



Switch Cabinet Air Conditioning

The principle of Peltier cooling is similar to that of an electronic heat pump. The Peltier elements transport heat energy from the cold exchanger in the switch cabinet interior to the heat exchanger on the switch cabinet exterior. The warm air inside the switch cabinet is blown into the cold exchanger by a fan and thereby cooled. The heat exchanger on the switch cabinet exterior is then cooled by ambient air. The advantage of Peltier cooling is its functional reliability. There are no fluids and thus no danger of leakage. In addition,

our switch cabinet coolers can therefore be used in moving or accelerating systems. All DR.NEUMANN switch cabinet coolers are designed so that there is no air exchange between the switch cabinet interior and the surrounding air, even after installation. They are quickly and easily installed and interchangeable, due to identical installation dimensions for a specific size. Additionally we offer our surface coolers. They are ideal for the direct cooling of components and surfaces, e.g. for cooling mounting plates in switch cabinets.



The direct thermal contact makes the units run extremely effectively and efficiently. All of our units of the "Standard", "LRC" and "AC" series, as well as our surface coolers, are equipped with temperature protection switches and alarm relays as standard. In addition, the exterior of all of our switch cabinet coolers is designed to comply with degree of protection IP67 / IP55, which guarantees the highest level of safety. Each of our units can be adapted to your individual operating conditions, e.g. equipping with special sensors, resizing, salt mist-resistant design, different power supply, etc. is possible.

Overview of Switch Cabinet Coolers

Our range of switch cabinet coolers consists of 30 standard types in 6 sizes:

Type	Series	Size	Weight	Nominal power	Supply voltage	Recooling	Degree of Protection (outdoor)	Safety systems	Function	Max A	UL	Page
MX-004-C	Mini	0	1 kg	33 W	24V-DC	Air	IP 55	-	Cooling/Heating	+70 °C	-	12-13
EL-104-C	Basic	1	2.5 kg	50 W	24V-DC	Air	IP 55	-	Cooling/Heating	+70 °C	-	16
EN-104-C	Basic	1	2.5 kg	70 W	24V-DC	Air	IP 55	-	Cooling/Heating	+70 °C	-	16
ER-104-C	Basic	1	2.5 kg	100 W	24V-DC	Air	IP 55	-	Cooling/Heating	+70 °C	-	16
EL-208-C	Basic	2	5 kg	100 W	24V-DC	Air	IP 55	-	Cooling/Heating	+70 °C	-	17
EN-208-C	Basic	2	5 kg	140 W	24V-DC	Air	IP 55	-	Cooling/Heating	+70 °C	-	17
ER-208-C	Basic	2	5 kg	200 W	24V-DC	Air	IP 55	-	Cooling/Heating	+70 °C	-	17
FL-104-C	Standard	1	2.5 kg	50 W	24V-DC	Air	IP 67	yes	Cooling/Heating	+70 °C	yes	20
FN-104-C	Standard	1	2.5 kg	70 W	24V-DC	Air	IP 67	yes	Cooling/Heating	+70 °C	yes	20
FR-104-C	Standard	1	2.5 kg	100 W	24V-DC	Air	IP 67	yes	Cooling/Heating	+70 °C	yes	20
FL-208-C	Standard	2	5 kg	100 W	24V-DC	Air	IP 67	yes	Cooling/Heating	+70 °C	yes	21
FN-208-C	Standard	2	5 kg	140 W	24V-DC	Air	IP 67	yes	Cooling/Heating	+70 °C	yes	21
FR-208-C	Standard	2	5 kg	200 W	24V-DC	Air	IP 67	yes	Cooling/Heating	+70 °C	yes	21
FL-316-C	Standard	3	10 kg	200 W	24V-DC	Air	IP 67	yes	Cooling/Heating	+70 °C	yes	22-23
FN-316-C	Standard	3	10 kg	280 W	24V-DC	Air	IP 67	yes	Cooling/Heating	+70 °C	yes	22-23
FR-316-C	Standard	3	10 kg	400 W	24V-DC	Air	IP 67	yes	Cooling/Heating	+70 °C	yes	22-23
HL-104-C	HL	1	2.5 kg	50 W	24V-DC	Air	IP 67	yes	Cooling/Heating	+90 °C	-	26-27
HL-208-C	HL	2	5 kg	100 W	24V-DC	Air	IP 67	yes	Cooling/Heating	+90 °C	-	26-27
HL-316-C	HL	3	10 kg	200 W	24V-DC	Air	IP 67	yes	Cooling/Heating	+90 °C	-	26-27
FL-208-AC	AC	2	6 kg	100 W	90...305 V-AC, 47...63 Hz	Air	IP 67	yes	Cooling	+70 °C	yes	30
FR-208-AC	AC	2	6 kg	200 W	90...305 V-AC, 47...63 Hz	Air	IP 67	yes	Cooling	+70 °C	yes	30
FL-416-AC	AC	4	12.5 kg	200 W	90...305 V-AC, 47...63 Hz	Air	IP 67	yes	Cooling	+70 °C	yes	31
FR-416-AC	AC	4	14.5 kg	400 W	90...305 V-AC, 47...63 Hz	Air	IP 67	yes	Cooling	+70 °C	yes	31
FL-508-AC	AC	5	25 kg	450 W	90...305 V-AC, 47...63 Hz	Air	IP 67	yes	Cooling	+70 °C	-	32-33
FR-508-AC	AC	5	25 kg	900 W	90...305 V-AC, 47...63 Hz	Air	IP 67	yes	Cooling	+70 °C	-	32-33
XFL-208-AC	AC	2	6 kg	100 W	90...305 V-AC, 47...63 Hz	Air	IP 67	yes	Cooling/Heating	+70 °C	-	34
XFR-208-AC	AC	2	6 kg	200 W	90...305 V-AC, 47...63 Hz	Air	IP 67	yes	Cooling/Heating	+70 °C	-	34
XFL-416-AC	AC	4	12.5 kg	200 W	90...305 V-AC, 47...63 Hz	Air	IP 67	yes	Cooling/Heating	+70 °C	-	35
XFR-416-AC	AC	4	14.5 kg	400 W	90...305 V-AC, 47...63 Hz	Air	IP 67	yes	Cooling/Heating	+70 °C	-	35
LR-208-AC	LRC	2	5 kg	200 W	24V-DC	Water	IP 67	yes	Cooling/Heating	+90 °C	-	36-37

All of our switch cabinet coolers can be customized.

* Max. ambient temperature

Performance Curves

The performance diagrams of our coolers show the results of a long series of in-house tests for every single device type. They depict the exact performance of a cooler relative to the ambient temperature and internal temperature of the control box. For the layout design, the operating point is first assumed, which means that the cooling capacity of the Peltier device corresponds exactly with dissipation loss in the control box. That keeps the internal temperature stable. In order to determine this, the dissipation loss is first located on the X-axis of the diagram and a vertical line is drawn through it. On the Y-axis, a horizontal line is then drawn through the intersection of this vertical line

and the line for maximum ambient temperature. The adjusting internal box temperature can now be read on this horizontal line. If the temperature is too high, the next larger cooler model is tested in the same way. If the internal temperature is clearly too low, a smaller cooler type can be used. If the exact cooling capacity of a device at a given temperature needs to be determined, a horizontal line is first drawn through the corresponding internal temperature on the Y-axis. A vertical line is then drawn down to the X-axis through the intersection of the horizontal line and the coded maximum ambient temperature line. This indicates the exact cooling capacity of the device.

