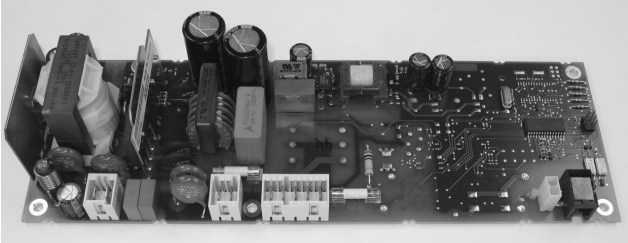
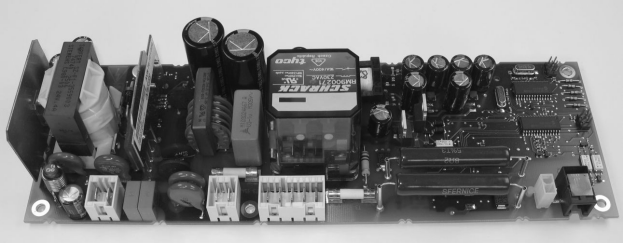
SIEMENS





Albatros^2
Grid supervision module / PSU AVS76.39x/309
User Manual

Edition 1.2
Controller series A
CE1U2331en
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Building Technologies

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Table of contents

1 Summary

This User Manual describes the products listed below and covers the handling and configuration of the units for readers ranging from end users to heating engineers.

Type reference(ASN)	*Name*
AVS76.390/309	Power supply and grid supervision module G83
AVS76.391/309	Power supply and grid supervision module ENS

The product is a combination of a 24Vdc power supply and a grid supervision module according to different standards.

The power supply is a switch-mode power supply with a rated output of 100W at 24V

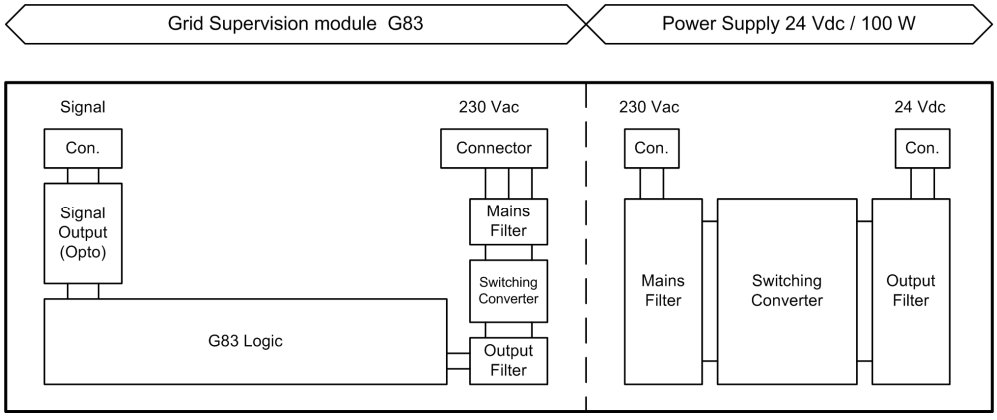
The grid supervision module monitors the mains supply according to the national settings and will indicate by a signal output an unhealthy mains supply. The signal can be used to disconnect a generator from the grid.

The ENS version contains a redundant supervision circuit with additional impedance measurement. A Power Relay will disconnect mains within the module to fulfil the need for a second disconnection contact.

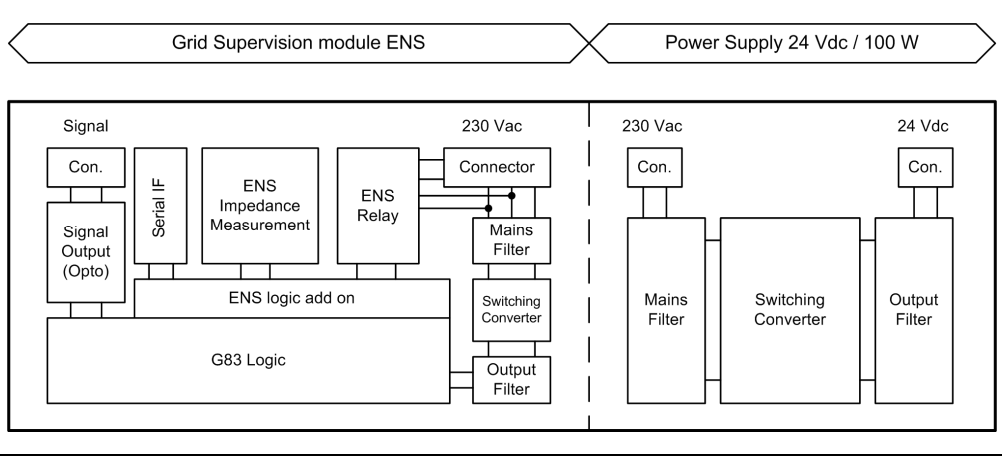
1.1 Type summary

Block diagram of the versions

G83 version
AVS76.390/309



ENS version
AVS76.391/309



2 Safety notes

2.1 Product liability

- The products may only be used in building services plant and applications as described in this document
- When using the products, all requirements specified in chapters "Handling" and "Technical data" must be satisfied
- Local regulations (for installation, etc.) must be complied with
- Do not open the units if cased. If not observed, Siemens warranty will be invalidated

3 Mounting and installation

3.1 Regulations

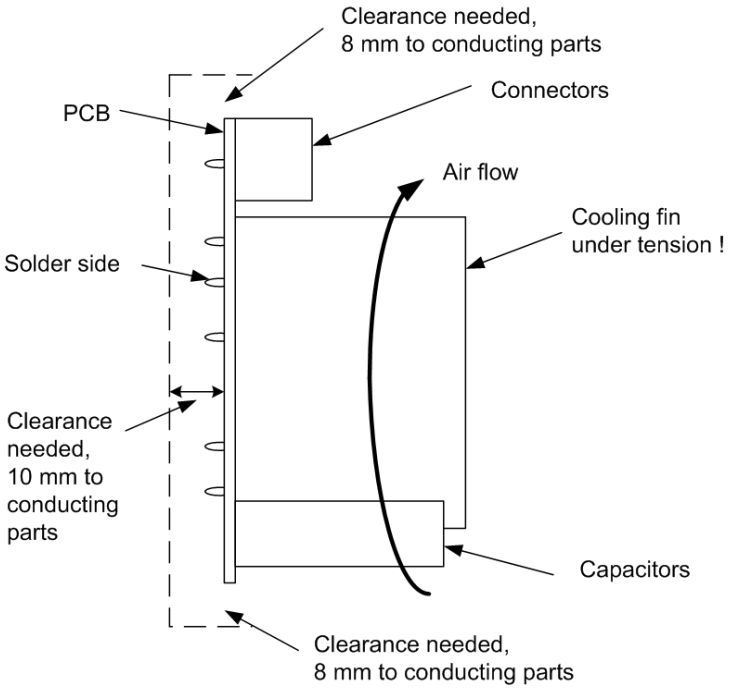
Electrical installation

- The power supply must be turned off prior to installation
- The connections for mains and low-voltage are separated
- Wiring must be made in compliance with the requirements of safety class II. This means that sensor and mains cables must not be run in the same duct
- Wiring must be checked for correct functionality before connecting the generator to the grid.

3.2 Module AVS76.9xx

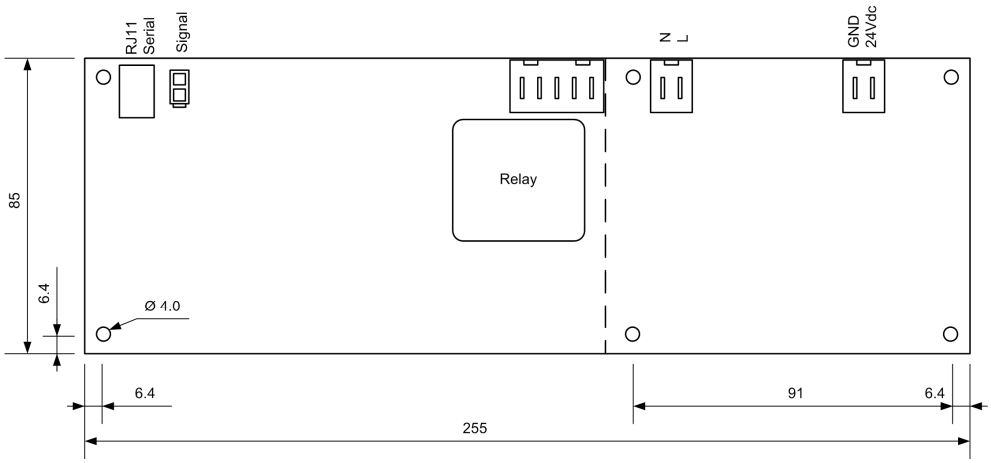
Planning

- Air circulation around the unit must be ensured, allowing the unit to emit the heat produced by it.
- The unit is designed conforming to the directives for safety class II devices and should be mounted in compliance with these regulations
- Clearances to conducting enclosure parts must be according to regulations
- Power to the unit may only be supplied after it is installed. If this is not observed, there is a risk of electric shock near the terminals and through the cooling slots
- The unit must not be exposed to dripping water
- Permissible ambient temperature when mounted and when ready to operate: 0...55 °C
- Power cables must be clearly segregated from low-voltage lines observing a distance of at least 100 mm
- The unit must be installed with the PCB in a vertical position and with the connectors on the top edge of the PCB. Other positions are not allowed
- An enclosure around the fitted PCB must allow enough air circulation the heat produced by it



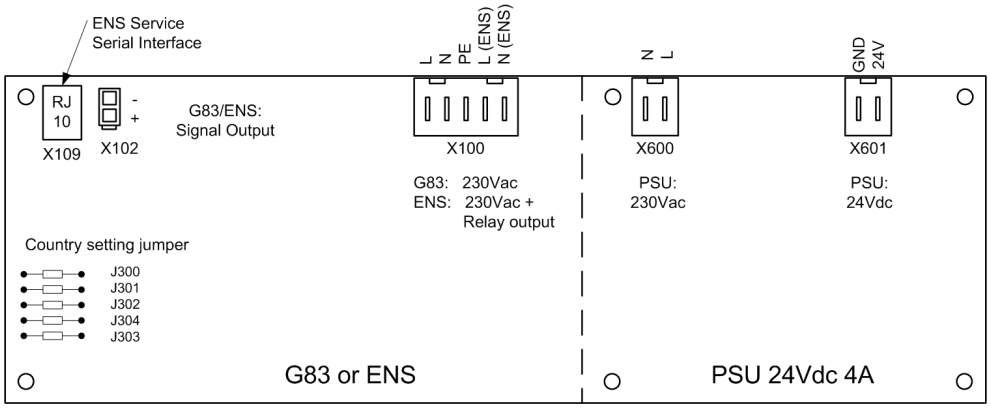
Dimensions

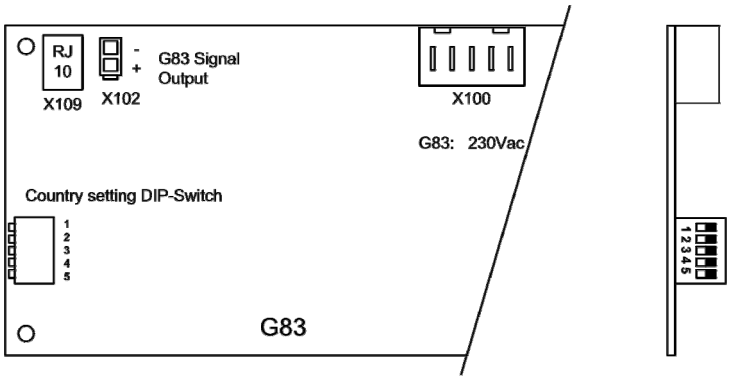
Dimensions in mm



	L	*W*	*H*
AVS76.390/309	255	85	48
AVS76.391/309	255	85	55

3.2.1 Connection terminals of AVS76.39x/309





Terminal markings

Mains voltage GSM

	Use	*Terminal*	*Type of connector*
N	Appliance Neutral (ENS version)	X100, 1	TYCO: 2-928247-5
L	Appliance Line (ENS version)	X100, 2	
⏚	Grid Protective earth	X100, 3	
N	Grid Neutral	X100, 4	
L	Grid Line	X100, 5	

Low voltage GSM

	Use	*Terminal*	*Type of connector*
+	Signal +	X102, 1	Molex mini Fit Jr.
–	Signal –	X102, 2	

	Use	*Terminal*	*Type of connector*
	TXD PC +	X109, 1	RJ10
	TXD PC –	X109, 2	
	RXD PC +	X109, 3	
	RXD PC –	X109, 4	

Mains voltage PSU

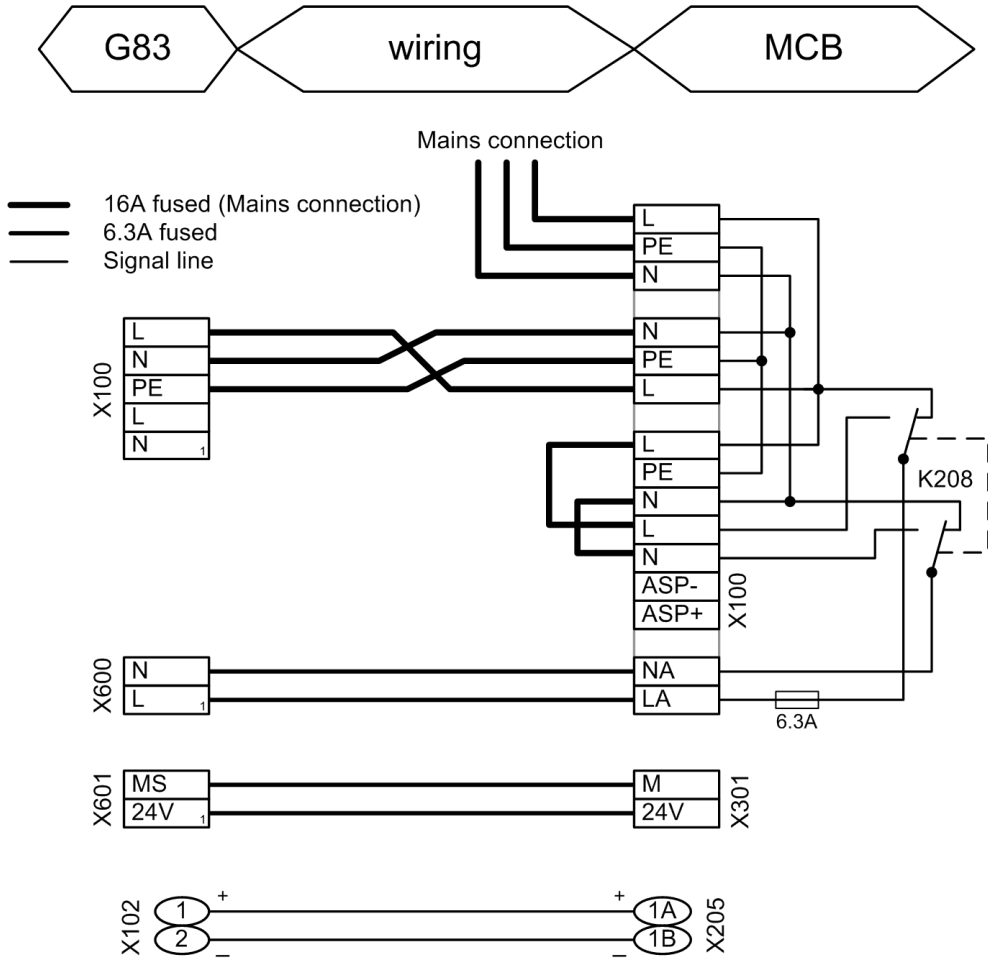
	Use	*Terminal*	*Type of connector*
L	Grid Line	X600, 1	Lumberg: 3623 02K02
N	Grid Neutral	X600, 2	Tyco: 0-928247-2

Low voltage PSU

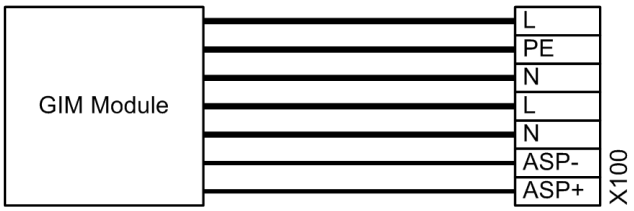
	Use	*Terminal*	*Type of connector*
24V	24 Vdc	X601, 1	Lumberg: 3623 02K46
GND	GND	X601, 2	(Tyco: 5-969484-1)

3.2.2 Wiring of AVS76.390/309 to RVC32.4x0

G83 version



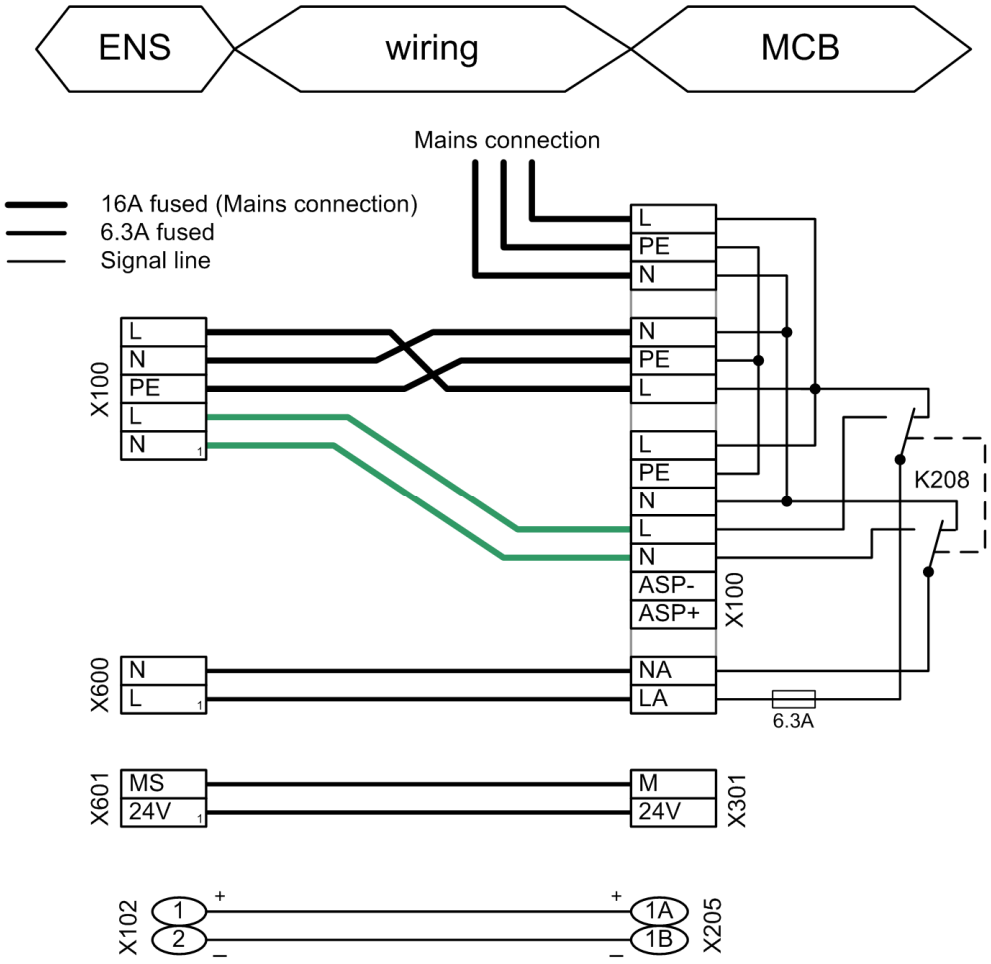
Changed wiring in combination with GIM



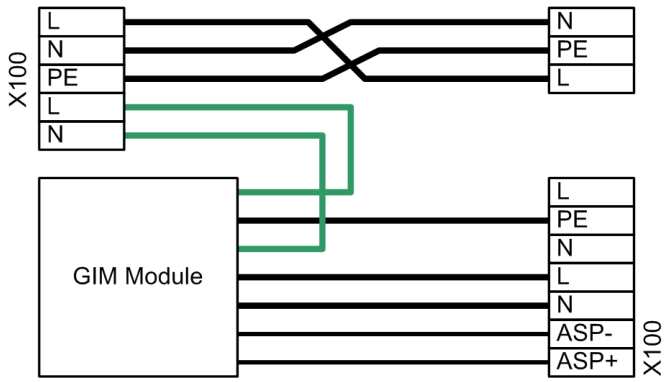
Twisted wires are recommended.

3.2.3 Wiring of AVS76.391/309 to RVC32.4x0

ENS version



Changed wiring in combination with GIM



Twisted wires are recommended.

Parallel operation

For connection of more then one unit equipped with AVS76.391 (ENS) we recommend to use for each unit an one phase.
Using more then one ENS unit on the same location and on the same phase may increase switch off occurrence.
It is recommended to use a low impedance connection to the Mains. The impedance must be lower then 1 Ohm.

4 Commissioning

Prerequisites

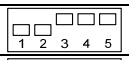
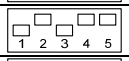
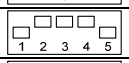
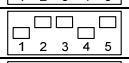
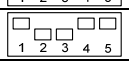
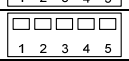
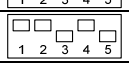
To commission the units, the following steps must be carried out:

- Prerequisite is correct mounting and correct electrical installation

The Country setting is done with the DIP-switches or by cutting the appropriate Jumpers on the PCB (See 3.2.1 for location).
The grey marked values are limited by engine protection values.

Configuration

Country configurations: AVS76.390/309

Country	DIP-Switch setting	▲ voltage [V], [s]		▼ voltage [V], [s]		▲ frequency [Hz], [s]		▼ frequency [Hz], [s]	
Belgium		244	0.2	184	0.2	50.2	0.2	49.8	0.2
Czech R		264	0.2	196	0.2	50.5	0.2	49.5	0.2
Denmark		253	2.0	196	10	51.0	0.2	47.0	0.2
Finland		253	1.5	196	5.0	51.0	0.2	48.0	0.2
Ireland		253	0.5	207	0.5	50.5	0.5	48.0	0.5
UK (default)		264	1.5	207	1.5	50.5	0.5	47.0	0.5
NL		253	2.0	184	2.0	50.5	0.5	49.5	0.5

Country configurations: AVS76.391/309

Country	DIP-Switch setting	▲ voltage [V], [s]		▼ voltage [V], [s]		▲ frequency [Hz], [s]		▼ frequency [Hz], [s]	
Austria	302;304	253	0.2	196	0.2	51.0	0.2	47.0	0.2
France	303;304	264	0.2	196	0.2	50.5	0.2	49.5	0.2
Germany / Switzerland		264	0.2	184	0.2	50.2	0.2	47.5	0.2
Italy	301;304	276	0.1	184	0.2	51.0	0.1	49.0	0.1

Engine protection: AVS76.390/309 and AVS76.391/309

Stage	over voltage [V]		under voltage [V]		over frequency [Hz]		under frequency [Hz]	
1st	260	65 ms	184	65 ms	50.5	65 ms	49.5	65 ms
2nd	280	35 ms	140	15 ms	52.7	25 ms	47.3	25 ms
3rd	300	15 ms						

Functional check

To facilitate commissioning and fault tracing, the controller allows input tests to be made. With these tests, the controller's inputs and outputs can be checked. To make the tests, select operating page "Input/output test" and go through all available operating lines.

Operating state

The current operating state can be checked on operating page "Diagnostic generator" Line: 8220; G83/ENS, the Status of the output is displayed.

As the output is polarity sensitive, the proper switching of the signal output must be checked, before use with the running generator.

5 Handling

5.1 Operation (operating elements)

Operating elements AVS76.39x

No handling elements on the unit.

6 Technical data

6.1 Grid supervision module on AVS76.39x/309

Power supply	Mains	AC 230 V
	Rated frequency	50 Hz
	Max. power consumption	AVS76.390/309: 0.8 W AVS76.391/309: 2.5 W
	Fusing of supply lines	max. 16 AT
	Internal fusing	3.15 A
	Inrush current	15 A
Wiring of terminals	Power supply	RAST 5 connection system
	Output	Molex Mini-Fit, Jr. 2 pole
Function	AVS76.390/309	Grid supervision function according to Recommendation G83 with different country settings, Signal output to external disconnection relay
	AVS76.391/309	Grid supervision function according to VDE 0126-1-1 with different country settings, redundant signal generation with signal output to external and internal disconnection relays
Output	Signal output	Opto decoupled, potential free, **polarity sensitive** Voltage: < 30 Vdc Current: < 100 mA
Internal Relay	Contact rating (AVS76.391/309 only)	> 10 A Basic isolation over open contacts
	Switching behaviour internal relay	Internal relay opens delayed to signal relay
Interface	Serial service interface (ENS only)	Opto decoupled on AVS76.391/309 Connector: RJ10
	Used service tool	OCIxxx

6.2 Power supply part on AVS76.39x/309

Power supply	Rated voltage	AC 230 V
	Input voltage range	170 – 270 Vac
	Rated frequency	50 / 60 Hz
	Max. power consumption	115 W at rated output
	Fusing of supply lines	max. 16 AT
	Internal fusing	3.15 A
	Inrush current	15A
Wiring of terminals	Power supply and outputs	RAST 5 connection system
	Earth connection	Same Earth connection used as grid supervision module
Output	Voltage Factory setting (no load)	24 Vdc (±1%)
	Current (nominal)	4 A
	Output characteristics	Current limiting below 6A
	Buffer time	> 40 ms at U_{in} = 230 Vac and nominal load

6.3 General data AVS76.39x/309

Degree of protection and safety class	Degree of protection EN 60 529	IP00	
	Safety class to EN 60 730	I safety class I (with ground wire), after correct installation	
	Degree of contamination to EN 60 730	normal contamination Degree of pollution: 2	
Standards, safety, EMC, etc.	CE conformity to		
	Low-voltage directive	2006/95/EC	
	- Electrical safety	- EN 60335	
Climatic conditions	For devices without batteries:		
	Storage to IEC721-3-1 class 1K3	temperature –20...70 °C	
	Transport to IEC721-3-2 class 2K3	temperature –20…70 °C	
	Operation to IEC721-3-3 class 3K5	temperature 0…55 °C (no condensing)	
Mounting	Orientation	Vertical PCB with connectors on top	
	Ventilation needs	Free convection cooling needed Case has to be designed with suitable ventilation	
	Thermal Design Power in variation output load on PSU	@ 2A @ 3A @ 4A	11 W 15 W 16 W
Dimensions	Length x Width:	255 x 85 mm	
	Height:	AVS76.390/309:	48 mm
		AVS76.391/309:	55 mm
Weight	Weight (excl. packaging)	AVS76.390/309:	350 g
		AVS76.391/309:	470 g

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