



Digireg®



Bypass



EC-motor



ErP conform



Max. recuperation efficiency



VAV-CAV-COP control types

Technical Parameters

Cabinet

Patented modular ISOSTREAM® system with 45 mm thick wall panels made of galvanized steel sheet with external paint in RAL9002 (gray-white). The panels are filled with sound and heat insulation made of non-combustible glass mineral wool on the inside. To facilitate service, the unit housing is equipped with openable doors with locks or fully removable panels. The unit frame is made of aluminum profiles, the wall panels are screwed to the frame. On the service side, the unit housing is equipped with openable doors with pressure locks, alternatively, fully removable panels can be supplied. Condensate outlets from the heat recovery exchanger and cooler are always located in the bottom panel of the unit and are prepared for connecting an anti-odour siphon. At the customer's request, the unit casing can be provided with atypical surface protection with increased corrosion resistance.

Fans

Fans with backward curved blades are mounted on the inlet and outlet sides of the unit. The impeller is made of composite material and is statically and dynamically balanced.

Motors

An EC motor is mounted directly on the fan impeller. The fan motor can be continuously controlled by an external 0...10 V signal. The motor is equipped with its own built-in thermal protection. Motor efficiency class IE4, motor protection IP54.

Heat Exchanger

The heat exchanger with counter-flow heat exchanger with completely separate supply and extract air flows is made of aluminum. The heat exchanger includes a bypass with a damper that fully controls the air inlet to the heat exchanger or to the bypass. On request, the heat exchanger can be equipped with a circulation or mixing damper (marked C or MX in the unit code).

Filters

On the fresh air intake and the exhaust air intake, it is possible to place 2 sets of compact filter elements of different filtration classes with a thickness of 48 mm or 1 set of filter elements with a thickness of 96 mm. Filters in filtration classes from G4 to F9 are available. Access to the filters is through an inspection door on the operating side of the unit.

Dampers

Aluminum control dampers with preparation for mounting an actuator are integrated for fresh air intake and exhaust air discharge. The dampers meet tightness class 2 according to EN1751. On request, the unit can be retrofitted with dampers in tightness class 3.

Heating and Cooling provisions

Depending on the design, the unit is equipped with a water or electric air heater. A water cooler or direct evaporator is installed for air cooling. For the possibility of direct heating and cooling, the evaporator can be manufactured as a reversible avolit operation with bivalent water or electric heating. The evaporators are designed as standard for the refrigerant R410A and R32. Water heaters, coolers and evaporators have copper pipes and aluminum fins in a galvanized steel frame as standard. For higher corrosion protection, the exchangers can be provided with additional anti-corrosion protection. Electric heaters have smooth heating rods as standard and are equipped with an operating thermostat with a start-up temperature of 60 °C and an emergency thermostat with manual reset and a start-up temperature of 120 °C.

Electrical connection

The supply voltage is 3x400 V/50 Hz. The supply cables, sensor cables and power cables are fed into the unit through plastic grommets in the unit wall. Rubber grommets with a membrane are prepared inside the unit for cable routing.

Regulation

The unit is equipped with a Digireg® digital regulation as standard according to the unit configuration. If the unit is equipped with a MaR system directly from the manufacturing plant, all sensors and actuators are electrically connected and tested. The control box is located on the side service wall of the unit (in the case of an atypical location of the MaR system control box, this must be consulted with the manufacturer and specified in the order).

Installation

In a vertical position on the floor of the machine room or the roof of the building. The specific arrangement of the supply and exhaust air nozzles relative to the service side must be specified, see below. The prescribed service space must be maintained in front of the unit for the needs of service interventions, filter replacement, etc. There must be space under the unit for installing a siphon for condensate drainage. The unit must be mounted with a 1° slope towards the condensate drainage nozzle on the air cooler side. The HVAC duct is connected to the rectangular nozzles prepared in the sandwich panel and integrated. We recommend installing flexible sleeves between the pipe nozzles and the unit to eliminate the transmission of vibrations from the unit to the duct. The rectangular nozzles are integrated in the unit's wall sandwich panel and the spacing of the corner connection holes is optimized for P30 connection flanges (30 mm flange height).

Noise

The noise data given in the tables represent the sound power levels at the individual unit ports with A-weighted filter correction, the sound power level of the entire unit casing. The acoustic parameters are within a tolerance of ±3 dB.

Variants

The individual unit variants are distinguished by their equipment using a code. Atypical designs must be consulted.

Warranty conditions

The DUOVENT® MODULAR DV evo device, including the DVAV, DCAV and DCOP control system, must be put into operation exclusively by the Seller or by a person designated by the Seller. Failure to comply with this condition results in the Buyer's rights from defective performance and the Quality Guarantee being terminated. More detailed conditions are set out in the Seller's Complaints Procedure.

■ HVAC accessories

- SPIRO circular spiro pipes and fittings (K7.3)
- IAE flexible couplings (K7.1)
- IAA silencers (K7.1)
- TSK check valves (K7.1)
- MSK, IJK throttle and mixing valves (K7.1)
- Plate valves, anemostats, nozzles, grilles (K7.2)
- Rain blinds (K7.1)
- ESU mixing nodes (K7.1)
- SF-P vacuum siphon (K7.1)

■ EL accessories

- Digireg® digital control system for heating and cooling units, touch screen controller (K9)
- JTR triac switch for electric heater output control (K9)
- HIG, HYG hygrostats (K8.2)
- AIRSENS, EDF-CO₂, SQA CO₂ sensors (K8.2)
- RTR thermostats (K8.2)
- DTS PSA pressure sensors (K8.2)
- Servo actuators (K8.2)

Information

The unit is intended for ventilation of commercial premises. The unit is intended for continuous operation. The unit is supplied in 3 separate blocks. The connection of the blocks is a matter of the installation procedure during the installation of the unit. The connecting material is included in the delivery. Units in the PROCESS version (i.e. outside the scope of EC Regulation No. 1253/2014) must be consulted.

Model Number Abbreviation List

DUOVENT MODULAR DV evo 10100 DCA DCC MX KL F7/M5 DVAV AV PRV LAK-C4

- 1 – unit size – 8500, 10100, 12000, 14500
- 2 – type of heating:
- D1** – electric heater
 - D12** – electric heater with reduced power
 - DCA** – water, temperature gradient 80/60 °C
 - DCB** – water, temperature gradient 45/35 °C
- 3 – type of cooling:
- DCC** – water, temperature gradient 6/12 °C
 - DX** – direct evaporation coil, R410A or R32 refrigerant, evaporation temperature 6 °C
(When using DX coil we must specify type of refrigerant, cooling capacity and amount of cooling circuits based on type of condensing unit being used)
Use of heat pump needs to be specified in the order.
 - DXr** – direct evaporation cooling coil use for heating and cooling, R410A or R32 refrigerant
- 4 – **MX** – mixing air damper, without actuator (when unit is ordered with Digireg MAR system, the power actuator becomes part of delivery)
- C** – mixing air damper designed for 100% air recirculation (when unit is ordered with Digireg MAR system, the power actuator becomes part of delivery)
- 5 – **KL** – outside air and return air dampers, without actuators (when unit is ordered with Digireg MAR system, the power actuator becomes part of delivery)
- 6 – classification of air filters for outside air and return air inlets (G4–F9)
- 7 – type of unit control system:
- | | Class acc. to EN779 | Class acc. to EN ISO 16890 |
|---------------------|---------------------|----------------------------|
| D – Digireg® | G4 | ISO Coarse 60% |
| D – Digireg® | M5 | ISO ePM10 50% |
| D – Digireg® | F7 | ISO ePM2,5 70% |
| D – Digireg® | F9 | ISO ePM1 80% |
- 8 – type of airflow regulation:
- VAV** – variable air volume
 - CAV** – constant air volume
 - COP** – constant operating pressure
- 9 – placement of unit's inlets and outlets – AV or AV2
- 10 – **PRV** – setup for process ventilation (PROCESS) – for applications excluded from EC regulation no. 1253/2014, for applications excluded from EC regulation no. 1253/2014
- 11 – **LAK-C4** – fully painted unit (corrosion protection C4)
- LAG-C4** – internal and external parts made of MAGNELIS® ZM310 material

Order examples

DUOVENT® MODULAR DV 14500 DI DX MX KL G4+F7/F7 DVAV AV2

Unit size 14500, equipped with electric heater, direct evaporation coil for cooling, mixing damper, two filter brackets on supply side G4+F7, single filter bracket on exhaust side F7, Digireq® MAR system with VAV, AV2 inlet/ outlet configuration.

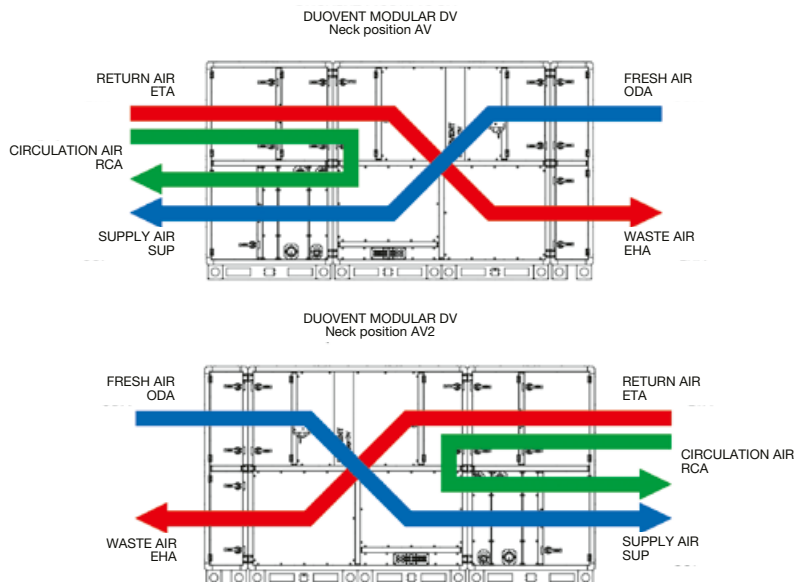
DUOVENT® MODULAR DV 8500 DCA M5/G4 DVAV AV PRV

Unit size 8500, equipped with water heater 80/60°C, supply filter rated M5, exhaust filter rated G4, Digireg® MAR system with VAV, AV inlet/ outlet configuration. Setup for process ventilation not complying EC regulation no-1253/2014.

Class acc. to EN779	Class acc. to EN ISO 16890
G4	ISO Coarse 60%
M5	ISO ePM10 50%
F7	ISO ePM2,5 70%
F9	ISO ePM1 80%

Supplementing Figures

Air flow directions in DUOVENT® MODULAR DV units:



Type	nominal flow [m³/h]	voltage [V/Hz]	fan inlet/outlet		heater		cooler power* [kW]	efficiency* [%]	max. unit air flow** [m³/h]	control system Digireg®	weight*** [kg]
			max. input [W]	power [A]	current* [kW]	power [A]					
8500	8500	3×400V 50Hz	4178/2952	6/4,3	—	—	—	94,3	9000	M3-Vx	860–950
8500 DCA					64,2	—	—				
8500 DCB					45,5	—	—				
8500 DCA DCC					64,2	—	65,8				
8500 DCA DX					64,2	—	69,9				
8500 DI2					15,0	22,0	—				
8500 DI					30,0	43,3	—			M3-E36	
10100	10100	3×400V 50Hz	4907/3763	7,1/5,4	—	—	—	94,6	11500	M3-Vx	1025–1138
10100 DCA					79,5	—	—				
10100 DCB					56,0	—	—				
10100 DCA DCC					79,5	—	81,7				
10100 DCA DX					79,5	—	84,8				
10100 DI2					22,5	33,0	—			M3-E24	
10100 DI					45,0	65,0	—			M3-E72	
12000	12000	3×400V 50Hz	5738/4297	8,3/6,2	—	—	—	94,3	13500	M3-Vx	1188–1321
12000 DCZ					94,5	—	—				
12000 DCB					65,0	—	—				
12000 DCA DCC					94,5	—	98,0				
12000 DCA DX					94,5	—	99,3				
12000 DI2					22,5	33,0	—			M3-E24	
12000 DI					45,0	65,0	—			M3-E72	
14500	14500	3×400V 50Hz	6738/5075	9,8/7,3	—	—	—	92,3	16500	M3-Vx	1469–1631
14500 DCA					116,0	—	—				
14500 DCB					79,5	—	—				
14500 DCA DCC					116,0	—	121,0				
14500 DCA DX					116,0	—	119,0				
14500 DI2					30,0	43,3	—			M3-E36	
14500 DI					60,0	86,6	—			M3-E72	

* at nominal air flow, $t_e = 12^\circ\text{C}/90\% \text{ r.h.}$, $t_e = 22^\circ\text{C}/50\% \text{ r.h.}$, $t_e = 35^\circ\text{C}/35\% \text{ r.h.}$ (SUMMER)

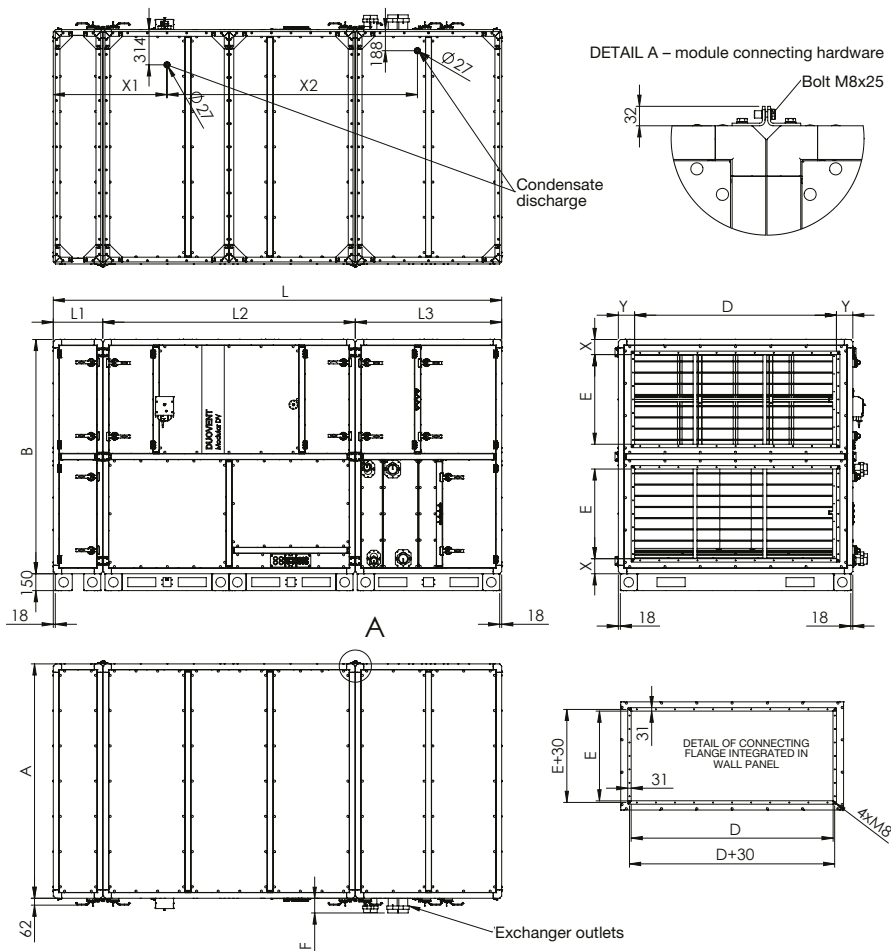
** for arrangement – inlet: filter F7+DV+DCB, outlet: filter M5+DV

*** in relation to the unit accessory (without I&C)

Water cooler power DCC for $t_e = 35^\circ\text{C}/35\% \text{ r.h.}$, $t_e = 6/12^\circ\text{C}$. Water heater power DCA for $t_e = 10^\circ\text{C}$, $t_e = 80/60^\circ\text{C}$.Water heater power DCB for $t_e = 10^\circ\text{C}$, $t_e = 45/35^\circ\text{C}$. Direct evaporating unit power DX for R410A coolant, $t_e = 35^\circ\text{C}/35\% \text{ r.h.}$, $t_{op} = 6^\circ\text{C}$.

Dimensions

DUOVENT® MODULAR DV 8500 to 14500

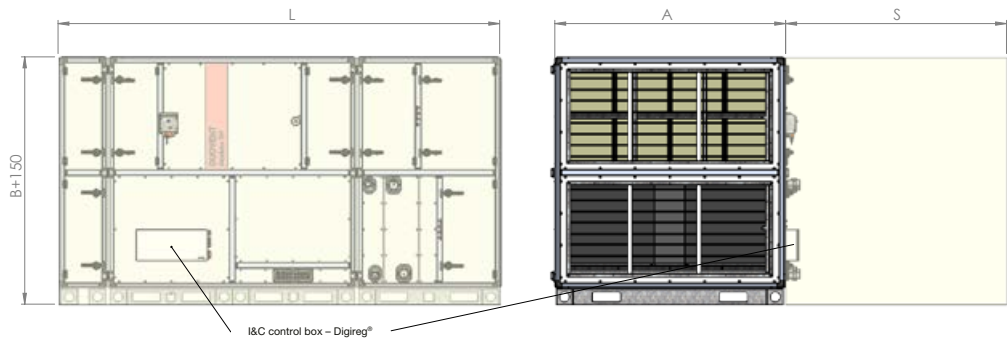


Type	A [mm]	B [mm]	D [mm]	E [mm]	F [mm]	L [mm]	L1 [mm]	L2 [mm]	L3 [mm]	X [mm]	Y [mm]	X1 [mm]	X2 [mm]
DV 8500	1620	1620	1350	600	132	3289	442	1698	1149	118	135,0	740	1883
DV 10100	1777	1777	1500	650	132	3525	442	1934	1149	132	138,5	858	2001
DV 12000	1934	1934	1650	700	132	3604	442	1934	1228	146	142,0	858	2018
DV 14500	2091	2091	1800	800	132	3996	442	2248	1306	135	145,5	1015	2233

Supplementing Figures

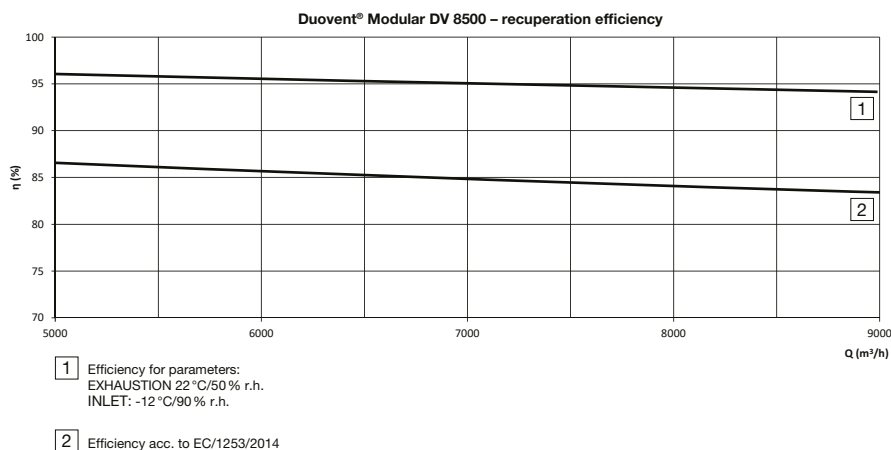
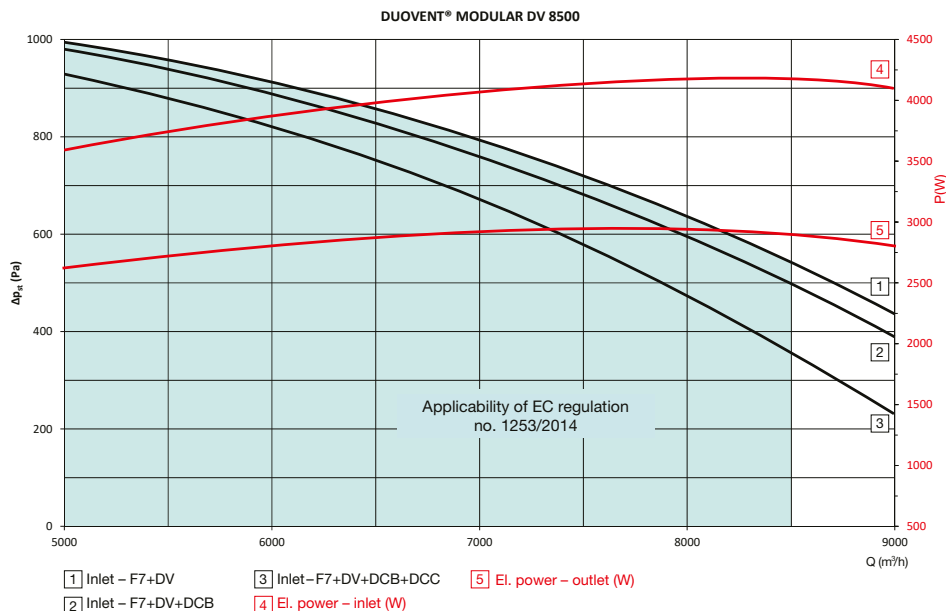
Minimum unit service space

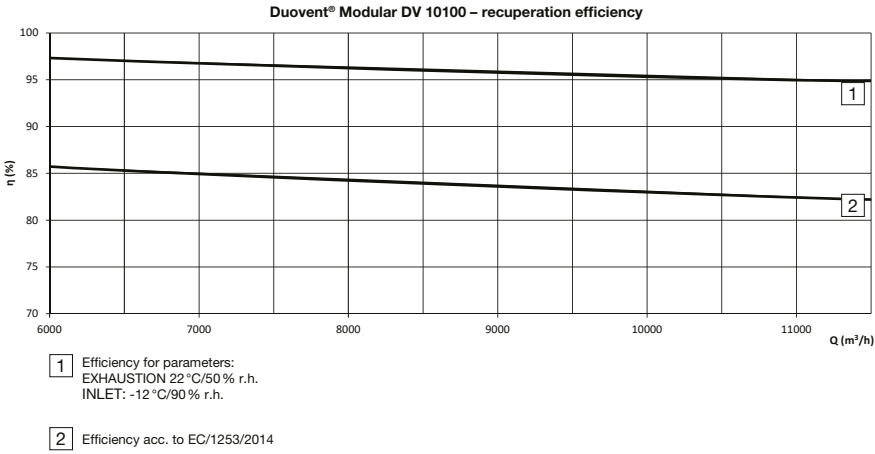
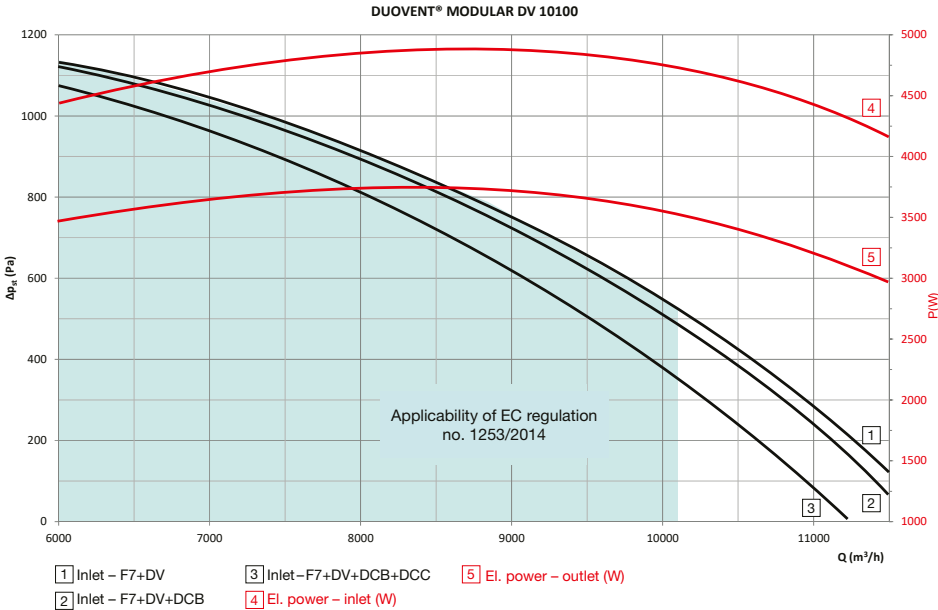
Size	A [mm]	B [mm]	L [mm]	S [mm]
DV 8500	1620	1620	3289	1700
DV 10100	1777	1777	3525	1800
DV 12000	1934	1934	3604	2000
DV 14500	2091	2091	3996	2150



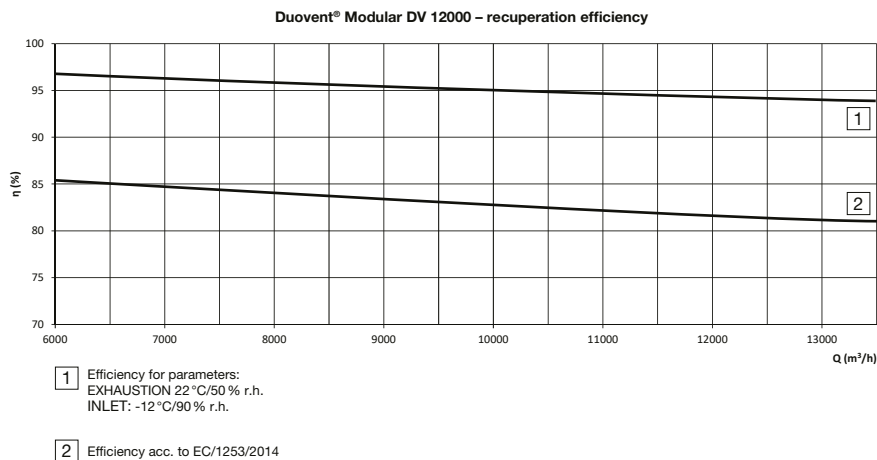
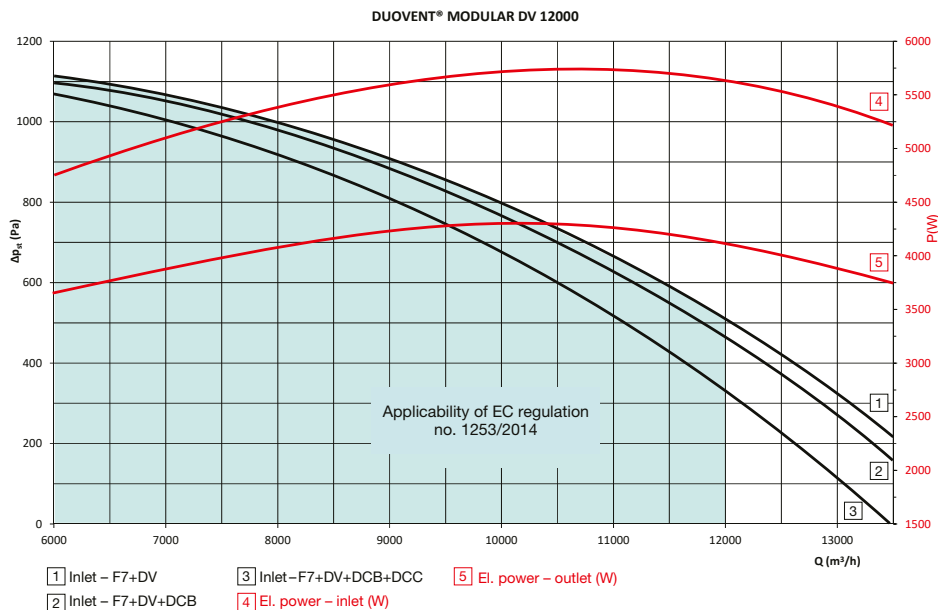
Characteristics

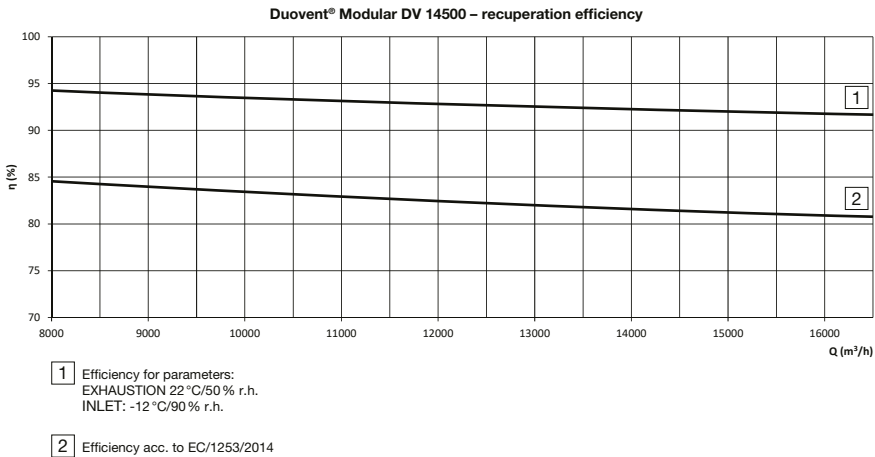
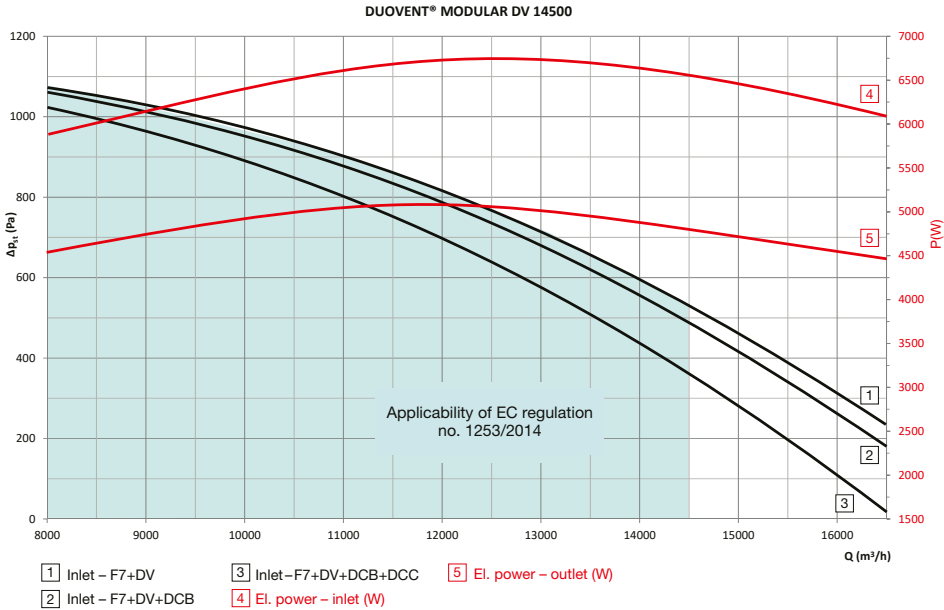
Q air flow (m³/h)
 Δp_{st} unit external static pressure (Pa)
P fan electric input power (W)
 η heat recuperation efficiency (%)
F7+DV+DCB+DCC ... performance curve with maximum pressure loss of inner parts at inlet side
(i.e. filter F7 at inlet, regenerator, water heaters 3 lines, water cooler 4 lines, drop eliminator)





Recuperation





Recuperation

Acoustic power (pressure) level in octave ranges [db(A)]*

DUOVENT® MODULAR DV 8500 (for $V_{nom} = 8500 \text{ m}^3/\text{h}$)

Hz	63	125	250	500	1000	2000	4000	8000	L_{WA}
fresh	39	45	63	64	61	61	55	53	69
inlet	51	59	75	79	85	83	78	74	88
L_{WA} exhaust	40	48	67	68	65	66	61	61	73
waste	45	53	69	72	78	75	68	66	81
case**	43	54	68	63	60	52	40	33	70

DUOVENT® MODULAR DV 10100 (for $V_{nom} = 10100 \text{ m}^3/\text{h}$)

Hz	63	125	250	500	1000	2000	4000	8000	L_{WA}
fresh	40	46	65	65	62	62	56	55	70
inlet	51	59	77	81	87	84	79	76	90
L_{WA} exhaust	44	51	70	71	68	68	63	66	76
waste	48	56	72	75	80	78	70	70	84
case**	44	56	71	65	62	54	42	36	72

DUOVENT® MODULAR DV 12000 (for $V_{nom} = 12000 \text{ m}^3/\text{h}$)

Hz	63	125	250	500	1000	2000	4000	8000	L_{WA}
fresh	41	47	67	65	62	63	56	54	71
inlet	55	62	79	82	86	84	78	75	90
L_{WA} exhaust	44	51	73	71	68	68	63	64	77
waste	49	57	74	76	79	76	69	69	83
case**	47	58	73	66	61	53	41	35	74

DUOVENT® MODULAR DV 14500 (for $V_{nom} = 14500 \text{ m}^3/\text{h}$)

Hz	63	125	250	500	1000	2000	4000	8000	L_{WA}
fresh	42	51	69	68	64	62	53	53	73
inlet	51	64	82	84	89	88	82	77	93
L_{WA} exhaust	49	58	74	74	71	68	61	64	79
waste	51	62	77	79	82	81	74	70	86
case**	45	61	76	68	64	57	45	36	77

* Configuration data (integrated flaps, water cooler DCC, water heater DCA, filtering class F7/M5)

** case damping with D_v value acc. to EN1886

Characteristics of recuperation units acc. to 2009/125/EC, EC regulation no. 1253/2014.

unit size	nominal air flow [m³/h]	SFP _{rel} [W/(m³/s)]	recuperation efficiency [%]	SFP _{int LIMIT 2018} [W/(m³/s)]	external pressure [Pa]
DV 8500	8500	1015	83,7	1121	350
DV 10100	10100	1047	82,1	1073	350
DV 12000	12000	1031	81,6	1058	350
DV 14500	14500	918	81,8	1064	350

Technical data of water heaters DCA ($t_w = 80/60 \text{ }^\circ\text{C}$) and DCB ($t_w = 45/35 \text{ }^\circ\text{C}$)

unit size	temperature gradient [°C/°C]	power [kW]	nominal air flow [m³/h]	inlet air temperature [°C]	outlet air temperature [°C]	pressure loss at water side [kPa]	water flow [m³/h]
DV 8500	80/60	64,2	8500	10	32,6	10	2,82
	45/35	45,5			26,0	27	3,95
DV 10100	80/60	79,5	10100	10	33,5	12	3,49
	45/35	56,0			26,6	31	4,86
DV 12000	80/60	94,5	12000	10	33,5	15	4,15
	45/35	65,0			26,2	13	5,64
DV 14500	80/60	116,0	14500	10	33,8	19	5,08
	45/35	79,5			26,4	17	6,91

Technical data of water coolers DCC ($t_w = 6/12 \text{ }^\circ\text{C}$) and evaporation units DX ($t_{vp} = 6 \text{ }^\circ\text{C}$, R410A coolant)

unit size	temperature gradient/ evaporation temperature [°C]	power [kW]	nominal air flow [m³/h]	inlet air temperature [°C] Air humidity [%]	outlet air temperature [°C]	pressure loss at water/ coolant side [kPa]	water flow [m³/h]
DV 8500	6/12	65,8	8500	35°C/35%	18,3	30	9,40
	6	69,9			17,8	48	–
DV 10100	6/12	81,7	10100	35°C/35%	17,8	35	11,67
	6	84,8			17,4	57	–
DV 12000	6/12	98,0	12000	35°C/35%	17,7	46	14,00
	6	99,3			17,6	73	–
DV 14500	6/12	121,0	14500	35°C/35%	17,5	57	17,23
	6	119,0			17,6	89	–

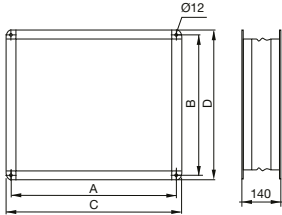
Technical data of electric heaters (supply voltage 3× 400V/50Hz), assignment of control sets

unit size	DI type	power [kW]	No. of sections	Digireg® set
DV 8500	IBE-Duovent® DV8500_15/1	15	1 (10 kW)	M3-E15 / M3-E36
	IBE-Duovent® DV8500_30/1	30	1 (30 kW)	
DV 10100	IBE-Duovent® DV10100_22,5/2	22,5	1 (22,5 kW)	M3-E24 / M3-E72
	IBE-Duovent® DV10100_45/2	45	2 (15+30 kW)	
DV 12000	IBE-Duovent® DV12000_22,5/1	22,5	1 (22,5 kW)	M3-E24 / M3-E72
	IBE-Duovent® DV12000_45/2	45	2 (15+30 kW)	
DV 14500	IBE-Duovent® DV14500_30/1	30	1 (30 kW)	M3-E36 / M3-E72
	IBE-Duovent® DV14500_60/2	60	2 (30+30 kW)	

Optionally, the unit can be ordered with atypical powers of electric heaters For this variant contact our technical dept.

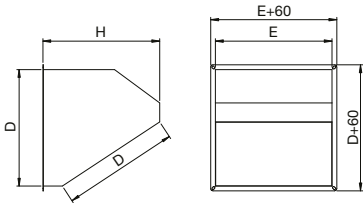
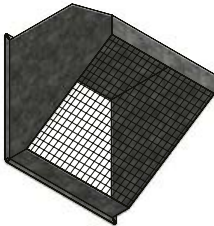
Unit Accessories

- DUO-DV-IAE
- Flexible coupling for connection of inlet/outlet necks of A/C unit with A/C piping
 - Prevents transfer of vibration to air-ducts
 - Flange width 30 mm



Type	A [mm]	B [mm]	C [mm]	D [mm]
DUO-DV-IAE-8500-P30	1380	630	1410	660
DUO-DV-IAE-10100-P30	1530	680	1560	710
DUO-DV-IAE-12000-P30	1680	730	1710	760
DUO-DV-IAE-14500-P30	1830	830	1860	860

- DUO-DV-MOUNT RAIN LOUVRES
- Rain louvres for outdoor use
 - Made from galvanized sheet metal
 - Fitted with bird mesh
 - Optional color coating
 - Flange width 30 mm



Typ	D [mm]	E [mm]	H [mm]
DUO-DV-MOUNT 8500-P30	600	1350	600
DUO-DV-MOUNT 10100-P30	650	1500	650
DUO-DV-MOUNT 12000-P30	700	1650	700
DUO-DV-MOUNT 14500-P30	800	1800	800

■ ROOFPACK-A

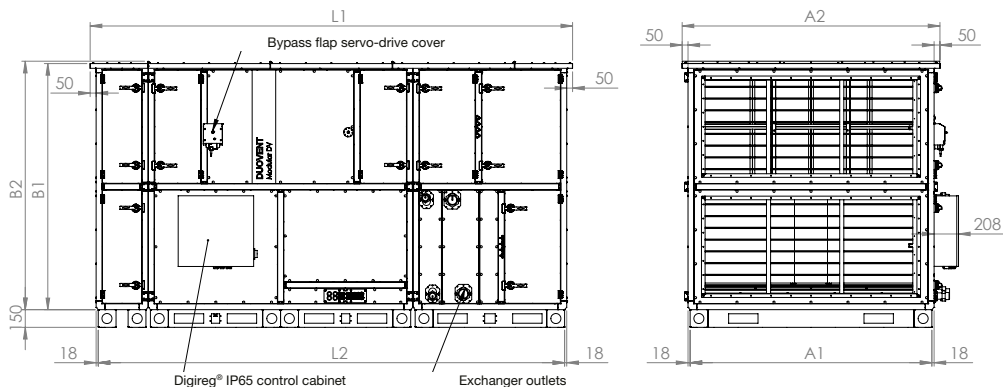
- Made from galvanized steel or painted steel
- Mounted directly to top of the unit
- Frame height is 150 mm when feet are incorporated
- Insulated corner profiles of cabinet frame
- Waterproof external case
- Digireg® control box in IP65
- As an option, unit's supply side can be fitted with 1000W electric heaters IBET in unison with thermostat F2000 with adjustable temperature settings. The heater tempers inside of the unit while preventing freezing of water coil when the unit is not operational.

Type key for ordering of ROOFPACK accessory

ROOFPACK - A - DUO - MOD DV - 8500

1 2 3

- 1 – ROOFPACK accessory type: A
- 2 – Identification of recuperation unit type:
DUO-MOD-DV = DUOVENT® MODULAR DV
- 3 – Size of unit DUOVENT® MODULAR DV:
8500, 10100, 12000, 14500



unit size	L1 [mm]	L2 [mm]	A1 [mm]	A2 [mm]	B1 [mm]	B2 [mm]	weight [kg]
DV8500	3389	3253	1584	1720	1622	1640	61
DV10100	3625	3489	1741	1877	1779	1797	71
DV12000	3704	3568	1898	2034	1936	1954	79
DV14500	4096	3960	2055	2191	2093	2111	94



Example of ROOFPACKA
for units DUOVENT® MODULAR DV