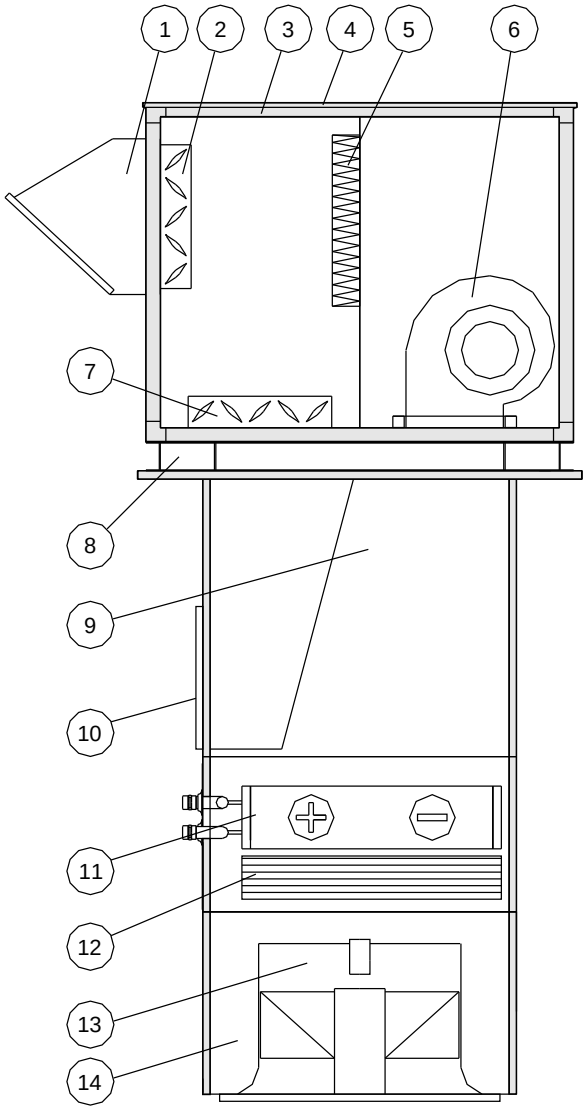
INTRODUCTION

Roof heating-ventilation units as a mechanical supply ventilation w air recirculation are intended for large hall compartments, storage warehouses, production warehouses, sports halls as the other objects located on the single-storey buildings or on the last floors of other buildings. The air is supplied from above towards the floor vertically or at some angle limits unfavorable stratification of the temperature inside the hall and reduces at the same time heat looses through the ceiling keeping the set temperature in the work zone . Air is supplied without draughts and uniformly with the help of rotational diffuser set remotely from the control box. Unit operation with the participation of external air requires the simultaneous exhaust of similar spent air quantity outside. So it's necessary to work with the separate exhaust fan with the consumption which is changed proportionally to the external air participation in the supply air.

CONSTRUCTION

The unit consists of the head installed on the roof pedestal and suspended to it, placed below the roof, vertical supply/exhaust set. The unit consists of following functional elements.



1. Air intake
2. External air throttling valve
3. Casing
4. Roof
5. G4 class air filter.
6. Intake fans set
7. Circulating air throttling valve
8. Base
9. Intake air chamber
10. Recirculation air inlet
11. Two-functional water exchanger
12. Drop separator (option).
13. Rotational diffuseR
14. Division chamber (option).

CONSTRUCTION DESCRIPTION

HEAD CASING

Casing construction (3) is based on the framework made of aluminum and “sandwich” type panels.
Panels are made of galvanized sheet. Outside it's additionally covered with the varnish. Filling consists of 45 mm thick mineral wool thickness.
In order to protect against the atmospheric precipitation the upper part of the unit is protected with the roof (4) made of galvanized varnished sheet.
Fresh air inlet is equipped with the inclined intakes (1). Technical data for the casing according to the standard PN-EN 1886-2008:

- heat infiltration coefficient - T3 class,
- coefficient of heating bridges influence - TB1 class,

THROTTING VALVES

Two multi-plane throttling valves are used in the deviece: fresh air throttling valve (3) circulating air throttling valve (7). Regulation of fresh and circulating air mixing level is made continuously from 0 to 100%.

FILTER

On external and circulating air inlet the G4 class filters (4,12) are placed. Final pressure drop on the contaminated filter is 150Pa.

FANS SET

The device uses radial fans (6) with double suction in the spiral casing made of galvanized sheet. They are driven directly by motors with the external supplied by 3x400V/50Hz current and they are adapted to the operation with the inverter. Sizes DAWGn-1 have one fan and sizes DAWGn-2 have 2 fans.

WATER HEAT EXCHANGER

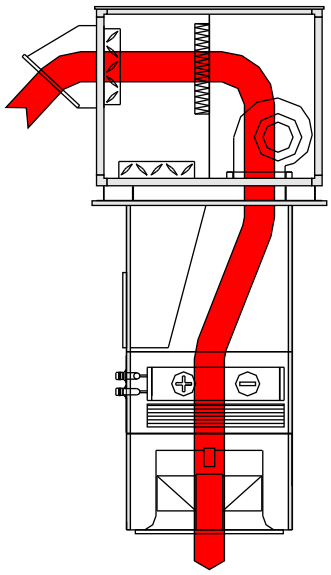
Exchanger construction (15) bases on the aluminum fins with the copper pipes. Depending on the needs it's used as the heater or cooler. In case of planned cooling option the drop separator (16) is used behind the exchanger. Condensates drain is realized gravitationally or with the help of pump.
ATTENTION: Solutions including two separate heat exchangers: cooling and heater – is offered as a special option – only after agreeing such opportunity with the manufacturer.

DIFFUSER

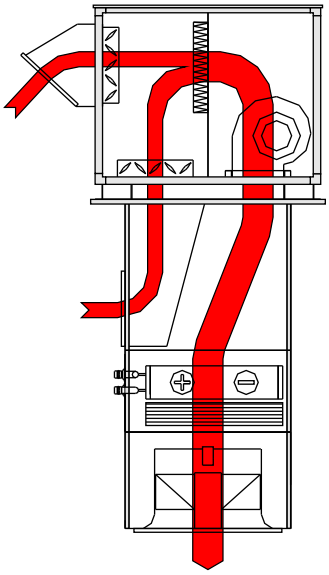
Rotational diffuser (17) is used on the intake air outlet from the unit and it has two adjustable elements enabling adjusting the air stream range controlled on the remotely with the help of electric servo-motor. Diagrams presenting the range of the air stream are presented in the next part of this catalogue. As an option instead of single diffuser we can use the division chamber (18) with the possibility of connecting two diffusers. In such case each diffuser receives the half or flowing air stream.

WORKING MODES

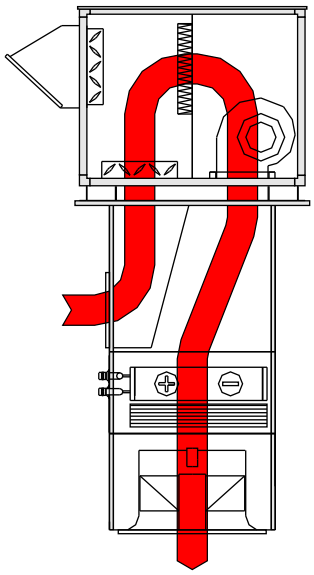
100% FRESH AIR



PARTIAL RECIRCULATION



100% CIRCULATION AIR



TECHNICAL DATA

Exchangers in heating function																			
Unit type	Exchanger designation	Heating medium temp. [°C]	DN	V	T1	Tn	Q	Mw	Pw	T1	Tn	Q	Mw	Pw	T1	Tn	Q	Mw	Pw
			[mm]	[dm³]	[°C]	[°C]	[kW]	[kg/s	[kPa]	[°C]	[°C]	[kW]	[kg/s	[kPa]	[°C]	[°C]	[kW]	[kg/s	[kPa]
DAWGn-1	1-II	90/70	32	4,0	-20	32,1	95,6	1,14	30,21	-10	36,5	85,4	1,02	24,46	0	41,0	75,2	0,90	19,28
		80/60				26,1	84,7	1,01	24,37		30,6	74,5	0,89	19,18		35,0	64,3	0,77	14,68
		70/50				20,1	73,6	0,88	19,05		24,6	63,5	0,76	14,44		29,1	53,4	0,64	10,44
		60/40				14,0	62,5	0,75	14,25		18,5	52,4	0,63	10,26		23,0	42,3	0,51	6,89
	1-IV	90/70	40	7,5		59,2	145,4	1,74	18,08		61,0	130,4	1,56	14,74		62,8	115,3	1,38	11,72
		80/60				50,5	129,4	1,55	14,74		52,3	114,4	1,37	11,70		54,1	99,3	1,19	8,99
		70/50				41,7	113,2	1,35	11,66		43,5	98,2	1,17	8,94		45,3	83,1	0,99	6,55
		60/40				32,7	96,8	1,16	8,86		34,5	81,7	0,98	6,47		36,3	66,6	0,79	4,42
DAWGn-2	2-II	90/70	40	7,5	-20	32,8	158,4	1,89	18,45	-10	37,1	141,4	1,69	14,92	0	41,5	124,4	1,49	11,74
		80/60				26,7	140,0	1,67	14,45		31,0	123,1	1,47	11,66		35,4	106,1	1,27	8,84
		70/50				20,5	121,5	1,45	11,55		24,9	104,6	1,25	8,74		29,2	87,7	1,05	8,29
		60/40				14,2	102,7	1,23	8,60		18,6	85,8	1,03	6,16		23,0	69,0	0,83	4,11
	2-IV	90/70	40	12,0		61,8	245,5	2,93	32,43		63,5	220,6	2,63	26,57		65,2	195,6	2,34	21,25
		80/60				53,1	219,4	2,62	26,69		54,8	194,4	2,32	21,32		56,5	169,4	2,02	16,52
		70/50				44,3	192,9	2,31	21,38		46,0	167,9	2,01	16,53		47,6	142,8	1,71	12,26
		60/40				35,4	166,1	1,99	16,53		37,0	141,0	1,69	12,22		38,6	115,8	1,38	8,50

Exchangers in cooling function																			
Unit type	Exchanger designation	Heating medium temp. [°C]	DN	V	T1	Tn	Q	Mw	Pw	T1	Tn	Q	Mw	Pw	T1	Tn	Q	Mw	Pw
			[mm]	[dm³]	[°C]	[°C]	[kW]	[kg/s	[kPa]	[°C]	[°C]	[kW]	[kg/s	[kPa]	[°C]	[°C]	[kW]	[kg/s	[kPa]
DAWGn-1	1-II	7/12	32	4,0	32	22,2	21,8	1,04	29,4	30	21,3	20,1	0,96	25,3	28	20,4	19,1	0,91	23,0
		10/16				24,2	14,3	0,57	9,4		23,3	12,4	0,49	7,2		22,3	10,5	0,42	5,3
	1-IV	7/12	40	7,5		17,5	33,0	1,57	17,5		17,1	30,5	1,45	15,1		16,7	29,0	1,38	13,8
		10/16				20,4	21,3	0,85	5,5		19,9	18,5	0,73	4,2		19,4	15,7	0,63	3,1
DAWGn-2	2-II	7/12	40	7,5	32	22,3	34,3	1,63	16,3	30	21,4	31,4	1,50	13,9	28	20,5	29,8	1,42	12,6
		10/16				24,3	23,0	0,913	5,5		23,4	19,9	0,79	4,2		22,4	16,7	0,66	3,1
	2-IV	7/12	40	12,0		16,6	60,7	2,89	37,4		16,2	56,3	2,68	32,6		15,8	53,8	2,56	30,0
		10/16				19,5	37,6	1,49	11,0		19,0	32,9	1,31	8,6		18,7	30,2	1,20	7,3

ATTENTION! All the values were calculated for max air flow of the given device size.

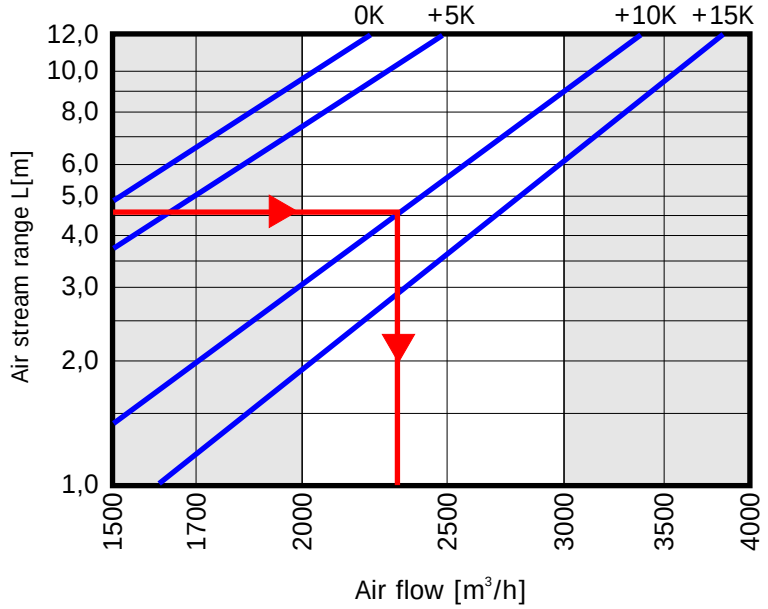
ELECTRICAL AND FLOW DATA			
		DAWGn-1	DAWGn-2
Minimal air flow	[m³/h]	2000	5000
Maximal air flow	[m³/h]	5500	9000
Nominal voltage	[V]	3x400	3x400
Frequency	[Hz]	50	50
Nominal power	[kW]	1,5	2x1,5
Nominal current consumption	[A]	4,3	2x4,3
Protection class	[-]	IP54	IP54

Designations for the heating calculations table:
T1 – air temperature in the front of exchanger
Tn – air temperature behind the exchanger
Q - exchanger power for programmed parameters
Mw - mass flow of heating medium
Pw - hydraulic resistances of the exchanger on the heating medium side
V – exchanger volume

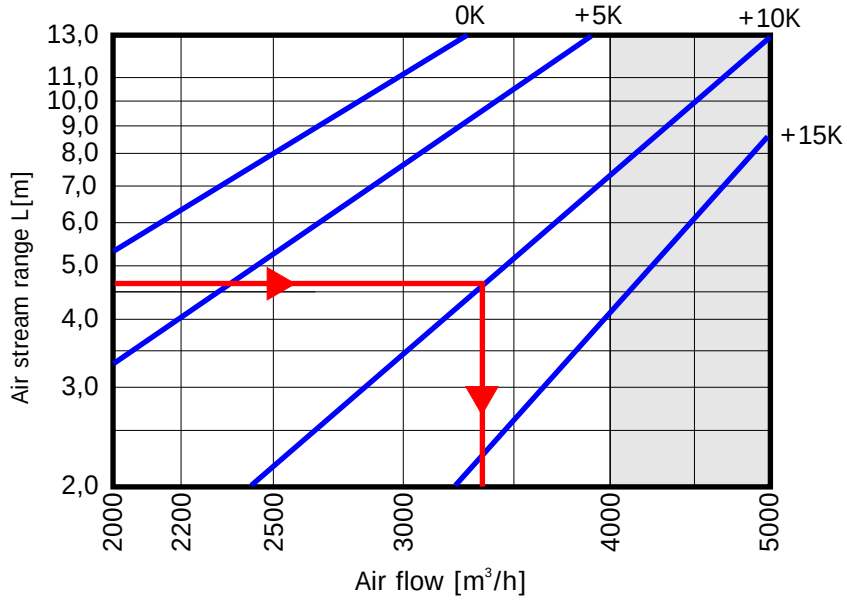
For the cooling power calculations the following air humidity was accepted
-for 32°C humidity 40%
-for 30°C humidity 45%
-for 28°C humidity 52%
ATTENTION! All the values were calculated for maximal air flow in the given device size

AIR STREAM RANGE

N1 TYPE DIFFUSER



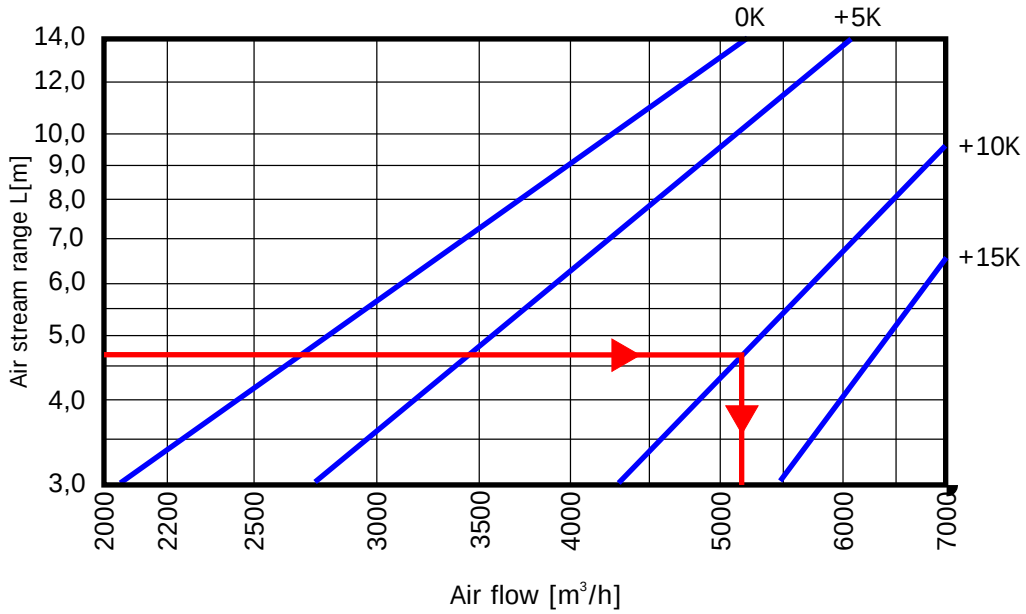
N2 TYPE DIFFUSER



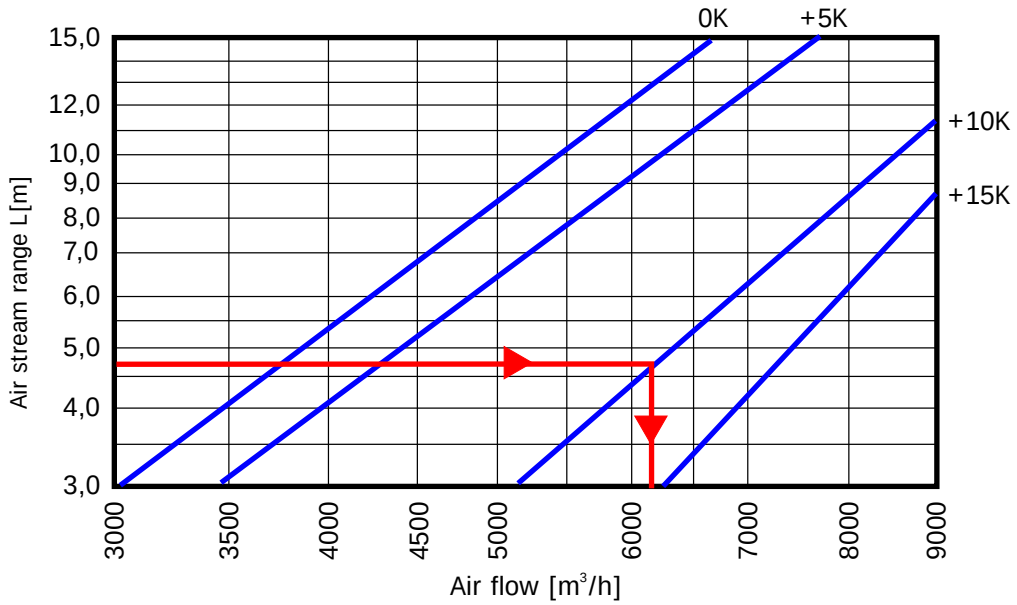
- Forbidden work area

AIR STREAM RANGE

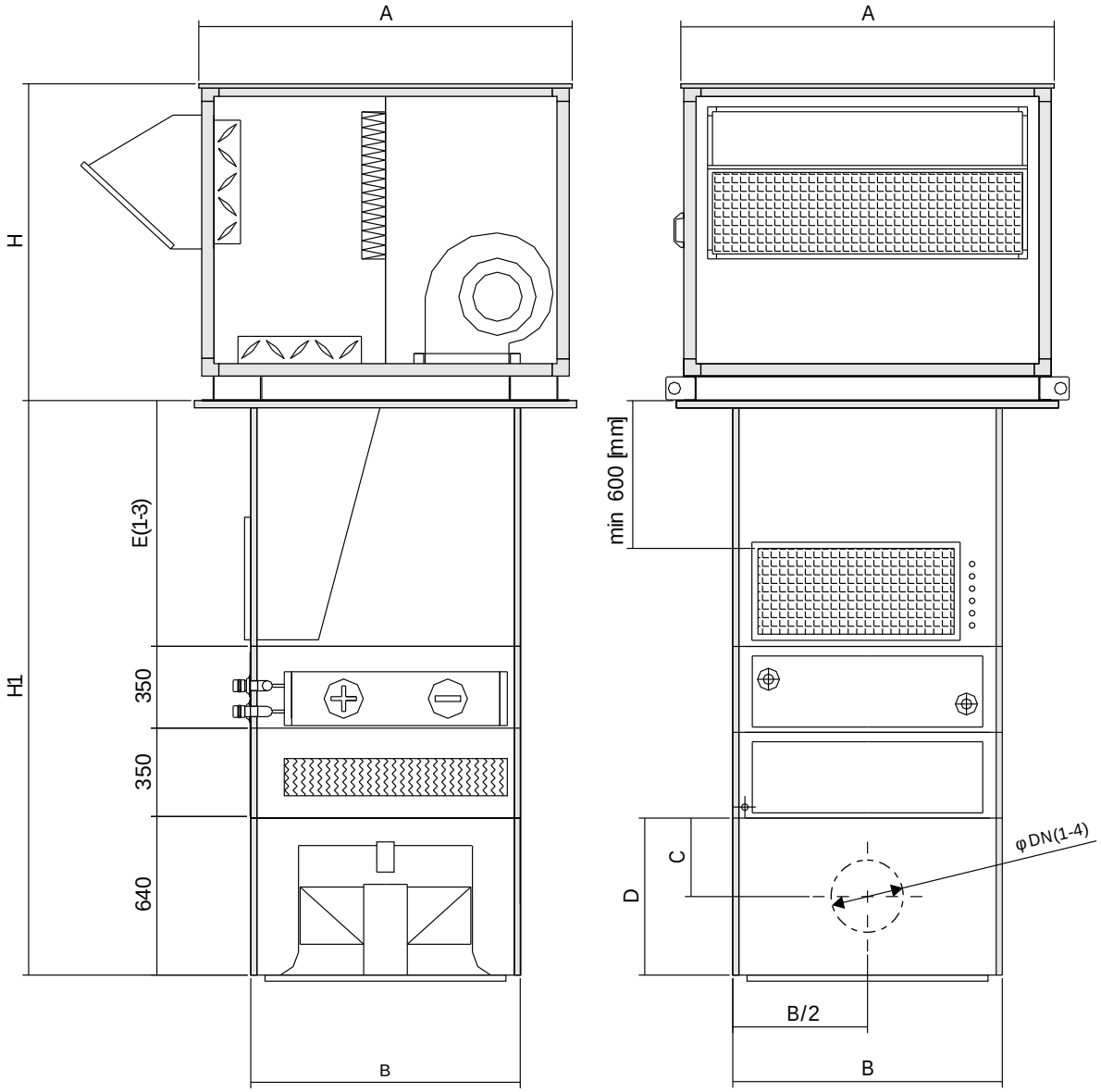
N3 TYPE DIFFUSER



N4 TYPE DIFFUSER



DIMENSIONS AND WEIGHT



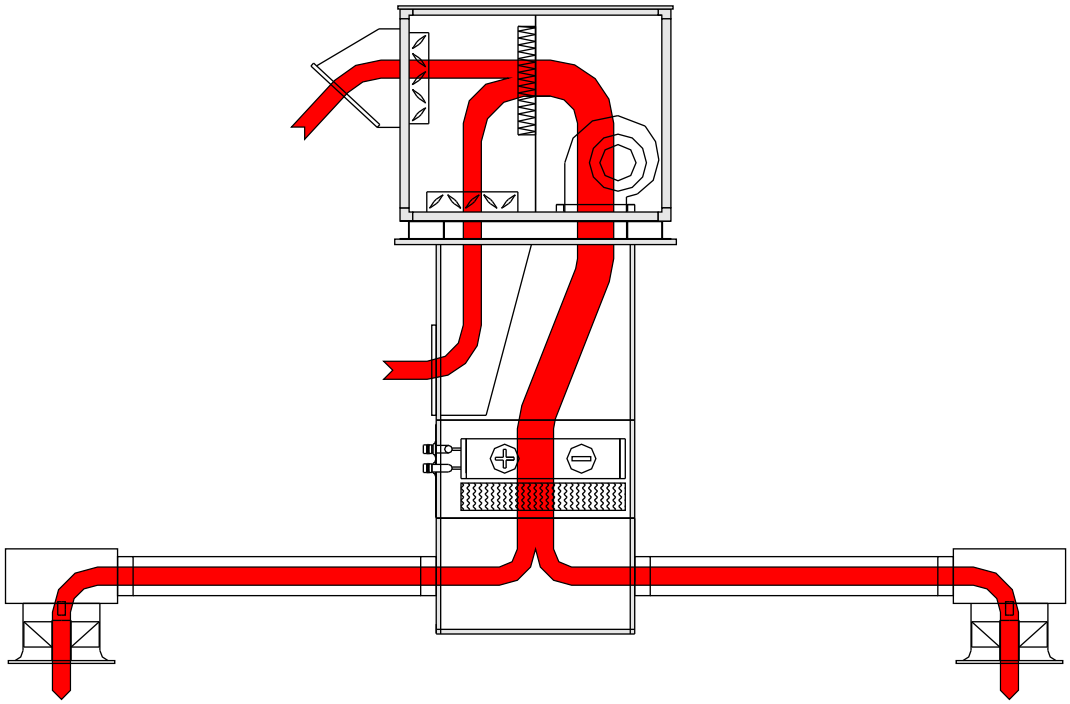
ATTENTION!
Total height (H1) of under-ceiling part depends on the height (E) of the mixing chamber and drop separator section which is installed if the fin exchanger is used as the cooler.

WEIGHT						
Description	DAWGn-1			DAWGn-2		
Head	-	310	[kg]	-	360	[kg]
Recirculation chamber	1000[mm]	32		1000[mm]	36	
	1200[mm]	39		1200[mm]	45	
	1500[mm]	48		1500[mm]	55	
Exchanger section	1-II	33		2-II	47	
	1-IV	48		2-IV	75	
Drop separator	-	32		-	39	
Diffuser section	N1	27		N1	32	
	N2	29		N2	34	
	N3	30		N3	38	
	N4	32		N4	40	
Division chamber	900[mm]	28		900[mm]	32	

DIMENSIONS			
		DAWGn-1	DAWGn-2
A	[mm]	1324	1524
B		900	1100
H		1100	1290
C		435	
D		900	
D-N1		2xφ400	
D-N2		2xφ500	
D-N3		2xφ630	
D-N4		2xφ710	
E1		1000	
E2		1200	
E3		1500	

OPTIONAL SOLUTIONS

As an option instead of single diffuser the division chamber can be used where air streams are divided into two branches. In such case for the diffuser selection the half of flowing air stream should be accepted.
The spouts diameters are showed in the table of overall dimensions.
ATTENTION. Delivery doesn't include the ducts connecting the unit with the diffusers.



DESIGNATIONS

DAWGn - [...] - [...] - [...] / [...] / [...] / [...]

SIZE

1, 2

HEATING AND COOLING FUNCTION

N - heating, C - cooling, NC – heating and cooling

EXCHANGER TYPE

1-II, 1-IV, 2-II, 2-IV

DIFFUSER TYPE

N1, N2, N3, N4, RN1*, RN2*, RN3*, RN4*

HEIGHT OF RECIRCULATING CHAMBER

E1, E2, E3

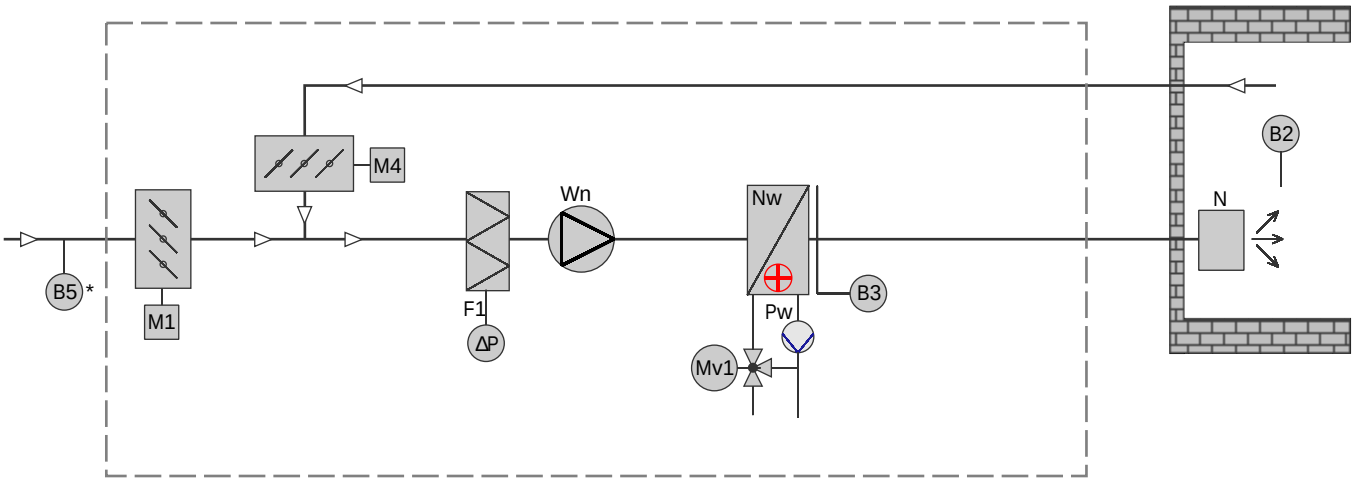
AUTOMATICS

*- if You chose the division chamber the delivery includes two the same type diffusers eg. for RN2 means that the device will be equipped with the division chamber and two N2 type diffusers.

AUTOMATICS

Air supply automatics systems with recirculation

Automatics system supplying and operating the work of the diffuser of the unit with water heater and recirculation is intended for keeping the constant temperature in the compartment.



DESIGNATIONS:

M1- intake throttling valve servo-motor
MV1- heater 3-way valve with servo-motor
B2- room temperature sensor
B5*- external temperature sensor
Pw - water pump
M4- recirculation throttling valve servo-motor
F1- pressure switch of intake filter
B3- anti – freeze thermostat
N- rotational diffuser

* optional, depending on the unit system configuration

SYSTEM DESCRIPTION:

The unit is controlled by the supply-control cabinet with temperature controller. After switching the unit on, controller as the answer to the signal from temperature sensor controls with the M1 and M4 servo-motors the air recirculation level and when sets it at maximal permissible recirculation level, and temperature will be too low, then the MV1 heater valve will be opened. Air efficiency adjustment in the units is established by the frequency converters and the air stream range is set remotely on the rotational diffuser.

SENSOR:

- temperature in the compartment is controlled by the B2 room temperature sensor;
- B3 anti – freeze sensor protects the heaters against freezing in two ways (it's active also in stand-by mode);
- external B5* when temperature falls below -10C it transfers the signal to the controller which switches the pump on (it switches it off again when the external temperature will rise by 5C);
- F1 pressure switch informs about excessive filter contamination;

Temperature adjustment is made on the CPU controller with the possibility of readout and setting of adjustment parameters on the display.

CONTROL AND PROTECTION:

-anti –freeze - in case when temperature behind the heater falls below the threshold value +5C, the B3 detector will switch the unit operation of, close M1 throttling valve, fully open MV1 valve until the temperature increase on the heater will rise and the lamp HEATER FAILURE on the cabinet will be switched (triple activation of thermostat will block the system);

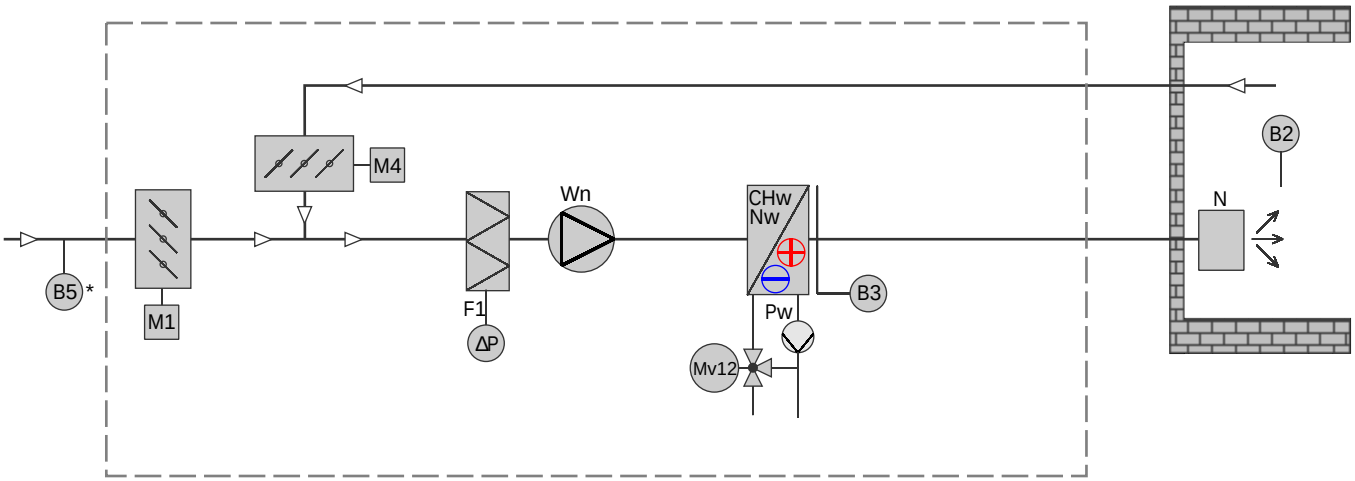
- filter pressure switch - Filter is equipped with F1 pressure switch measuring the pressure drop on the filter. In case of filter contamination the lamp „DIRTY FILTER" on the cabinet will be switched on.
- fans operation - Lamp on the cabinet signals the fans operation;
- pump operation - Lamp „PUMP OPERATION" on the cabinet signals switching the pump on at 5% of valve opening;
- fan - In case of too small fan efficiency or in case of exceeding motor nominal currents the overcurrent protection will be activated and the lamp "DRIVE FAILURE" on the cabinet will be switched on.

ATTENTION: DAWGn unit operation with the participation of external air usually requires simultaneous exhaust of the adequate spent air quantity from the hall to outside with use of eg. separate exhaust fan. Taking into consideration the adequate control circuit of such fan in the automatics system for DAWGn requires the earlier agreement of type, power, and the quantity of such fan or fans.

AUTOMATICS

Air supply automatics systems with recirculation

Automatics system supplying and controlling the operation of diffuser unit with the water heater-cooler and with recirculation is intended for keeping the constant temperature in the compartment.



DESIGNATIONS:

M1- intake throttling valve servo-motor
MV12- 3-way valve of the heater/cooler with servo-motor
B2- room temperature sensor
B5*- external temperature sensor
Pw- water pump
M4- recirculation throttling valve servo-motor
F1- intake filter pressure switch
B3- anti – freeze thermostat
N- rotational diffuser

* optional, depending on the unit system configuration

SYSTEM DESCRIPTION

The unit is controlled by the supply-control cabinet with temperature. After switching the unit on, controller as the answer to the signal from temperature sensor controls with the M1 and M4 servo-motors the air recirculation level and when sets it at maximal permissible recirculation level, and temperature will be too low, then the MV12 heater valve will be opened. The same heater is also used for cooling. Switching the system to heating and cooling is performed in manual mode. Selector switch is installed in the supply-control cabinet or remotely. Air capacity adjustment in the units is determined with the frequency converters, as the air stream range is set remotely on the rotational diffuser.

SENSOR:

- B2 room temperature sensor controls the temperature in the compartment;
- B3 anti – freeze sensor protects the heaters against freezing in two ways (it's active also in standby mode);
- external B5* when temperature falls below -10C it transfers the signal to the controller which switches the pump on (switches it off again when the external temperature will rise by about 5C);
- F1 pressure switch informs about excessive filter contamination;

Temperature adjustment is made on the CPU controller with possibility of readout and setting of adjustment parameters on the display.

CONTROL AND PROTECTION:

-anti –freeze - in case of temperature behind the heater falls below the threshold value +5C, the B3 detector will switch the unit operation off, close M1 throttling valve, fully open MV1 valve until the temperature on the heater will rise and then on the lamp HEATER FAILURE on the cabinet will be switched on (triple activation of the thermostat will block the system);

- filter pressure switch - the filter is equipped with F1 pressure switch measuring the pressure drop on the filter. In case of filter contamination the lamp „FILTER POLLUTED" on the cabinet will be switched on.
- fans operation - lamp on the cabinet signals the fans operation;
- pump operation - lamp „PUMP OPERATION" on the cabinet signals switching the pump on at 5% of valve opening;
- fan - in case of too small fan efficiency or exeeding motor nominal currents the overcurrent protection will be activated and the lamp "DRIVE FAILURE" on the cabinet will be switched on.

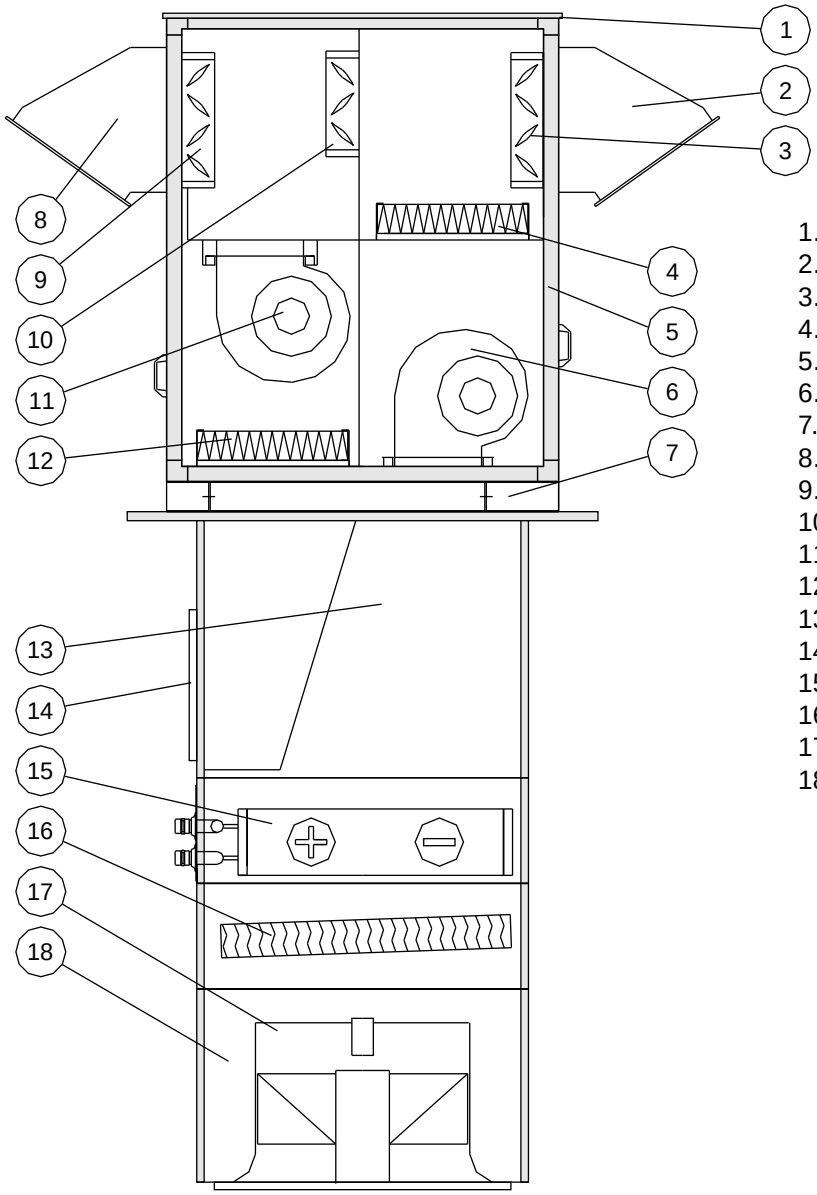
ATTENTION: DAWGn unit operation with the participation of external
air usually requires simultaneous exhaust of the adequate spent air quantity from the hall to outside with using eg. separate exhaust fan. Taking into consideration the adequate control circuit of such fan in the automatics system for DAWGn requires the earlier agreement of type, power, and the quantity of such fan or fans.

INTRODUCTION

DAWGn/w roof vent-heating units in the supply-exhaust version with the air recirculation are intended for heating and to ventilating the large commercial compartments, storage warehouses, production warehouses, sports halls and the other objects located in the single-storey buildings or on the last floors of the others buildings. Air intake from above toward the floor, vertically or at some angle, limits adverse stratification of the temperature inside the hall and at the same time lowers the heat looses through the ceiling keeping in the working zone programmed temperature. Air is supplied without draughts and uniformly with the help of rotational diffuser set remotely from the control cabinet. Unit operation with the participation of external air requires the simultaneous exhaust of similar spent air quantity outside. So it's necessary to work with the separate exhaust fan with the consumption which is changed proportionally to the external air participation in the supply air. Difference comparing to the apparatus DAWGn type consists in eliminating the need of simultaneous using the separate exhaust fans to work with this unit.

CONSTRUCTION

The unit consists of head installed on the roof pedestal and supply/exhaust set suspended below the roof pedestal. The unit consists of following functional elements.



1. Roof
2. Air intake
3. External air throttling valve.
4. G4 class air filter.
5. Casing
6. Intake fans set.
7. Base.
8. Exhauster
9. Removed air throttling valve.
10. Circulating air throttling valve.
11. Exhaust fans set.
12. G4 class air filter.
13. Intake air chamber
14. Recalculating air inlet
15. Two function water exchanger
16. Drop separator (option).
17. Rotational diffuser
18. Division chamber (option)

CONSTRUCTION DESCRIPTION

HEAD CASING

Casing construction (5) is based on the framework made of aluminum profiles and “sandwich” type panels. Panels are made of galvanized sheet, additionally covered with varnish from outside. Filling consists of 45 mm thick mineral wool. In order to protect against the atmospheric precipitation the upper part of the unit is protected with the roof (1) made of galvanized, varnished sheet. Fresh air inlet is equipped with the inclined intake vent (2). Removed air outlet is equipped with air exhausters (8).

Technical data for the casing according to the PN-EN1886-2008 standard:

- heat infiltration coefficient - T3 class,
- coefficient of heating bridges influence - TB1 class,

THROTTING VALVES

Three multi-plane throttling valves are used in the device: fresh air throttling valve (3) circulating air throttling valve (10) and removed air throttling valves (1).

Regulation of fresh and circulating air mixing level is conducted in the continuous way from 0 to 100%.

FILTERS

G4 class filters (4,12) are placed on external and circulating air inlet. Final pressure decrease on the contaminated filter is 150Pa.

FANS SET

The device is using the radial fans (6, 11) sucking the air from both sides in the spiral casing made of galvanized sheet. They are driven directly with the motors with the external and supplied by 3x400V/50Hz current and they are adapted for operation with the inverter. There are 2 set with 2 fans in all unit sizes.

WATER HEAT EXCHANGER

Exchanger construction (15) bases on the aluminum fins with the copper pipes. Depending on the requirements it's used as the heater or cooler. In case of projecting cooling the drop separator (16) is placed behind the exchanger. Condensates drain is realized gravitationally or with the help of pump.

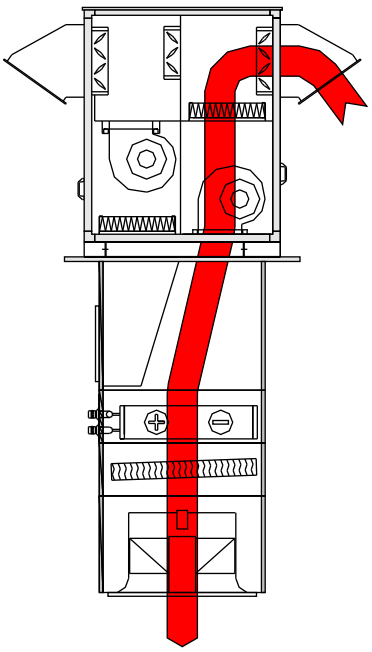
ATTENTION: Solutions including two separate heat exchangers: cooling and heater are offered as a special option – only after agreement such opportunity with the manufacturer.

DIFFUSER

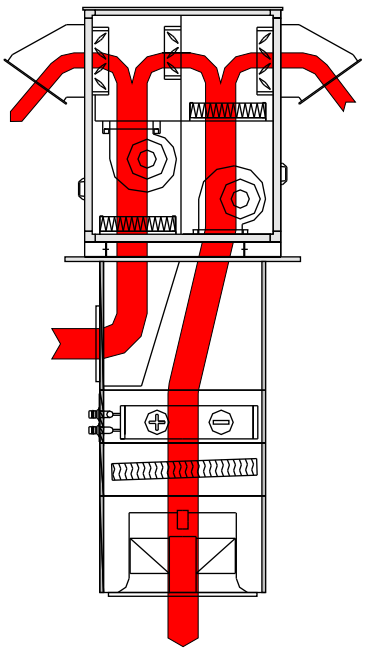
On the intake air outlet from the unit the rotational diffuser (17) is used and it has two adjustable elements enabling adjusting the air stream range controlled remotely with the electric servo-motor. Diagrams presenting the range of air stream are presented in the next part of this catalogue. As an option instead of a single diffuser we can use the division chamber (18) with the possibility of connecting two diffusers. In such case each diffuser receives half of flowing air stream.

WORKING MODES

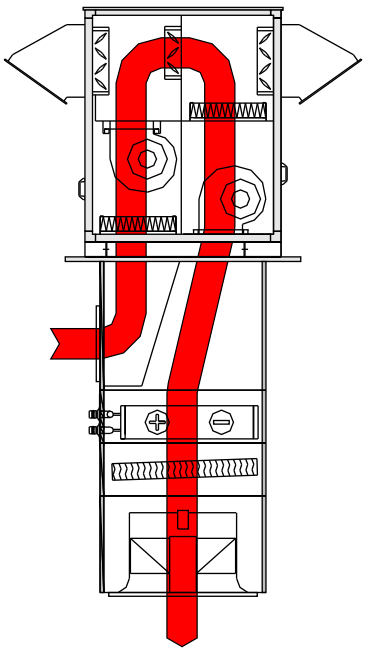
100% FRESH AIR



PARTIAL RECIRCULATION



100% CIRCULATION AIR



TECHNICAL DATA

Exchangers in heating function																			
Unit type	Exchanger designation	Heating medium temp. [°C]	DN	V	T1	Tn	Q	Mw	Pw	T1	Tn	Q	Mw	Pw	T1	Tn	Q	Mw	Pw
			[mm]	[dm³]	[°C]	[°C]	[kW]	[kg/s	[kPa]	[°C]	[°C]	[kW]	[kg/s	[kPa]	[°C]	[°C]	[kW]	[kg/s	[kPa]
DAWGn/w-1	1-II	90/70	32	4,0	-20	32,1	95,6	1,14	30,21	-10	36,5	85,4	1,02	24,46	0	41,0	75,2	0,90	19,28
		80/60				26,1	84,7	1,01	24,37		30,6	74,5	0,89	19,18		35,0	64,3	0,77	14,68
		70/50				20,1	73,6	0,88	19,05		24,6	63,5	0,76	14,44		29,1	53,4	0,64	10,44
		60/40				14,0	62,5	0,75	14,25		18,5	52,4	0,63	10,26		23,0	42,3	0,51	6,89
	1-IV	90/70	40	7,5		59,2	145,4	1,74	18,08		61,0	130,4	1,56	14,74		62,8	115,3	1,38	11,72
		80/60				50,5	129,4	1,55	14,74		52,3	114,4	1,37	11,70		54,1	99,3	1,19	8,99
		70/50				41,7	113,2	1,35	11,66		43,5	98,2	1,17	8,94		45,3	83,1	0,99	6,55
		60/40				32,7	96,8	1,16	8,86		34,5	81,7	0,98	6,47		36,3	66,6	0,79	4,42
DAWGn/w-2	2-II	90/70	40	7,5	-20	32,8	158,4	1,89	18,45	-10	37,1	141,4	1,69	14,92	0	41,5	124,4	1,49	11,74
		80/60				26,7	140,0	1,67	14,45		31,0	123,1	1,47	11,66		35,4	106,1	1,27	8,84
		70/50				20,5	121,5	1,45	11,55		24,9	104,6	1,25	8,74		29,2	87,7	1,05	8,29
		60/40				14,2	102,7	1,23	8,60		18,6	85,8	1,03	6,16		23,0	69,0	0,83	4,11
	2-IV	90/70	40	12,0		61,8	245,5	2,93	32,43		63,5	220,6	2,63	26,57		65,2	195,6	2,34	21,25
		80/60				53,1	219,4	2,62	26,69		54,8	194,4	2,32	21,32		56,5	169,4	2,02	16,52
		70/50				44,3	192,9	2,31	21,38		46,0	167,9	2,01	16,53		47,6	142,8	1,71	12,26
		60/40				35,4	166,1	1,99	16,53		37,0	141,0	1,69	12,22		38,6	115,8	1,38	8,50

Exchangers in cooling function																			
Unit type	Exchanger designation	Heating medium temp. [°C]	DN	V	T1	Tn	Q	Mw	Pw	T1	Tn	Q	Mw	Pw	T1	Tn	Q	Mw	Pw
			[mm]	[dm³]	[°C]	[°C]	[kW]	[kg/s	[kPa]	[°C]	[°C]	[kW]	[kg/s	[kPa]	[°C]	[°C]	[kW]	[kg/s	[kPa]
DAWGn/w-1	1-II	7/12	32	4,0	32	22,2	21,8	1,04	29,4	30	21,3	20,1	0,96	25,3	28	20,4	19,1	0,91	23,0
		10/16				24,2	14,3	0,57	9,4		23,3	12,4	0,49	7,2		22,3	10,5	0,42	5,3
	1-IV	7/12	40	7,5		17,5	33,0	1,57	17,5		17,1	30,5	1,45	15,1		16,7	29,0	1,38	13,8
		10/16				20,4	21,3	0,85	5,5		19,9	18,5	0,73	4,2		19,4	15,7	0,63	3,1
DAWGn/w-2	2-II	7/12	40	7,5	32	22,3	34,3	1,63	16,3	30	21,4	31,4	1,50	13,9	28	20,5	29,8	1,42	12,6
		10/16				24,3	23,0	0,913	5,5		23,4	19,9	0,79	4,2		22,4	16,7	0,66	3,1
	2-IV	7/12	40	12,0		16,6	60,7	2,89	37,4		16,2	56,3	2,68	32,6		15,8	53,8	2,56	30,0
		10/16				19,5	37,6	1,49	11,0		19,0	32,9	1,31	8,6		18,7	30,2	1,20	7,3

ATTENTION! All the values were calculated for max air flow of the given device size.

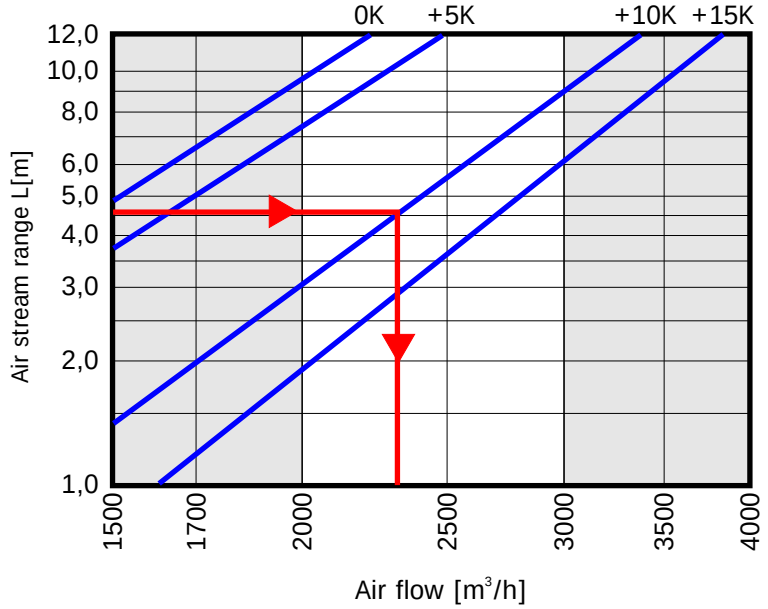
ELECTRICAL AND FLOW DATA					
		DAWGn/w-1		DAWGn/w-2	
		Supply	Exhaust	Supply	Exhaust
Minimal air flow	[m³/h]	2000		5000	
Maximal air flow	[m³/h]	5500		9000	
Nominal voltage	[V]	3x400		3x400	
Frequency	[Hz]	50		50	
Nominal power	[kW]	2x1,1	2x1,1	2x1,5	2x1,1
Nominal current consumption	[A]	2x1,8	2x1,8	2x4,3	2x4,2
Protection class	[-]	IP54	IP54	IP54	IP54

Designations for the heating calculations table:
T1 – air temperature in the front of exchanger
Tn – air temperature behind the exchanger
Q - exchanger power for programmed parameters
Mw - mass flow of heating medium
Pw - hydraulic resistances of the exchanger on the heating medium side
V – exchanger volume

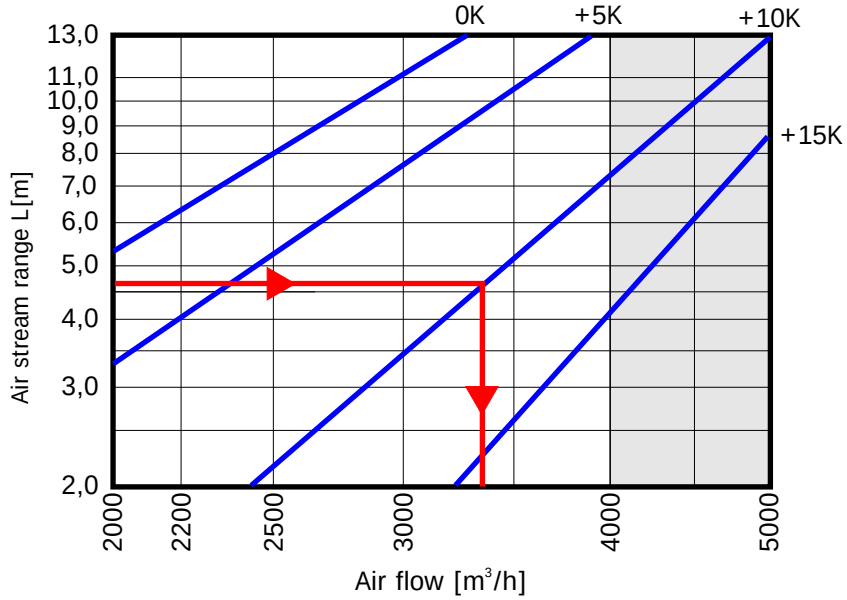
For the cooling power calculations the following air humidity was accepted
-for 32°C humidity 40% -for 30°C humidity 45% -for 28°C humidity 52%
ATTENTION! All the values were calculated for maximal air flow in the given device size

AIR STREAM RANGE

N1 TYPE DIFFUSER



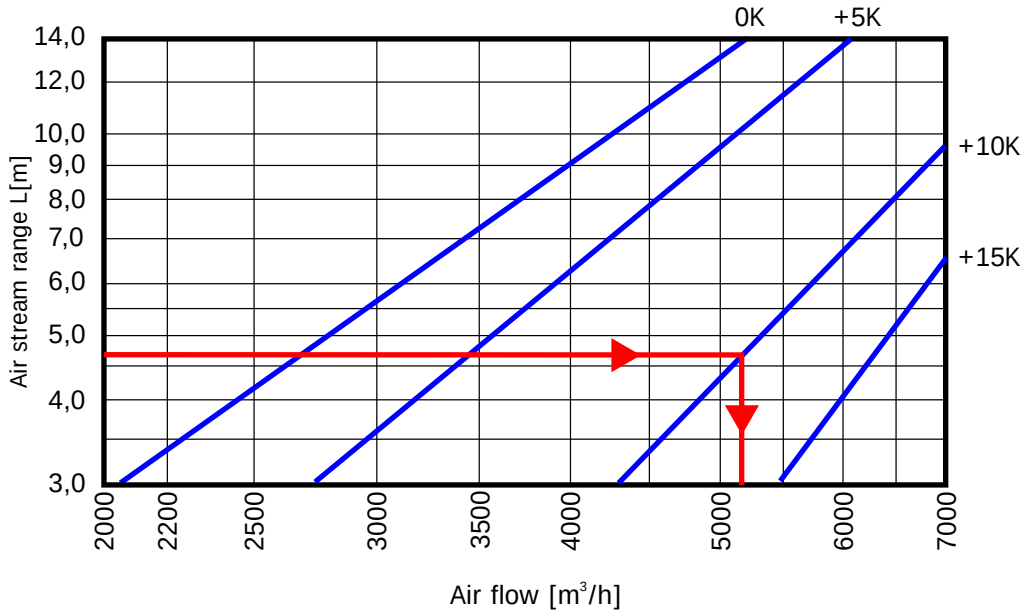
N2 TYPE DIFFUSER



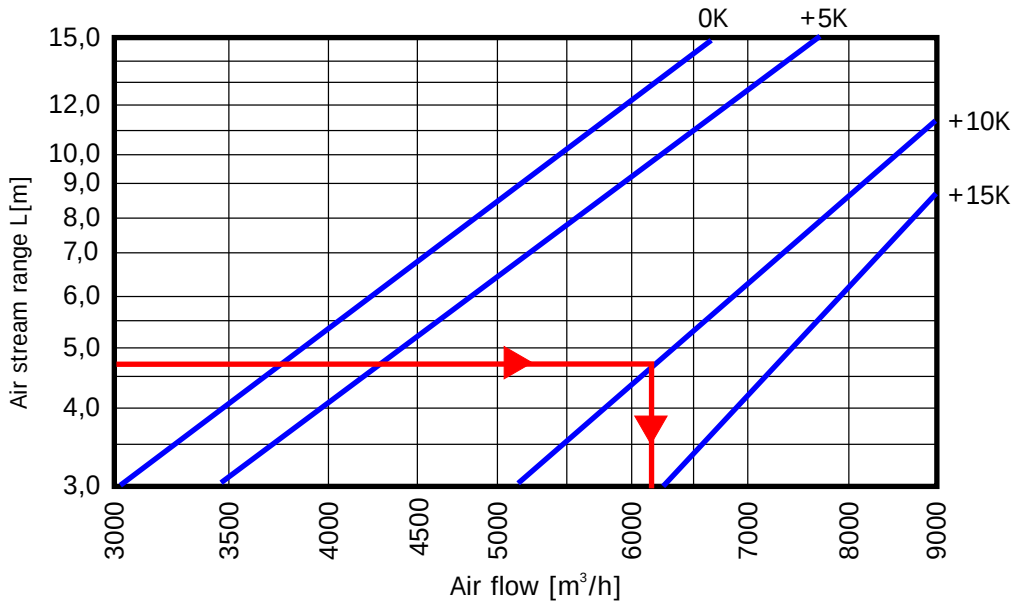
- Forbidden work area

AIR STREAM RANGE

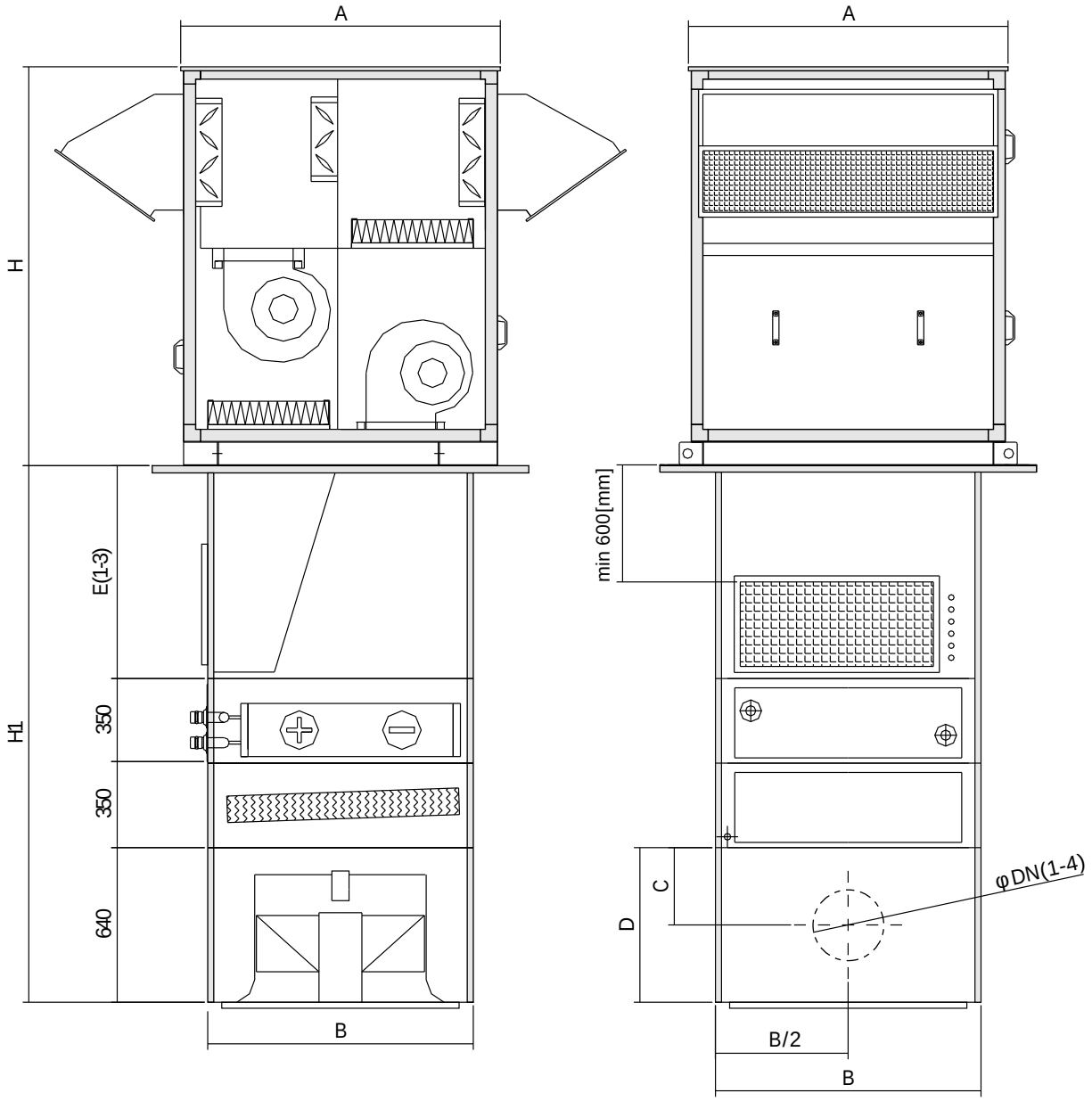
N3 TYPE DIFFUSER



N4 TYPE DIFFUSER



DIMENSIONS AND WEIGHT



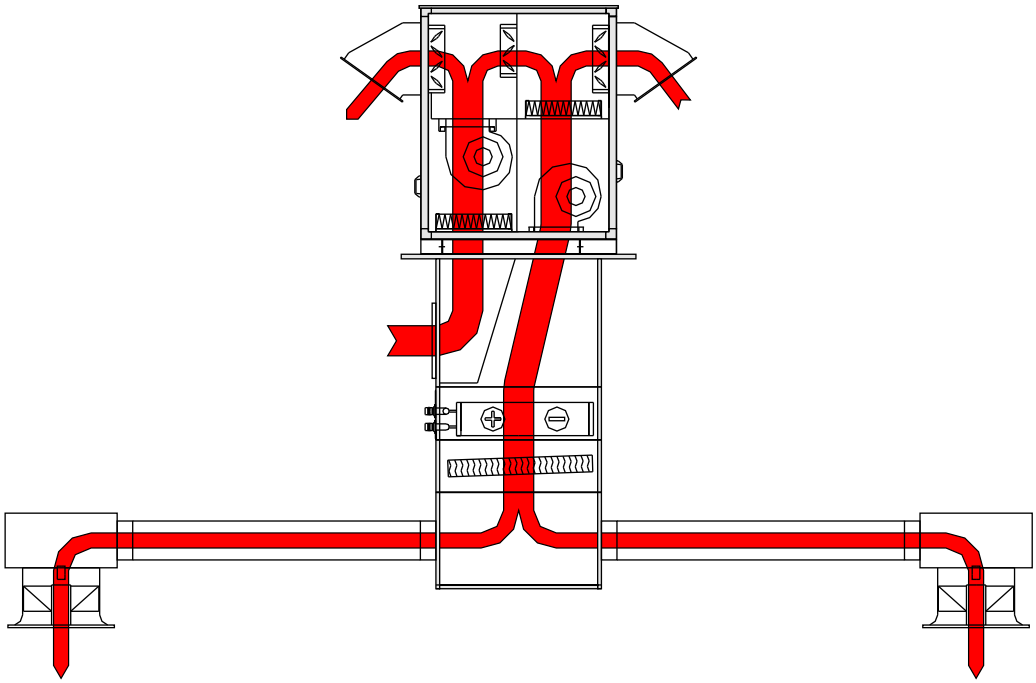
ATTENTION!
Total height (H1) of under-ceiling part depends on the height (E) of the mixing chamber and drop separator section which is installed if the fin exchanger is used as the cooler.

WEIGHT						
Description	DAWGn/w-1			DAWGn/w-2		
Head	-	310	[kg]	-	360	[kg]
Recirculation chamber	1000[mm]	32		1000[mm]	36	
	1200[mm]	39		1200[mm]	45	
	1500[mm]	48		1500[mm]	55	
Exchanger section	1-II	33		2-II	47	
	1-IV	48		2-IV	75	
Drop separator	-	32		-	39	
Diffuser section	N1	27		N1	32	
	N2	29		N2	34	
	N3	30		N3	38	
	N4	32		N4	40	
Division chamber	900[mm]	28		900[mm]	32	

DIMENSIONS			
		DAWGn/w-1	DAWGn/w-2
A	[mm]	1324	1524
B		900	1100
H		1650	1850
C		435	
D		900	
D-N1		2xφ400	
D-N2		2xφ500	
D-N3		2xφ630	
D-N4		2xφ710	
E1		1000	
E2		1200	
E3		1500	

OPTIONAL SOLUTIONS

As an option instead of single diffuser the division chamber can be used where air streams are divided into two branches. In such case for the diffuser selection the half of flowing air stream should be accepted.
The spouts diameters are showed in the table of overall dimensions.
ATTENTION. Delivery doesn't include the ducts connecting the unit with the diffusers.



DESIGNATIONS

DAWGn/w - ... - ... - ... / ... / ... / ...

SIZE

1, 2

HEATING AND COOLING FUNCTION

N - heating, C - cooling, NC – heating and cooling

EXCHANGER TYPE

1-II, 1-IV, 2-II, 2-IV

DIFFUSER TYPE

N1, N2, N3, N4, RN1*, RN2*, RN3*, RN4*

HEIGHT OF RECIRCULATING CHAMBER

E1, E2, E3

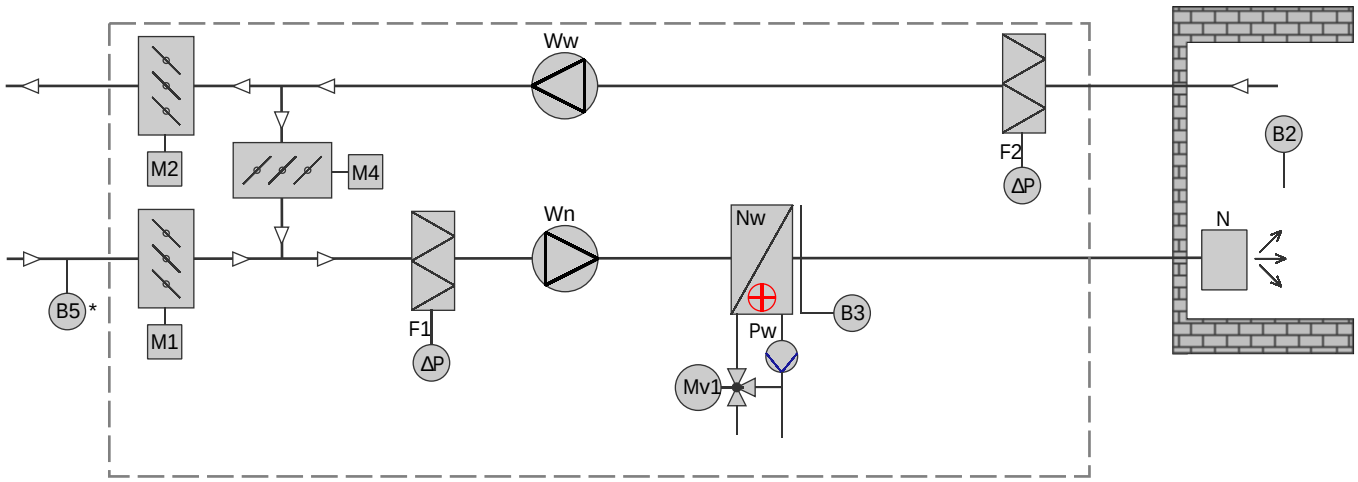
AUTOMATICS

*- if You chose the division chamber the delivery includes two the same type diffusers eg. for RN2 means that the device will be equipped with the division chamber and two N2 type diffusers.

AUTOMATICS

Supply-exhaust automatics system with recirculation

The task of the automatics system supplying and controlling the work of the supply-exhaust ventilation unit with water heater, recirculation is to maintain constant temperature in the compartment.



DESIGNATIONS

M1- Intake throttling valve servo-motor
M2- exhaust throttling valve servo-motor
M4- recirculation throttling valve servo-motor
MV1- 3-way heater valve with servo-motor
F1- intake filter pressure switch
F2- exhaust filter pressure switch
B2- room temperature sensor
B3- anti-freeze thermostat
B5*- external temperature sensor
N- rotational diffuser
Pw- water pump

* optional, depending on the unit system configuration

SYSTEM DESCRIPTION:

The unit operation is controlled by the supply-control cabinet with temperature controller. After switching the unit on, controller as the answer to the signal from temperature sensor controls the air recirculation level with the M1, M2, M4 servo-motors and when sets maximal permissible recirculation level and the temperature will be too low the MV1 heater valve will be opened. Air efficiency adjustment in the units is determined by frequency converter and the air stream range is set remotely on the rotational diffuser.

SENSOR:

- B2 room temperature sensor controls the temperature in the compartment;
- B3 anti – freeze sensor protects the heaters against freezing in two ways (it's active also in standby mode);
- external B5* when temperature falls below -10C it transfers the signal to the controller which switches the pump on (switches it off again when the external temperature will rise by about 5C);
- F1 and F 2 pressure switch inform about excessive filter contamination;

Temperature adjustment is made on the CPU controller with the possibility of readout and setting of adjustment parameters on the display.

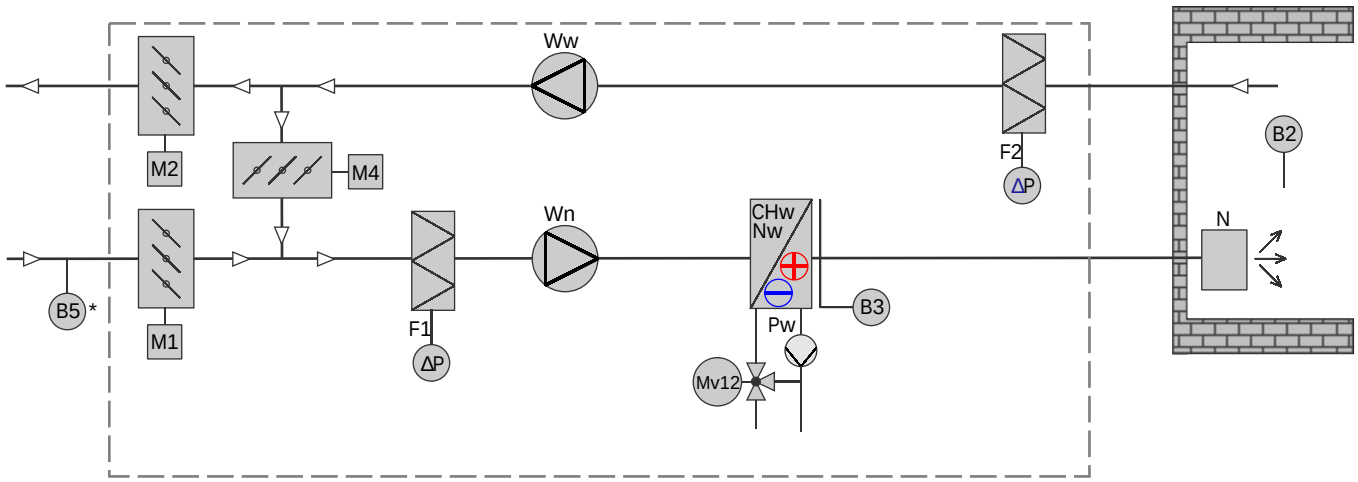
CONTROL AND PROTECTION:

- anti –freeze - in case of temperature drop behind the heater below the threshold value +5C, the B3 detector will switch the unit off, close M1, M2 throttling valves, fully open MV1 valve until the temperature on the heater will rise and then the lamp HEATER FAILURE on the cabinet will be switched on (triple activation of the thermostat will block the system);
- filter pressure switches – the filter is equipped with pressure switch (F1, F2) measuring the pressure drop on the filter. In case of filter contamination the lamp „DIRTY FILTER" on the cabinet will be switched on.
- fans operation - lamp on the cabinet signals the fans operation;
- pump operation - lamp „PUMP OPERATION" on the cabinet signals switching the pump on at 5% of the valve opening;
- fan - in case of too small fan efficiency or in case of exceeding motor nominal currents the overload protection will be activated and the lamp "DRIVE FAILURE" on the cabinet there will be switched on.

AUTOMATICS

Supply-exhaust automatics system with recirculation

The task of the automatics system supplying and controlling the work of the supply-exhaust ventilation unit with water heater/cooler, recirculation is to maintain constant temperature in the compartment.



DESIGNATIONS

M1- supply throttling valve servo-motor
M2- exhaust throttling valve servo-motor
M4- recirculation throttling valve servo-motor
MV12- 3-way heater-cooler valve with servo-motor
F1- intake filter pressure switch
F2- exhaust filter pressure switch
B2- room temperature sensor
B3- anti-freeze thermostat
B5*- external temperature sensor
N- rotational diffuser
Pw- water pump

* optional, depending on the unit system configuration

SYSTEM DESCRIPTION:

The unit operation is controlled by the supply-control cabinet with temperature controller. After switching the unit on, controller as the answer to the signal from temperature sensor controls the air recirculation level with the M1, M2, M4 servo-motors and when sets maximal permissible recirculation level and the temperature will be too low the MV12 heater valve will be opened. The same heater is used for cooling. Switching the system to heating and cooling is performed in manual mode. Selector switch is installed in the supply-control cabinet or switching is done remotely. Air efficiency adjustment in the units is determined by frequency converter and the air stream range is set remotely on the rotational diffuser.

SENSOR:

- B2 room temperature sensor controls the temperature in the compartment;
- B3 anti – freeze sensor protects the heaters against freezing in two ways (it's active also in standby mode);
- external B5* when temperature falls below -10C transfers the signal to the controller which switches the pump on (switches it off again when the external temperature will rise by about 5C);
- F1 and F2 pressure switches inform about excessive filter contamination;

Temperature adjustment is made on the CPU controller with the possibility of readout and setting of adjustment parameters on the display.

CONTROL AND PROTECTION:

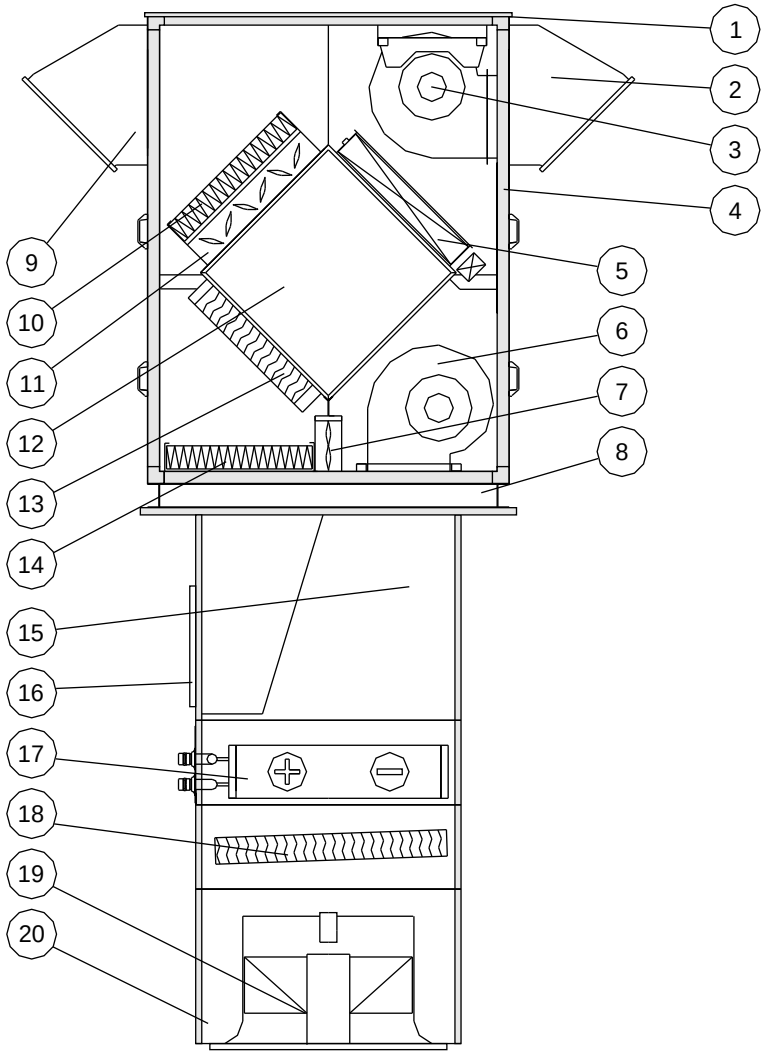
- anti –freeze - in case of temperature drop behind the heater below the threshold value +5C, the B3 detector will switch the unit off, close M1, M2 throttling valves, fully open MV1 valve until the temperature on the heater will rise and then the lamp HEATER FAILURE on the cabinet will be switched on (triple activation of the thermostat will block the system);
- filter pressure switches – the filter is equipped with pressure switch (F1, F2) measuring the pressure drop on the filter. In case of filter contamination the lamp „DIRTY FILTER" on the cabinet will be switched on.
- fans operation - lamp on the cabinet signals the fans operation;
- pump operation - lamp „PUMP OPERATION" on the cabinet signals switching the pump on at 5% of the valve opening;
- fan - in case of too small fan efficiency or in case of exceeding motor nominal currents the overload protection will be activated and the lamp "DRIVE FAILURE" on the cabinet there will be switched on.

INTRODUCTION

DAWGo roof ventilation-heating units in supply/exhaust version with the heat recovery on the cross-flow exchanger are intended for heating and ventilating large commercial compartments, storage warehouses, production warehouses, sport sports halls and other objects in a single-storey buildings or on the last floors of other buildings. The air is supplied from above towards the floor vertically or at some angle limits unfavorable stratification of the temperature inside the hall and reduces at the same time heat looses through the ceiling keeping the set temperature in the work zone . Air is supplied without draughts and uniformly with the help of rotational diffuser set remotely from the control cabinet. DAWGo units are the constructional development of the DAWGn/w units by introducing to them plate cross-flow exchanger to the heat recovery. They can be used everywhere where using the air recirculation, excluding the rest period – when it's possible to use 100% recirculation with using only one diffusers set, is forbidden because of hygienic conditions.

CONTRUCTION

The unit consists of the head installed on the roof pedestal and suspended to it, located below the roof, vertical supply-exhaust unit. The unit includes also following functional elements:



1. Roof
2. Exhaust vent
3. Exhaust fans set
4. Casing
5. By-pass throttling valve
6. Intake fans set
7. Circulating air throttling valve
8. Base
9. Air intake vent
10. G4 class air filter.
11. External air throttling valve
12. Cross-flow exchanger
13. Drop separator
14. G4 class air filter.
15. Intake air chamber
16. Recalculating air inlet.
17. Double-function water exchanger.
18. Drop separator (option).
19. Rotational diffuser.
20. Division chamber (option)

CONSTRUCTION DESCRIPTION

HEAD CASING

Casing construction (4) is based on the framework made of aluminum and “sandwich” type panels. Panels are made of galvanized sheet. Sheets are additionally covered with the varnish from outside. Filling consists of 45 mm mineral wool thickness. In order to protect against the atmospheric precipitation the upper part of the uit is protected with the roof (1) made of galvanized, varnished sheet. Fresh air inlet is equipped with the inclined intake vent (8). Removed air outlet is equipped with (2) air exhausters .

Technical data for the casing according to the PN-EN1886-2008 standard:

- heat infiltration coefficient - T3 class,
- coefficient of heating bridges influence - TB1 class,

THROTTING VALVES

the DAWGo unit contains adjusting throttling valves set with the proportional operation, including coupled, electric throttling valves of cross-flow exchanger (5) and two throttling valves with the on/off operation which are: external air throttling valve (11), open during the standard unit operation and the recalculating air throttling valve (7) which is open only in the night time (rest mode).

FILTERS

On external and circulating air inlet the filters (4,12) class G4 are placed. Final pressure drop on the contaminated filter is 150Pa.

FANS SET

The unit is using radial fans (3,6), sucking the air from both sides, in the spiral casing made of galvanized sheets. They are driven directly with the motors with the external rotor and are supplied with voltage 3x400V/50Hz current, they are adapted for working with the inverter. All sizes contain 2 sets with 2 fans.

CROSS-FLOW EXCHANGER

Cross-flow exchanger (12) made of aluminum plates with the efficiency about 50% is used.

WATER HEAT EXCHANGER

Exchanger construction (17) bases on the aluminum fins with the copper pipes. Depending on the requirements it's used as the heater or cooler. In case of expected cooling option behind the exchanger the drop separator (18) is used. Condensates drain is done gravitationally or with the help of the pump.

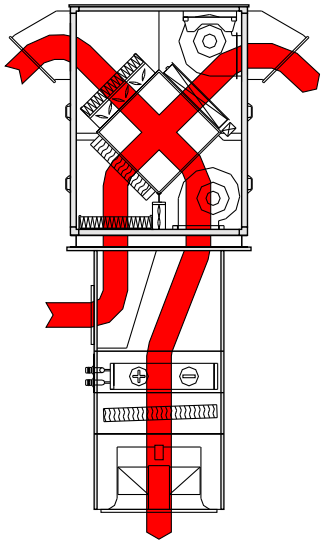
ATTENTION: Solutions including two separate heat exchangers as a cooler and heater are offered as a special option, only after agreement of such option with the manufacturer.

DIFFUSER

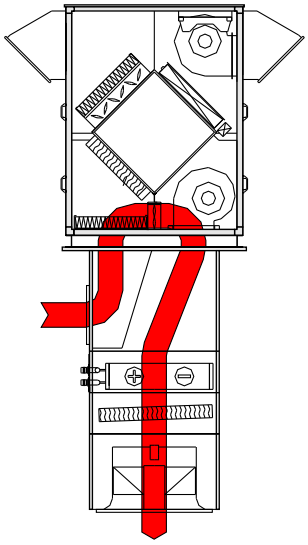
Rotational diffuser (19) used on the inlet air outlet from the unit has adjustable elements enabling adjusting the air stream range controlled remotely with the help of electric servo-motor. Diagrams presenting the range of air stream are presented in the next part of this catalogue. As an option instead of single diffuser the division chamber (20) can be used with possibility of connecting two diffusers. In such case it should be accepted that each diffuser receives the half of flowing air stream

WORKING MODES

100% FRESH AIR



100% CIRCULATION AIR



TECHNICAL DATA

Exchangers in heating function																			
Unit type	Exchanger designation	Heating medium temp. [°C]	DN	V	T1	Tn	Q	Mw	Pw	T1	Tn	Q	Mw	Pw	T1	Tn	Q	Mw	Pw
			[mm]	[dm³]	[°C]	[°C]	[kW]	[kg/s	[kPa]	[°C]	[°C]	[kW]	[kg/s	[kPa]	[°C]	[°C]	[kW]	[kg/s	[kPa]
DAWGo-1	1-II	90/70	32	4,0	-10	37,3	83,4	0,99	23,38	0	41,6	73,4	0,88	18,43	5	43,8	68,5	0,82	16,17
		80/60				31,2	72,8	0,87	18,35		35,6	62,8	0,75	13,95		37,8	57,9	069	11,97
		70/50				25,2	62,0	0,74	13,82		29,6	52,1	0,62	9,99		31,8	47,2	0,56	8,30
		60/40				19,0	51,2	0,61	9,38		23,4	41,3	0,49	6,60		25,6	36,4	0,44	5,22
	1-IV	90/70	40	7,5		61,8	126,6	1,51	13,95		63,5	112,0	1,34	11,09		64,4	104,7	1,25	9,78
		80/60				53,0	111,1	1,33	11,08		54,7	96,5	1,15	8,52		55,6	89,2	1,07	7,35
		70/50				44,1	95,4	1,14	8,47		45,8	80,8	0,97	6,22		46,6	73,4	0,88	5,21
		60/40				35,1	79,5	0,95	6,14		36,7	64,8	0,78	4,20		37,6	57,4	0,69	3,36
DAWGo-2	2-II	90/70	40	7,5	-10	37,1	141,4	1,69	14,92	0	41,5	124,4	1,49	11,74	5	43,6	115,9	1,38	10,28
		80/60				31,0	123,1	1,47	11,92		35,4	106,1	1,27	8,84		37,5	97,6	1,17	7,57
		70/50				24,9	104,6	1,25	8,74		29,2	87,7	1,05	8,29		31,4	79,2	0,95	5,21
		60/40				18,6	85,6	1,03	6,16		23,0	69,0	0,83	4,11		25,2	60,6	0,73	3,23
	2-IV	90/70	40	12,0		63,5	220,6	2,63	26,57		65,2	195,6	2,34	21,25		66,0	183,1	2,19	18,80
		80/60				54,8	194,4	2,32	21,32		56,5	169,4	2,02	16,52		57,3	156,8	1,87	14,32
		70/50				46,0	167,9	2,01	16,53		47,6	142,8	1,71	12,26		48,4	130,2	1,56	10,34
		60/40				37,0	141,0	1,69	12,22		38,6	115,8	1,38	8,50		39,4	103,1	1,23	6,86

Exchangers in cooling function																			
Unit type	Exchanger designation	Heating medium temp. [°C]	DN	V	T1	Tn	Q	Mw	Pw	T1	Tn	Q	Mw	Pw	T1	Tn	Q	Mw	Pw
			[mm]	[dm³]	[°C]	[°C]	[kW]	[kg/s	[kPa]	[°C]	[°C]	[kW]	[kg/s	[kPa]	[°C]	[°C]	[kW]	[kg/s	[kPa]
DAWGo-1	1-II	7/12	32	4,0	32	22,2	21,8	1,04	29,4	30	21,3	20,1	0,96	25,3	28	20,4	19,1	0,91	23,0
		10/16				24,2	14,3	0,57	9,4		23,3	12,4	0,49	7,2		22,3	10,5	0,42	5,3
	1-IV	7/12	40	7,5		17,5	33,0	1,57	17,5		17,1	30,5	1,45	15,1		16,7	29,0	1,38	13,8
		10/16				20,4	21,3	0,85	5,5		19,9	18,5	0,73	4,2		19,4	15,7	0,63	3,1
DAWGo-2	2-II	7/12	40	7,5	32	22,3	34,3	1,63	16,3	30	21,4	31,4	1,50	13,9	28	20,5	29,8	1,42	12,6
		10/16				24,3	23,0	0,913	5,5		23,4	19,9	0,79	4,2		22,4	16,7	0,66	3,1
	2-IV	7/12	40	12,0		16,6	60,7	2,89	37,4		16,2	56,3	2,68	32,6		15,8	53,8	2,56	30,0
		10/16				19,5	37,6	1,49	11,0		19,0	32,9	1,31	8,6		18,7	30,2	1,20	7,3

ATTENTION! All the values were calculated for max air flow of the given device size.

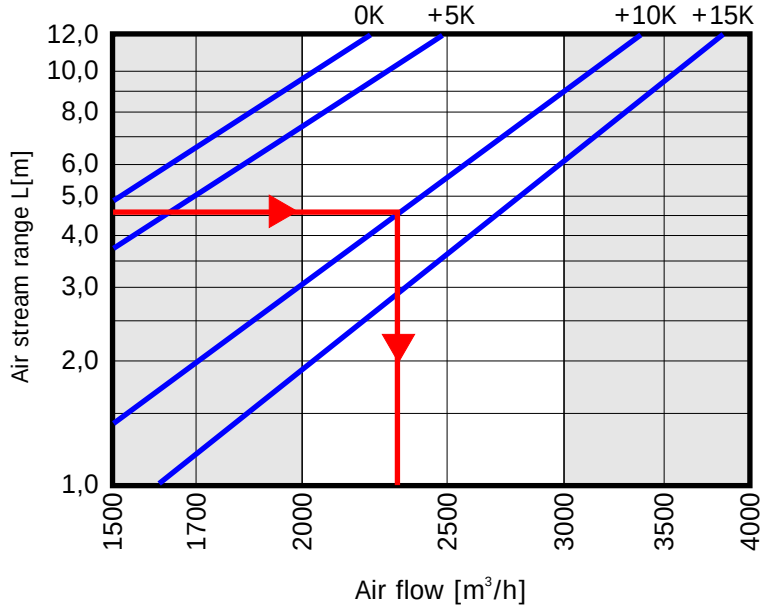
ELECTRICAL AND FLOW DATA					
		DAWGo-1		DAWGo-2	
		Supply	Exhaust	Supply	Exhaust
Minimal air flow	[m³/h]	2000		5000	
Maximal air flow	[m³/h]	5500		9000	
Nominal voltage	[V]	3x400		3x400	
Frequency	[Hz]	50		50	
Nominal power	[kW]	2x1,5	2x1,1	2x1,5	2x1,1
Nominal current consumption	[A]	2x4,3	2x1,8	2x4,3	2x4,2
Protection class	[-]	IP54	IP54	IP54	IP54

Designations for the heating calculations table:
T1 – air temperature in the front of exchanger
Tn – air temperature behind the exchanger
Q - exchanger power for programmed parameters
Mw - mass flow of heating medium
Pw - hydraulic resistances of the exchanger on the heating medium side
V – exchanger volume

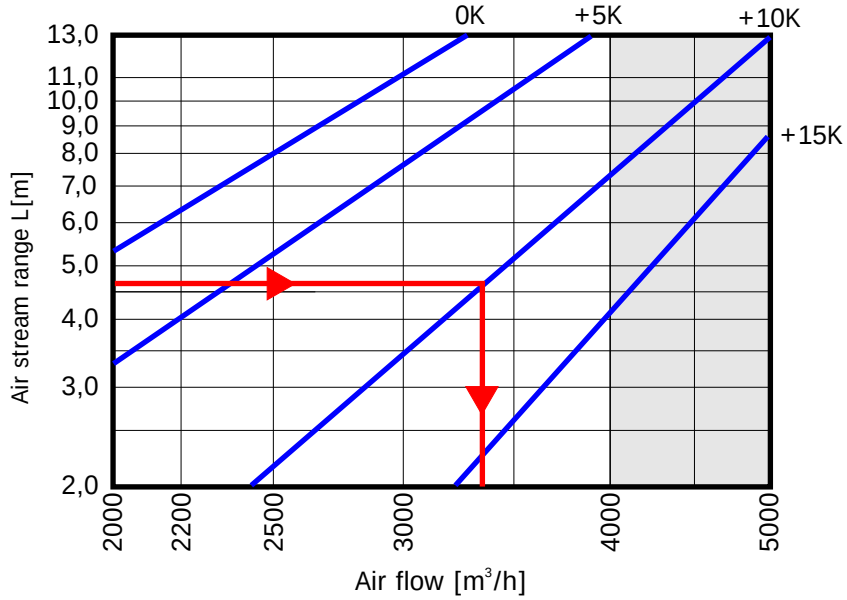
For the cooling power calculations the following air humidity was accepted
-for 32°C humidity 40%
-for 30°C humidity 45%
-for 28°C humidity 52%
ATTENTION! All the values were calculated for maximal air flow in the given device size

AIR STREAM RANGE

N1 TYPE DIFFUSER



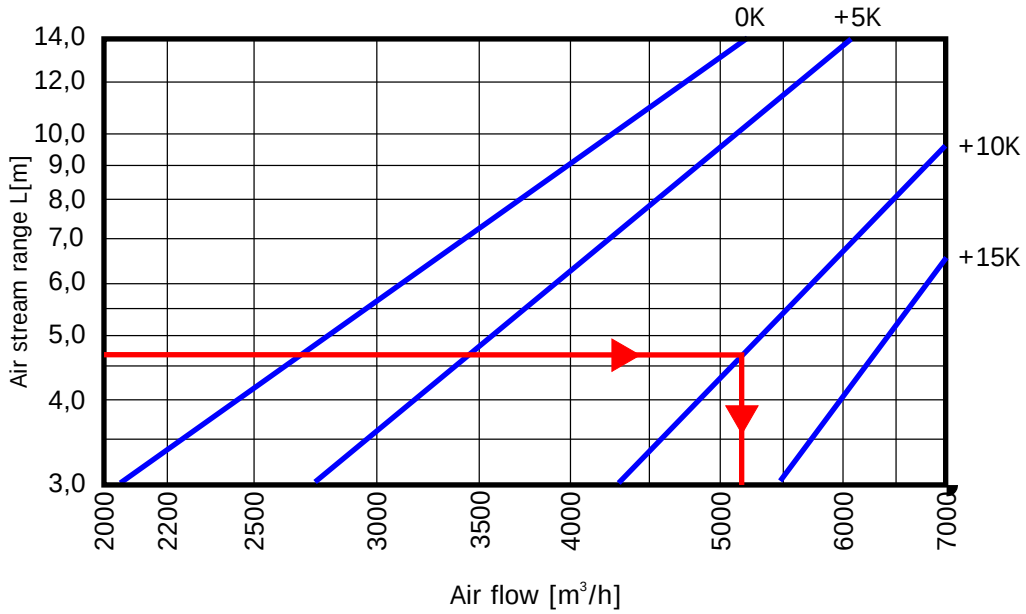
N2 TYPE DIFFUSER



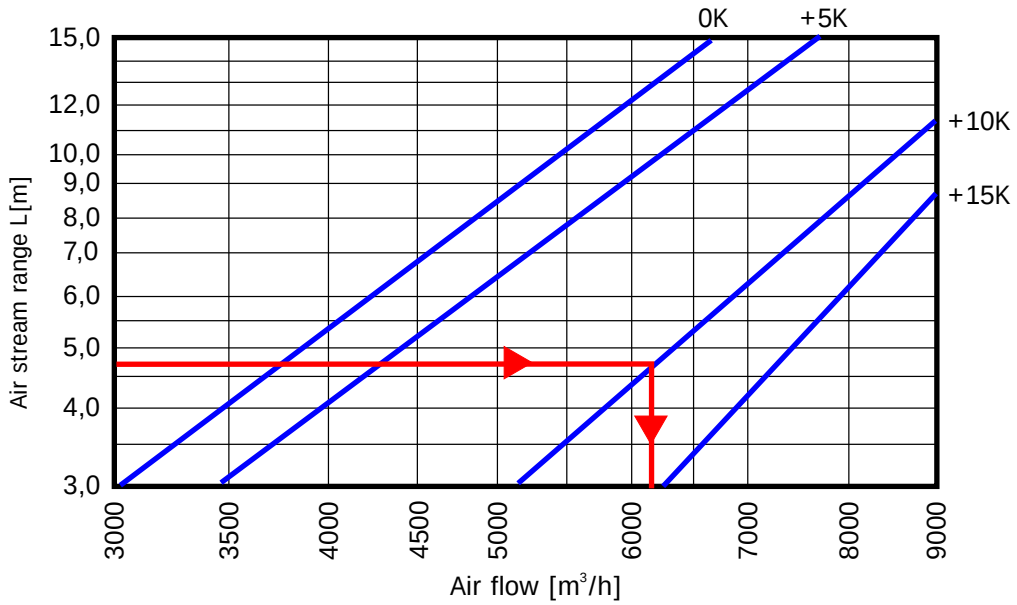
- Forbidden work area

AIR STREAM RANGE

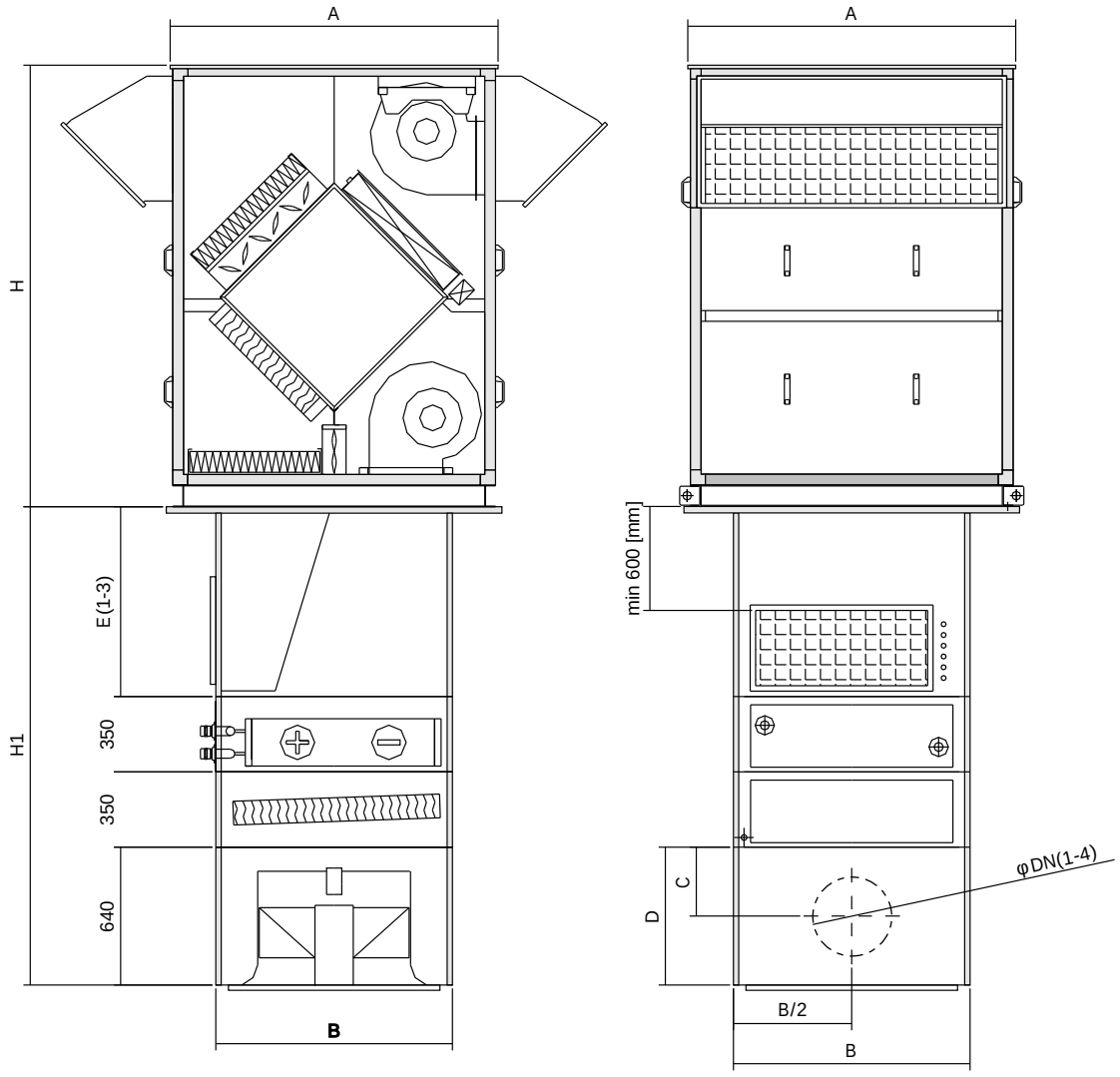
N3 TYPE DIFFUSER



N4 TYPE DIFFUSER



DIMENSIONS AND WEIGHT



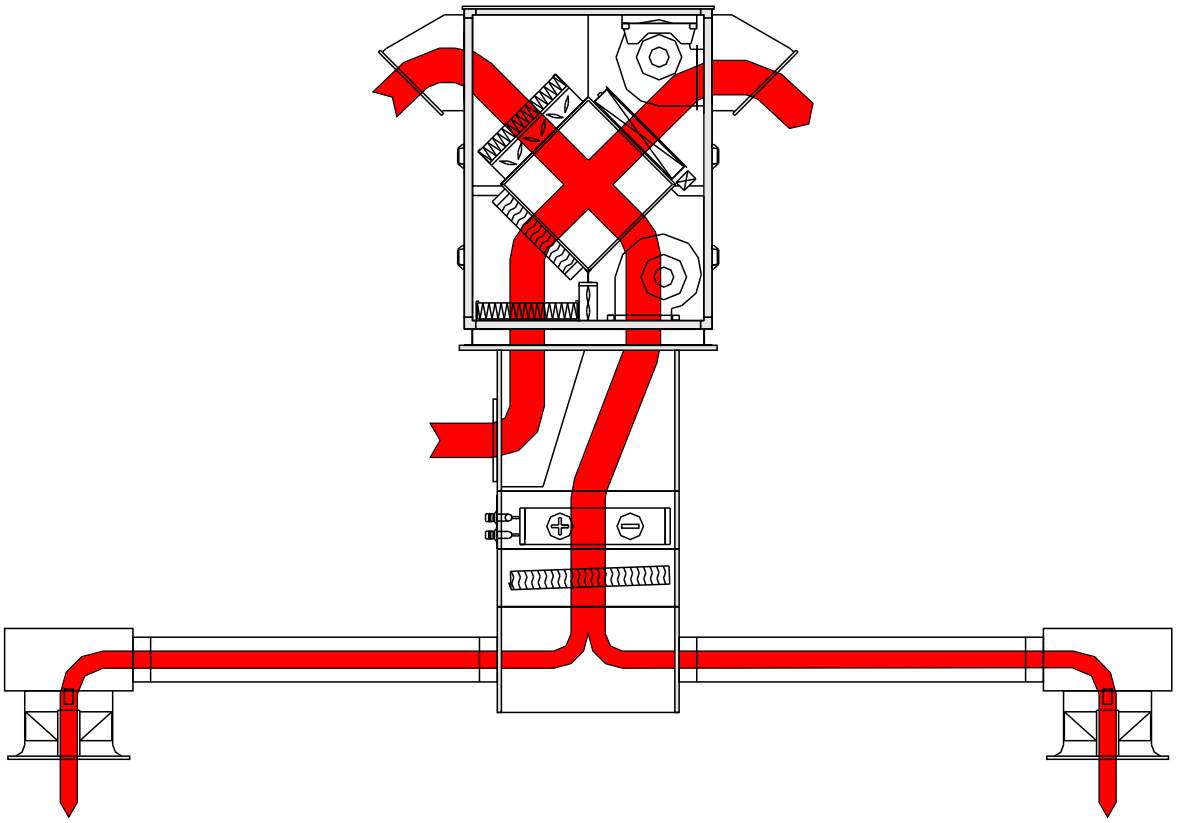
ATTENTION!
Total height (H1) of under-ceiling part depends on the height (E) of the mixing chamber and drop separator section which is installed if the fin exchanger is used as the cooler.

WEIGHT						
Description	DAWGo-1			DAWGo-2		
Head	-	310	[kg]	-	360	[kg]
Recirculation chamber	1000[mm]	32		1000[mm]	36	
	1200[mm]	39		1200[mm]	45	
	1500[mm]	48		1500[mm]	55	
Exchanger section	1-II	33		2-II	47	
	1-IV	48		2-IV	75	
Drop separator	-	32		-	39	
Diffuser section	N1	27		N1	32	
	N2	29		N2	34	
	N3	30		N3	38	
	N4	32		N4	40	
Division chamber	900[mm]	28		900[mm]	32	

DIMENSIONS			
		DAWGo-1	DAWGo-2
A	[mm]	1324	1524
B		900	1100
H		1900	2070
C		435	
D		900	
D-N1		2xφ400	
D-N2		2xφ500	
D-N3		2xφ630	
D-N4		2xφ710	
E1		1000	
E2		1200	
E3		1500	

OPTIONAL SOLUTIONS

As an option instead of single diffuser the division chamber can be used where air streams are divided into two branches. In such case for the diffuser selection the half of flowing air stream should be accepted.
The spouts diameters are showed in the table of overall dimensions.
ATTENTION. Delivery doesn't include the ducts connecting the unit with the diffusers.



DESIGNATIONS

DAWGo - ... - ... - ... / ... / ... / ...

SIZE

1, 2

HEATING AND COOLING FUNCTION

N - heating, C - cooling, NC – heating and cooling

EXCHANGER TYPE

1-II, 1-IV, 2-II, 2-IV

DIFFUSER TYPE

N1, N2, N3, N4, RN1*, RN2*, RN3*, RN4*

HEIGHT OF RECIRCULATING CHAMBER

E1, E2, E3

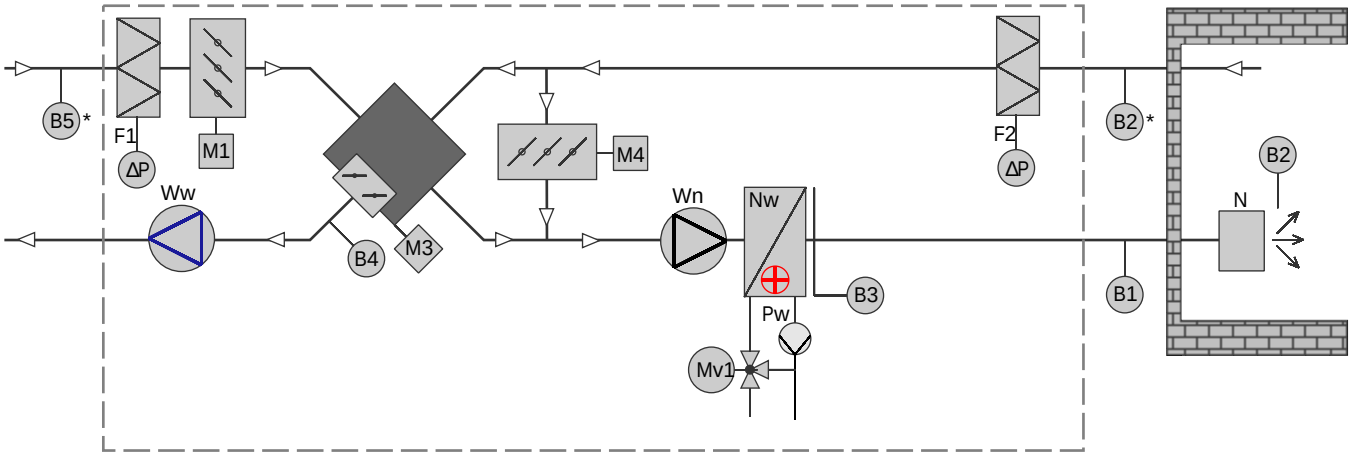
AUTOMATICS

*- if You chose the division chamber the delivery includes two the same type diffusers eg. for RN2 means that the device will be equipped with the division chamber and two N2 type diffusers.

AUTOMATICS

Supply-exhaust automatics system behind the cross-flow exchanger

The task of the automatics system supplying and controlling the work of the supply-exhaust ventilation unit with water heater and cross-flow heat recovery exchanger is to maintain constant temperature in the compartment.



DESIGNATIONS

M1- supply throttling valve servo-motor
M4- recirculation throttling valve servo-motor
F1- intake filter pressure switch
B2- room temperature sensor
B4- exchanger duct temperature sensor
N- rotational diffuser
M3- cross-flow exchanger servo-motor
MV1- 3-way valve of the heater with servo-motor
F2- exhaust filter pressure switch
B3- anti-freeze thermostat
B5* internal temperature sensor
Pw- water pump

* optional, depending on the unit system configuration

SYSTEM DESCRIPTION

The unit operation is controlled by the supply-control cabinet with temperature controller. After switching the unit on, controller as the answer to the signal from temperature sensor controls the air recirculation level with the M1 and M4 servo-motors and when sets maximal permissible recirculation level and the temperature still will be too low the MV1 heater valve will be opened. Air efficiency adjustment in the units is determined by frequency converters and the air stream range is set remotely on the rotational diffuser.

SENSOR:

- B2 room temperature sensor controls the temperature in the compartment;
- B3 anti – freeze sensor protects the heaters against freezing in two ways (it's active also in standby mode);
- B4 of the exchanger protects it from icing;
- external B5* when temperature falls below -10C it transfers the signal to the controller which switches the pump on (switches it off again when the external temperature will rise by about 5C);
- F1 and F2 pressure switches inform about excessive filter contamination;

Temperature adjustment is made on the CPU controller with the possibility of readout and setting of adjustment parameters on the display.

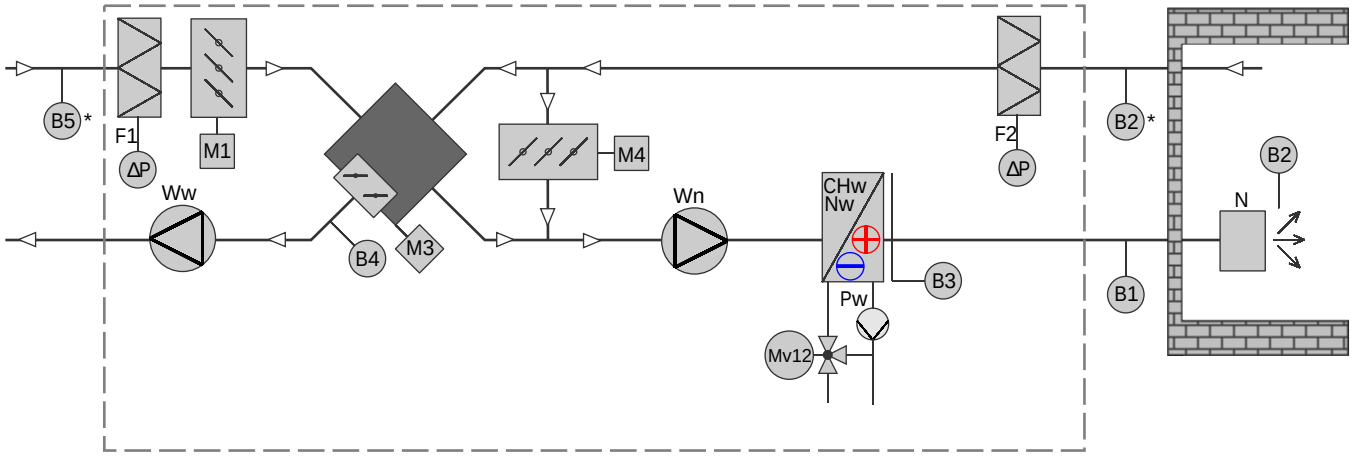
CONTROL AND PROTECTION:

- anti –freeze - in case of temperature drop behind the heater below the threshold value +5C, the B3 detector will switch the unit off, close M1 throttling valve, fully open MV1 valve until the temperature on the heater will rise and then the lamp HEATER FAILURE on the cabinet will be switched on (triple activation of the thermostat will block the system);
- filter pressure switches – the filter is equipped with pressure switch (F1, F2) measuring the pressure drop on the filter. In case of filter contamination the lamp „DIRTY FILTER” on the cabinet will be switched on.
- fans operation - lamp on the cabinet signals the fans operation;
- pump operation - lamp „PUMP OPERATION” on the cabinet signals switching the pump on at 5% of the valve opening;
- fan - in case of too small fan efficiency or in case of exceeding motor nominal currents the overload protection will be activated and the lamp “DRIVE FAILURE” on the cabinet there will be switched on.
- exchanger sensor - if the temperature behind the B4 exchanger falls below the value set on the controller (t=0C), the controller activates the process of closing the exchanger M3 throttling valve with simultaneous by-pass opening. This states lasts until the moment when the temperature behind the exchanger returns to the safe value.

AUTOMATICS

Supply-exhaust automatics system behind the cross-flow exchanger

The task of the automatics system supplying and controlling the work of the supply-exhaust ventilation unit with water heater-cooler and cross-flow heat recovery exchanger is to maintain constant temperature in the compartment.



DESIGNATIONS

M1- supply throttling valve servo-motor
M4- recirculation throttling valve servo-motor
F1- intake filter pressure switch
B2- room temperature sensor
B4- exchanger duct temperature sensor
N- rotational diffuser
M3- cross-flow exchanger servo-motor
MV1- heater-cooler 3-way valve with servo-motor
F2- exhaust filter pressure switch
B3- anti-freeze thermostat
B5* external temperature sensor
Pw- water pump

* optional, depending on the unit system configuration

SYSTEM DESCRIPTION

The unit operation is controlled by the supply-control cabinet with temperature controller. After switching the unit on, controller as the answer to the signal from temperature sensor controls the air recirculation level with the M1 and M4 servo-motors and when sets maximal permissible recirculation level and the temperature still will be too low it will send the signal again and sets maximal flow through the exchanger. MV12 valve servo-motor will be opened ff the temperature is still too low. The same heater is used for cooling. Switching the system to heating and cooling is performed in manual mode. The selector switch is installed in the supply-control cabinet or switching is done remotely. Air efficiency adjustment in the units is determined by frequency converters and the air stream range is set remotely on the rotational diffuser.

SENSOR:

- B2 room temperature sensor controls the temperature in the compartment;
- B3 anti – freeze sensor protects the heaters against freezing in two ways (it's active also in standby mode);
- B4 exchanger sensor protects it against icing
- external B5* when temperature falls below -10C it transfers the signal to the controller which switches the pump on (switches it off again when the external temperature will rise by about 5C);
- F1 and F2 pressure switches inform about excessive filter contamination;

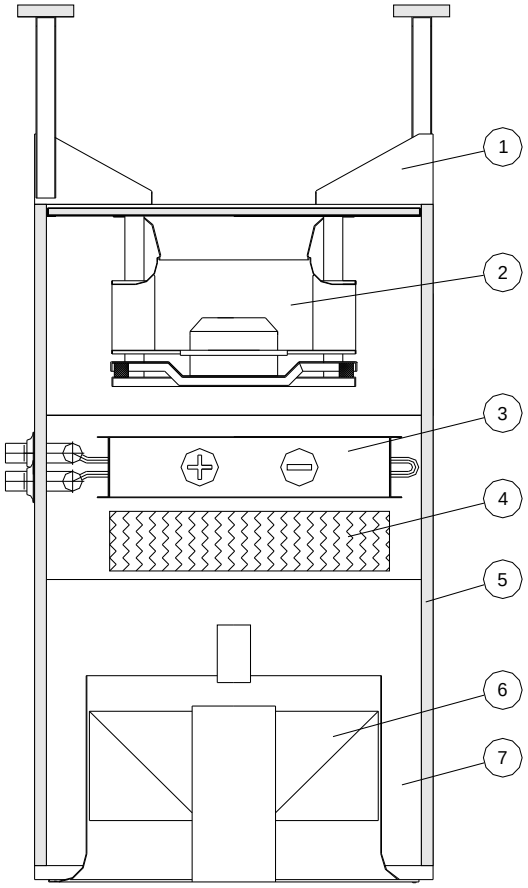
Temperature adjustment is made on the CPU controller with the possibility of readout and setting of adjustment parameters on the display.

CONTROL AND PROTECTION:

- anti –freeze - in case of temperature drop behind the heater below the threshold value +5C, the B3 detector will switch the unit off, close M1 throttling valve, fully open MV1 valve until the temperature on the heater will rise and then the lamp HEATER FAILURE on the cabinet will be switched on (triple activation of the thermostat will block the system);
- filter pressure switches – the filter is equipped with pressure switch (F1, F2) measuring the pressure drop on the filter. In case of filter contamination the lamp „DIRTY FILTER" on the cabinet will be switched on.
- fans operation - lamp on the cabinet signals the fans operation;
- pump operation - lamp „PUMP OPERATION" on the cabinet signals switching the pump on at 5% of the valve opening;
- fan - in case of too small fan efficiency or in case of exceeding motor nominal currents the overload protection will be activated and the lamp "DRIVE FAILURE" on the cabinet there will be switched on.
- exchanger sensor - if the temperature behind the B4 exchanger falls below the value set on the controller (t=0C), the controller activates the process of closing the exchanger M3 throttling valve with simultaneous by-pass opening. This states lasts until the moment when the temperature behind the exchanger returns to the safe value.

INTRODUCTION

DAWGr under ceiling ventilation-heating units in supply version with the air recirculation are intended for heating and ventilating large commercial compartments, storage warehouses, production warehouses, sport sports halls and other objects of a different cubature and height. The air is supplied from above towards the floor, vertically or at some angle, limits unfavorable stratification of the temperature inside the hall and reduces at the same time heat looses through the ceiling keeping precisely the set temperature in the work zone. Air is supplied without draughts and uniformly with the help of rotational diffuser set remotely from the control cabinet.



1.Elements mounting the unit to the ceiling.
2. Fans set
3. Two-function heat exchanger
4. Drop separator (option)
5. Casing
6. Rotational diffuser
7. Division chamber (option)

CONSTRUCTION DESCRIPTION

The unit consists of vertical inflow set installed under the compartment ceiling and it includes following functional elements:

CASING

Self-supporting construction of galvanized, varnished sheets.

FANS SET

The device is using the radial (2) fan without the casing, with blades inclined backwards, driven directly by the motors with the external rotor with the supply voltage 3x400V/50Hz which are adapted for operation with the inverter.

WATER HEAT EXCHANGER

Heat exchanger construction (3) bases on the aluminum fins with the copper pipes. In can be used as a heater or cooler depending on the requirements. In case of projecting cooling the drop separator (4) is placed behind the exchanger. Condensates drain is realized gravitationally or with the help of pump.

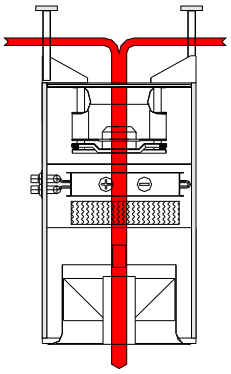
ATTENTION: Solutions including two separate heat exchangers as the cooler and heater are the special option made after consultation with the manufacturer.

DIFFUSER

Rotational diffuser (6) used on the inlet air outlet from the unit has adjustable elements enabling adjusting the air stream range controlled remotely with the help of electric servo-motor. Diagrams presenting the range of air stream are presented in the next part of this catalogue. As an option instead of single diffuser the division chamber (7) can be used with possibility of connecting two diffusers. In such case it should be accepted that each diffuser receives the half of flowing air stream.

WORKING MODES

100% CIRCULATION AIR



TECHNICAL DATA

Exchangers in heating function

Unit type	Exchanger designation	Heating medium temp. [°C]	DN	V	T1	Tn	Q	Mw	Pw	T1	Tn	Q	Mw	Pw	T1	Tn	Q	Mw	Pw
			[mm]	[dm³]	[°C]	[°C]	[kW]	[kg/s	[kPa]	[°C]	[°C]	[kW]	[kg/s	[kPa]	[°C]	[°C]	[kW]	[kg/s	[kPa]
PAWGr-1	1-II	90/70	32	4,0	10	44,3	68,2	0,81	16,1	15	46,6	62,9	0,75	13,8	20	48,9	57,5	0,68	11,7
		80/60				38,3	56,8	0,67	11,6		40,8	51,5	0,61	9,6		43,1	46,1	0,55	7,8
		70/50				32,7	45,3	0,54	7,7		35,1	40,0	0,47	6,1		37,4	34,6	0,41	4,7
		60/40				26,9	33,6	0,40	4,5		29,2	28,3	0,33	3,3		31,5	23,0	0,27	2,2
	1-IV	90/70	40	7,5		63,3	106,3	1,26	10,1		64,3	98,2	1,17	8,7		45,3	90,2	1,07	7,4
		80/60				54,8	89,2	1,06	7,4		55,7	81,1	0,96	6,2		56,7	73,0	0,87	5,1
		70/50				46,1	71,9	0,85	5,0		47,0	63,8	0,76	4,0		47,9	55,6	0,66	3,1
		60/40				37,2	54,2	0,64	3,0		38,1	46,0	0,55	2,2		39,0	37,8	0,45	1,5
PAWGr-2	2-II	90/70	40	7,5	10	45,8	107,4	1,28	8,9	15	48,0	99,0	1,18	7,6	20	50,1	90,4	1,01	6,5
		80/60				39,7	89,1	1,06	6,4		41,9	80,7	0,96	5,3		44,1	72,2	0,86	4,3
		70/50				33,6	70,7	0,84	4,2		35,8	62,3	0,74	3,3		37,9	53,8	0,64	2,5
		60/40				27,4	52,2	0,62	2,4		29,6	43,7	0,52	1,8		31,8	35,3	0,42	1,2
	2-IV	90/70	40	12,0		66,9	170,0	2,03	16,5		67,7	158,0	1,88	14,3		68,5	145,4	1,73	12,3
		80/60				58,1	144,2	1,73	12,3		58,9	131,6	1,57	10,4		59,7	119,0	1,42	8,6
		70/50				49,2	117,0	1,40	8,6		50,0	104,9	1,25	6,9		50,7	92,1	1,10	5,5
		60/40				40,1	90,4	1,08	5,4		40,8	77,5	0,92	4,1		41,5	64,4	0,77	2,9

Exchangers in cooling function

Unit type	Exchanger designation	Heating medium temp. [°C]	DN	V	T1	Tn	Q	Mw	Pw	T1	Tn	Q	Mw	Pw	T1	Tn	Q	Mw	Pw
			[mm]	[dm³]	[°C]	[°C]	[kW]	[kg/s	[kPa]	[°C]	[°C]	[kW]	[kg/s	[kPa]	[°C]	[°C]	[kW]	[kg/s	[kPa]
PAWGr-1	1-II	7/12	32	4,0	28	20,5	16,0	0,76	16,6	26	19,5	12,9	0,61	11,1	24	18,5	10,9	0,51	8,1
		10/16				22,5	11,0	0,43	5,8		21,5	9,0	0,35	4,0		20,4	7,1	0,28	2,6
	1-IV	7/12	40	7,5		16,1	28,3	1,34	28,1		15,5	21,1	1,00	16,4		15,1	17,8	0,84	12,0
		10/16				18,9	18,1	0,71	8,7		18,4	15,1	0,60	6,2		17,9	12,1	0,48	4,2
PAWGr-2	2-II	7/12	40	7,5	28	20,4	23,7	1,12	8,2	26	19,4	19,8	0,94	5,9	24	18,5	16,6	0,79	4,3
		10/16				22,4	16,7	0,66	3,1		21,5	13,6	0,54	2,1		20,5	10,6	0,42	1,3
	2-IV	7/12	40	12,0		15,7	44,2	2,10	20,9		15,2	33,0	1,57	12,2		14,7	27,8	1,32	8,9
		10/16				18,6	28,2	1,11	6,5		18,2	23,5	0,93	4,6		17,7	18,9	0,75	3,1

ATTENTION! All the values were calculated for max air flow of the given device size.

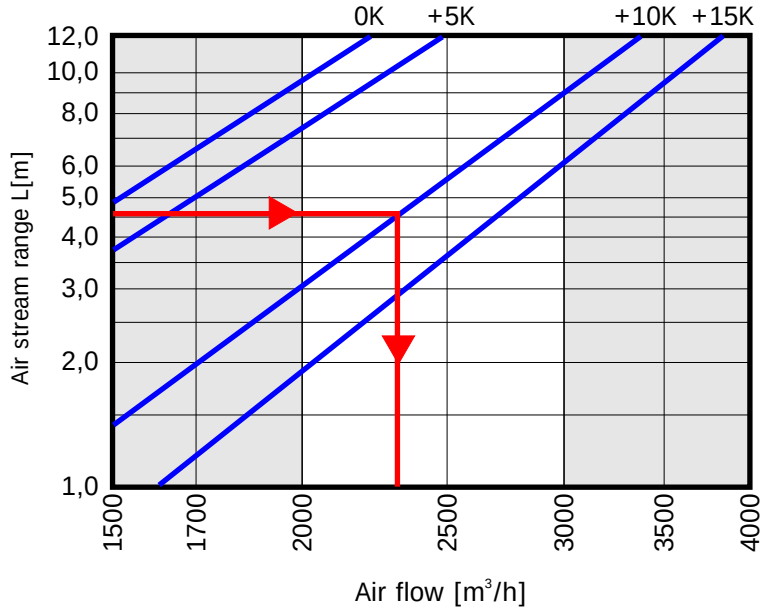
Designations for the heating calculations table:
T1 – air temperature in the front of exchanger
Tn – air temperature behind the exchanger
Q - exchanger power for programmed parameters
Mw - mass flow of heating medium
Pw - hydraulic resistances of the exchanger on the heating medium side
V – exchanger volume

For the cooling power calculations the following air humidity was accepted
-for 32°C humidity 40%
-for 30°C humidity 45%
-for 28°C humidity 52%
ATTENTION! All the values were calculated for maximal air flow in the given device size

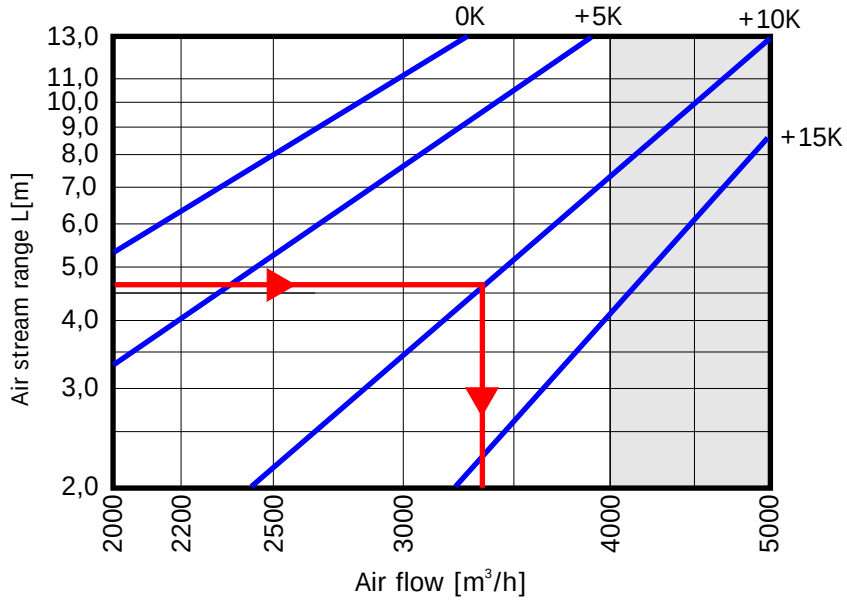
ELECTRICAL AND FLOW DATA			
		PAWGr-1	PAWGr-2
Minimal air flow	[m^3/h]	2000	5000
Maximal air flow	[m^3/h]	6000	9000
Nominal voltage	[V]	3x400	3x400
Frequency	[Hz]	50	50
Nominal power	[kW]	1,5	2,5
Nominal current consumption	[A]	2,9	4,5
Protection class	[-]	IP54	IP54

AIR STREAM RANGE

N1 TYPE DIFFUSER



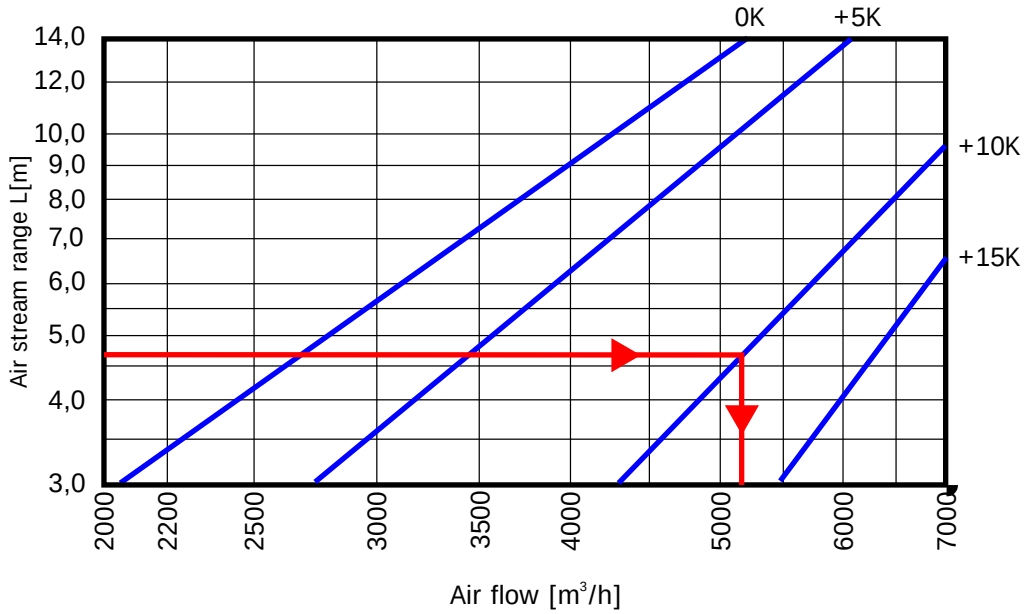
N2 TYPE DIFFUSER



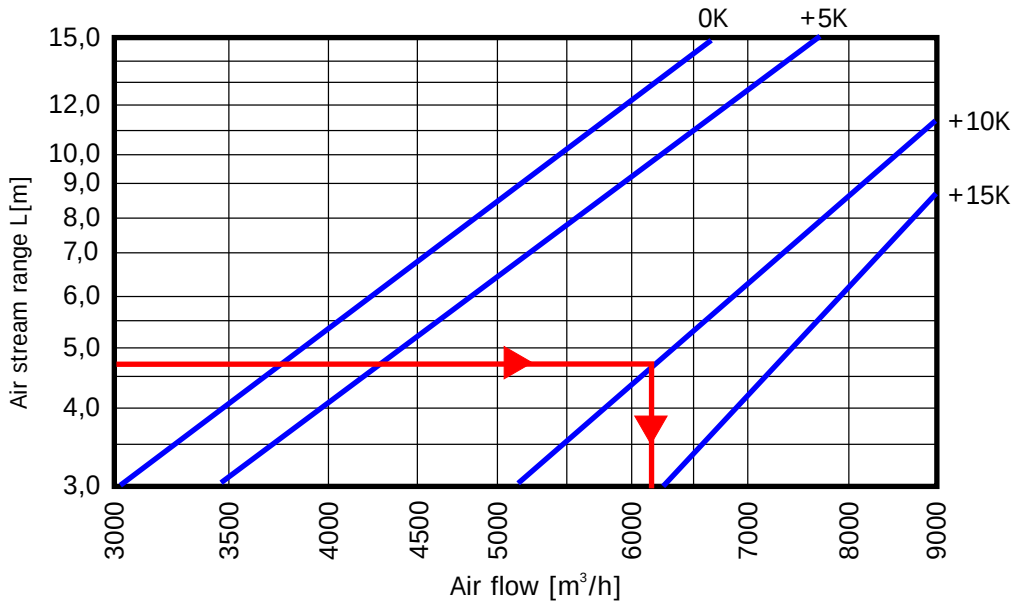
- Forbidden work area

AIR STREAM RANGE

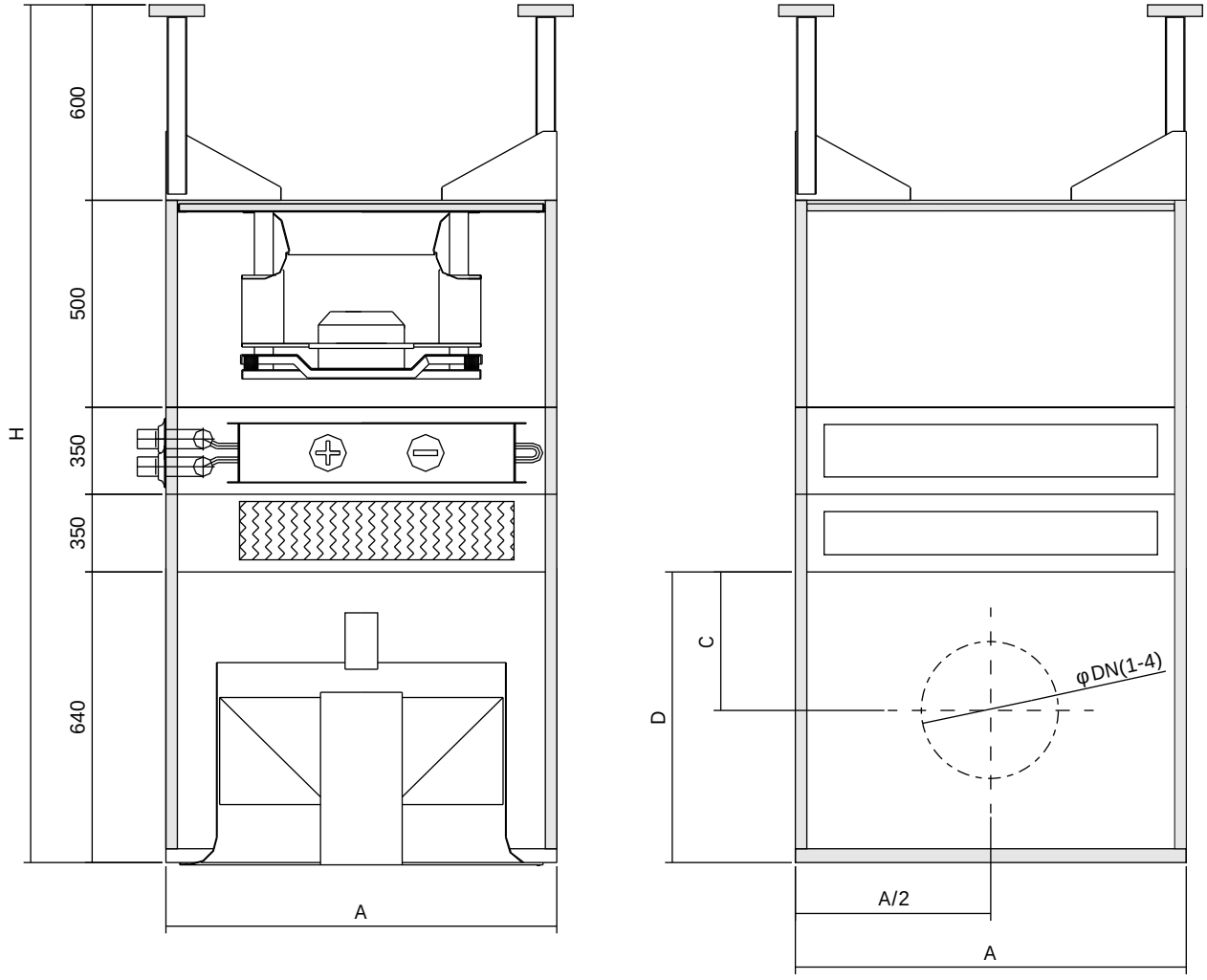
N3 TYPE DIFFUSER



N4 TYPE DIFFUSER



DIMENSIONS AND WEIGHT



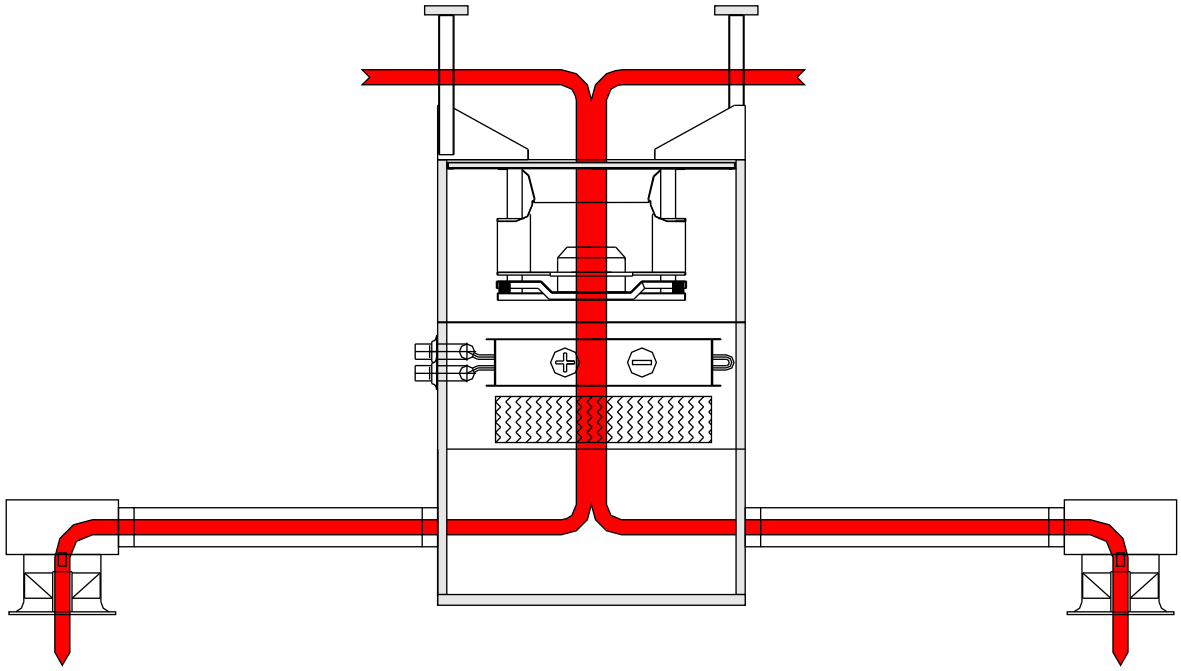
ATTENTION!
Total height (H) IS 2440mm in case of using the single diffuser or 2700mm in case of using the division chamber.

WEIGHT						
Description	PAWGr-1			PAWGr-2		
Fan section	-		[kg]	-		[kg]
Exchanger section	1-II	33		2-II	47	
	1-IV	48		2-IV	75	
Drop separator	-	32		-	39	
Diffuser section	N1	27		N1	32	
	N2	29		N2	34	
	N3	30		N3	38	
	N4	32		N4	40	
Division chamber	900[mm]	28		900[mm]	32	

DIMENSIONS			
		PAWGr-1	PAWGr-2
A	[mm]	900	1100
C		435	
D		900	
D-N1		2xφ400	
D-N2		2xφ500	
D-N3		2xφ630	
D-N4		2xφ710	

OPTIONAL SOLUTIONS

As an option instead of single diffuser the division chamber can be used where air streams are divided into two branches. In such case for the diffuser selection the half of flowing air stream should be accepted.
The spouts diameters are showed in the table of overall dimensions.
ATTENTION. Delivery doesn't include the ducts connecting the unit with the diffusers.



DESIGNATIONS

PAWGr - ... - ... - ... / ... / ...

SIZE

1, 2

HEATING AND COOLING FUNCTION

N - heating, C - cooling, NC – heating and cooling

EXCHANGER TYPE

1-II, 1-IV, 2-II, 2-IV

DIFFUSER TYPE

N1, N2, N3, N4, RN1*, RN2*, RN3*, RN4*

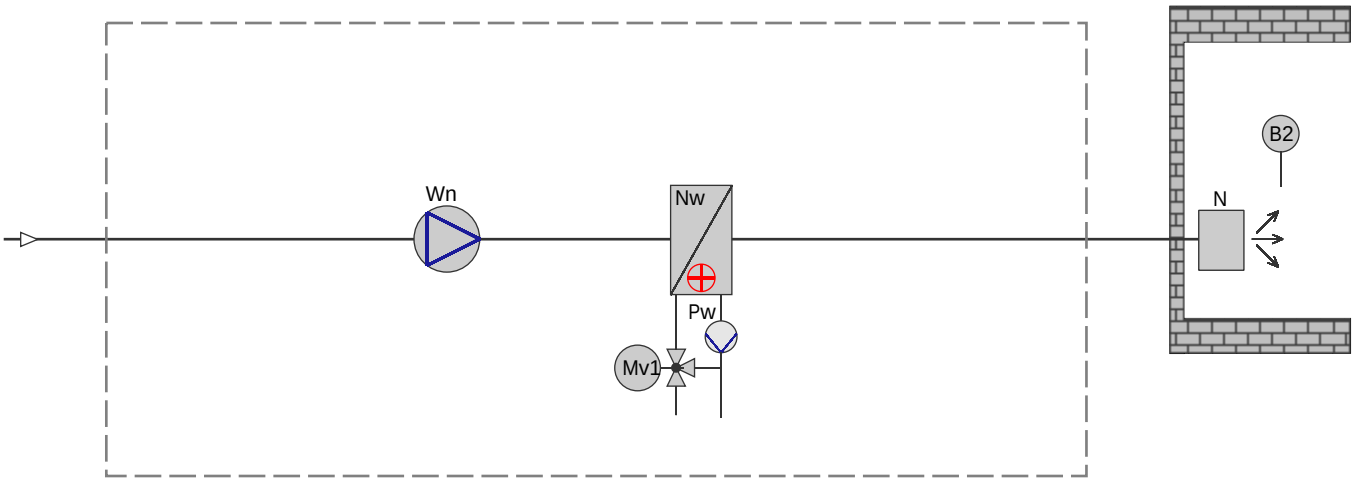
AUTOMATICS

*- if You chose the division chamber the delivery includes two the same type diffusers eg. for RN2 means that the device will be equipped with the division chamber and two N2 type diffusers.

AUTOMATICS

Air supply automatics system

The task of the automatics system supplying and controlling the work of the air supply ventilation unit with water heater is to maintain constant temperature in the compartment.



DESIGNATIONS

MV1- 3-way heater valve with the servo-motor
B2- room temperature sensor
N- rotational diffuser
Pw- water pump

SYSTEM DESCRIPTION:

The unit operation is controlled by the supply-control cabinet with temperature controller. After switching the unit on, controller as the answer to the signal from temperature sensor sets proper level of the MV1 heater valve servo-motor. Air efficiency adjustment in the units is determined by frequency converters and the air stream range is set remotely on the rotational diffuser.

SENSOR:

- B2 room temperature sensor controls the temperature in the compartment;

Temperature adjustment is made on the CPU controller with the possibility of readout and setting the control parameters on the display.

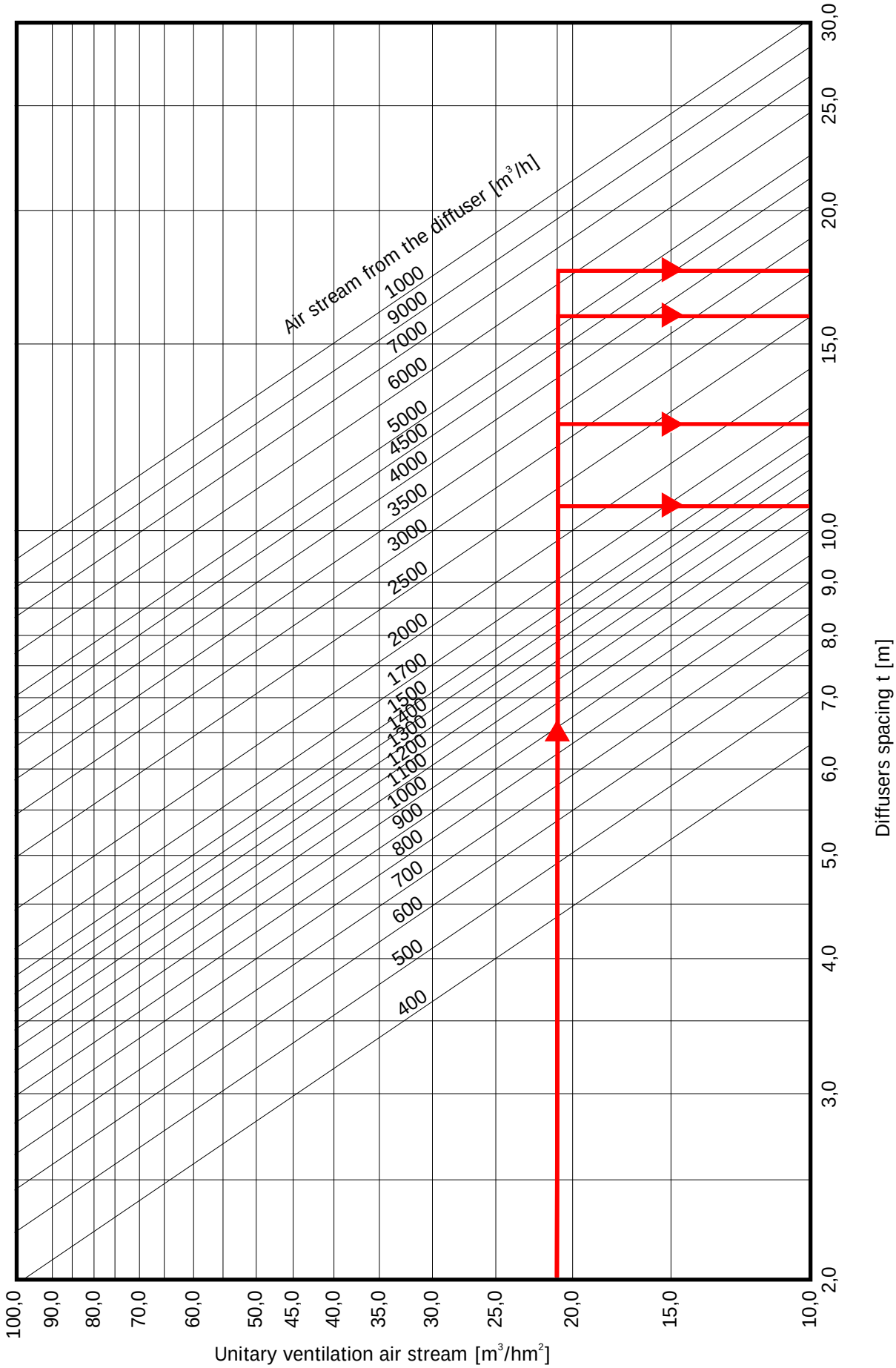
CONTROL AND PROTECTION:

- fan operation - lamp on the cabinet signals the fan operation;
- pump operation - lamp „PUMP OPERATION” on the cabinet signals switching the pump on with 5% of valve opening;
- fan - in case of too small fan efficiency or in case of exceeding motor nominal currents the overload protection will be activated and the lamp “DRIVE FAILURE” on the cabinet there will be switched on.

ATTENTION:

Automatics systems in case of using the water cooler or two-function exchanger as cooler – water heater – is the analogical simplification of the automatics diagram of the DAWGn unit.

PROJECT GUIDELINES
DETERMINATION OF DEVICES SPACING



EXAMPLE OF SELECTION

DESIGNATIONS

- total stream of ventilation air	Vp [m^3 /h]
- air stream form diffuser	V [m^3/h]
- unitary ventilation air stream	Vf[m^3/hm^2]
- floor surface area	F [m^2]
- diffuser placing height	Hp[m]
- peoples` presence zone height	Hw [m]
- air stream range	L [m]
- diffusers spacing	t [m]
- temperature in the compartment	tp [°C]
- difference between the inflow air temperature and air temperature in the compartment	tp [K]
- external air temperature	T1 [°C]
- supply air temperature	T2 [°C]

DATA FOR SELECTION

- total stream of ventilation air	Vp = 42000 [m^3/h]
- floor surface area	F=2000 [m^2]
- temperature in compartment	tp = 24 [°C]
- diffusers placing height	Hp = 6,0 [m]
- peoples` presence zone height	Hw = 1,5 [m]
- difference between the inflow air temperature and air temperature in the compartment	tp = 10 [K]
- external air temperature	T2 = -20 [°C]
- heating medium parameters	90/70 [°C]

SELECTION

Unitary ventilation air stream	Vf = Vp/F
	Vf=42000/2000=21[m^3/hm^2]
Air stream range	L = Hp - Hw
	L = 6,0 - 1,5 = 4,5 [m]

For calculated stream range and accepted temperature difference tp=10 (K) on the diagrams for separate diffusers we read out the air stream from diffuser:

For N1 diffuser	V = 2300 [m^3/h]
For N2 diffuser	V = 3300 [m^3/h]
For N3 diffuser	V = 5100 [m^3/h]
For N4 diffuser	V = 6200 [m^3/h]
Number of diffusers	n = Vp/V
For N1 diffuser	n = 42000 / 2300 - 18 pcs.]
For N2 diffuser	n = 42000 / 3300 - 13 [pcs..]
For N3 diffuser	n = 42000 / 5100 - 8 [pcs.
For N4 diffuser	n = 42000 / 6200 - 7 [pcs.]

On the basis of calculated unitary ventilation air stream 21 (m^3/hm^2) and for the air stream from the diffuser we read out maximal diffusers spacing:

For N1 diffuser	tφ11 [m]
For N2 diffuser	tφ13 [m]
For N3 diffuser	tφ16 [m]
For N4 diffuser	tφ17 [m]

On the basis of above calculations and the knowledge concerning the possibility of spacing the devices on the roof of a given object we chose the adequate device size. In the presented above example 13 pieces. of DAWGn/w –1 were chosen with N2 type diffuser. Then, depending on the type of chosen device we select the size of heat exchanger.

Heating power: Q=Vx1,2x1,005 x (T2-T1)/3600 [kW]

Q=3300x1,2x1,005x(34-(-20))/3600=59,7 [kW]

In the tables with technical data of the heat exchangers in the heating function we can find DAWGn/w-1 device and adequate parameters of the heating medium. For a given external air temperature -20 [°C] we check which exchanger can match with calculated power around 60kW. Chosen exchanger is: 1-II.

Designation of chosen device: DAWGn/w - 1 - N / 1-II / N2 / E1 / A20

CALCULATON OF TEMPERATURE BEHIND THE CROSS-FLOW EXCHANGER IN THE DAWGo UNITS

Air temperature behind the cross-flow exchanger is calculated basing on following formula:
T2 = T1 + h x (T3-T1)
where:
T1 – fresh air temeprature [°C]
T2 - air temeprature behind the cross-flow exchanger [°C]
T3 – exhaust air temperature [°C]
h - exchanger temperature efficiency [%].

We akccept the constant value h = 50%
EXAMPLE

- fresh air temperature T1 = -20°C
- exhaust air temperature T3= +20°C

T2= -20 + 0,5 x (20 - (-20))
T2 = 0,0°C
In order to select the heat exchanger in the heating function we accept the following air temperature on the inlet=0°C

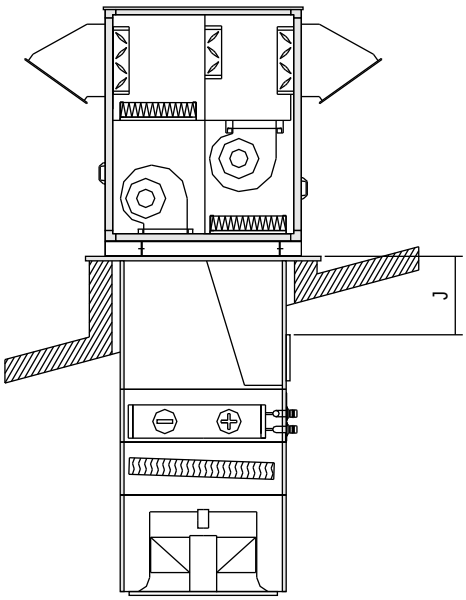
ROOF PEDESTAL

Roof pedestals are necessary for installing the DAWG units on the roof. During determination of dimensions and construction it's necessary to adhere to the following guidelines:

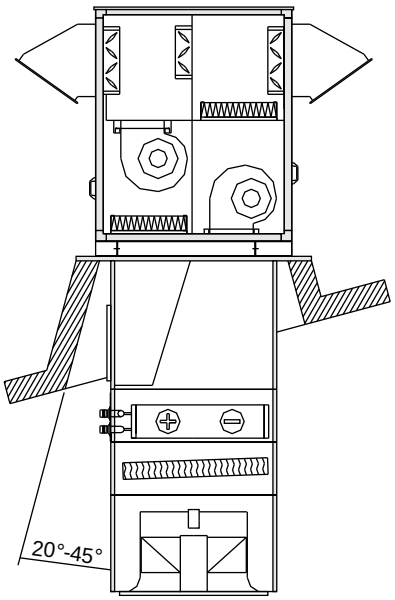
- Inspection hatch and exhaust air grids have to be freely accessible from underneath the roof.
- Roof pedestal should protrude at the minimum 200mm from the roof in order to avoid the water infiltration in the case of rain or snow.
- Hole (F dimension) should be adequately large in order to make installation of under-roof unit possible.
- External dimension (G dimension) should be adequately large in order to ensure that sealing collar of the roof unit can cover the roof pedestal.
- Roof pedestal should be insulated.
- Roof pedestal should be flat and horizontal.

Depending on local conditions there are two kinds of roof pedestals used:

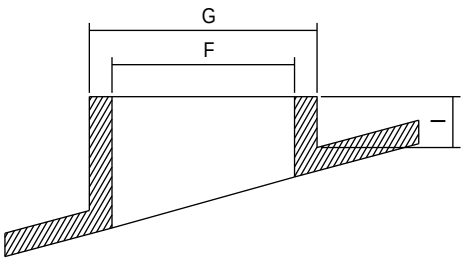
- roof pedestal with straight side walls (when there is enough space).
- Roof pedestal with skew side walls on all the sides (where entering compartments under-roof unit can disturb the operation of lifts, cranes etc.)



Roof pedestal with straight walls.



Roof pedestal with cone roof walls from all the sides.



PEDESTAL DIMENSIONS			
		DAWG-1	DAWG-2
G max	[mm]	1000	1285
F min		920	1120
I min		200	
J min		600	

INSTALLING THE TEMPERATURE SENSOR

EXTERNAL TEMERATURE SENSOR

Sensor has to be installed in the visible area on the height about 1,5m. Measurement values can be distorted by the heating or cool source (machines, sun, windows, door etc.). Usually only one external temperature sensor is necessary on each adjustment zone . It's also possible to install four sensors in order to calculate average value.

EXTGERNAL TEMPERATURE SENSOR

Sensor has to be installed at least 3 m above the floor on the northern façade in order to protect it against direct solar radiation. The sensor should be additionally covered with roof and isolated from the building. Only one external temperature sensor is required per installation.

SETTING THE HEATER CONNECTIONS

As a standard heater connections are placed under the air inlet to the recirculation chamber. In case of other location guidelines should be precised in the order