

FEATURES

Feeding source DVPWR1 serves for feeding of racks for set ZAT-DV in control system ZAT – 2000 MP. Output voltages and their tolerances, time courses of logic signals and current carrying capacity respond to standard VMEbus specification ANSI/IEEE STD 1984-1987 IEC 821, IEC 297 - VME bus definition. The sources utilize parallel connection with so called current sharing – which is a circuit enabling uniform spreading of load among sources connected in a parallel way. Through this way there could be dealt with higher current consumption and even any requirements for feeding redundancy.

FUNCTION DESCRIPTION

Feeding source DVPWR1 is repeatedly switched three-level source of modern design. Concerning function it could be divided to supply circuits, circuit of main regulation loop and output voltage +5 V, circuits of output voltages ± 12 V, current sharing circuit and circuit of logic signals for VME bus.

In input of supply part there are fuse and protection circuits and two-stage filter. The source could be fed by both AC and DC voltage. In source input there is connected internal fusible cut-out, which disconnects the source from phase conductor in case of a defect. PWM control circuit itself is of UC2844 type. Switches fitted with transistors of IRF 840 type work in push-pull mode, which provides for maximal efficiency. Repeatedly switched source works at frequency approximately 100 kHz.

As a rectifier there is used special doubled Schottky diode placed in a branch of main feeding (+5 V). After rectification the output voltage +5 V is filtered by a set of filters and capacitors.

Redundancy control is performed by means of integrated circuit of UC2907 type. In case of parallel connection of sources this circuit provides for uniform spreading of power into branch +5 V to all the sources connected in a parallel way. For sensing of output voltage in branch +5 V there are used signals +S and -S,

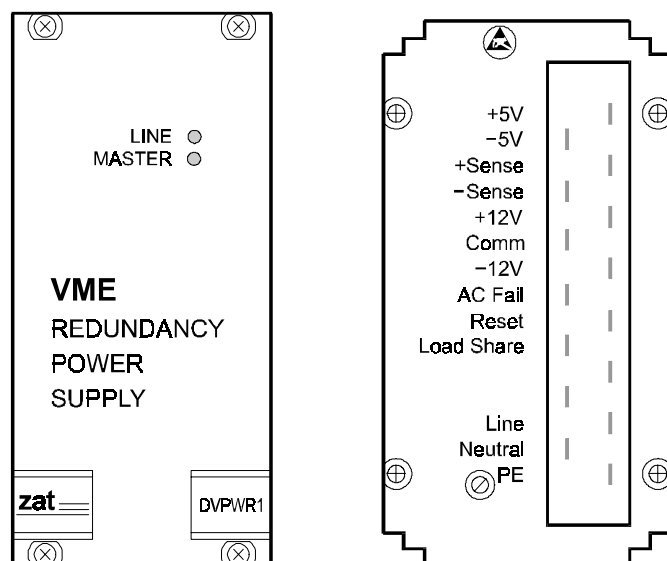
which provide for precise adjustment of output voltage in a place of required consumption. To output of branch +5 V, logic circuits generating signals RESET and ACFAIL follow. These circuits are designed such a way to fulfill exact criteria for time course of signals according to VMEbus specification ANSI/IEEE STD 1984-1987 IEC 821, IEC 297.

Circuits of output voltages ± 12 V use for regulation of output voltage transductors of VITROVAC 6025 type. Advantage of this design consists especially in lower output level of source interference and small emission. For proper function of outputs ± 12 V there is however needed minimal load in output +5 V approximately 0,5 A. Concerning that for basic use the source is determined for feeding of bus systems, this restriction is not harmful at all.

The source is placed in compact metal box determined for 19" rack with height 3 HE and width 12 TE. On the front panel there are placed two green indication LEDs. The LED diode LINE indicates presence of feeding voltage and correct function of the source. The LED diode MASTER indicates in case of redundant mode the overtaking of sources set control. On the rear part of the source there is standardized connector H15 (according to standard IEC 60603-2), which enables easy taking out and inserting into the rack.

The source is designed as device with protection class I with led protection terminal PE, which has to be (during operation) permanently interconnected with protecting earthing set of the system (according to standard ČSN 33 0600). The source could work in both systems TN-S (system with separated protection and neutral conductor), and insulated systems with protecting earth (IT) (according to standard ČSN 33 2000-4-41). For reaching of high resistance against interference and low level of emission there is need to thoroughly earth the rack, where the source is used, and in line feeding use two-stage filter, for example of FN 660-16/06 type.

Fig. 1 – Front and rear side of power source DVPWR1.



TECHNICAL DATA :

Parameter		Value
Input data	Feeding voltage	230 V AC rms, 220 V DC
	Tolerance of feeding voltages	±20 %
	Frequency of feeding voltage	47 ÷ 63 Hz, 0 Hz
	Maximal current consumption at full load	0,6 A AC rms
	Maximal current consumption at minimal load	0,1 A AC rms
	Maximal peak current at source switching on at full load	10 A (4 ms)
	Maximal apparent power demand of source at full load	140 VA
	Maximal active power demand of source at full load	100 W
	Internal fuse unit	T 2,5 A
Output data	Specification of output voltages	VMEbus specification ANSI/IEEE STD 1984-1987 IEC 821, IEC 297 section 6.
	Output voltage +5 V	+5,05 V DC
	Tolerance of output voltage +5 V in entire scope of load	±1 %
	Minimal load current of output voltage +5 V	0,5 A DC
	Maximal current consumption of voltage +5 V	8,5 A DC

Parameter		Value
Output data	Output voltage +12 V	+12,2 V DC
	Tolerance of output voltage +12 V in entire scope of load	±3 %
	Minimal load current of output voltage +12 V	0,1 A DC
	Maximal current consumption of voltage +12 V	0,9 A DC
	Output voltage -12 V	-12,2 V DC
	Tolerance of output voltage -12 V in entire scope of load	±3 %
	Minimal load current of output voltage -12 V	0,1 A DC
	Maximal current consumption of voltage -12 V	0,9 A DC
Logic signals	Redundancy	Yes
	Control of sources redundancy	current sharing signal
	Maximal number of sources connected in a redundant way	Not restricted * ¹⁾
	Output logic signals	RESET, ACFAIL
	Specification of output signals	VMEbus specification ANSI/IEEE STD 1984-1987 IEC 821, IEC 297 section 5 and 6.
	Type of output signals	TTL, open collector
	Output current in log.L ($U_{OL} \leq 0,2V$)	≥ 50 mA
EMC parameters	Interference resistance (electrostatic charge acc. to ČSN EN 61000-4-2)	8 kV
	Interference resistance (against emitted high-frequency electromagnetic field acc. to ČSN EN 61000-4-3)	10 V/m
	Interference resistance into feeding through capacity filter (against set of pulses acc. to ČSN EN 61000-4-4)	2 kV, 10 kHz, 15 ms and 4 kV, 2,5 kHz, 15 ms
	Interference resistance into feeding through capacity filter (against impact pulse acc. to ČSN EN 61000-4-5)	2 kV not-symmetrically 1 kV symmetrically
	Source emission into surrounding space and feeding (emission acc. to ČSN EN 55011)	Satisfactory

Parameter		Value
Safety parameters	Dielectric strength of feeding (interconnected terminals L and N) against outputs – all the output terminals interconnected in a parallel way (acc. to ČSN EN 61010-1)	5300 V DC ^{*2)}
	Insulation resistance of feeding (interconnected terminals L and N) against outputs – all the output terminals interconnected in a parallel way (at 1000 V DC)	min. 40 MΩ
	Dielectric strength of feeding (interconnected terminals L and N) against protection terminal and source cover (acc. to ČSN EN 61010-1)	3100 V DC ^{*2)}
	Insulation resistance of feeding (interconnected terminals L and N) against protection terminal and source cover (at 1000 VDC)	min. 40 MΩ
	Dielectric strength of outputs – all the output terminals interconnected in a parallel way against protection terminal and source cover (acc. to ČSN EN 61010-1)	700 V DC ^{*2)}
	Insulation resistance of outputs – all the output terminals interconnected in a parallel way against protection terminal and source cover (at 500 VDC)	min. 20 MΩ
	Protection class for device	I (acc. to ČSN 33 0600)
	Overvoltage category in installation	III
	Pollution class	2
Dimensions, weight, temper. range	Working temperature range ^{*3)}	-5 up to 60 °C
	Weight	0,97 kg
	Dimensions (H x W x D)	127 mm (3 HE) x 61 mm (12 TE) x 160 mm

^{*1)} At practical usage, the number of sources connected in a redundant way is restricted especially by rack capacity and conductors section.

^{*2)} Measurement of dielectric strength through DC method has been selected for reasons that filter capacitors of Y and X2 type in the source do not enable usage of AC measurement.

^{*3)} At working temperatures over 40 °C there is need to cool the source by a fan with minimal power 25m³ / hour or reduce the source power according to the following graph (see next page).

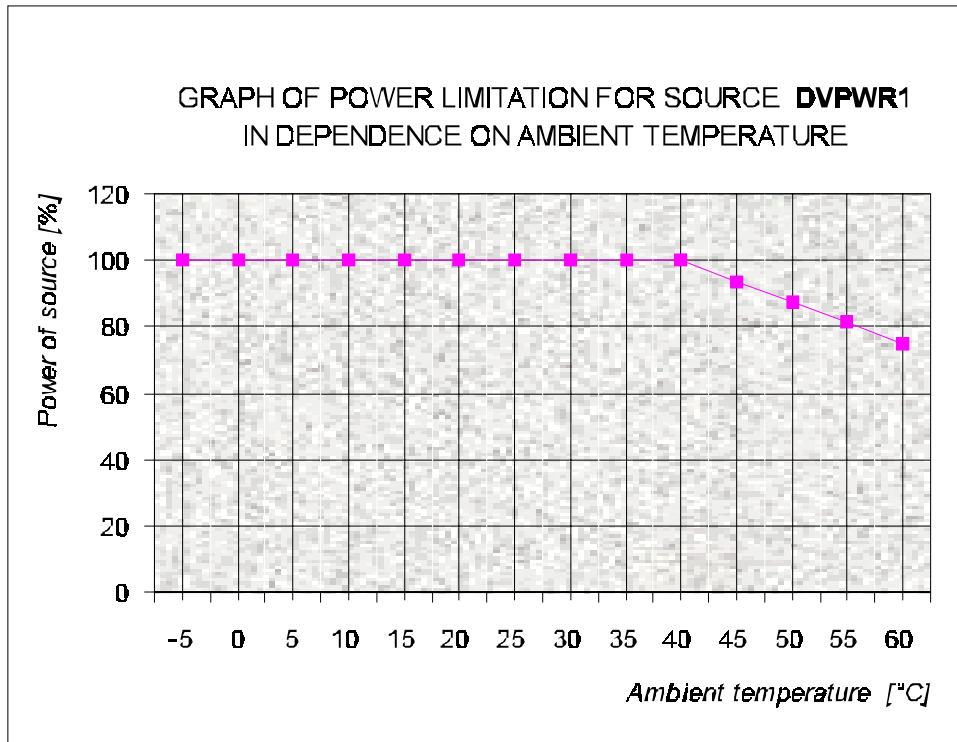


Fig. 1 THE EXAMPLE OF SOURCE DVPWR1 CONNECTION IN NON REDUNDANT MODE

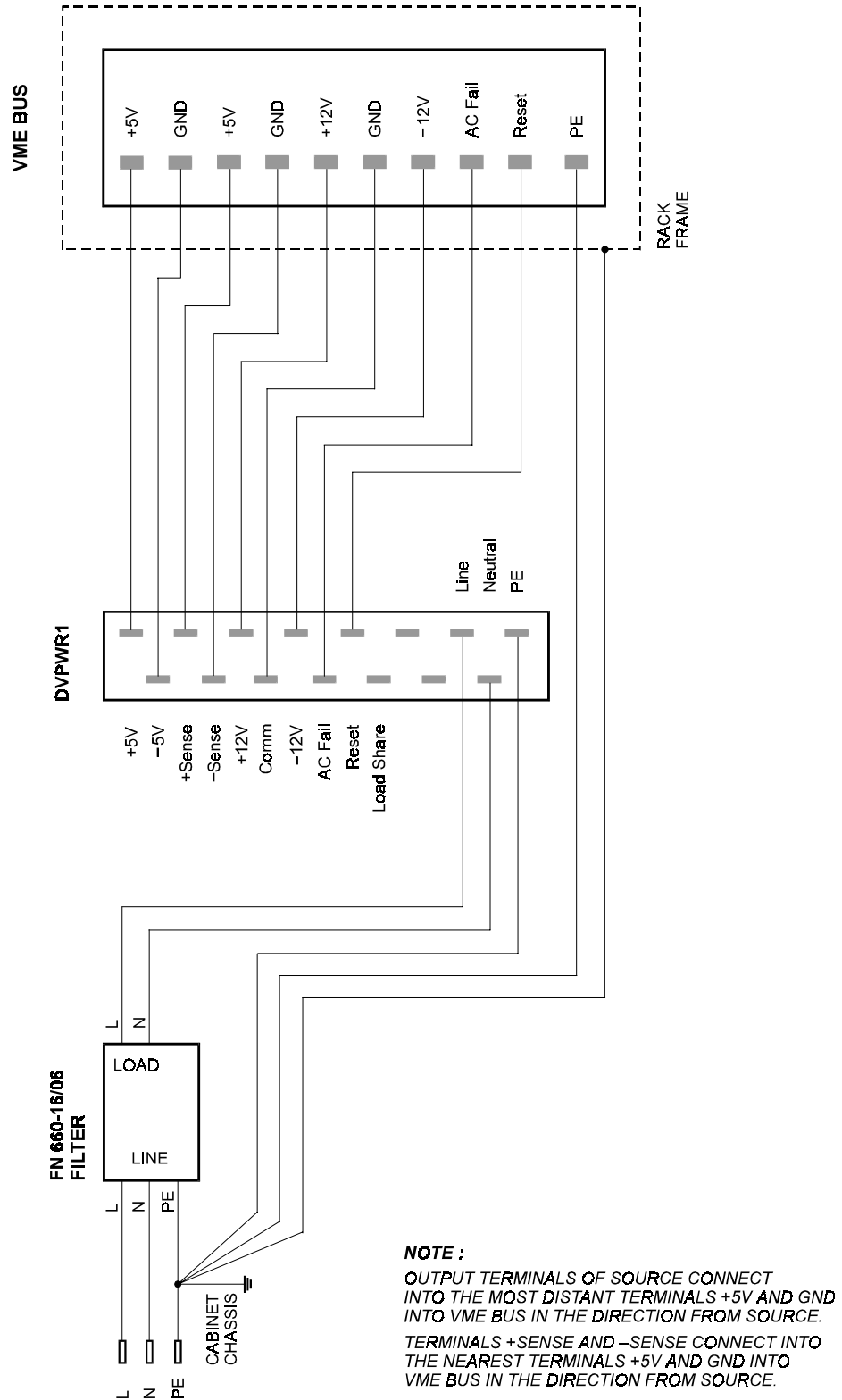


Fig. 2 THE EXAMPLE OF SOURCES DVPWR1 CONNECTION IN REDUNDANT MODE

