nVent SCHROFF
LHX+

Description MIB File

Release 0.9 Preliminary
03.03.2022

1 LHX+ overview

The nVent SCHROFF LHX+ product family are closed electronics cabinets with integrated air-to-water heat exchangers installed at the bottom of the 19" plane.

1	Controller box	5	Warm air temperature sensor top
2	Cold air temperature sensor top	6	Warm air temperature sensor bottom
3	Cold air temperature sensor bottom	7	Cooling module
4	Door contact	8	Display

![nVent SCHROFF logo]

Cooling module 10 kW
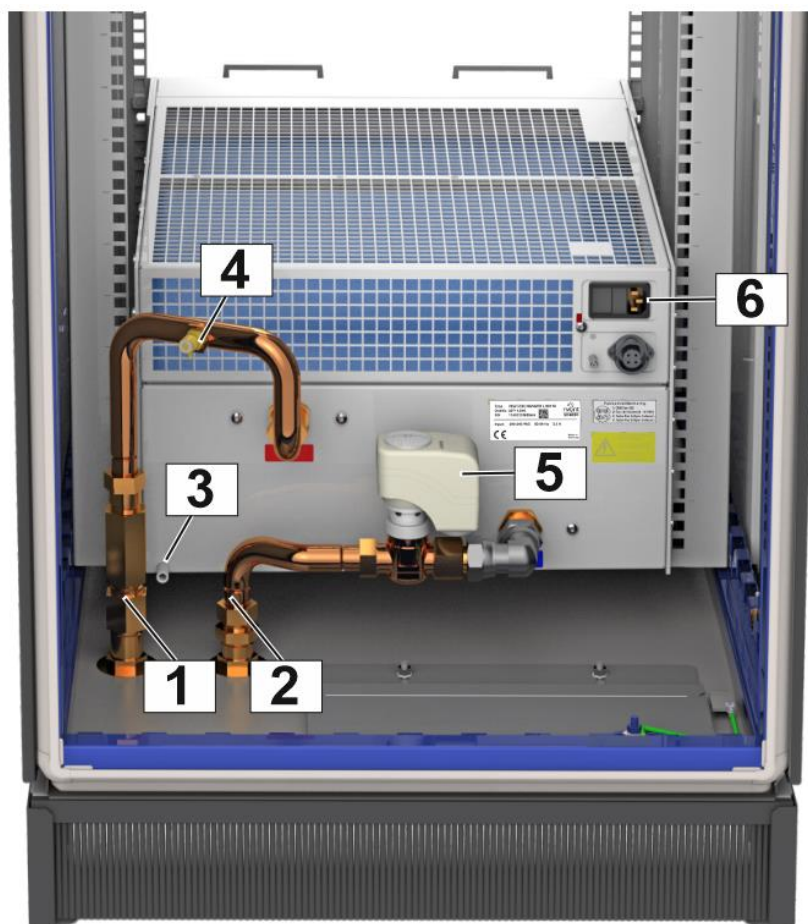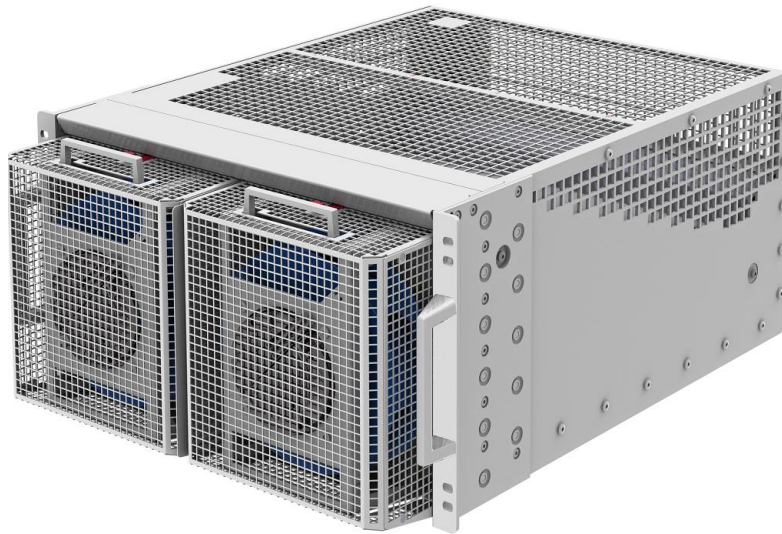
1	Water outlet	4	Bleeding valve
2	Water inlet	5	Actuator water valve
3	Condensate drain (10 mm)	6	Fused mains input IEC60320-C14

1.1 Functional description

The cooling system consists of an air loop and a water loop.

The fans of the cooling unit draw warm air from the rear section of the cabinet and into an air/water heat exchanger. The air is cooled down and then blown into the front area of the cabinet.

Inside the air/water heat exchanger the heat energy of the warm air is transferred to the medium of water. The air/water heat exchanger is connected to an external reciprocal chiller unit (not supplied with the module), where the water is cooled down again.
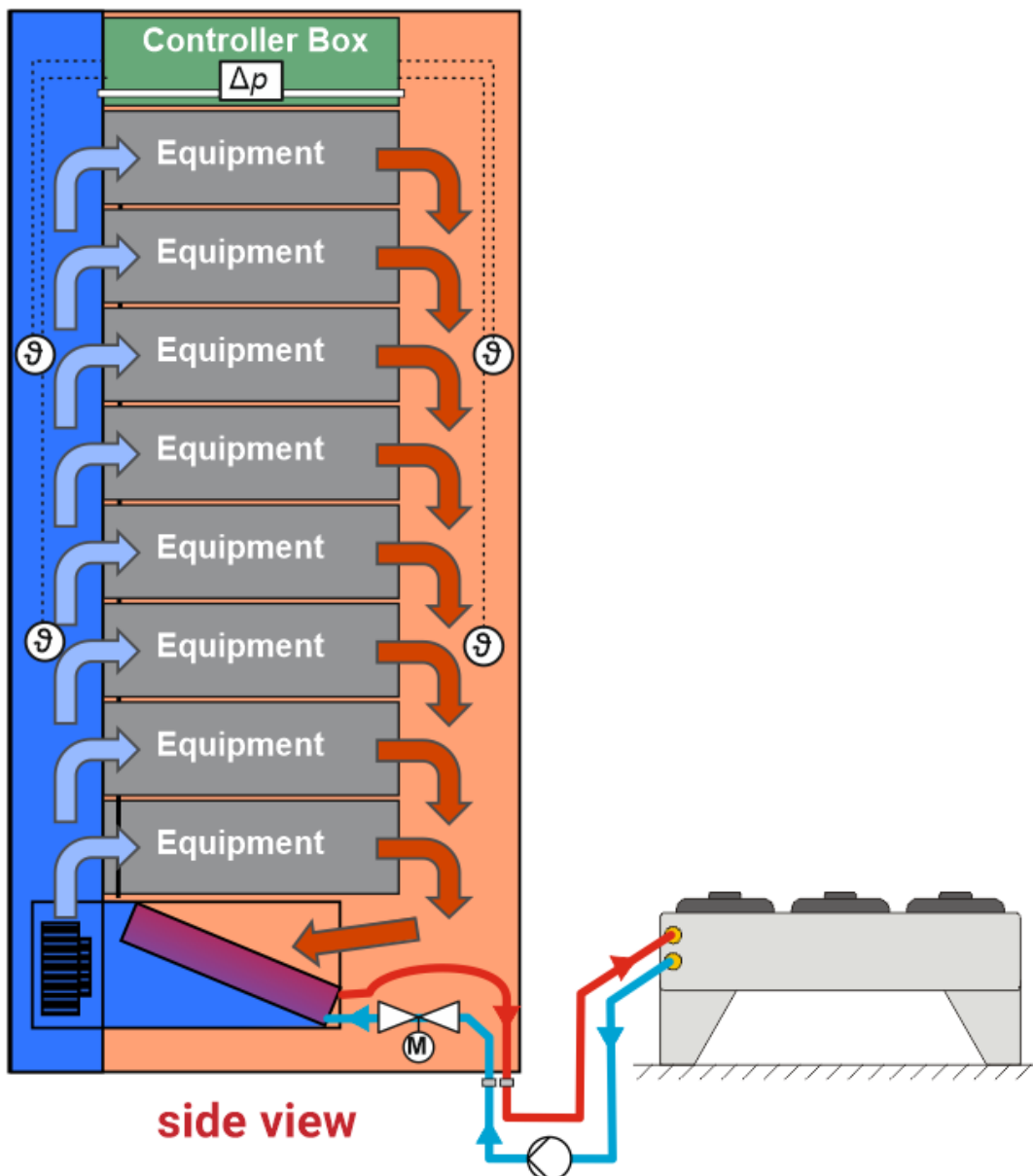
The water inlet temperature and the cooling water flow and the air flow determine the cooling capacity of the cooling module.

1.2 Cooling capacity control

Controller Box

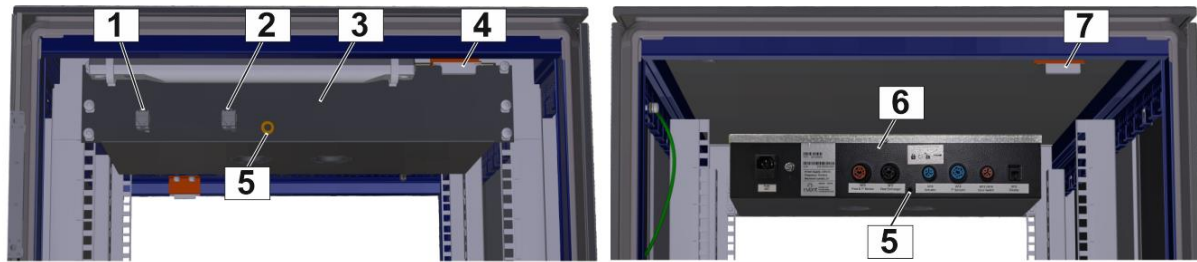|			
1	RJ45 connector Ethernet	5	Air inlet for differential pressure sensor
2	RJ45 connector RS485 (Modbus RTU)	6	Controller box rear view
3	Controller box front view	7	Door contact rear door/rear panel
4	Door contact front door		

The LHX+ controller is located together with the differential pressure sensor in a 2 U / 19" controller box (6) at the top of the cabinet.

The controller drives an electromechanical control valve in the water circuit to regulate the flow of water through the heat exchanger as a function of the heat load. The control variable is the data from the cold air temperature sensors.

In order to compensate for temperature stratification, the cold air temperature is measured by 2 temperature sensors at different heights. As control variable the temperature of the lower, the upper or the average value of these temperature sensors can be used as a reference. The air flow rate also has an influence on the cooling capacity, the controller can either set the fan speed to a fixed value of 20 % -100 % or adjust it depending on the differential pressure.

2 MIB Description

SNMP enables the acquisition of sensor values such as temperature, differential pressure, fan speeds or water flow, the setting of operating parameters or alarm thresholds, and the readout of alarms assigned to the sensors.

Overview of the most important variables of the MIB file
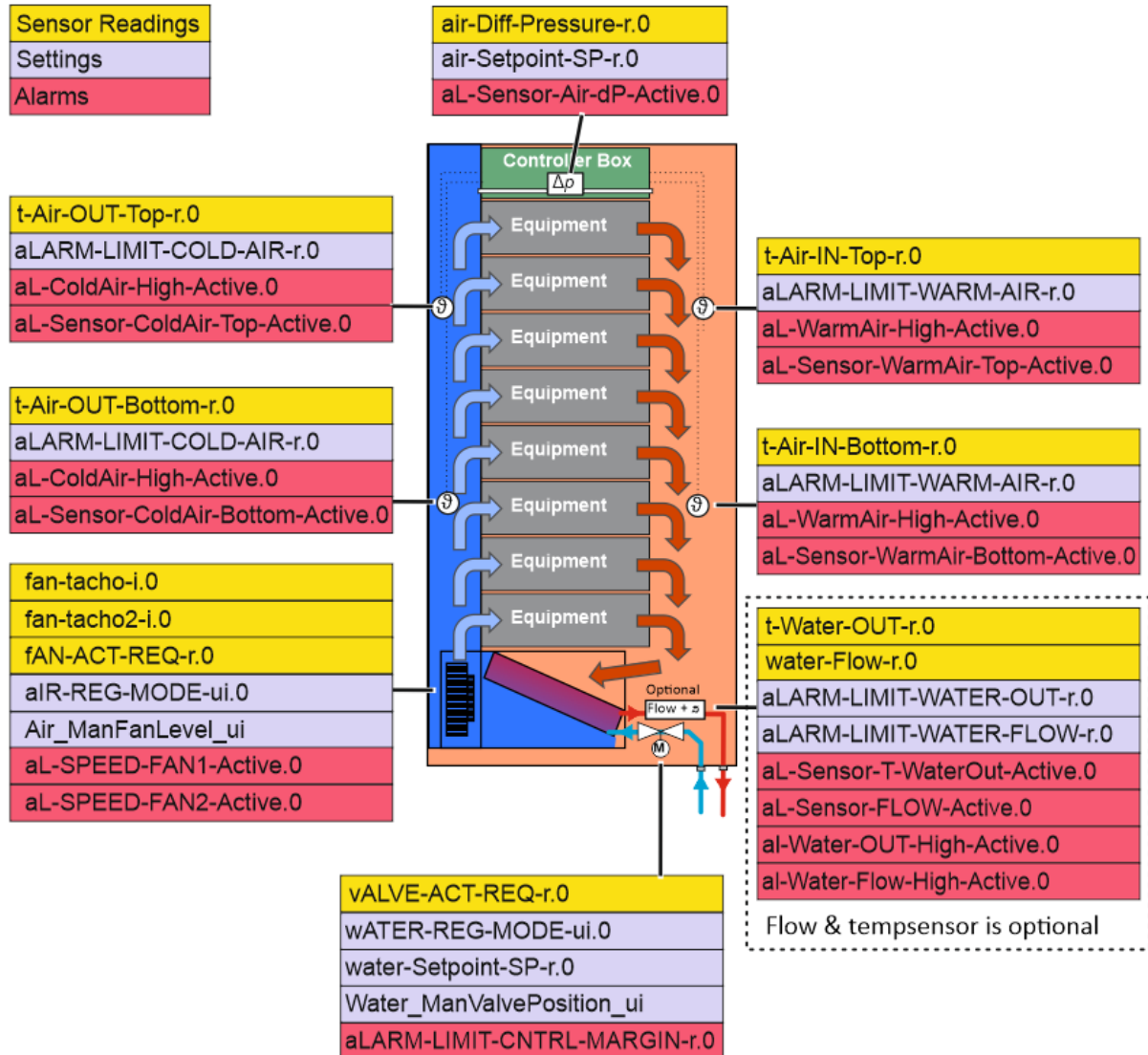
MIB Variables

OID	1.3.6.1.4.1.16394.200.1.1.xx			

xx	Variable	Value (examples)		Description
1	oEM-Version-DevicePN-udi.0	0	R/W	OEM Hardware Part Number
2	oEM-Version-DeviceSN-udi.0	0	R/W	OEM Hardware Revision
3	oEM-Version-Main-udi.0	63998256	Read	Schroff Software Part Number
4	oEM-Version-Sub-ui.0	52	Read	Schroff Software Revision Number
5	hourCount-System-udi.0	20	Read	Operating hour counter (h)
6	unitOn.0	true (1)	Read	Unit On status: TRUE = Unit ON
7	pOU-Unit-Mng-BmsOn.0	true (1)	Read	Unit On/Off by BMS: TRUE = Unit ON
8	unit-Alarm.0	true (1)	Read	Aggregated alarm status: TRUE = Alarm
9	door-Open.0	false (2)	Read	Door Open status: TRUE = Open
10	waterLevel-High.0	false (2)	Read	Condensate water Level status: TRUE = High
11	mAX-COOLING.0	false (2)	R/W	Manual Max Cooling request: 1 = True
12	wATER-REG-MODE-ui.0	3	R/W	Valve Control Mode: 0 = Manual 1 = T Air Out Top 2 = T Air Out Bottom 3 = T Air Out Average
13	water-Setpoint-SP-r.0	24.0	R/W	Setpoint Water: 20 - 40 ° C
14	Water_ManValvePosition_ui	5.0	R/W	Manual valve position: 0 - 100 % (1/10)
15	vALVE-ACT-REQ-r.0	100.0	Read	Valve Opening Request 0-100 %
16	aIR-REG-MODE-ui.0	0	R/W	Fan Control Mode 0 = Differential Pressure 1 = Manual
17	air-Setpoint-SP-r.0	15.0	R/W	Setpoint Differential Air Pressure (pa)
18	air-Diff-Pressure-r.0	15.1	Read	Air Differential Pressure (pa)
19	Air_ManFanLevel_ui	2.0	R/W	Manual Fan Level: 20 - 100 % (1/10)
20	fAN-ACT-REQ-r.0	100.0	Read	Fan Speed Request 0-100 %
21	fan-tacho-i.0	2050	Read	Speed Fan 1 [rpm]
22	fan-tacho2-i.0	2070	Read	Speed Fan 2 [rpm]
23	aL-SPEED-FAN1-Active.0	true (1)	Read	Alarm Fan Speed too low
24	aL-SPEED-FAN2-Active.0	true (1)	Read	Alarm Fan Speed too low
25	t-Air-OUT-Top-r.0	21.0	Read	Temperature cold air top (° C)
26	t-Air-OUT-Bottom-r.0	21.0	Read	Temperature cold air bottom (° C)
27	t-Air-IN-Top-r.0	26.0	Read	Temperature warm air top (° C)
28	t-Air-IN-Bottom-r.0	26.0	Read	Temperature warm air bottom (° C)
29	t-Water-OUT-r.0	_		Temperature water outlet (° C)
30	water-Flow-r.0	_		Water flow rate
31	dO-Alarm3-Val.0	true (1)	Read	Status Output Alarm 1

32	dO-Alarm4-Val.0	false (2)	Read	Status Output Alarm 2
33	dO-Alarm5-Val.0	false (2)	Read	Status Output Alarm 3
34	aLARM-LIMIT-WARM-AIR-r.0	55.0	R/W	Alarm Limit Warm Air (° C)
35	aLARM-LIMIT-COLD-AIR-r.0	35.0	R/W	Alarm Limit Cold Air (° C)
36	aLARM-LIMIT-WATER-OUT-r.0	30.0	R/W	Alarm Limit Water Outlet Temp (° C)
37	aLARM-LIMIT-WATER-FLOW-r.0	100.0	R/W	Alarm Limit Water Flow (° C)
38	aLARM-LIMIT-CNTRL-MARGIN-r.0	4.0	R/W	Alarm Limit Control Margin (° C)
39	aL-Sensor-ColdAir-Top-Active.0	true (1)	Read	Alarm Cold Air sensor top broken: TRUE = Alarm
40	aL-Sensor-ColdAir-Bottom-Active.0	true (1)	Read	Alarm Cold Air sensor bottom broken: TRUE = Alarm
41	aL-Sensor-WarmAir-Top-Active.0	true (1)	Read	Alarm Warm Air sensor top broken: TRUE = Alarm
42	aL-Sensor-WarmAir-Bottom-Active.0	true (1)	Read	Alarm Warm Air sensor bottom broken: TRUE = Alarm
43	aL-Sensor-FLOW-Active.0	false (2)	Read	Alarm Warm flow sensor broken: TRUE = Alarm
44	aL-Sensor-T-WaterOut-Active.0	false (2)	Read	Alarm Water Outlet Temp Sensor broken: TRUE = Alarm
45	aL-Sensor-Air-dP-Active.0	false (2)	Read	Alarm Diff Air Sensor broken: TRUE = Alarm
46	aL-WarmAir-High-Active.0	true (1)	Read	Alarm Warm Air Limit Reached: TRUE = Alarm
47	aL-ColdAir-High-Active.0	true (1)	Read	Alarm Cold Air Limit Reached: TRUE = Alarm
48	aL-Control-Margin-Active.0	true (1)	Read	Alarm Control Margin Reached: TRUE = Alarm
49	al-Water-OUT-High-Active.0	false (2)	Read	AlarmWater Outlet Temp Limit Reached: TRUE = Alarm
50	al-Water-Flow-High-Active.0	false (2)	Read	Alarm Water Flow Limit Reached: TRUE = Alarm