NOVENCO®
NOVA™ AIR HEATERS VMA-VMB
Standard

Product facts

Product

The Novenco NoVa™ air heaters are water-based units with hot-water heating coils and axial flow fans fitted in cabinets.

- VMA for 10 to 20 °C cooling of heat media, typically boiler water or heat pump
- VMB for 30 to 40 °C cooling of heat media, typically district heating water

Application

The VMA-VMB air heaters for room heating are designed for use in industrial and work-shop buildings, halls, warehouses etc.

A range of accessories is available for all versions. These fit on the outlet for air distribution in varying supply patterns.

Installation of the VMA-VMB air heaters can be for horizontal or vertical air delivery.

Range

Five installation sizes with three coil sizes each and airflow rates from 0.2 to 2.2 m^3/s and heat outputs from 3 to 104 kW.

Materials

Fan and motor: Blades of aluminium, steel or plastic
Heating coil: Copper pipes with aluminium fins
Cabinet: Sendzimir galvanised sheet steel powder coated dark grey externally and with internal priming

Classifications

Corrosion standards: Operation in unheated low corrosive environments according to DS/EN ISO 12944-2
Corrosion category: C3

Data

The heating coils are designed for 10 bar working pressure and 20 bar test pressure.

Max. working temperature is 110 °C

Airflow rates are specified as volume flows (q_v) in m^3/s with an air density (ρ) of 1.20 kg/m^3.

Heat outputs are specified in kW.

Pipes are 5/4" with thread connections.

Delivery form

All parts are delivered in separate boxes.

The basic unit includes fittings, a drill jig, installation and maintenance instructions and installation screws for air distribution accessories.

Accessories for control

- Multi stage switches
- Stepless regulators
- Thermostats
- Dynamic valves
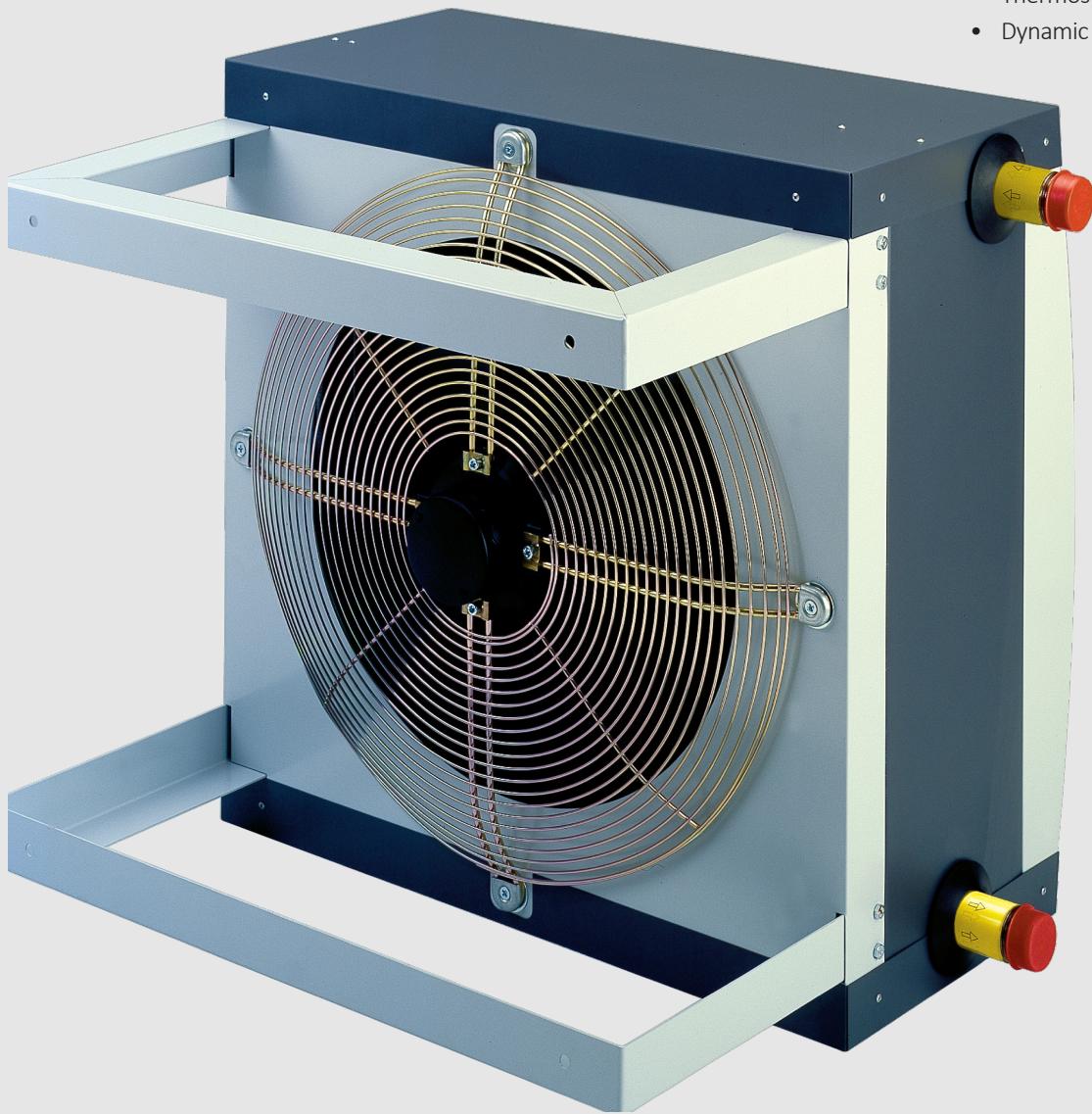
Heating requirements in buildings

Buildings are heated in different ways depending on requirements and layouts. Novenco's range of air heaters addresses this need and is designed for large rooms such as halls, workshops and sports centres.

Basis of calculations

Calculation of the heating requirement of buildings includes the transmission and ventilation losses.

The transmission loss (ΦT) depends on the difference between indoor and outdoor temperatures, the type of building components, the degree of insulation and a number of other factors.

The transmission calculation includes the heat gained from machines, lighting and persons.

The ventilation loss (ΦV) is directly dependent on the difference between outdoor and indoor temperatures and the mechanically supplied quantity of outdoor air.

ΦV $=$ $q \times \rho \times c \times (t_r - t_u)$ [W]

t_r $=$ Room temperature [°C]

t_u $=$ Outdoor temperature [°C]

q $=$ Airflow rate [m^3/s]

r $=$ Air density [1.20 kg/m^3]

c $=$ Air heat capacity [kJ/kg]

For installations without ventilation the supply temperature (t_1) of the heat source equals the room temperature (t_r).

In installations with ventilation the supply temperature equals the following.

$$t_1 = \frac{(t_u \times q_v) + (t_r \times q_r)}{q}$$

t_u $=$ Outdoor temperature [°C]

q_v $=$ Airflow rate, supplied outdoor air [m^3/s]

t_r $=$ Room temperature [°C]

q_r $=$ Airflow rate, circulating room air [m^3/s]

q $=$ To airflow rate through heat source [m^3/s]

The heat sources are dimensioned on the basis of the given conditions and the capacity data for the heat sources.

Experience values and estimates

An exact heat loss calculation is the basis for correct dimensioning of heat sources.

The empirical values in the table can be used to estimate the heating requirement in buildings with various degrees of insulation. They express the heating requirement in relation to the airflow rate. The dimensioning outdoor temperature is -12 °C.

Airflow rates

To ensure proper distribution of the heat, it is normally necessary to have a circulating airflow rate of at least three times per hour in room sections served by the heat source.

Building types	Heating requirements [W/m^3]
Buildings after Danish Building Code BR10 - BR15	10
Buildings with medium insulation or that have been re-insulated	15 - 20
Buildings with little insulation	25 - 30

Experience values for heating requirements

Principle of Air heaters

Air heaters are integrated units containing heating coils and fans. Primary application is for heating of large rooms through hot air delivery.

A number of advantages are connected with air heaters. They fall in three categories – spatial, operational and economic.

- Air heaters, which are easily installed on walls or under ceilings, take up little space and can be placed in well-suited locations with respect to the layout of the buildings.
- The supplied hot air mixes quickly with the room air and creates a circulating airflow that distributes the heat to all parts of the room.
- In rooms requiring forced air renewal, the air heaters can be fitted with accessories for taking in outdoor air. Thus they form a combined heating and ventilation system, which can be combined with roof extractors for corresponding extraction.

- Air heaters represent a very flexible heating and ventilation system that can be modified and extended in line with structural modifications.
- The system also allows for individual operation with changing heating and ventilation needs.

Air heaters represent an ideal heating system for industry and workshops, storage buildings and places with large ceiling heights.

NOVENCO Air heaters

The range includes two types.

- VMA for 10 to 20 °C cooling of heat media, typically boiler water or heat pumps
- VMB for 30 to 40 °C cooling of heat media, typically district heating water

The types are described in detail with accessories and technical data on the following pages.
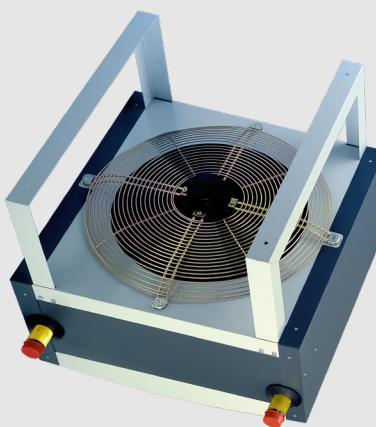
| Horizontal mount | Vertical mount | Heating by recirculation |
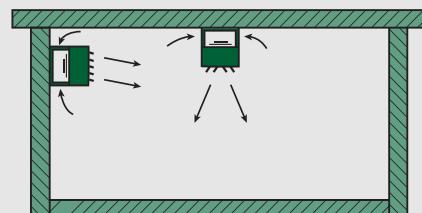
Products are shown with accessories.

NoVa system

The NoVa range consists of a number of air heaters for both horizontal and vertical installation.

The VMA and VMB are produced in five installation sizes with three coil sizes each and airflow rates ranging from 0.2 to 2.2 m^3/s and heating capacities from 3 to 104 kW.

The basic unit consists of an axial flow fan integrated with a fin heating coil. The outlet side on the unit can be fitted with accessories for air distribution in various designs.

VMA type

The VMA is typically used in connection with boiler water or heat pumps. The heat media is cooled between 10 and 20 °C.

The VMA can be installed horizontally or vertically.

VMB type

The VMB is typically used for district heating water. There is a 30 to 40 °C cooling of the heat media. The VMB can be installed horizontally or vertically with the pipe sockets on either side.

Types	Sizes				
VMA	42	52	62	72	82
	43	53	63	73	83
					84
VMB	43	53	63	73	83

NoVa-range

Construction

The motor and axial flow fan form an integrated unit.

The fan mount and guard net are of galvanised steel.

The heating coil consists of copper pipes with aluminium fins. The number of pipe rows varies depending on the desired heat output.

The fan unit and heating coil are integrated in a joint cabinet of sheet steel.

The collecting pipe for the heating coil has supply and return sockets lead out through the side of the cabinet. For best possible heat efficiency, the supply socket is closest to the front of the unit.

Surface treatment

The cabinet is Sendzimir galvanised. The inside is primed and the outside is powder coated.

The fan casing and mounting brackets are powder coated.

Accessories

Parts for air distribution, injection nozzles and mounting angles are powder coated.

The adjustable fins are of aluminium.

The front louvres are of aluminium.
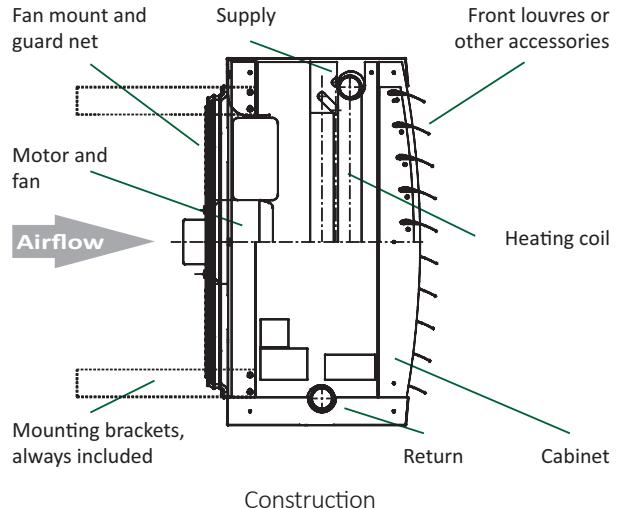
Construction

Construction system

Standard components

1. Base unit VMA/VMB

- fan and heating coil in one cabinet

Accessories

2. Front louvres J1

- with separately adjustable fins

3. Front louvres J2

- with separately adjustable fins in two opposite directions

4. Air distributor J4

- for horizontal air distribution at vertical inlet. Air distribution in four directions and with adjustable fins.

5. Injection nozzle K

- for beam shaped vertical inlet in high rooms
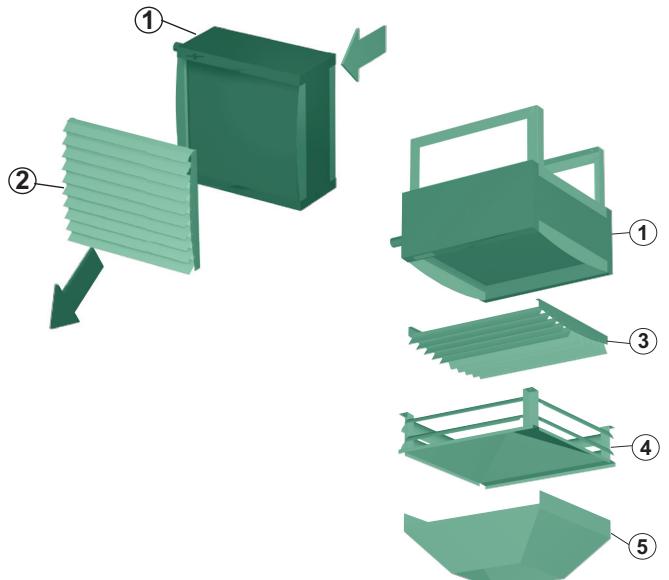
Other accessories

Fittings for installation of air heater on ceiling or wall are included with the base unit.

See section "Motors and regulators" on page 16 for details on control equipment for heating and ventilation.

Dimensions — Weights — Arrangements
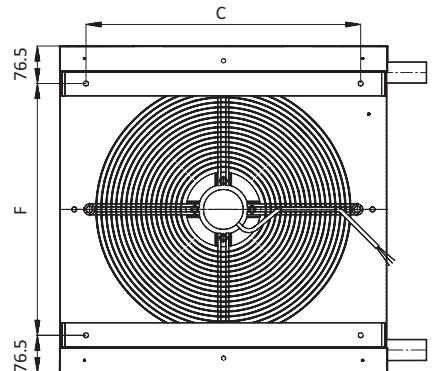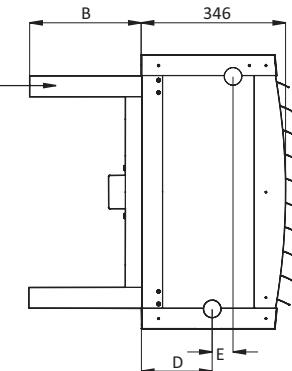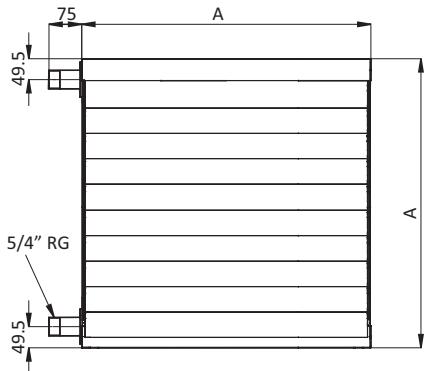
Sizes	A	B	C	D	E	F	Weight [kg]
VMA-42 VMA-43 / VMB-43	460	200	352.5	164	57 50	307	18 20
VMA-52 VMA-53 / VMB-53	560	225	452.5	164	57 50	407	27 30
VMA-62 VMA-63 / VMB-63	660	250	552.5	170	57 50	507	36 40
VMA-72 VMA-73 / VMB-73	760	275	652.5	180	57 50	607	45 50
VMA-82 VMA-83 / VMB-83 VMA-84	860	300	752.5	164 164 150	57 50 107	707	54 60 67

Designations	
J1	Front louvres, one direction
J2	Front louvres, two directions
J4	Air distributor
K	Injection nozzle
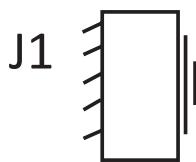
J1
J1
J2
(J4)
(K)

Accessories
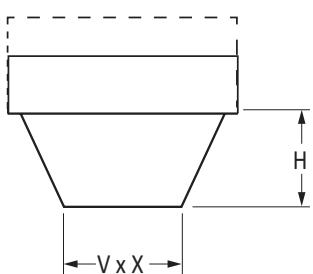
Injection nozzle K
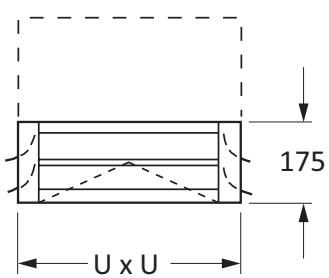
Air distributor J4

	Installation sizes [mm]				
	4-	5-	6-	7-	8-
U	458	558	658	758	858
V	222	298	332	397	449
X	205	278	329	407	474

Dimensions

	Installation sizes [kg]				
	4-	5-	6-	7-	8-
J1 [2]	1.5	2.4	3.6	5.0	6.6
J2 [2]	1.5	2.4	3.6	5.0	6.6
J4	3.7	4.9	6.2	7.6	9.3
K	1.6	2.5	3.5	4.8	6.2

Weights

Selection graphs

NoVa type VMA 80-60 °C / 18 °C
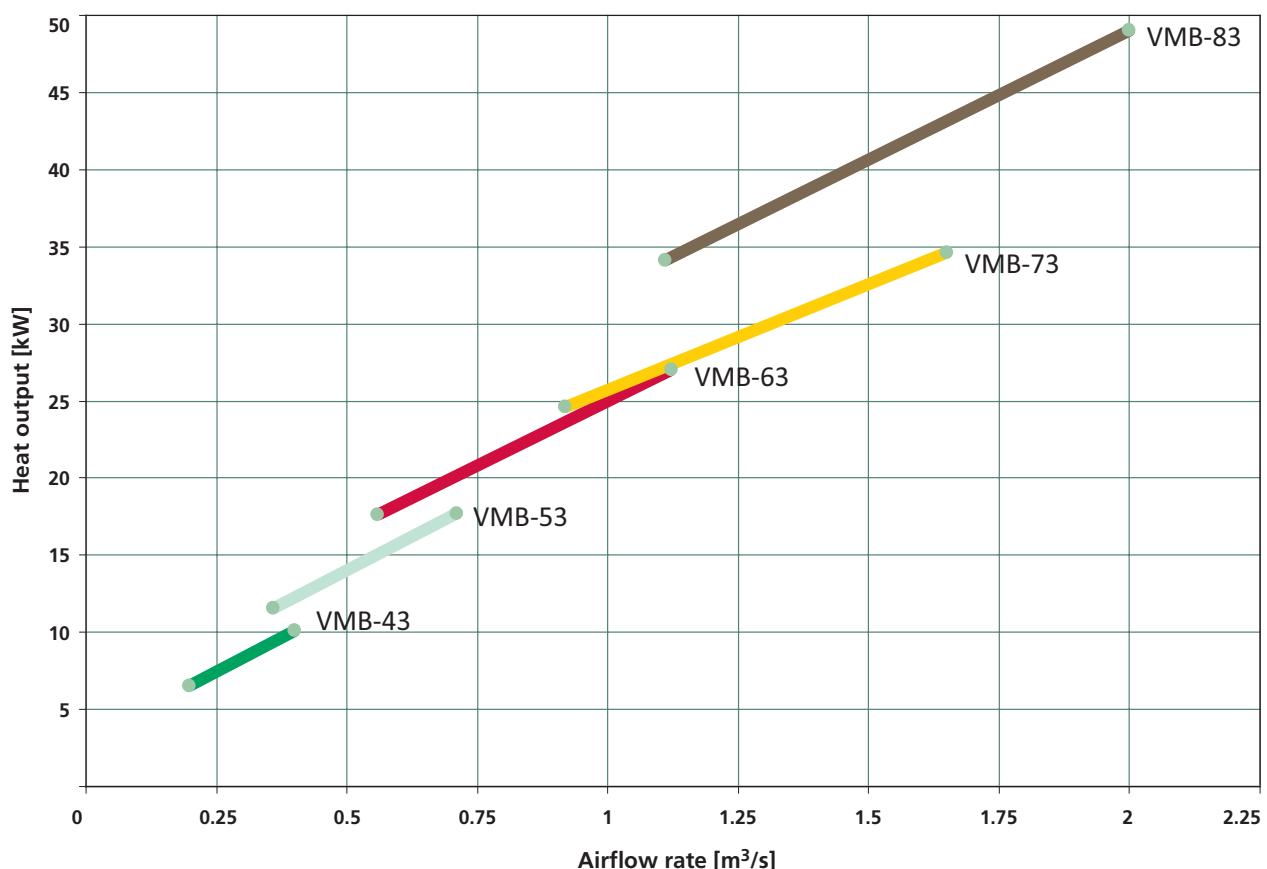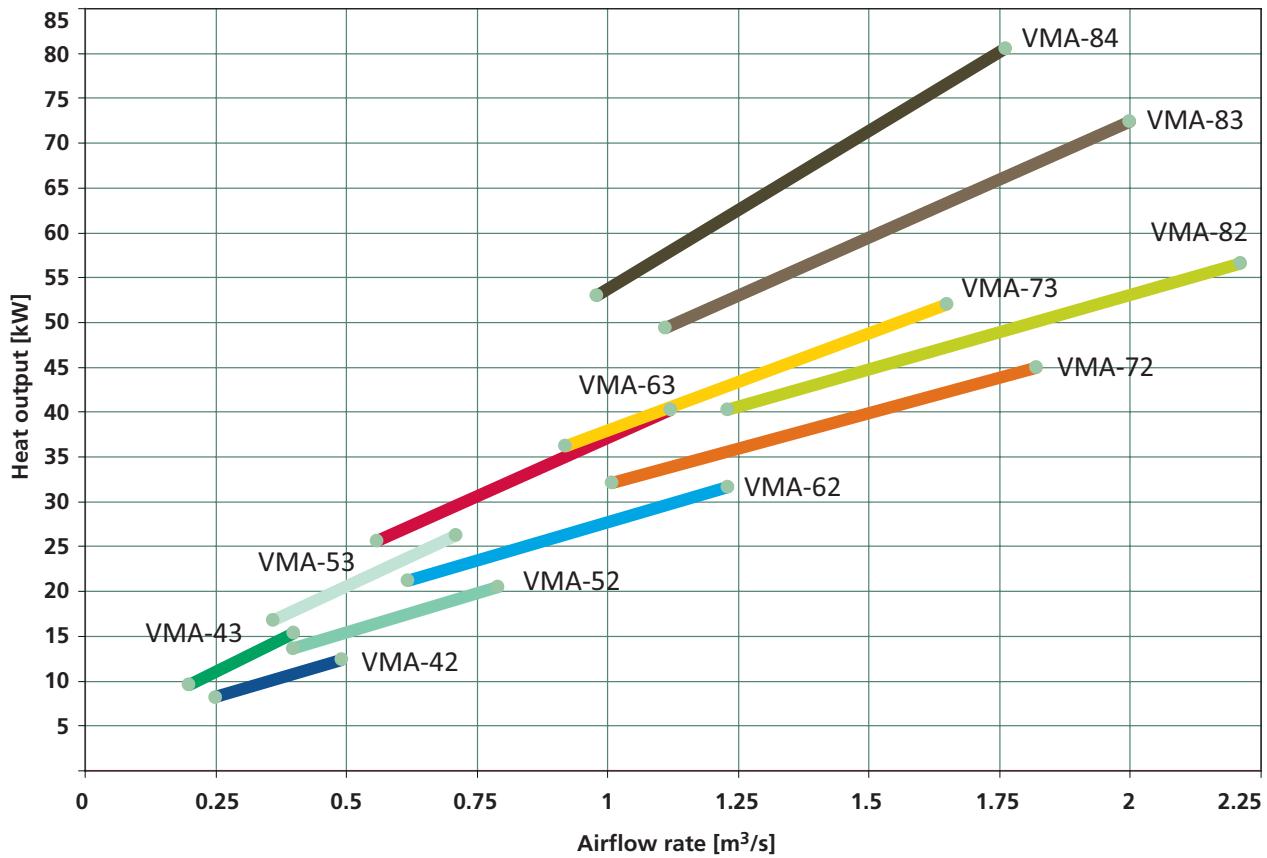
NoVa type VMB 70-40 °C / 18 °C

Capacities at 60 / 30 °C

The capacities are suitable for systems using district heating water
as heat medium. T1/T2 = 60/30 °C

	Air volume		t_2	Power, Q	Fluid flow	Fluid, P_{loss}	t_2	Power, Q	Fluid flow	Fluid, P_{loss}
				t_1 = 5 °C				**t_1 = 10 °C**		
Types	[m³/s]	[m³/h]	[°C]	[kW]	[l/h]	[kPa]	[°C]	[kW]	[l/h]	[kPa]
VMA-42	0.47	1700	19.0	8.4	242	0.6	21.3	6.6	190	0.4
VMA-43	0.42	1500	26.3	11.3	323	0.8	27.5	9.1	261	0.6
VMB-43	0.42	1500	29.1	12.8	366	4.0	30.6	10.7	307	2.9
VMA-52	0.81	2900	19.1	14.4	414	0.8	21.5	11.5	331	0.5
VMA-53	0.71	2550	23.8	17.0	486	0.4	24.8	13.0	374	0.2
VMB-53	0.81	2900	28.2	23.7	681	8.0	29.9	20.0	574	5.9
VMA-62	1.19	4300	19.6	22.1	633	1.0	22.0	17.9	512	0.7
VMA-63	1.14	4100	25.0	28.9	829	0.9	26.5	23.4	670	0.6
VMB-63	1.14	4100	28.4	33.9	972	6.8	30.1	28.5	818	5.0
VMA-72	1.67	6000	19.0	29.6	850	0.8	21.4	23.7	679	0.6
VMA-73	1.5	5400	23.1	34.4	987	0.5	23.9	26.0	746	0.3
VMB-73	1.5	5400	28.1	44.0	1261	3.7	29.7	36.8	1055	2.7
VMA-82	2.17	7800	19.0	38.5	1104	0.9	21.4	30.7	880	0.6
VMA-83	1.89	6800	24.8	47.5	1361	0.8	26.0	37.7	1080	0.5
VMB-83	1.89	6800	28.8	57.2	1639	4.6	30.4	48.0	1377	3.4
VMA-84	1.67	6000	29.5	52.0	1490	0.8	29.6	40.7	1167	0.5

	Air volume		t_2	Power, Q	Fluid flow	Fluid, P_{loss}	t_2	Power, Q	Fluid flow	Fluid, P_{loss}	t_2	Power, Q	Fluid flow	Fluid, P_{loss}
				t_1 = 15 °C				**t_1 = 18 °C**				**t_1 = 20 °C**		
Types	[m³/s]	[m³/h]	[°C]	[kW]	[l/h]	[kPa]	[°C]	[kW]	[l/h]	[kPa]	[°C]	[kW]	[l/h]	[kPa]
VMA-42	0.47	1700	22.8	4.5	129	0.2								
VMA-43	0.42	1500	28.3	6.8	195	0.3	27.9	5.0	143	0.1	27.8	3.9	112	0.1
VMB-43	0.42	1500	31.9	8.6	247	2.0	32.6	7.3	210	1.5	32.9	6.4	184	1.2
VMA-52	0.81	2900	23.5	8.4	240	0.3	23.9	5.8	165	0.1				
VMA-53	0.71	2550	24.8	8.4	242	0.1								
VMB-53	0.81	2900	31.5	16.2	465	4.0	32.3	13.9	399	3.1	32.8	12.3	353	2.5
VMA-62	1.19	4300	24.2	13.4	384	0.4	25.2	10.4	298	0.3	25.3	7.6	219	0.1
VMA-63	1.14	4100	27.5	17.4	500	0.4	27.5	13.1	375	0.2	27.5	10.2	293	0.1
VMB-63	1.14	4100	31.6	23.1	663	3.4	32.4	19.8	567	2.6	32.8	17.5	502	2.1
VMA-72	1.67	6000	23.5	17.3	495	0.3	24.0	12.2	349	0.1	25.2	10.5	300	0.1
VMA-73	1.5	5400	24.6	17.7	507	0.1								
VMB-73	1.5	5400	31.1	29.5	847	1.8	31.8	25.1	718	1.3	32.2	21.9	629	1.1
VMA-82	2.17	7800	23.4	22.2	637	0.3	23.8	15.2	436	0.1	25.4	13.9	399	0.1
VMA-83	1.89	6800	26.3	26.1	748	0.2	26.7	19.9	570	0.1				
VMB-83	1.89	6800	31.8	38.7	1111	2.3	32.5	33.0	947	1.7	32.9	29.1	834	1.4
VMA-84	1.67	6000	27.7	25.9	742	0.2	30.4	25.0	716	0.2				

Capacities at 70 / 40 °C

The capacities are suitable for systems using district heating water
as heat medium. T1/T2 = 70/40 °C

			$t_1 = 5$ °C				$t_1 = 10$ °C			
	Air volume		t_2	Power, Q	Fluid flow	Fluid, P_{loss}	t_2	Power, Q	Fluid flow	Fluid, P_{loss}
Types	[m³/s]	[m³/h]	[°C]	[kW]	[l/h]	[kPa]	[°C]	[kW]	[l/h]	[kPa]
VMA-42	0.47	1700	24.9	12.0	343	1.1	27.5	10.3	295	0.8
VMA-43	0.42	1500	34.1	15.4	442	1.4	35.8	13.4	383	1.1
VMB-43	0.42	1500	36.6	16.7	479	6.5	38.3	14.7	421	5.1
VMA-52	0.81	2900	24.8	20.2	580	1.4	27.4	17.5	500	1.1
VMA-53	0.71	2550	32.0	24.3	697	0.8	33.7	20.9	599	0.6
VMB-53	0.81	2900	35.2	30.9	884	12.7	37.1	27.2	778	10.0
VMA-62	1.19	4300	25.1	30.5	873	1.8	27.7	26.4	756	1.4
VMA-63	1.14	4100	32.5	39.7	1138	1.5	34.3	34.4	986	1.2
VMB-63	1.14	4100	35.5	44.1	1262	10.8	37.3	38.8	1110	8.5
VMA-72	1.67	6000	24.6	41.5	1187	1.5	27.2	35.8	1025	1.1
VMA-73	1.5	5400	31.2	50.0	1431	0.9	32.9	42.8	1226	0.7
VMB-73	1.5	5400	35.3	57.7	1653	5.9	37.1	50.7	1451	4.6
VMA-82	2.17	7800	24.6	54.0	1547	1.6	27.3	46.6	1334	1.2
VMA-83	1.89	6800	32.7	66.5	1903	1.5	34.4	57.4	1644	1.1
VMB-83	1.89	6800	36.1	74.6	2138	7.3	37.9	65.6	1879	5.7
VMA-84	1.67	6000	39.4	72.9	2086	1.4	40.3	63.0	1803	1.1

			$t_1 = 15$ °C				$t_1 = 18$ °C				$t_1 = 20$ °C			
	Air volume		t_2	Power, Q	Fluid flow	Fluid, P_{loss}	t_2	Power, Q	Fluid flow	Fluid, P_{loss}	t_2	Power, Q	Fluid flow	Fluid, P_{loss}
Types	[m³/s]	[m³/h]	[°C]	[kW]	[l/h]	[kPa]	[°C]	[kW]	[l/h]	[kPa]	[°C]	[kW]	[l/h]	[kPa]
VMA-42	0.47	1700	29.9	8.6	247	0.6	31.3	7.6	218	0.5	32.2	6.9	198	0.4
VMA-43	0.42	1500	37.3	11.4	325	0.8	38.1	10.1	290	0.7	38.6	9.3	266	0.6
VMB-43	0.42	1500	39.9	12.7	363	3.9	40.8	11.5	328	3.2	41.4	10.7	305	2.8
VMA-52	0.81	2900	29.9	14.7	421	0.8	31.4	13.0	373	0.6	32.3	11.9	340	0.5
VMA-53	0.71	2550	35.2	17.4	500	0.4	35.9	15.3	439	0.3	36.4	13.9	397	0.3
VMB-53	0.81	2900	38.9	23.5	673	7.7	39.9	21.3	610	6.4	40.6	19.8	568	5.7
VMA-62	1.19	4300	30.3	22.3	640	1.0	31.8	19.9	569	0.8	32.7	18.2	522	0.7
VMA-63	1.14	4100	36.0	29.2	836	0.9	36.9	26.0	745	0.7	37.5	23.9	683	0.6
VMB-63	1.14	4100	39.1	33.5	960	6.5	40.1	30.4	870	5.5	40.7	28.3	810	4.8
VMA-72	1.67	6000	29.8	30.1	862	0.8	31.3	26.7	765	0.7	32.2	24.4	698	0.6
VMA-73	1.5	5400	34.4	35.6	1020	0.5	35.2	31.1	892	0.4	35.6	28.1	804	0.3
VMB-73	1.5	5400	38.8	43.6	1250	3.5	39.8	39.4	1130	2.9	40.4	36.6	1050	2.6
VMA-82	2.17	7800	29.8	39.2	1122	0.9	31.3	34.7	994	0.7	32.2	31.7	907	0.6
VMA-83	1.89	6800	35.9	48.3	1384	0.8	36.8	42.8	1226	0.6	37.3	39.0	1118	0.5
VMB-83	1.89	6800	39.5	56.6	1622	4.4	40.5	51.3	1468	3.7	41.1	47.7	1366	3.2
VMA-84	1.67	6000	41.0	53.0	1517	0.8	41.3	46.9	1342	0.6	41.4	42.7	1223	0.5

Capacities at 80 / 60 °C

The capacities are suitable for systems using boiler water as heat medium. T1/T2 = 80/60 °C

	Air volume		t_2	Power, Q	Fluid flow	Fluid, P_{loss}	t_2	Power, Q	Fluid flow	Fluid, P_{loss}
			t_1 = 5 °C				t_1 = 10 °C			
Types	[m³/s]	[m³/h]	[°C]	[kW]	[l/h]	[kPa]	[°C]	[kW]	[l/h]	[kPa]
VMA-42	0.47	1700	34.6	17.8	761	4.7	37.3	16.1	690	3.9
VMA-43	0.42	1500	46.4	21.9	941	5.5	48.4	19.9	854	4.6
VMA-52	0.81	2900	34.1	29.8	1277	5.7	36.9	27.0	1157	4.8
VMA-53	0.71	2550	44.8	35.8	1535	3.1	46.7	32.4	1390	2.6
VMA-62	1.19	4300	34.2	44.3	1901	7.4	37.0	40.2	1724	6.2
VMA-63	1.14	4100	44.3	56.9	2439	6.1	46.4	51.6	2213	5.1
VMA-72	1.67	6000	33.8	60.9	2614	6.3	36.6	55.3	2370	5.2
VMA-73	1.5	5400	43.9	74.2	3181	4.0	45.9	67.1	2879	3.3
VMA-82	2.17	7800	33.9	79.5	3410	6.6	36.7	72.1	3092	5.5
VMA-83	1.89	6800	45.1	96.3	4128	6.1	47.1	87.3	3744	5.0
VMA-84	1.67	6000	54.0	103.7	4449	5.7	55.3	94.1	4035	4.7

	Air volume		t_2	Power, Q	Fluid flow	Fluid, P_{loss}	t_2	Power, Q	Fluid flow	Fluid, P_{loss}	t_2	Power, Q	Fluid flow	Fluid, P_{loss}
			t_1 = 15 °C				t_1 = 18 °C				t_1 = 20 °C			
Types	[m³/s]	[m³/h]	[°C]	[kW]	[l/h]	[kPa]	[°C]	[kW]	[l/h]	[kPa]	[°C]	[kW]	[l/h]	[kPa]
VMA-42	0.47	1700	40.0	14.4	620	3.2	41.6	13.5	578	2.8	42.7	12.8	550	2.6
VMA-43	0.42	1500	50.2	17.9	769	3.8	51.3	16.7	718	3.3	52.0	16.0	685	3.0
VMA-52	0.81	2900	39.6	24.3	1040	3.9	41.3	22.6	971	3.5	42.4	21.6	925	3.2
VMA-53	0.71	2550	48.6	29.1	1249	2.1	49.8	27.2	1165	1.9	50.5	25.9	1109	1.7
VMA-62	1.19	4300	39.8	36.2	1551	5.1	41.4	33.8	1448	4.5	42.5	32.2	1380	4.1
VMA-63	1.14	4100	48.4	46.4	1991	4.2	49.5	43.4	1859	3.7	50.3	41.3	1773	3.4
VMA-72	1.67	6000	39.4	49.7	2130	4.3	41.0	46.3	1988	3.8	42.1	44.1	1893	3.5
VMA-73	1.5	5400	47.9	60.2	2584	2.7	49.0	56.2	2409	2.4	49.8	53.5	2294	2.2
VMA-82	2.17	7800	39.5	64.8	2778	4.5	41.1	60.4	2592	4.0	42.2	57.6	2470	3.6
VMA-83	1.89	6800	49.0	78.4	3364	4.1	50.1	73.2	3140	3.6	50.8	69.8	2992	3.3
VMA-84	1.67	6000	56.6	84.6	3630	3.9	57.3	79.0	3390	3.4	57.8	75.4	3232	3.1

Capacities at 70 / 50 °C

The capacities are suitable for systems using boiler water as heat medium. T1/T2 = 70/50 °C

| Types | Air volume | | t_2 | Power, Q | Fluid flow | Fluid, P_{loss} | t_2 | Power, Q | Fluid flow | Fluid, P_{loss} |
			$t_1 = 5$ °C				$t_1 = 10$ °C			
	[m³/s]	[m³/h]	[°C]	[kW]	[l/h]	[kPa]	[°C]	[kW]	[l/h]	[kPa]
VMA-42	0.47	1700	29.3	14.6	627	3.3	32.0	13.0	556	2.7
VMA-43	0.42	1500	39.4	18.2	782	3.9	41.2	16.2	696	3.2
VMA-52	0.81	2900	29.0	24.5	1053	4.1	31.7	21.8	936	3.3
VMA-53	0.71	2550	37.8	29.5	1267	2.2	39.7	26.2	1125	1.8
VMA-62	1.19	4300	29.1	36.6	1572	5.3	31.9	32.6	1399	4.3
VMA-63	1.14	4100	37.6	47.1	2024	4.4	39.5	41.9	1802	3.5
VMA-72	1.67	6000	28.7	50.2	2157	4.5	31.5	44.6	1916	3.6
VMA-73	1.5	5400	37.0	61.0	2620	2.8	38.9	54.1	2324	2.3
VMA-82	2.17	7800	28.8	65.5	2813	4.7	31.5	58.2	2498	3.8
VMA-83	1.89	6800	38.1	79.6	3418	4.3	40.0	70.7	3038	3.5
VMA-84	1.67	6000	45.7	86.1	3699	4.0	46.9	76.6	3292	3.2

| Types | Air volume | | t_2 | Power, Q | Fluid flow | Fluid, P_{loss} | t_2 | Power, Q | Fluid flow | Fluid, P_{loss} | t_2 | Power, Q | Fluid flow | Fluid, P_{loss} |
			$t_1 = 15$ °C				$t_1 = 18$ °C				$t_1 = 20$ °C			
	[m³/s]	[m³/h]	[°C]	[kW]	[l/h]	[kPa]	[°C]	[kW]	[l/h]	[kPa]	[°C]	[kW]	[l/h]	[kPa]
VMA-42	0.47	1700	34.6	11.3	487	2.1	36.2	10.4	446	1.8	37.2	9.7	418	1.6
VMA-43	0.42	1500	43.0	14.3	612	2.5	44.0	13.1	562	2.2	44.7	12.3	529	1.9
VMA-52	0.81	2900	34.4	19.1	820	2.6	36.0	17.5	751	2.2	37.0	16.4	705	2.0
VMA-53	0.71	2550	41.5	22.9	984	1.4	42.5	21.0	901	1.2	43.2	19.7	846	1.1
VMA-62	1.19	4300	34.6	28.6	1227	3.4	36.2	26.2	1125	2.9	37.2	24.6	1058	2.6
VMA-63	1.14	4100	41.5	36.8	1583	2.8	42.6	33.8	1453	2.4	43.3	31.8	1367	2.1
VMA-72	1.67	6000	34.2	39.1	1678	2.8	35.8	35.8	1538	2.4	36.9	33.6	1445	2.1
VMA-73	1.5	5400	40.8	47.3	2031	1.8	41.9	43.2	1858	1.5	42.6	40.6	1743	1.3
VMA-82	2.17	7800	34.2	50.9	2188	3.0	35.8	46.7	2004	2.5	36.9	43.8	1883	2.2
VMA-83	1.89	6800	41.9	62.0	2665	2.7	42.9	56.9	2443	2.3	43.6	53.4	2296	2.1
VMA-84	1.67	6000	48.0	67.3	2889	2.5	48.7	61.7	2652	2.2	49.1	58.1	2494	1.9

Capacities at 60 / 40 °C

The capacities are suitable for systems using boiler water as heat medium. T1/T2 = 60/40 °C

Types	Air volume		t_2	Power, Q	Fluid flow	Fluid, P_{loss}	t_2	Power, Q	Fluid flow	Fluid, P_{loss}
				t_1 = 5 °C				t_1 = 10 °C		
	[m³/s]	[m³/h]	[°C]	[kW]	[l/h]	[kPa]	[°C]	[kW]	[l/h]	[kPa]
VMA-42	0.47	1700	24.0	11.4	489	2.2	26.6	9.7	419,0	1.6
VMA-43	0.42	1500	32.2	14.4	619	2.6	33.9	12.4	534,0	2.0
VMA-52	0.81	2900	23.7	19.2	825	2.7	26.4	16.5	708,0	2.0
VMA-53	0.71	2550	30.6	23.0	991	1.5	32.3	19.7	848,0	1.1
VMA-62	1.19	4300	23.9	28.7	1236	3.5	26.6	24.7	1064,0	2.7
VMA-63	1.14	4100	30.7	37.2	1599	2.9	32.6	32.1	1379,0	2.2
VMA-72	1.67	6000	23.5	39.3	1689	2.9	26.2	33.7	1450,0	2.2
VMA-73	1.5	5400	29.9	47.5	2042	1.8	31.7	40.6	1745,0	1.4
VMA-82	2.17	7800	23.6	51.2	2201	3.0	26.3	43.9	1890,0	2.3
VMA-83	1.89	6800	31.0	62.5	2688	2.8	32.8	53.7	2311,0	2.1
VMA-84	1.67	6000	37.1	68.0	2923	2.6	38.2	58.5	2515,0	2.0

Types	Air volume		t_2	Power, Q	Fluid flow	Fluid, P_{loss}	t_2	Power, Q	Fluid flow	Fluid, P_{loss}	t_2	Power, Q	Fluid flow	Fluid, P_{loss}
				t_1 = 15 °C				t_1 = 18 °C				t_1 = 20 °C		
	[m³/s]	[m³/h]	[°C]	[kW]	[l/h]	[kPa]	[°C]	[kW]	[l/h]	[kPa]	[°C]	[kW]	[l/h]	[kPa]
VMA-42	0.47	1700	29.1	8.1	350	1.2	30.6	7.2	308	0.9	31.5	6.5	280	0.8
VMA-43	0.42	1500	35.6	10.5	450	1.5	36.5	9.3	400	1.2	37.1	8.5	366	1.0
VMA-52	0.81	2900	29.0	13.8	592	1.5	30.5	12.2	523	1.2	31.5	11.1	477	1.0
VMA-53	0.71	2550	34.0	16.4	707	0.8	34.9	14.4	621	0.6	35.5	13.1	564	0.5
VMA-62	1.19	4300	29.2	20.8	894	1.9	30.8	18.4	792	1.6	31.8	16.8	724	1.3
VMA-63	1.14	4100	34.4	27.0	1160	1.6	35.4	23.9	1029	1.3	36.1	21.9	942	1.1
VMA-72	1.67	6000	28.9	28.2	1214	1.6	30.4	24.9	1072	1.3	31.4	22.7	978	1.1
VMA-73	1.5	5400	33.4	33.7	1450	1.0	34.3	29.6	1272	0.8	34.9	26.8	1152	0.6
VMA-82	2.17	7800	28.9	36.8	1581	1.7	30.4	32.4	1395	1.3	31.4	29.6	1272	1.1
VMA-83	1.89	6800	34.5	45.0	1935	1.5	35.4	39.8	1711	1.2	36.0	36.3	1560	1.0
VMA-84	1.67	6000	39.1	49.1	2110	1.4	39.6	43.4	1866	1.1	39.8	39.5	1701	1.0

Capacities at 50 / 40 °C

The capacities are suitable for systems using heat pumps as heat source. T1/T2 = 50/40 °C

	Air volume		t_2	Power, Q	Fluid flow	Fluid, P_{loss}	t_2	Power, Q	Fluid flow	Fluid, P_{loss}
				$t_1 = 5$ °C				$t_1 = 10$ °C		
Types	[m³/s]	[m³/h]	[°C]	[kW]	[l/h]	[kPa]	[°C]	[kW]	[l/h]	[kPa]
VMA-42	0.47	1700	23.1	10.9	935	7.2	25.7	9.3	797	5.4
VMA-43	0.42	1500	30.3	13.4	1153	8.4	32.1	11.5	987	6.3
VMA-52	0.81	2900	22.8	18.2	1569	8.8	25.5	15.6	1339	6.6
VMA-53	0.71	2550	29.2	21.8	1879	4.8	31.1	18.6	1603	3.6
VMA-62	1.19	4300	22.9	27.2	2338	11.5	25.6	23.2	1998	8.6
VMA-63	1.14	4100	29.0	34.7	2990	9.3	30.9	29.7	2559	7.0
VMA-72	1.67	6000	22.6	37.3	3212	9.6	25.3	31.9	2743	7.2
VMA-73	1.5	5400	28.7	45.2	3892	6.1	30.6	38.5	3315	4.5
VMA-82	2.17	7800	22.7	48.7	4191	10.2	25.4	41.6	3577	7.6
VMA-83	1.89	6800	29.5	58.7	5056	9.2	31.3	50.2	4320	6.9
VMA-84	1.67	6000	34.8	63.1	5432	8.5	36.0	53.9	4645	6.4

	Air volume		t_2	Power, Q	Fluid flow	Fluid, P_{loss}	t_2	Power, Q	Fluid flow	Fluid, P_{loss}	t_2	Power, Q	Fluid flow	Fluid, P_{loss}
				$t_1 = 15$ °C				$t_1 = 18$ °C				$t_1 = 20$ °C		
Types	[m³/s]	[m³/h]	[°C]	[kW]	[l/h]	[kPa]	[°C]	[kW]	[l/h]	[kPa]	[°C]	[kW]	[l/h]	[kPa]
VMA-42	0.47	1700	28.3	7.7	662	3.8	29.9	6.8	582	3.0	30.9	6.1	528	2.5
VMA-43	0.42	1500	33.8	9.6	824	4.5	34.8	8.5	728	3.6	35.5	7.7	664	3.0
VMA-52	0.81	2900	28.1	12.9	1114	4.7	29.7	11.4	980	3.7	30.7	10.3	891	3.1
VMA-53	0.71	2550	32.9	15.5	1330	2.5	33.9	13.6	1169	2.0	34.5	12.3	1062	1.7
VMA-62	1.19	4300	28.3	19.3	1665	6.1	29.8	17.0	1468	4.9	30.9	15.5	1336	4.1
VMA-63	1.14	4100	32.8	24.8	2134	5.0	33.9	21.9	1883	4.0	34.6	19.9	1717	3.4
VMA-72	1.67	6000	28.0	26.5	2281	5.1	29.6	23.3	2006	4.1	30.6	21.2	1825	3.4
VMA-73	1.5	5400	32.4	31.9	2749	3.2	33.5	28.0	2414	2.5	34.2	25.4	2190	2.1
VMA-82	2.17	7800	28.1	34.5	2974	5.4	29.6	30.4	2616	4.3	30.7	27.6	2379	3.6
VMA-83	1.89	6800	33.1	41.8	3596	4.9	34.1	36.8	3168	3.9	34.8	33.5	2884	3.2
VMA-84	1.67	6000	37.1	45.0	3874	4.5	37.4	39.7	3416	3.6	38.1	36.2	3113	3.0

Capacities at 45 / 35 °C

The capacities are suitable for systems using heat pumps as heat
source. T1/T2 = 45/35 °C

Types	Air volume		t₂	Power, Q	Fluid flow	Fluid, P_loss	t₂	Power, Q	Fluid flow	Fluid, P_loss
				t₁ = 5 °C				**t₁ = 10 °C**		
	[m³/s]	[m³/h]	[°C]	[kW]	[l/h]	[kPa]	[°C]	[kW]	[l/h]	[kPa]
VMA-42	0.47	1700	20.5	9.3	800	5.5	23.1	7.7	663	3.9
VMA-43	0.42	1500	26.8	11.5	993	6.4	28.5	9.6	828	4.6
VMA-52	0.81	2900	20.2	15.6	1344	6.7	22.9	13.0	1116	4.8
VMA-53	0.71	2550	25.8	18.7	1608	3.6	27.5	15.5	1334	2.6
VMA-62	1.19	4300	20.3	23.3	2006	8.7	23.0	19.4	1670	6.3
VMA-63	1.14	4100	25.6	29.9	2573	7.2	27.5	24.9	2144	5.1
VMA-72	1.67	6000	20.1	32.0	2752	7.3	22.8	26.5	2286	5.2
VMA-73	1.5	5400	25.3	38.6	3327	4.6	27.1	32.0	2754	3.2
VMA-82	2.17	7800	20.1	41.7	3589	7.7	22.8	34.6	2980	5.5
VMA-83	1.89	6800	26.0	50.4	4342	7.0	27.8	41.9	3609	5.0
VMA-84	1.67	6000	30.6	54.3	4675	6.5	31.8	45.2	3894	4.6

Types	Air volume		t₂	Power, Q	Fluid flow	Fluid, P_loss	t₂	Power, Q	Fluid flow	Fluid, P_loss	t₂	Power, Q	Fluid flow	Fluid, P_loss
				t₁ = 15 °C				**t₁ = 18 °C**				**t₁ = 20 °C**		
	[m³/s]	[m³/h]	[°C]	[kW]	[l/h]	[kPa]	[°C]	[kW]	[l/h]	[kPa]	[°C]	[kW]	[l/h]	[kPa]
VMA-42	0.47	1700	25.6	6.1	528	2.6	27.1	5.2	447	1.9	28.1	4.6	393	1.5
VMA-43	0.42	1500	30.2	7.7	666	3.1	31.1	6.6	569	2.3	31.8	5.9	505	1.9
VMA-52	0.81	2900	25.5	10.3	891	3.2	27.0	8.8	757	2.4	28.0	7.8	668	1.9
VMA-53	0.71	2550	29.2	12.3	1061	1.7	30.2	10.4	899	1.3	30.8	9.2	789	1.0
VMA-62	1.19	4300	25.6	15.5	1338	4.2	27.2	13.2	1140	3.1	28.2	11.7	1009	2.5
VMA-63	1.14	4100	29.4	3.4	1722	3.4	30.4	17.1	1470	2.6	31.1	15.1	1303	2.1
VMA-72	1.67	6000	25.4	21.2	1825	3.5	27.0	18.0	1551	2.6	28.0	15.9	1368	2.1
VMA-73	1.5	5400	28.9	25.4	2187	2.1	29.8	21.4	1847	1.6	30.5	18.8	1618	1.2
VMA-82	2.17	7800	25.4	27.6	2379	3.6	27.0	23.5	2020	2.7	28.0	20.7	1781	2.1
VMA-83	1.89	6800	29.5	33.5	2887	3.3	30.5	28.5	2456	2.4	31.1	25.2	2168	1.9
VMA-84	1.67	6000	32.8	36.2	3121	3.0	33.3	30.9	2658	2.3	33.7	27.3	2348	1.8

Correction factors and projection distances

Capacities – correction factors

The use of accessories reduces the airflow rate and the heat output.

The table in the below example shows the approximate percentages of capacities with various accessories fitted.

Air distribution example

Heat output: 100 x 0.95 = 95%
Airflow rate: 100 x 0.90 = 90%

Designations	Heat output	Airflow rate
Front louvres J1 and J2	100%	100%
Air distributor J4	95%	90%
Injection nozzle K	93%	85%

Correction factors for accessories

Projection distances – for nozzle and front louvre

The table shows the connection between outlet temperature, room temperature and projection distances of the outlet air.

The projection distance influences on the heating of cold rooms to normal room temperature. The heating occurs faster in the residence zone when the inlet temperature is gradually increased. The reason for this is the increase of the projection distance due to the smaller difference in temperature between the inlet and room air.

Sizes	Vertical, injection nozzle, K				Horizontal, front louvre, J1	
	Airflow [m³/s]	10 °C	30 °C	50 °C	Airflow [m³/s]	10 °C
-42	0.40	9.0	5.0	4.0	0.47	14.0
-43	0.36	7.4	4.2	3.3	0.42	12.5
-52	0.69	11.3	6.5	5.0	0.81	19.1
-53	0.60	10.1	5.8	4.5	0.71	16.7
-62	1.01	13.0	7.6	5.7	1.19	23.1
-63	0.97	11.1	6.5	4.9	1.14	22.2
-72	1.42	14.5	8.0	6.0	1.67	27.6
-73	1.28	13.0	7.3	5.5	1.5	24.8
-82	1.84	14.5	8.2	6.3	2.17	31.3
-83	1.61	13.0	7.0	5.5	1.89	27.3
-84	1.42	10.5	6.0	4.7	1.67	24.1

Projection distances [m] at different temperature differences $(t_2 - t_r)$ [1]

1. t_2 = Outlet temperature, air; t_r = Room temperature

Sound conditions

The sound produced by the air heaters when operating is called the sound power level. It is a measure of the sound energy emitted by the fan and depends primarily on the fan output. The sound power level is part of all calculations of sound conditions in rooms served by the air heaters. It is expressed in dB with a reference value of 10^{-12} W.

The sound pressure level is a measure of the perceived sound impression at a given location in the environment. It depends on the sound power level, the distance from the fans, the direction factor and the sound absorbing properties of the environment.
The sound pressure level is expressed in dB(A) with a reference value of 2×10^{-5} Pa.

The table shows the sound power and sound pressure levels at different RPMs. The values depend on the installed accessories.

Sizes	RPMs	Sound power level total [dB]	Sound pressure level [dB(A)] [1]
4-	1350	59	45
5-	1300	67	53
6-	1400	74	60
7-	910	71	57
8-	950	76	62

Sound data for VMA and VMB without accessories

1. Sound pressure level at a distance of 5 m, 1500 m3 room, normal reflection (R = 120) and direction factor Q = 2

Heat regulation

Heat from the air heaters can be regulated in several ways.

- Manual on-off start and stop of fans
- Semi- or fullly automated regulation of airflow rate with a regulator

The heating coils must be protected from frost in installations where the inlet air temperature may fall below 0 °C.

Optimum room comfort and operation economy is among other things controlled through regulation of the heat emission. It is recommended to install an automatic regulation system that can regulate the heat medium as to inflow and water temperature in the heating coil.

The system is furthermore protected against frost by fitting a thermostat in connection with the heating coil. With air heaters this is best done with a stem bulb sensor in the return water from the heating coil.

The frost thermostat is usually set to trigger at a value below +6 °C.

The fan then stops, the heat medium flows fully through coil and any outdoor air dampers are closed. When the temperature rises, the thermostat automatically reverts the system to normal.

In large installations, several air heaters can be included in the same regulation and control group. The operation of associated extraction fans can also be included in the control group.

M	=	Motor
MV	=	Dynamic flow valve
SV	=	Shut-off valve
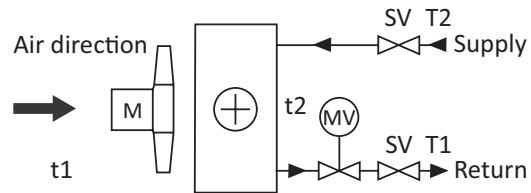
t1	=	Inlet air temperature
t2	=	Outlet air temperature
T1	=	Return water temperature
T2	=	Supply water temperature

Example of regulation circuit

Motors and regulators

Motors [1]

Sizes	Frequency [Hz]	RPMs	Power [W]	Current [A]	Starting current [A]	Ambient temp. ranges [°C]	Weight [kg]	Encap-sulation
4-	50 / 60	1350 / 1490	110 / 148	0.52 / 0.66	1.20 / 1.18	-20 to 45	3.5	IP44
5-	50 /-	1300 /-	190 /-	0.66 /-	-	-	-	
6-	50 / 60	1320 / 1450	410 / 570	1.90 / 2.50	4.40 /-	-15 to 60	9.2	IP54
7-		910 / 980	390 / 580	1.80 / 2.60	-	-	-	
8-		920 / 1080	470 / 730	2.30 / 3.20	5.50 /-	-15 to 45	12.8	

Specifications for 1 x 230 V motors

1. The motors comply with EU's ErP 2015 directive.

Temperature regulator RDG100T

The regulator displays the temperature received from the room sensor. The device has a week clock and is programmable.

It offers three modes of operation; comfort, economy and (frost) protection. The display is a backlit LCD. Operating voltage is 1x230 V, max. current 4 A and encapsulation is IP30.

Thermostat

This temperature regulator fits 5-step transformers and stepless TRIAC regulators.

The set temperature is compared to the surrounding temperature and a control signal turns the air heater on and off. The unit has a 5 °C night-time lowering and a regulating range of 0 - 40 °C.

Temperature regulator RDG100T

Thermostat NV515

5-step speed regulators

The speed regulators control the fan speed by user-selection of 5 preset speeds excl. the off-position. The units are in durable design with indicator lights, have low noise levels and with ready-mounted cable glands. Operating voltage is 1x230 V, max. currents available for 1.5 A , 3.5 A , 5 A and 10 A. Encapsulation is IP54.

Current fuses are built-in and manually reset after overheating by turning the switch to the off-position.

3.5 A and 5 A **1.5 A** **10 A**

5-step speed regulator

Stepless speed regulators

The stepless speed regulators are TRIAC regulators for industrial areas. The fan speed is set by hand with a knob. Versions for 2.5 A and 5 A are available.

The 2.5 A version is suitable for both inset and surface mounting, while the 5 A version is for surface mounting only.

Regulators

Types	Regulation type	Voltage [V]	Max. current [A]	Encapsulation	h [mm]	w [mm]	d [mm]	Weight [kg]
RDG100T	Thermostat		4	IP30	128	93	30.8	0.3
NV515			5	IP34	-	-	-	-
5-step	Speed	1x230	1.5	IP54	205	115	100	2.1
			3.5		255	170	140	5.0
			5		255	170	140	5.4
			10		325	300	185	13.2
Stepless			2.5		82	82	65	0.24
			5		160	83	81	0.59

Regulators for single-phased motors

The 5 A version has a separate off-position and the option of setting a minimum allowed speed. It offers two modes of operation. One called Kickstart where the motor starts at max. speed for 8 – 10 seconds and then follows the position of the potentiometer. Mode two is Normal and has no start-up delay.

For both versions, the operating voltage is 1x230 V, max. current is 2.5 A or 5 A, respectively. Encapsulation is IP54.

When in operation, the 2.5 A and 5 A stepless TRIAC regulators generate audible noise.

2.5 A **5 A**

Stepless speed regulators

Dynamic flow valve

The valves are made of stainless steel and have integrated measuring connectors. The operating ranges run from 65 - 3609 l/hour. The maximum differential pressure is 400 kPa and a temperature range of 0 - 120 °C.


Dynamic flow valve

Thermo actuator

The actuator is in encapsulation class IP 54, has an actuator power of 100 Nm, a stroke of 5.0 - 5.5 mm and 180 s running time.

Thermo actuator NV5528
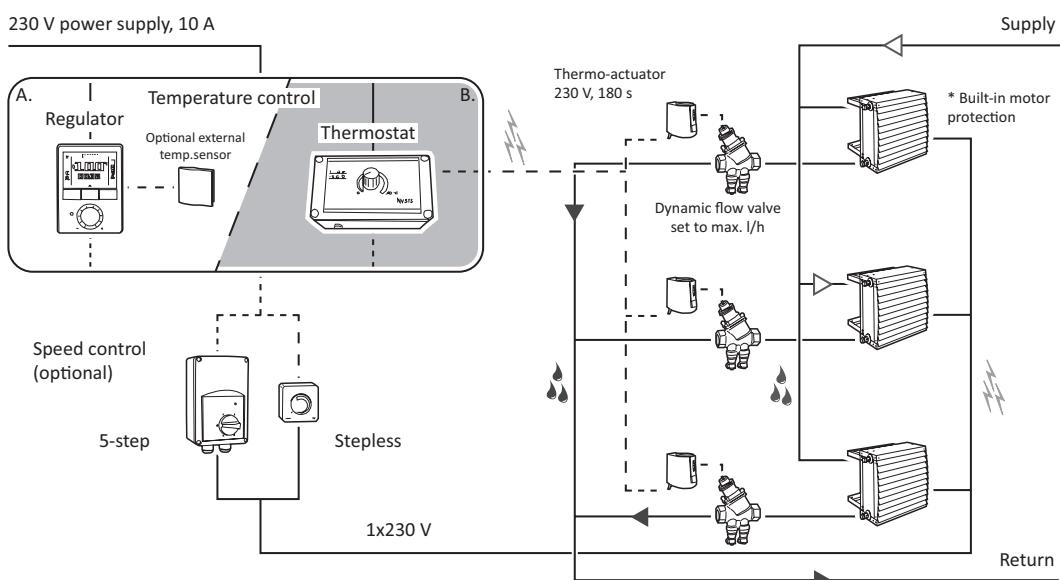
Basic system layout – pipe circuit and electric wiring

Sizes	Current [A]	Types							
		RDG100T (max. 4 A)	NV515 (max. 5 A)	5-step, 1.5 A	5-step, 3.5 A	5-step, 5 A	5-step, 10 A [1]	Stepless, 2.5 A	Stepless, 5 A
4-	0.52 / 0.66	7 / 5	9 / 7	2 / 2	6 / 5	9 / 7	15 / 13	4 / 3	9 / 7
5-	0.66 /-	6 /-	7 /-	2 /-	5 /-	7 /-	15 /-	3 /-	7 /-
6-	1.90 / 2.50	2 / 1	2 / 2	- /-	1 / 1	2 / 2	5 / 4	1 / 1	2 / 2
7-	1.80 / 2.60	2 / 1	2 / 1	- /-	1 / 1	2 / 1	5 / 3	1 /-	2 / 1
8-	2.30 / 3.20	1 / 1	2 / 1	- /-	1 / 1	2 / 1	4 / 3	1 /-	2 / 1

Max. number of motors per regulator at 50 / 60 Hz

1. The regulator cannot be used with the RDG100T.

Item numbers

	Voltage	Description	Item numbers				
			4	5	6	7	8
BASE UNITS							
VMA	1 x 230 V	* 2 pipe rows	630626-0	630632-0	630639-0	630645-0	630650-0
		* 3 pipe rows	630627-0	630633-0	630640-0	630646-0	630651-0
		* 4 pipe rows	-	-	-	-	630652-0
VMB		* 3 pipe rows	630628-0	630634-0	630641-0	630647-0	630653-0
ACCESSORIES							
Louvres	-	J1	630669-0	630670-0	630671-0	630672-0	630673-0
	-	J2	630674-0	630675-0	630676-0	630677-0	630678-0
Cones	-	K	630679-0	630680-0	630681-0	630682-0	630683-0
Distributors	-	J4	630684-0	630685-0	630686-0	630687-0	630688-0
Adapter plate - ARG70.2		for RDG100T	926596-0				
Room sensor - QAA32			926597-0				
ELECTRIC REGULATORS							
NV515		Thermostat	918097-0				
RDG100T		Temperature regulator	926595-0				
Transformer 1.5 A	1 x 230 V	5-step transformer	926603-0				
Transformer 3.5 A			926604-0				
Transformer 5.0 A			926605-0				
Transformer 10.0 A			926606-0				
Speed - 2.5 A		Stepless transformer	926643-0				
Speed - 5 A			926644-0				
VALVES							
Dynamic flow	-	65 - 370 l/hour	926519-0				
	-	220 - 1330 l/hour	926520-0				
	-	600 - 3609 l/hour	926521-0				
NV5528	1 x 230 V	Thermo actuator	926522-0				

NoVa air heaters and accessories

Quality and service

Rest assured

The production of the NoVa air heaters meets our standards for high quality, which includes inspection and test of all units.

Additionally, we offer technical guidance on installation, test of function and training.

Warranty

The 12-month statutory warranty period applies from when the product leaves the factory unless otherwise agreed. In addition, Novenco Building & Industry A/S offers a supplementary warranty as described in the terms and conditions of sale and delivery found on our website. Wear parts are not covered by the warranty. Special warranty provisions may be agreed upon.

Important

This document is provided 'as is'. Novenco Buidling & Industry A/S reserves the right to changes without further notice due to continuous product development.

Pictures in the catalogue may show products with accessories fitted.

The fans are designed for continuous operation. The following kinds of operation may cause fatigue break in the impellers and endanger people.

- Operation in stall area, i.e. with counter pressure that pulsates – called pump mode
- Operation with exceedingly starts and stops
- Uneven flow velocity through fan

If in doubt, Novenco should be contacted to assess the suitability of the fans.

Patents and trademarks

Novenco®, 诺文科, 诺万科 and 诺克 are registered trademarks of Novenco Marine & Offshore A/S. ZerAx® is a registered trademark of Novenco Building & Industry A/S. AirBox™, NoVa™ and NovAx™ are trademarks of Novenco Building & Industry A/S. Other trademarks that appear in this document are the property of their respective owners.

The Novenco ZerAx processes of manufacture, technologies and designs are patented by Novenco A/S or Novenco Building & Industry A/S. Pending patents include PCT no. EP2012/064908 and EP2012/064928.
The Novenco ZerAx processes of manufacture, technologies and designs are patented by Novenco A/S or Novenco Building & Industry A/S.
Granted patents include Brazil no. BR-11-2012-008543-3; BR-11-2012-008545-0,

BR-11-2012-008607-3, BR-11-2014-002282-8 and BR-11-2014-002426-0; Canada no. 2.777.140, 2.777.141, 2.777.144, 2.832.131 and 2.843.132; China no. ZL2010800458842, ZL2010800460965, ZL2010800464275 and ZL2012800387210; EU no. 2488759, 2488760, 2488761, 2739860 and 2739861; India no. 312464, 360298, 367515, 400863 and 403692; PCT no. EP2012/064908 and EP2012/064928 ; South Korea no. 10-1907239, 10-1933724, 10-1980600, 10-2011515 and 10-2127529; US no. 8.967.983, 9.200.641, 9.273.696 B2, 9.683.577 and 9.926.943 B2.
Granted designs include Brazil no. BR-30-2012-003932-0; Canada no. 146333; China no. 1514732, 1517779, 1515003, 1555664 and 2312963; EU no. 001622945-0001 to 001622945-0009 and 001985391- 0001; India no. 246293; South Korea no. 30-0735804; UK no. 001622945-0001 to 001622945-0009 and 001985391- 0001; US no. D665895S, D683840S, D692119S, D704323S, D712023S, D743018S, D755363S, D756500S, D821560S and D823452S.

The Novenco backdraft damper manufacturing processes, technologies and designs are patented by Novenco Building & Industry A/S.
Granted patents include Denmark no. 180313 and US no. 11.231.049 B2.

Quality and environment

Novenco Building & Industry A/S is certified in accordance with ISO 9001 and 14001.

Products from Novenco Building & Industry A/S are designed, developed and manufactured in Denmark.

info@novenco-building.com

+45 70 77 88 99

novenco-building.com