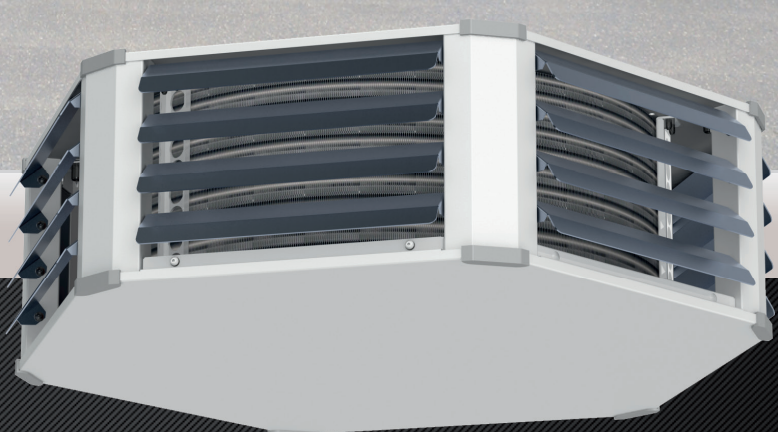


Heating unit

Multiflow

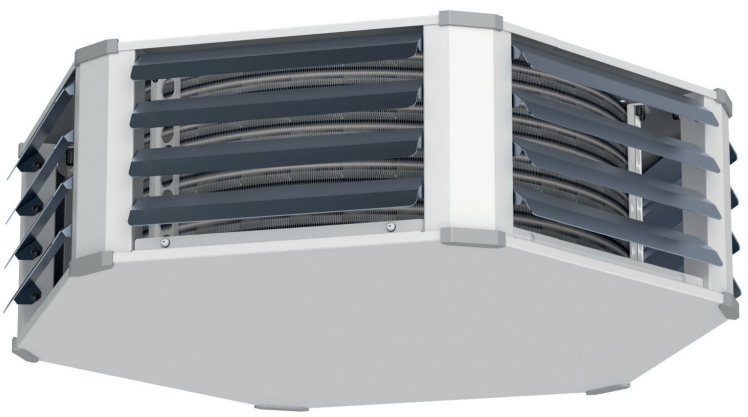
STAVOKLIMA

www.stavoklima.eu

Basic features

Multiflow hot water heating unit is designed for quick heating of industrial interiors. The interior air is sucked by axial AC or EC fan (depending on model) in the upper portion of the unit, the air heats up by flowing through hot water circular heat exchanger, and distributed back to the interior through the exhaust splines located circumferentially along the unit in six different directions. Owing to hexagonal shape of the casing, equal air distribution as well as maximum thermal comfort across the space are arranged.

The casing is made of zinc-coated steel being sufficiently strong to minimize deformations and undesired vibrations. The unit as a whole is delivered in RAL 9010 (white) colour. Other RAL colours are available for a charge. The unit is provided with double-suction AC or EC fans.



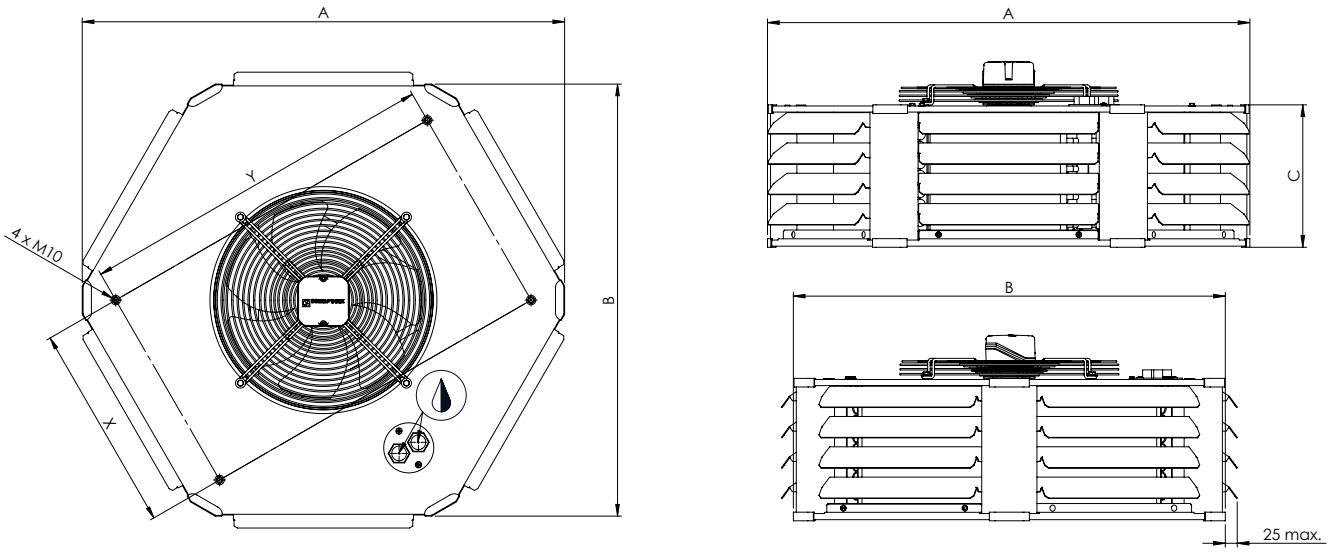
BASIC FEATURES

The Multiflow industrial heating units are intended in particular for:

- warehouses
- industrial and exhibition halls
- shop floors
- wholesale shops
- supermarkets

Features and advantages

- two power output sizes designed for ceiling height up to 2.3m and 4.0 m
- easy installation by suspension from the ceiling
- compact unit with a discrete appearance
- design: zinc-coated casing with RAL 9010 varnish
- highly powerful AC or EC fans with easy access for regular maintenance or service intervention
- powerful triple-row Co/AL heat exchangers for max 90°C/1.6MPa with a power reserve
- a wide range of installation possibilities or control methods
- easy to control and almost maintenance-free



	A	B	C	X	Y
Multiflow MF1	865	775	225	375	645
Multiflow MF2	1100	975	225	490	845

Technical data

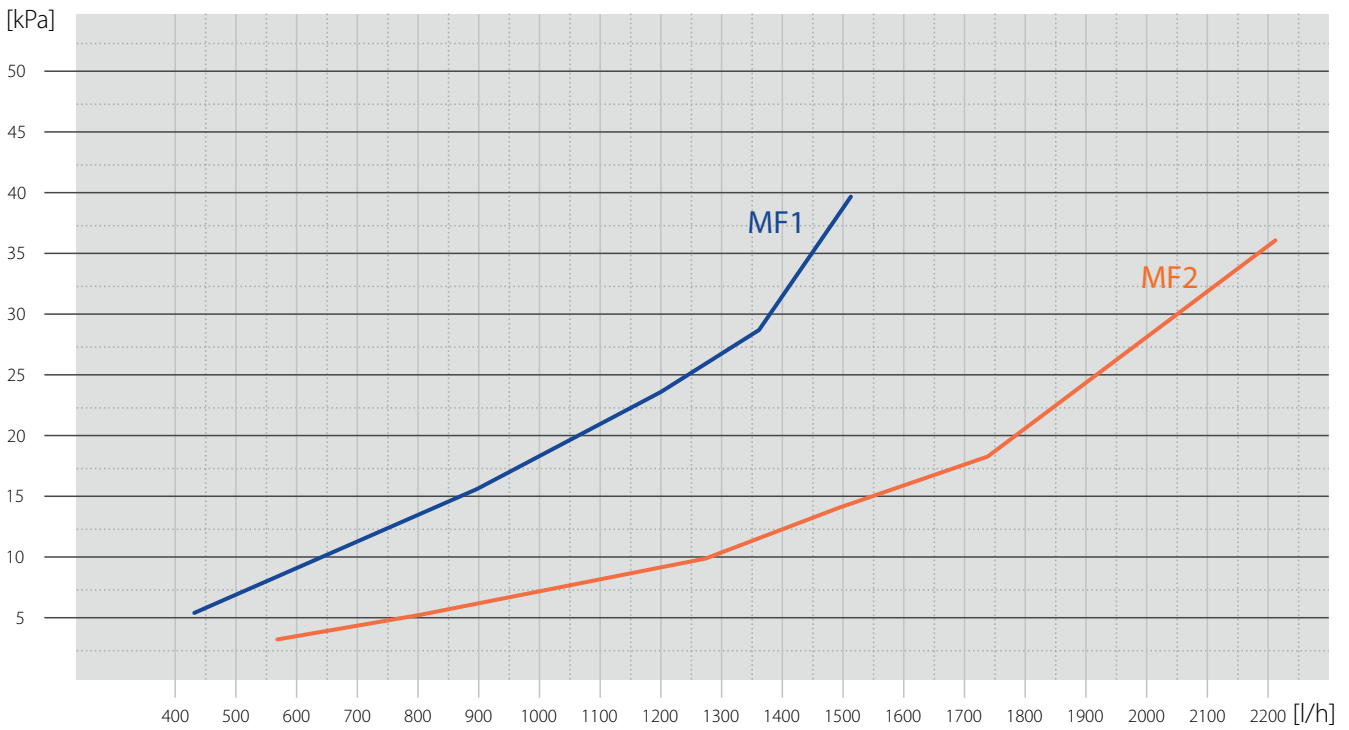
Model		Multiflow MF1-HW-AC	Multiflow MF2-HW-AC	Multiflow MF1-HW-EC	Multiflow MF2-HW-EC
Air volume	[m³/h]	2600	3450	2875	4525
Hot-water coil 70/50/15 °C					
heating capacity	[kW]	26,6	35,4	28,4	42,1
pressure loss	[kPa]	23,7	16,9	26,6	23,2
flow volume rate	[l/hod]	1112	1512	1188	1800
Hot-water coil 60/40/15 °C					
heating capacity	[kW]	20,4	27,2	21,8	32,2
pressure loss	[kPa]	15,3	10,9	17,2	14,8
flow volume rate	[l/hod]	864	1152	936	1368
Hot-water coil 50/30/15 °C					
heating capacity	[kW]	14,1	18,7	15	20,1
pressure loss	[kPa]	8,2	5,8	9,1	7,8
flow volume rate	[l/hod]	576	792	612	939
EC Fan					
fan voltage	[V]	230 V / 50 Hz	230 V / 50 Hz	230 V / 50 Hz	230 V / 50 Hz
power consumption	[W]	165	160	150	400
fan current	[A]	0,73	0,73	1,2	2,6
Weight	[kg]	35	53	33	55
Acoustic pressure*	[dB(A)]	46	52	54	59

* acoustic data in the distance 5m from the unit

Conversion data of heat exchangers

		Multiflow MF1-HW-AC			Multiflow MF2-HW-AC			Multiflow MF1-HW-EC			Multiflow MF2-HW-EC		
		Q [kW]	Ta [°C]	Qm [l/hod]	Q [kW]	Ta [°C]	Qm [l/hod]	Q [kW]	Ta [°C]	Qm [l/hod]	Q [kW]	Ta [°C]	Qm [l/hod]
70/50°C	0 °C	35,6	40,1	1512	47,4	40,5	2016	37,9	38,9	1620	56,5	36,8	24,1
	10°C	29,6	43,5	1260	39,4	43,7	1692	31,6	32,3	1332	47	40,6	2016
	15°C	26,6	45,2	1116	35,4	45,3	1512	28,4	44,1	1188	42,1	42,5	1800
	20°C	23,6	46,7	1008	31,4	46,8	1332	25,1	45,8	1080	37,3	44,3	1584
60/40°C	0 °C	29,5	33,4	1260	39,2	33,5	1656	31,5	32,3	1332	46,7	30,5	1980
	10°C	23,5	36,6	972	31,2	36,7	1332	25	35,7	1044	37,1	34,2	1584
	15°C	20,4	38,2	864	27,2	38,2	1152	21,8	37,4	936	32,2	36	1368
	20°C	17,4	39,7	720	23,1	39,7	972	18,5	39	792	27,3	37,8	1152
50/30°C	0 °C	23,3	26,5	972	31	26,5	1332	24,9	25,5	1044	36,9	24	1548
	10°C	17,2	29,5	720	22,9	29,5	972	18,3	28,8	756	27,1	27,6	1152
	15°C	14,1	31	576	18,7	31	792	15	30,4	612	20,1	29,4	939
	20°C	10,9	32,3	432	14,4	32,3	612	11,5	31,8	468	16,9	31	720
40/30°C	0 °C	20,6	23,3	1764	27,4	23,4	2340	22	22,5	1872	32,7	21,3	2808
	10°C	14,6	26,6	1224	19,5	26,6	1656	15,6	26	1332	23,2	25,1	1980
	15°C	11,6	28,2	972	15,5	28,2	1296	12,4	27,7	1044	18,4	27	1548
	20°C	8,6	29,7	720	11,4	29,7	972	9,2	29,4	756	13,5	28,8	1152

Diagram of pressure loss of heat exchangers



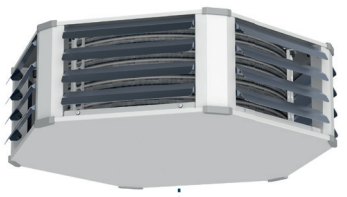
AC 230V

AC1 – O3

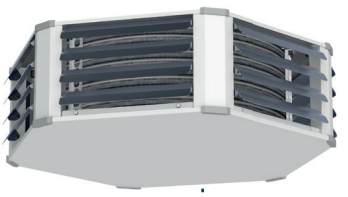
A control option with O series controller. The O3 controller is a five-stage transformer revolution controller for fans of 230V power voltage and provided with a separate button for light signalling of the connection. Optional control using an external TP thermostat. Multiple units may be connected to the controller.

Type of control	O3
Power supply	230V
Output power limitation	3A
Protection class	IP 54
Dimesions (w x h x d)	86x166x91 [mm]

Multiflow AC1



Multiflow AC1

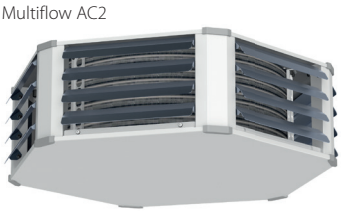


AC2 – UNIREG MF AC2 + PR 160

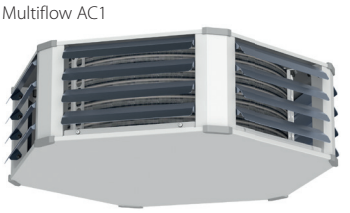
A control option with three-stage power controller PR 160 with 24V power voltage and output for actuators being 0-10V-signal controlled. Optional control using an external spatial PC sensor. Unireg MF AC2, in which the electronic components for the unit control are installed, is fitted in a plastic box with cooling holes, provided with circuit breaker and power components. Multiple units may be connected thereto.

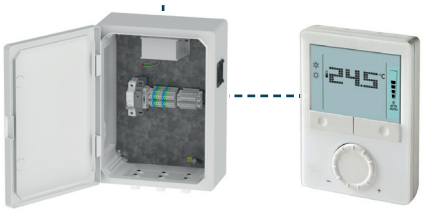
Type of control	Unireg MF AC2	PR 160
Power supply	230V	24V
Output power limitation	2,5A	-
Protection class	IP 20	IP 30
Dimesions (w x h x d)	300x400x170 [mm]	93x128x31 [mm]

Multiflow AC2



Multiflow AC1





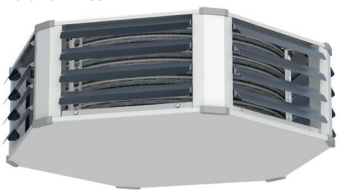
Control

AC3 – UNIREG MF BMS + PR 160

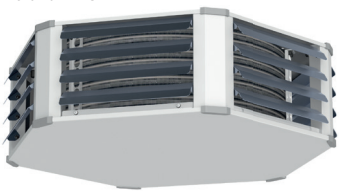
A control option with three-stage power controller PR 160 with 24V power voltage and output or actuators being 0-10V-signal controlled. Optional control using an external spatial PC sensor. Unireg MF BMS, in which the electronic components for the unit control are installed, is fitted in a plastic box with cooling holes, provided with circuit breaker and power components. Optional control from superior system using a BMS. Multiple units may be connected thereto.

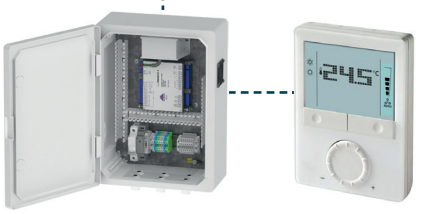
Type of control	Unireg MF BMS	PR 160
Power supply	230V	24V
Output power limitation	2,5A	-
Protection class	IP 20	IP 30
Dimesions (w x h x d)	300x400x170 [mm]	93x128x31 [mm]

Multiflow AC3



Multiflow AC1





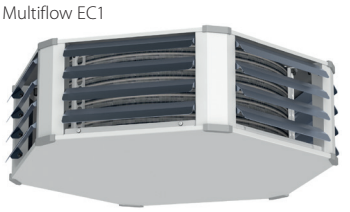
EC 230V

EC1 - OE 230

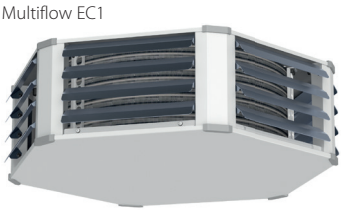
A control variant with OE 230 controller. The OE 230 controller continuously controls revolutions for fans with 230V power voltage. Optional control using an external TP thermostat. Multiple units may be connected to the controller.

Type of control	OE 230
Power supply	230V
Output power limitation	10A
Protection class	IP 40
Dimesions (w x h x d)	230x180x90 [mm]

Multiflow EC1



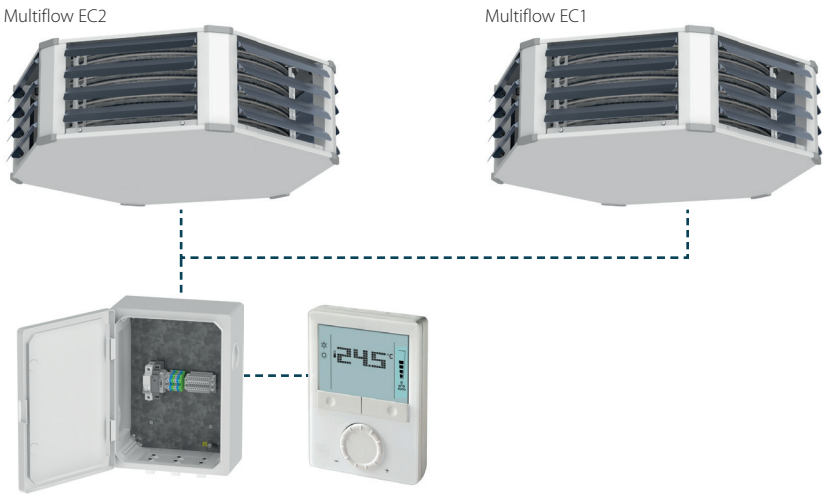
Multiflow EC1



EC2 - UNIREG MF EC2 + PR 160

A PR 160 control option with continuous power control using 0-10V signal with power voltage 24 V and output for actuators controlled by a 0-10V signal. Optional control using an external spatial PC sensor. Unireg MF EC2, in which the electronic components for the unit control are installed, is fitted in a plastic box provided with circuit breaker and power components. Multiple units may be connected thereto.

Type of control	Unireg MF EC2	PR 160
Power supply	230V	24V
Output power limitation	10A	-
Protection class	IP 54	IP 30
Dimesions (w x h x d)	300x400x170 [mm]	93x128x31 [mm]



EC3 – UNIREG MF BMS EC + PR 160

A PR 160 control option with continuous power control using 0-10V signal with power voltage 24 V and output for actuators controlled by a 0-10V signal. Optional control using an external spatial PC sensor. Unireg MF BMS EC, in which the electronic components for the unit control are installed, is fitted in a plastic box provided with circuit breaker and power components. Optional control from superior using BMS. Multiple units may be connected thereto.

Type of control	Unireg MF EC2	PR 160
Power supply	230V	24V
Output power limitation	10A	-
Protection class	IP 54	IP 30
Dimesions (w x h x d)	300x400x170 [mm]	93x128x31 [mm]

Control

	Multiflow AC-1	Multiflow AC-2	Multiflow AC-3	Multiflow EC-1	Multiflow EC-2	Multiflow EC-3
Electric						
Controller O3	✓	✗	✗	✗	✗	✗
Fan speed controller OE 230	✗	✗	✗	✓	✗	✗
TP - room thermostat	✓	✗	✗	✓	✗	✗
Controller PR 160	✗	✓	✓	✗	✓	✓
PC - room sensor	✗	✓	✓	✗	✓	✓
Unit chaining	1+1					
Mechanical						
Underceiling cover	✓	✓	✓	✓	✓	✓
Underceiling suspension	✓	✓	✓	✓	✓	✓
Connection flexible pipes	✓	✓	✓	✓	✓	✓
DKM - door contact	✗	✗	✗	✗	✗	✗
Spare filters - EU3	✗	✗	✗	✗	✗	✗
2-way valves						
ETVS 3/4" - N 24V 0-10V	✗	✓	✓	✗	✓	✓
ETVS 1" - N 24V 0-10V	✗	✓	✓	✗	✓	✓

TP1 basic room thermostat temperature range 5-35°C, 230V/3A/AC15, IP30

TP4 room thermostat for industrial application IP54

PC room temperature sensor for controller PR 160

PPH connection flexible pipes 3/4"

ZS-MF underceiling suspension Multiflow

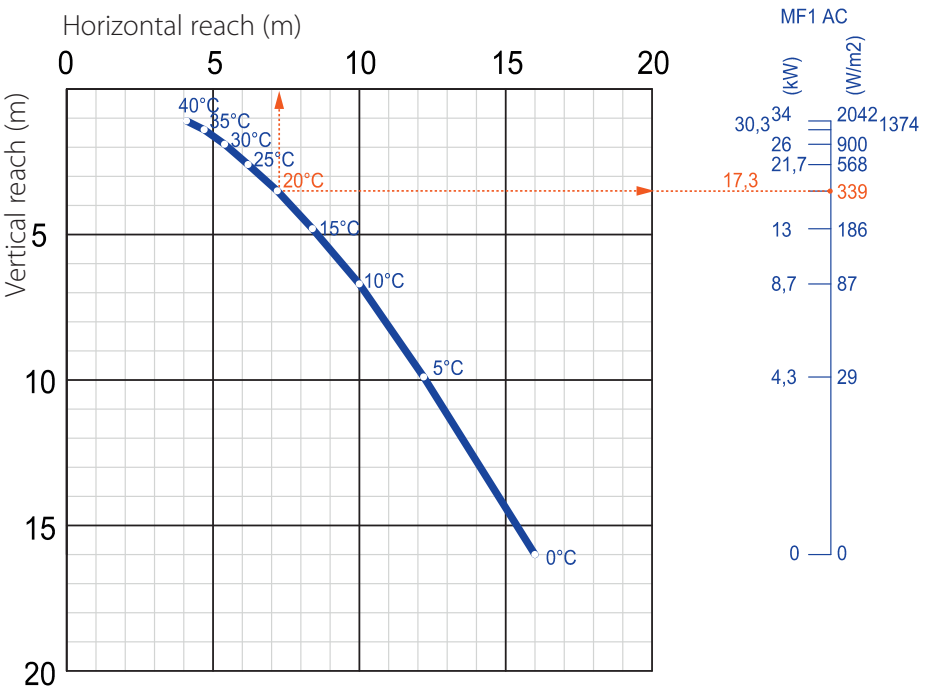
PK MF underceiling cover Multiflow

Valves

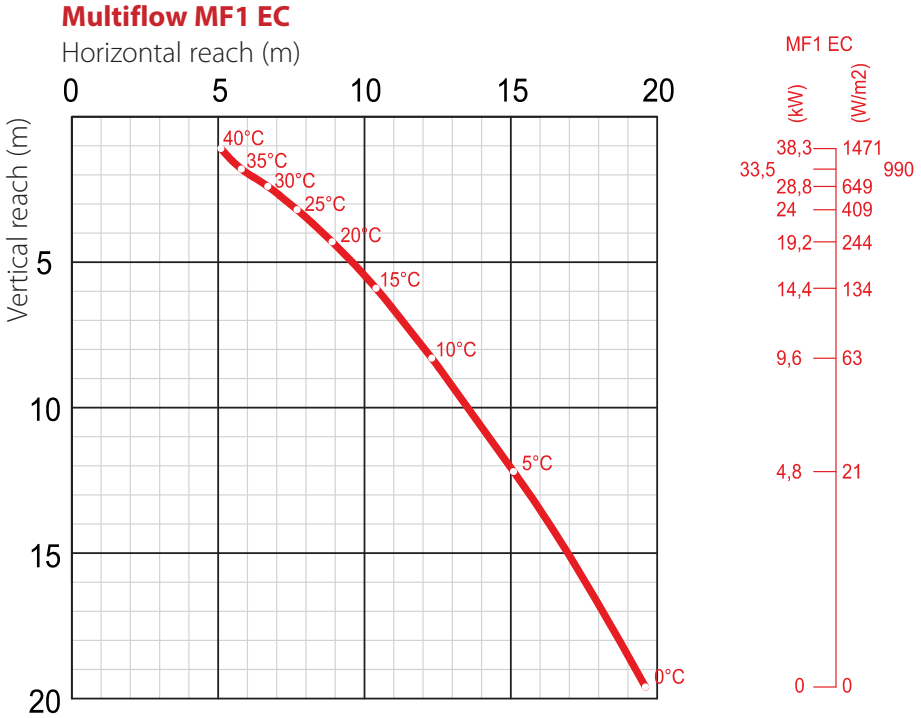
Upon request from a customer, a non-embedded pressure-independent 2-way valve with a control actuator may be delivered to the hot water heat exchanger.

Indentification	**Valves properties**	Permissible pressure difference [bar]	Permissible operation temperature [°C]	Permissible operation pressure [bar]	Power supply [V]	Drive properties
ETVS 3/4" - N 24V 0-10V	2-way, independent on pressure, not embedded	0,35 / 6	90	25	24	Electric servo drive with 0-10V output, IP 54
ETVS 1" - N 24V 0-10V	2-way, independent on pressure, not embedded	0,31 / 6	90	25	24	Electric servo drive with 0-10V output, IP 54

Multiflow MF1 AC



Multiflow MF1 EC



A model example how to read the graph:

1) Assembly height H of the Multiflow unit is 3.5m.

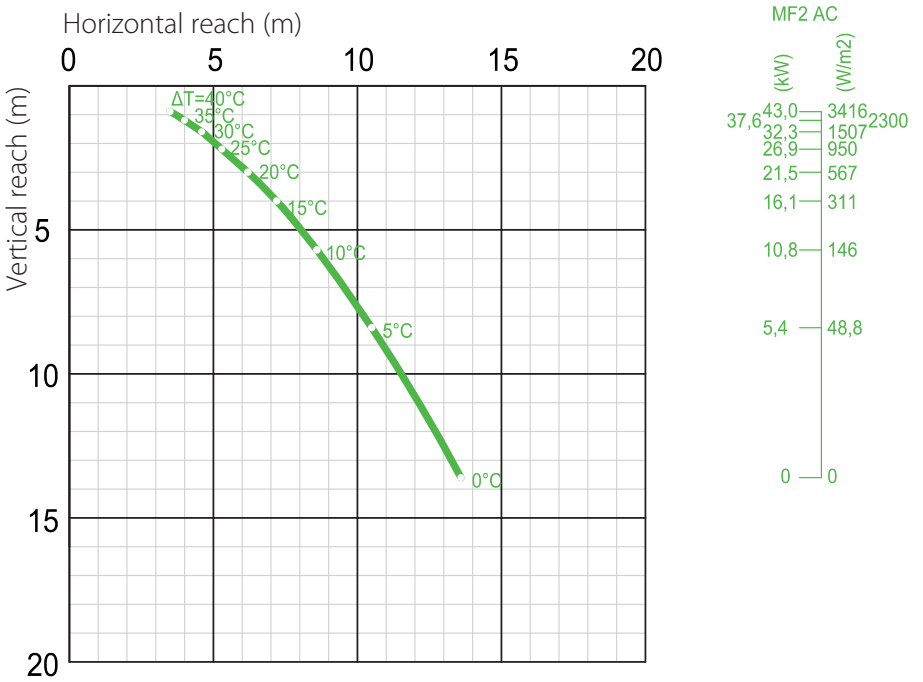
2) Temperature gradient is 70/50 °C (ΔT = 20 °C)

3) Horizontal reach is 7.2m (radius r). Floor surface diameter d = 2x r. In the model example it is 14.4m.

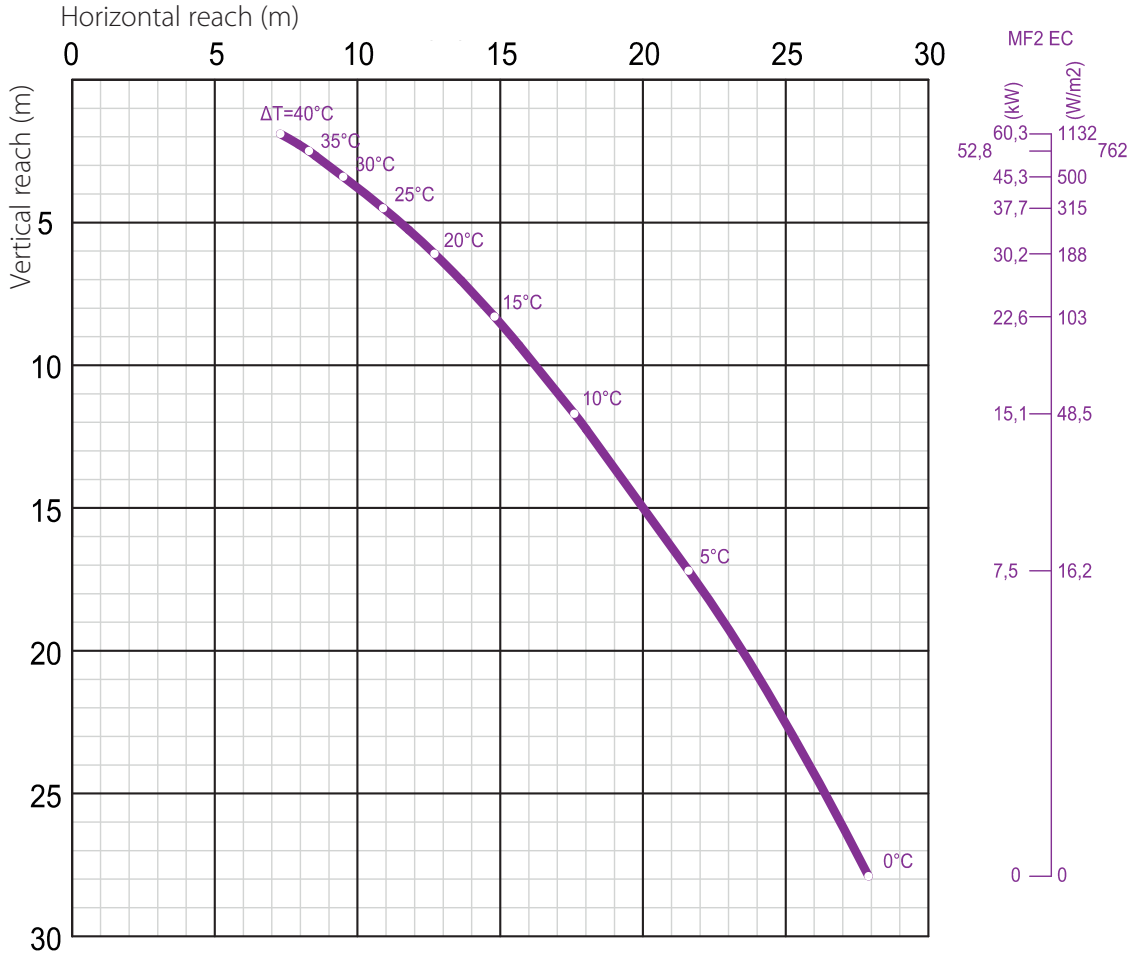
4) Heating capacity for said input values is 17.3 kW (area capacity 339 W/m2).

Ideal direction of air flow

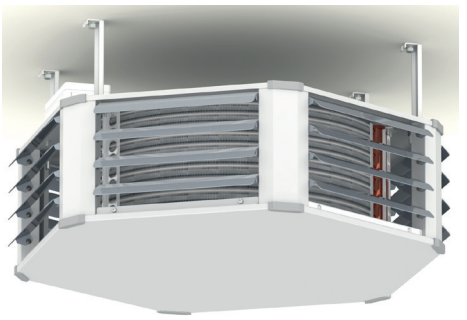
Multiflow MF2 AC



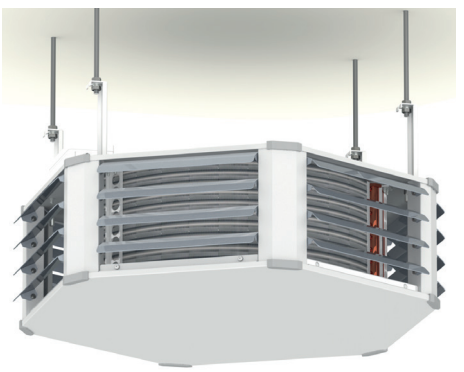
Multiflow MF2 EC



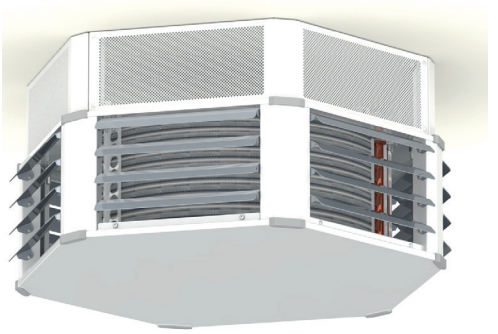
The Multiflow heating unit is designed both for direct ceiling suspension as well as for sub-ceiling suspension on a suspension kit (available upon request). A covering ceiling cover may be ordered for the ceiling suspension.



Ceiling suspension
The ceiling suspension of the Multiflow unit is the basic and simplest installation element.

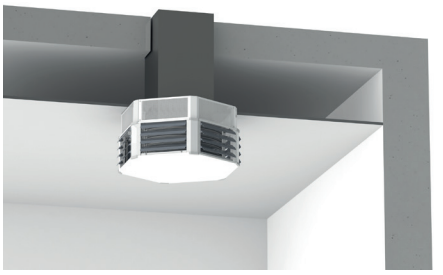


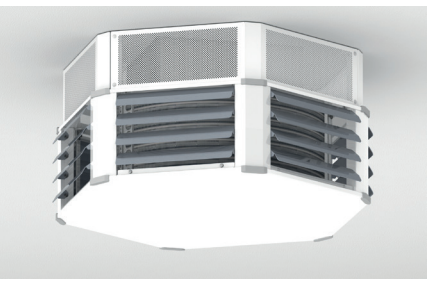
Underceiling suspension
The Multiflow heating unit can also be used for sub-ceiling assembly. The unit is suspended on four suspension points located on the external casing of the unit. Extension of the standard ceiling suspensions permits installation also in case of more complicated structural conditions.



Ceiling suspension with the cover
For the ceiling suspension of the Multiflow unit, a cover may be used to hide the components and may also operate as a suction grid of the unit. The cover is fastened using bolts to rivet nuts being located on external casing of the unit. The suspension device is thus excellently hidden and permits to install the unit in an aesthetic demanding spaces.

Installation – air recirculation





A recirculation unit is connected to the internal circuit

The heating unit is installed under the suspension ceiling. Air is input through an external grid of square shape being connected via AC pipeline with the recirculation unit.

The recirculation unit is connected to the external circuit.

The heating unit is installed under the suspension ceiling. Air is input via the external AC pipeline to the recirculation unit.

Recirculation unit with a fixed ceiling

The air unit is installed under the fixed ceiling. Air is input via a covering adapter being located between the recirculation unit and ceiling.

Order key

Order key

MULTIFLOW MF - 1 - HW - AC - 1

- **Type**: **Multiflow MF** - name of unit
- **Size of unit**: **1** – performance series „1“; **2** – performance series „2“
- **Type of heating**: **HW** - hot water heating
- **Type of fan**: Type of fan; **AC** – AC fan; **EC** – EC fan
- **Controller design**: **1** – basic unit; 2 – unit with the spatial controller; 3 – unit with the spatial controller with optional BMS control

Ditributor:

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