

1.1.4 Machinery Directive

In accordance with the Machinery Directive 89/392/EC, it should be ensured that if SIMADYN D fails or executes an incorrect function, that this does not result in the machine/system going into a potentially hazardous condition. This must always be taken into account when configuring the machine/system.

The system may not be commissioned until it has been proven that the final product is in conformance with the Directive.

Low-Voltage Directive

The Low-Voltage Directive 73/23/EC is only applicable for products with supply voltages of ≥ 50 V AC and/or > 75 V DC.

For SIMADYN D, this involves the following components:

- SP 7 6DD 1683-0BB0
- SP 8.5 6DD 1683-0BC0
- SP 9.5 6DD 1683-0BE5
- SP 22.5 6DD 1683-0CC5
- SP 23.5 6DD 1683-0CD5
- SB 60 6DD 1681-0AF4
- SB 70 6DD 1681-0AG2
- SRT 400 6DD 1662-0CG0

These components correspond to the requirements of the Low-Voltage Directive.



WARNING

Open equipment

SIMADYN D is regarded as open equipment. This means that you must always install SIMADYN D in a cubicle, cabinet or electrical control room that can only be accessed using a key or tool. Only trained or authorized personnel are allowed access to such cubicles, cabinets or electrical operating rooms.

1.1.4.1 SIMADYN D outputs



DANGER

When the equipment is powered-up or powered -on, the outputs have undefined statuses while the power supply voltages are running-up. This fact must be taken into account when designing the system.

2.2 Sub racks SR12 and SR24

Order No. Sub racks SR12.x and SR24.x are available for different supply voltages and with or without fan.

	Order No.	Supply voltage	Fan	Power supply type
SR12.1	6DD1682-0CC0	24 V DC	yes	SP22
SR12.2	6DD1682-0CD0	24 V DC	no	SP23
SR12.3	6DD1682-0BC3	115/230 V AC	yes	SP22.5
SR12.4	6DD1682-0BC4	115/230 V AC	no	SP23.5

SR24.1	6DD1682-0BC0	24 V DC	yes	SP8
SR24.2	6DD1682-0BE0	24 V DC	no	SP9
SR24.3	6DD1682-0CE3	115/230 V AC	yes	SP8.5
SR24.4	6DD1682-0CE4	115/230 V AC	no	SP9.5

Description The sub racks accommodate SIMADYN D modules with the format (H×T) 233.4 × 220 mm².
An integrated power supply provides the necessary voltages for the modules via 2 backplane buses (**L bus**, **C bus**) and permits data transfer between them.

Number of slots SR12.x: **12**
SR24.x: **24**
The slots are identified by a labeling strip.

2.2.1 Power supply

The power supply plugs into the SIMADYN D rack.

Line filter The power supply has a line filter which limits the radio interference voltage to limit value class A in accordance with VDE 0871.

Front panel elements

- Green LED: Error-free operation
- Red LED: Fault condition
- Compartment for the back-up battery
- Supply voltage connection (screw/plug-in terminal X1)
- Connection for an external back-up battery via screw/plug-in terminal X3 (this is optional to a back-up battery which can be inserted in the sub rack itself)
- Reset (cold restart of the modules) by
 - Depressing the reset button
 - Jumpering pins 1 and 2 at connector X4

- Test sockets to check the 3 output voltages 5 V, +/-15 V (short-circuit proof)

Supply connection

The line supply voltage is connected through the 3-pole screw/plug-in terminal X1.

The connection assignment is printed on the front panel:

Above the voltage selector switch (Slide switch) can be switched to between an input nominal voltage from 230 V and 115 V.

The in each case valid value becomes visible with transfer of the switch.

	SR12.1 and SR12.2 SR24.1 and SR24.2	SR12.3 and SR12.4 SR24.3 and SR24.4
Input voltage	24 V DC	230 V AC (default setting of voltage selector switch) 115 V AC (change over voltage selector switch)
X1 Pin 1	+24 V	Phase conductor L
X1 Pin 2	Ground (0 V)	Neutral conductor N
X1 Pin 3	Protective ground conductor PE	Protective conductor PE
External fuse (rating)	For SR12.x: In = 16 A max.. I ² t= 6 A ² s Is = 32 A (inrush peak) For SR24.x: In = 32 A max.. I ² t= 10 A ² s Is = 64 A (inrush peak)	For SR12.x: (AC230V) In = 1.2 A max.. I ² t= 0.6 A ² s Is = 6 A (inrush peak) For SR24.x: (AC230V) In = 2.7 A max.. I ² t= 1 A ² s Is = 9 A (inrush peak)
X2 pins 1 - 4	Monitoring the power supply and fan assembly (relay)	
X3 pins 1 - 2	Feed for an external back-up battery	
X4 pins 1 - 2	Reset: A reset is initiated by jumpering the contents (optional to using the reset button)	

The specified current In is the current that can occur at a maximum insertion of the subrack. The power supplies are in part oversized, and have a higher maximum input current (Chapter: Technical dates).

NOTES

The **protective conductor** must be connected at connector X1, pin 3. It is not sufficient to connect a protective conductor at the subrack.

It must be a slightly accessible circuit breaker in the supply circuit.

Interface modules with binary output function **SB70, SB71** should be powered-up approximately 200 ms before the modules are powered-up to prevent power-on effects.

This is achieved by **simultaneously powering-up** the subrack power supplies (this requires approximately 200 ms to establish the voltages) and the interface modules.

There are following fuses on the printed circuit board of the power supplies:

Power supply	Fuse	Type	Voltage rated value
SP22.5/SP23.5	F601	T4A H	250 V
SP8.5	F400	T8A H	250 V

NOTE

The power supply PC boards are suitable for the connection to IT systems.

2.2.2 Voltage monitoring functions

Input voltage

The input voltage is monitored for undervoltage and overvoltage conditions.

Input voltage	Response
Undervoltage: SRx.1/SRx.2: < 20 V or SRx.3/SRx.4: < 170 ...175 V	Green OK-LED goes dark The output voltages are shutdown; CPU stop (DSAVE signal) The system automatically restarts when the input voltage increases to approx. 196 V.
Overvoltage SRx.1/SRx.2: > 32 V or SRx.3/SRx.4: > approx. 265 V	Red fault LED is lit; The output voltages are shutdown, CPU stop (DSAVE signal) Automatic restart

Output voltage

All of the output voltages are monitored for an undervoltage condition (e.g. as a result of overload/short-circuit)

Undervoltages at the output	Response
V (5 V) < 4.7 ... 4.85 V (for $t > 100\text{-}200\ \mu\text{s}$)	Red fault LED is lit The output voltages are shut down; (CPU stop) No automatic restart (the line supply voltage must be disconnected)
V (+ 15 V) < approx. 14 V V (- 15 V) > approx. -14 V	Red fault is lit 5V voltage remains System failure message

System failure message

The associated module (under the „STOP“ tab) is configured in HWConfig under "object properties" to define how the module behaves when a system failure message is output (bus signal *RDYIN=low):

- Modules can reset their binary and analog outputs
- CPU modules can go into the "stop" condition ("H")

2.2.7 Technical data

Input voltages

DC-input

	Supply voltages	
	24 V DC	DC 24 V
	SR12.1 SR12.2	SR24.1 SR24.2
Input voltage range	20 ... 30 V	20 ... 30 V
Input current	16 A	32 A
Non-periodic overvoltages acc. to DIN VDE160, A5.3.1.1.2		
Max. voltage	35 V	
Duration	500 ms	
Recovery time, min.	50 s	
Events per hour	-	
Brief voltage dips acc. to DIN VDE 0160, A5.3.1.1.3		
Voltage	0 V	
Duration	5 ms	
Recovery time, min.	0.1 s	
Events per hour	max. 10	

Input voltages

AC-input

	Connecting voltages	
	AC 115/230 V SR12.3 SR12.4	AC 115/230 V SR24.3
Input voltage range	+ 10% / - 15%	+ 10% / - 15%
Input frequency	47.5-62.5 Hz	47.5-62.5 Hz
Input current	4 / 2 A	9 / 4 A
Aperiodic overvoltages acc. to DIN VDE160, A5.3.1.1.2		
Max. voltage	460 V	
Duration	1.3 ms	
Recovery time at least	0.1 s	
Events per hour	max. 10	
Short-term voltage drops acc. to DIN VDE 0160, A5.3.1.1.3		
Voltage	0 V	
Duration	10 ms	
Recovery time at least	10 s	
Events per hour	-	

Output voltages

Output voltage 5 V	+5.1 V +/- 0.1 V
Output current	SR12: 0 to 26 A SR24: 0 to 52 A
Ripple	< 50 mV _{pp}
Commutating spikes	< 5% (of 5V)
Base load	Guaranteed when a CPU module is inserted
Overvoltage protection	With suppressor diode, to protect the modules
Stabilization time	< 80 ms after U _{in} = 230 V; < 1 ms after a load step (0.5 -> 1) * I _{rated}

Output voltage +15 V	+15 V +/- 0.3 V
Output current	SR12: 0 to 3.3 A SR24: 0 to 6.5 A
Ripple	< 150 mV _{pp}
Base load	Guaranteed by an inserted module which requires this voltage

Output voltage -15 V	-15 V +/- 0.3 V
Output current	SR12: 0 to 3.0 A SR24: 0 to 6.0 A
Ripple	< 150 mV _{pp}
Base load	Guaranteed by an inserted module which requires this voltage

General data

	SR12	SR24
Dimensions in mm (W x H x D)	298.5 x 508.5 x 320	542 x 508.5 x 320
Weight	10.5 - 11 kg	16.2 - 17.3 kg

Radio interference suppression level	Limit value class B acc. to VDE 0871
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