DATA SHEET

vibro-meter®

VM600^{Mk2}/ VM600 RPS6U rack power supplies



VM600^{Mk2} RPS6U



VM600 RPS6U

KEY FEATURES AND BENEFITS

- From the vibro-meter® product line
- Power supply for VM600^{Mk2}/VM600 ABE04x 19" system racks with a height of 6U
- Input: AC-input and DC-input versions
- Outputs: +5 V_{DC} and ±12 V_{DC}
- Output over-voltage, short-circuit and overload protection
- Status indicators
- High-power, high-performance, high-efficiency
- Minimal derating within the operating temperature range

APPLICATIONS

- VM600^{Mk2}/VM600 machinery protection and/ or condition monitoring systems
- One RPS6U rack power supply powers a full rack of modules (cards)
- Two RPS6U rack power supplies enable rack power supply redundancy

DESCRIPTION

The VM600^{Mk2}/VM600 RPS6U rack power supplies are designed for use in the VM600^{Mk2}/VM600 series of machinery protection systems and condition and performance monitoring systems, from Meggitt's vibro-meter® product line.

A VM600^{Mk2}/VM600 RPS6U rack power supply is installed in the front of a VM600^{Mk2}/VM600 ABE04x system rack (19" system racks with a standard height of 6U) and connects via two high-current connectors to the VME bus of the rack's backplane. The RPS6U power supply provides +5 V_{DC} and ±12 V_{DC} to the rack itself and all installed modules (cards) in the rack via the rack's backplane.

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SPECIFICATIONS

Electrical

(At 25°C (77°F) with nominal line input voltage and maximum combination power load, unless otherwise stated.)

	AC-input version	DC-input versions	
Parameter	**RPS6U AC**	**RPS6U 24 DC**	**RPS6U 110 DC**
Nominal input (line) voltage	115/230 V_{AC} *or* 220 V_{DC}	24 V_{DC}	110 V_{DC}
Input voltage range	90 to 132 V_{AC} and 180 to 264 V_{AC} (autoranging) *or* 178 to 264 V_{DC}	18 to 32 V_{DC}	80 to 145 V_{DC}
Input frequency	47 to 63 Hz	Not applicable	
Input current	6.4 A_{RMS} max. at 115 V_{AC}. 4 A_{RMS} max. at 230 V_{AC}.	30 A max.	6 A max.
Efficiency	84% typ.	83% typ.	85% typ.
Inrush current	<10 times the nominal input current	<10 times the nominal input current	<10 times the nominal input current
Nominal output (supply) voltages	+5 V_{DC} up to 50 A, +12 V_{DC} up to 8 A, −12 V_{DC} up to −4 A	+5 V_{DC} up to 50 A, +12 V_{DC} up to 8 A, −12 V_{DC} up to −4 A	+5 V_{DC} up to 50 A, +12 V_{DC} up to 8 A, −12 V_{DC} up to −4 A
Output power See note 1 below	330 W max.	330 W max.	330 W max.
Factory adjustment	+5.41 V_{DC} ±0.02 V, ±12.5 V_{DC} ±0.05 V (at 60% max. output power)	+5.41 V_{DC} ±0.02 V, ±12.5 V_{DC} ±0.05 V (at 60% max. output power)	+5.41 V_{DC} ±0.02 V, ±12.5 V_{DC} ±0.05 V (at 60% max. output power)
Load range	+5.35 V_{DC} nom. (5.35 to 5.45 V accuracy with a load of 3 to 50 A). +12.5 V_{DC} nom. (12.2 to 12.8 V accuracy with a load of 0 to 8 A). −12.5 V_{DC} nom. (−12.2 to −12.8 V accuracy with a load of 0 to 4 A).	+5.35 V_{DC} nom. (5.35 to 5.45 V accuracy with a load of 3 to 50 A). +12.5 V_{DC} nom. (12.2 to 12.8 V accuracy with a load of 0 to 8 A). −12.5 V_{DC} nom. (−12.2 to −12.8 V accuracy with a load of 0 to 4 A).	+5.35 V_{DC} nom. (5.35 to 5.45 V accuracy with a load of 3 to 50 A). +12.5 V_{DC} nom. (12.2 to 12.8 V accuracy with a load of 0 to 8 A). −12.5 V_{DC} nom. (−12.2 to −12.8 V accuracy with a load of 0 to 4 A).
Ripple and noise (20 MHz bandwidth)	<50 $mV_{PEAK-TO-PEAK}$ for all outputs	<50 $mV_{PEAK-TO-PEAK}$ for all outputs	<50 $mV_{PEAK-TO-PEAK}$ for all outputs
Line regulation (±10% change in nominal input)	<±1% for all outputs	<±1% for all outputs	<±1% for all outputs
Load regulation (±40% change from 60% max. output power)	<±1% for +5 V_{DC} output. <±2% for ±12 V_{DC} outputs.	<±1% for +5 V_{DC} output. <±2% for ±12 V_{DC} outputs.	<±1% for +5 V_{DC} output. <±2% for ±12 V_{DC} outputs.

(Continued on the next page …)

SPECIFICATIONS *(continued)*

	AC-input version	DC-input versions	
Parameter	**RPS6U AC**	**RPS6U 24 DC**	**RPS6U 110 DC**
Output overvoltage protection	Yes, with automatic latch off	Yes, with automatic latch off	Yes, with automatic latch off
Output short-circuit and overload protection	Yes, with automatic recovery	Yes, with automatic recovery	Yes, with automatic recovery
Output power derating with convection cooling (natural ventilation)	2.5%/°C from 50 to 70°C for +5 V_{DC} output. 4%/°C from 55 to 70°C for ±12 V_{DC} outputs.	2%/°C from 50 to 70°C for +5 V_{DC} output. 3%/°C from 60 to 70°C for ±12 V_{DC} outputs.	2%/°C from 50 to 70°C for +5 V_{DC} output. 3%/°C from 60 to 70°C for ±12 V_{DC} outputs.
Output power derating with forced-air cooling	No derating required	2.5%/°C from 60 to 70°C for +5 V_{DC} output. No derating required for ±12 V_{DC} outputs.	2.5%/°C from 60 to 70°C for +5 V_{DC} output. No derating required for ±12 V_{DC} outputs.
Ordering number (PNR) See note 2 below	**200-582-500-12h** (VM600^{Mk2}) or **200-582-500-02h** (VM600)	**200-582-200-12h** (VM600^{Mk2}) or **200-582-200-02h** (VM600)	**200-582-600-12h** (VM600^{Mk2}) or **200-582-600-02h** (VM600)

Notes

1. In 2016, the RPS6U rack power supply was improved to provide a higher output power of 330 W with higher-performance and higher-efficiency, which required a redesign of the underlying power supply circuitry.
Accordingly, the different versions of the RPS6U rack power supply in use are:
- Later versions of the RPS6U (PNR 200-582-x00-02h or later) that define the power as a total maximum output power of 330 W, with nominal output (supply) voltages of +5 V_{DC} up to 50 A, +12 V_{DC} up to 8 A and −12 V_{DC} up to 4 A.
  Note: The total maximum output power of 330 W is a combination load for all outputs as the +5 V_{DC} and ±12 V_{DC} outputs are usually not simultaneously loaded to the maximum in practice. For example, if the +5 V_{DC} output is at its maximum rated load (5.35 V × 50 A = 267.5 W), then the combined loads on the +12 V_{DC} and −12 V_{DC} outputs must not exceed 62.5 W.
- Earlier versions of the RPS6U (PNR 200-582-x00-01h or earlier) that define the power as a rated power of 300 W, with nominal output (supply) voltages of +5 V_{DC} up to 35 A, +12 V_{DC} up to 6 A and −12 V_{DC} up to 2 A.

2. In 2021, VM600^{Mk2} (second-generation) machinery monitoring systems were launched with improved rack modules, notably the MPC4^{Mk2} + IOC4^{Mk2}, RLC16^{Mk2} and CPUM^{Mk2} + IOCN^{Mk2}. VM600^{Mk2} systems use the same system infrastructure as first-generation VM600 systems, that is, VM600^{Mk2} is backward compatible with existing VM600 (VM600^{Mk1}) racks and power supplies.
However, VM600^{Mk2} versions of the ABE040 system rack (PNR 200-040-100-016) and RPS6U rack power supplies (PNRs 200-582-200-12h, 200-582-500-12h and 200-582-600-12h) are also available. The VM600^{Mk2} versions are the same as the latest VM600 versions, except for the specific artwork/branding/finish. More specifically, the front panels of RPS6U rack power supplies are bare aluminium for the VM600^{Mk2} versions (PNRs 200-582-200-12h, 200-582-500-12h and 200-582-600-12h) and painted for the VM600 versions (PNRs 200-582-200-02h, 200-582-500-02h and 200-582-600-02h).

Environmental

Temperature	
• Operating	: 0 to 70°C (32 to 158°F)
• Storage	: −40 to 85°C (−40 to 185°F)
Humidity (according to IEC 60068-2-30)	: 5 to 90%, non-condensing
Vibration (according to IEC 60068-2-6)	: 10 to 55 Hz, 0.35 mm peak below resonance and 2 g peak above, 6 hours/axis
Shock (according to IEC 60068-2-27)	: 6 g peak, 11 ms, half-sine pulse, 3 shocks/axis
Drop test (according to IEC 60068-2-31)	: 30° drop angle
MTBF (according to MIL-HDBK-217F)	: >40000 hours at 70°C (158°F)
Conformal coating	: Applied to the circuitry of the power supply for additional environmental protection against chemicals, dust, moisture and temperature extremes
Indoor use	: Limited to indoor use only

Approvals

Conformity	: European Union (EU) declaration of conformity (CE marking). EAC marking, Eurasian Customs Union (EACU) certificate/ declaration of conformity.
Electromagnetic compatibility	: EN 55022 class "B". FCC Docket 20780 curve "B". IEC 61000-4-2: Performance criteria B, 4 kV contact discharge and 8 kV air discharge. IEC 61000-4-3: Performance criteria A, 10V/m. IEC 61000-4-4: Performance criteria A, 2 kV 5/50 ns, 5 kHz, direct IEC 61000-4-6: Performance criteria A, level 3 IEC 61000-4-8: Performance criteria A, 50 Hz/30 A/m TR CU 020/2011.
Electrical safety	: IEC/EN/UL/CSA 60950-1, 2nd edition. TR CU 004/2011.
Overvoltage category	: OVC II
Vibration	: IEC 60255-21-1 (Class 2)
Environmental management	: RoHS compliant (2011/65/UE)
Russian federal agency for technical regulation and metrology (Rosstandart)	: Pattern approval certificate OC.C.28.004.A N° 60224

SPECIFICATIONS *(continued)*

Status indicators (LEDs)

IN : Green indicates that the external mains supply is present and is within the normal range.
See **Mechanical drawings – VM600Mk2 versions on page 7** and **Mechanical drawings – VM600 versions on page 8**.

+5V : Yellow indicates that the +5 V_{DC} supply is being generated and is within the normal range

+12V : Yellow indicates that the +12 V_{DC} supply is being generated and is within the normal range

−12V : Yellow indicates that the −12 V_{DC} supply is being generated and is within the normal range

Connectors

Rear : Two high-current DIN 41612 type H15 connectors.
Sharing of power supply voltages and signals via the VM600^{Mk2}/ VM600 rack backplane (ABE04x).

Physical

Dimensions : See **Mechanical drawings – VM600Mk2 versions on page 7** and **Mechanical drawings – VM600 versions on page 8**

Weight : 2.4 kg (5.3 lb) approx.

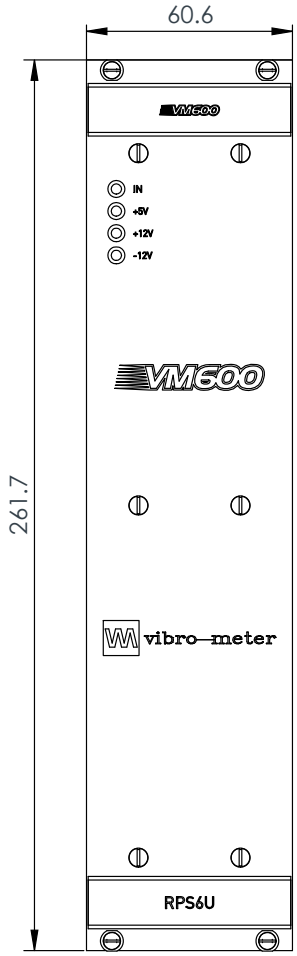
TOLERANCE TO INTERRUPTIONS IN THE MAINS SUPPLY

The table below shows the maximum permissible duration of an interruption (cut) to the external AC or DC mains supply used as the input voltage to an RPS6U rack power supply.
The maximum duration values depend on the maximum combination load for the RPS6U rack power supply, the number of RPS6U rack power supplies installed in the rack and the number of modules (cards) installed in the VM600^{Mk2}/VM600 rack (the actual load). If an interruption lasts longer than the maximum permissible duration, then the VM600^{Mk2}/VM600 modules (cards) installed in the rack may reset.

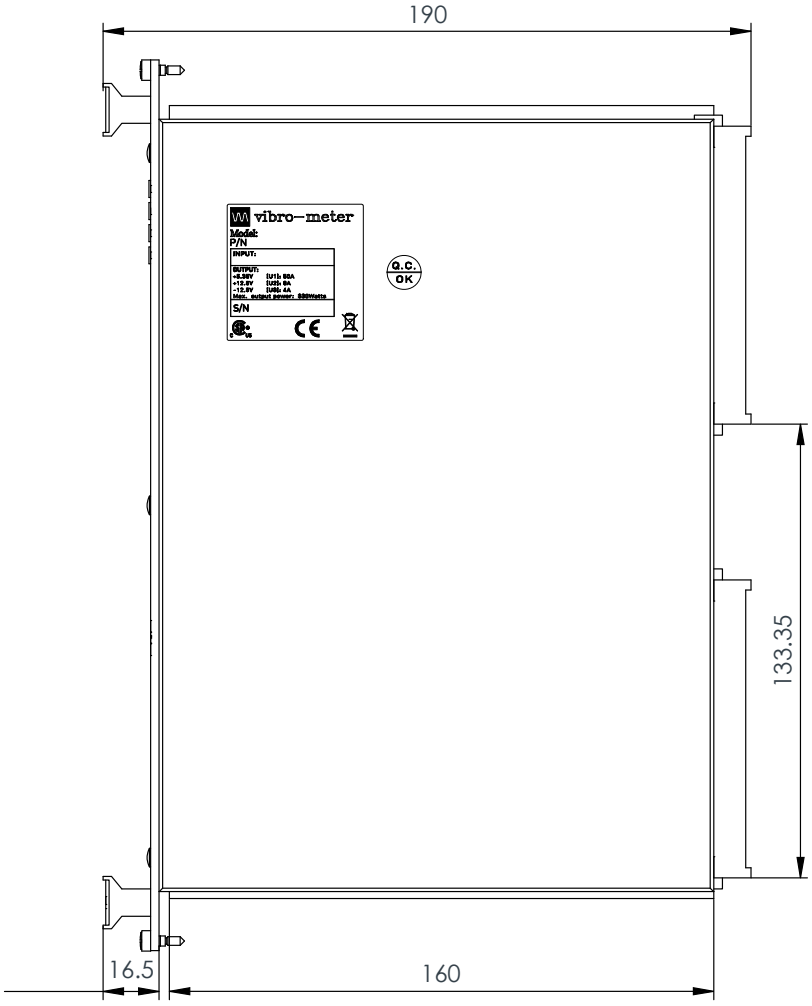
	Maximum duration of interruption to the supply input (ms)	
	At 10% of combination load	**At 100% of combination load**
One RPS6U AC rack power supply in the rack	190	10
Two RPS6U AC rack power supplies in the rack	250	20
One RPS6U 24 DC rack power supply in the rack	75	7
Two RPS6U 24 DC rack power supplies in the rack	150	14
One RPS6U 110 DC rack power supply in the rack	190	10
Two RPS6U 110 DC rack power supplies in the rack	250	20

MECHANICAL DRAWINGS – VM600 VERSIONS

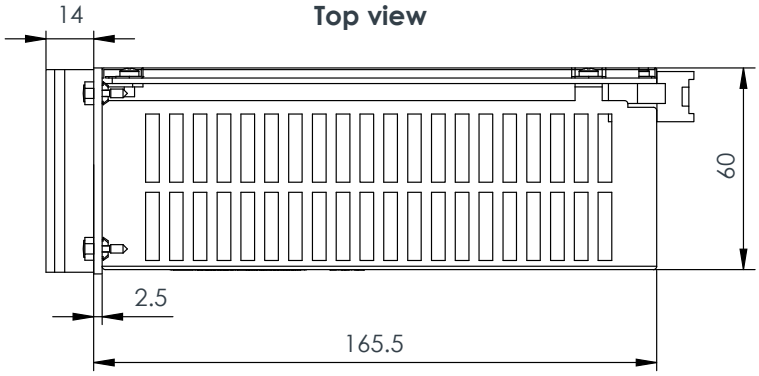
Front view



Side view



Top view



Note: All dimensions are in mm unless otherwise stated.

Notes

The later versions of VM600 RPS6U rack power supplies (PNRs 200-582-x00-02h or later) use the same front panel for both AC-input and DC-input versions:

- For both versions, the LED (top) used to indicate the status of the external mains supply is labelled "IN".

The earlier versions of the VM600 RPS6U rack power supplies (PNRs 200-582-x00-01h or earlier) use different front panels for AC-input and DC-input versions:

- For the AC-input version, the LED (top) used to indicate the status of the external mains supply is labelled "AC".
- For the DC-input version, the LED (top) used to indicate the status of the external mains supply is labelled "DC".

ORDERING INFORMATION

RPS6U rack power supply

To order, specify a type (**RPS6U rack power supply**), designation and ordering number (PNR) from the table below.

	AC-input version	DC-input versions	
Designation	**RPS6U AC**	**RPS6U 24 DC**	**RPS6U 110 DC**
Ordering number See notes 1 and 2 below	**200-582-500-12h** (VM600^{Mk2}) or **200-582-500-02h** (VM600)	**200-582-200-12h** (VM600^{Mk2}) or **200-582-200-02h** (VM600)	**200-582-600-12h** (VM600^{Mk2}) or **200-582-600-02h** (VM600)
Nominal input (line) voltage See note 3 below	115/230 V_{AC} *or* 220 V_{DC}	24 V_{DC}	110 V_{DC}

Notes

1. "h" represents the hardware version. "h" increments are for minor modifications with no effect on product interchangeability.

2. In 2021, VM600^{Mk2} (second-generation) machinery monitoring systems were launched with improved modules, notably the MPC4^{Mk2} + IOC4^{Mk2}, RLC16^{Mk2} and CPUM^{Mk2} + IOCN^{Mk2}. VM600^{Mk2} systems use the same system infrastructure as first-generation VM600 systems, that is, VM600^{Mk2} is backward compatible with existing VM600 (VM600^{Mk1}) racks and power supplies. However, VM600^{Mk2} versions of the ABE040 system rack (PNR 200-040-100-016) and RPS6U rack power supplies (PNRs 200-582-200-12h, 200-582-500-12h and 200-582-600-12h) are also available. In general, the VM600^{Mk2} versions are the same as the latest VM600 versions, except for VM600^{Mk2} specific artwork/branding/finish. More specifically, the front panels of RPS6U rack power supplies are bare aluminium for the VM600^{Mk2} versions (PNRs 200-582-200-12h, 200-582-500-12h and 200-582-600-12h) and painted for the VM600 versions (PNRs 200-582-200-02h, 200-582-500-02h and 200-582-600-02h).

3. The AC-input version of the RPS6U rack power supply can also operate with a 178 to 264 V_{DC} input when used with an appropriate rear panel with a DC input: 200-582-920-NHh, 200-582-993-NHh, 200-582-922-NHh, 200-582-990-NHh or 200-582-970-NHh.

VM600^{Mk2}/VM600 system considerations – rack power supplies and modules (cards)

The maximum number of modules (cards) that can be installed in a VM600^{Mk2}/VM600 ABE04x system rack depends on the following RPS6U power supply considerations:

- Number of RPS6U power supplies installed in the rack: one or two.
- Power capability of the RPS6U power supplies installed in the rack: 330 or 300 W.
- With two RPS6U power supplies installed in the rack, the mode of operation of the RPS6U supplies: redundant or non-redundant.
- The operating temperature of the environment where the VM600^{Mk2}/VM600 rack is installed: RPS6U power supplies require either output power derating and/or forced-air cooling for operating temperatures of 50°C (122°F) or higher.

The maximum number of modules (cards) that can be installed in a VM600^{Mk2}/VM600 ABE04x system rack also depends on individual VM600^{Mk2}/VM600 module (card) considerations, for example, the configuration of sensor power supplies and DC outputs for MPC4^{Mk2} + IOC4^{Mk2} or MPC4/IOC4T.

In general, a VM600^{Mk2}/VM600 ABE04x system rack can have either one or two RPS6U power supplies installed, as follows:

- One RPS6U (330 W) operating non-redundantly (that is, without rack power supply redundancy) in order to support a full rack of modules (cards), for operating temperatures up to 50°C (122°F).
- Two RPS6Us (330 W) operating redundantly (that is, with rack power supply redundancy) in order to support a full rack of modules (cards), for operating temperatures up to 50°C (122°F).
  Note: When two RPS6U rack power supplies operate redundantly to supply power to the modules (cards) in a VM600^{Mk2}/VM600 rack, the maximum current available for use is limited to the current available from a single RPS6U power supply.
- Two RPS6Us (330 W) operating non-redundantly (that is, without rack power supply redundancy) in order to support any combination of modules (cards) under all circumstances, notably operating temperatures up to 70°C (158°F).
  Note: When two RPS6U rack power supplies operate non-redundantly to supply power to the modules (cards) in a VM600^{Mk2}/VM600 ABE04x system rack, the maximum current available for use is limited to approximately 125% (× 1.25) the current available from a single RPS6U because of the way in which the power supplies share the load. The current load is shared between the two RPS6U power supplies with a maximum ratio of 20 to 80%.

A VM600^{Mk2}/VM600 ABE04x system rack with two RPS6U power supplies (330 W) operating non-redundantly is typically only necessary for a full rack of modules (cards) in applications where the operating environment requires RPS6U output power derating. For a VM600^{Mk2}/VM600 rack configuration that contains more than ten processing modules (cards) (MPC4^{Mk2} + IOC4^{Mk2} or MPC4/IOC4T, AMC8/IOC8T card and/or XMx16/XIO16T) together with a CPUM^{Mk2} + IOCN^{Mk2} or CPUx/IOCx "rack controller" and/or RLC16^{Mk2} or RLC16 relay cards, the power consumption of the rack should be calculated in order to determine the number of RPS6U power supplies required and the permitted modes of operation.

VM600^{Mk2}/VM600 system considerations – electrical circuit protection

The maximum input current specified for the different versions of the RPS6U rack power supply in the Specifications should be used to help specify suitable electrical circuit protection for a VM600^{Mk2}/VM600 ABE04x system rack:

- For the AC-input version of the RPS6U power supply, the associated rear panels include appropriately rated fuses for the AC inputs.
- For the DC-input versions of the RPS6U power supply, the associated rear panels do not include electrical circuit protection for the DC inputs, so an appropriately rated external circuit breaker or equivalent must be used.