Table 2- 2 Environmental conditions

Degree of protection	IPXXB according to EN 60529, open type according to UL 508
Protection class, line supply circuits **Electronic circuits**	I (with protective conductor connection) safety extra-low voltage PELV / SELV
Type of cooling	Internal air cooling, power units with forced air cooling using an integrated fan
Permissible cooling medium temperature (air) and installation altitude in operation	0° C to +40° C and an installation altitude of up to 1000 m without derating, >40° C to +55° C, see derating characteristics Installation altitude >1000 m to 4000 m refer to the characteristic for current derating or reduction of the ambient temperature by 3.5 K per 500 m.
Chemically active substances	
Long-term storage in the transport packaging	Class 1C2 according to EN 60721-3-1
Transport in the transport packaging	Class 2C2 according to EN 60721-3-2
Operation	Class 3C2 according to EN 60721-3-3
Biological environmental conditions:	
Storage in the transport packaging	Class 1B1 according to EN 60721-3-1
Transport in the transport packaging	Class 2B1 according to EN 60721-3-2
Operation	Class 3B1 according to EN 60721-3-3
Vibratory load	
Long-term storage in the transport packaging	Class 1M2 according to EN 60721-3-1
Transport in the transport packaging	Class 2M3 according to EN 60721-3-2
Shock load	
Long-term storage in the transport packaging	Class 1M2 according to EN 60721-3-1
Transport in the transport packaging	Class 2M3 according to EN 60721-3-2
Operation	Class 2M2 according to EN 60721-3-2
Blocksize format FSA to FSB	Test values: 147 m/s^2 (15g)/11 ms
Blocksize format FSC to FSF	Test values: 49 m/s^2 (5g)/30 ms
Chassis format	Test values: 98 m/s^2 (10g)/20 ms
Climatic ambient conditions	
Long-term storage in the transport packaging	Class 1K4 according to EN 60721-3-1 Temperature: -25° C to +55° C
Transport in the transport packaging	Class 2K4 according to EN 60721-3-2 Temperature: -40° C to +70° C
Operation	Class 3K3 according to EN 60721-3-3 Temperature +0° C to +40° C Relative humidity: 5% to 90% Oil mist, salt mist, ice formation, condensation, dripping water, spray, splash water, water jets are not permitted

Table 2- 3 Certificates

Declarations of Conformity	CE (Low-Voltage and EMC Directive)
Approvals	cULus cURus

2.6 Derating as a function of the ambient temperature, pulse frequency, and installation altitude

Preliminary remark

The air pressure and therefore the air density drop at altitudes above sea level. At these altitudes, the same quantity of air does not have the same cooling effect and the air gap between two electrical conductors can only insulate a lower voltage. Typical values for air pressure are summarized in the table below:

Table 2- 4 Air pressure for various installation altitudes

Installation altitude above sea level in [m]	0	1000	2000	3000	4000
Air pressure in mbar [kPa]	100	90	80	70	62

Derating

The Power Modules are designed for operation under the following conditions:

- Ambient temperature 0° C up to 40° C
- The pulse frequency specified for each Power Module
- Installation altitude of up to 1000 m above MSL for Blocksize Power Modules.
- Up to 2000 m above MSL for Chassis Power Modules.

If you operate the Power Modules at higher ambient temperatures, pulse frequencies, or installation altitudes, you must reduce the output current.

You will find the reduction factors for the individual units in the technical data of the relevant Power Modules.

The maximum permissible ambient temperature for all Power Modules is 55° C.

A TN or TT system with grounded neutral point is required (no grounded phase conductor) for installation altitudes above 2000 m. If the neutral point is not grounded, an isolating transformer must be connected upstream for which the secondary windings are grounded at the neutral point.

A reduction of the line supply voltage phase-phase is not necessary.