

DUPLEX 2000 - 8000

multi-purpose compact heat recovery ventilators

The compact DUPLEX 2000 - 8000 heat recovery ventilators are used for comfort ventilation, as well as warm air heating and cooling of small office areas, shops, retail facilities, school buildings, restaurants, small stores, sport centers, industrial halls and swimming pools.

The units are suitable for all facilities where effective ventilation or warm air circulation heating/cooling at minimum operating costs is required; it means high-efficient heat recovery, low power consumption of fans and minimum noise level.

The units are available in two basic versions:

- indoor version
- rooftop version (with double insulation)

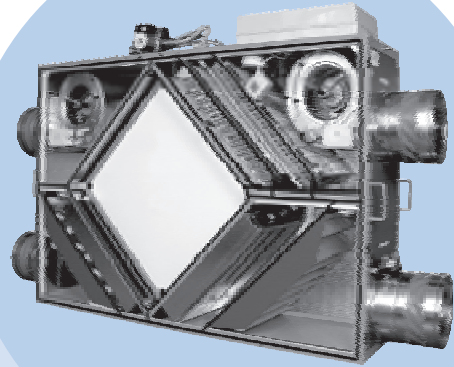
The DUPLEX unit is designed as compact appliance. In single casing it contains: two independently driven centrifugal fans with anti-vibration motor support, high-efficient cross-flow air-to-air heat recovery core assembled from thin plastic plates, removable supply and exhaust air filters of the G4 or F7 class, condensation pans, an optional internal by-pass with a remote-controlled actuator and an internal mixing damper.

The unit casing consists of steel L-profile frame and sandwich panels made of aluminum metal sheets filled with polyurethane insulation (thermal resistance $R = 1,05 \text{ m}^2\text{KW}^{-1}$, or $2,1 \text{ m}^2\text{KW}^{-1}$). The sandwich panels are fixed to the frame. A front access door enables comfortable access to all components and filters. Standard surface finish.

Inlet and outlet ports are round or rectangular with different location configuration based on an order.

Indoor ports of the rooftop unit are from bottom and outdoor ports are fitted with hoods. They can optionally be fitted with sound attenuators. It is recommended that both shutoff air dampers be installed to prevent draft.

The units can be equipped with high-efficient EC fans with optional constant volume flow control.



DUPLEX 2000 - 8000

Features of the DUPLEX units

- highly compact shape enables space reduction up to 60 % compared to units with modular construction
- low purchase cost
- eight (sixteen) different installation configurations for the indoor type
- choice of non-standard connection ports (round or rectangular) on request
- very low noise level
- low weight
- low power input
- high efficiency of heat recovery
- different types of complete control systems based on application complexity; fully integrated into the unit
- high chemical resistance of the hPS heat exchanger
- optional hygienic design according to the VDI 6022
- optional delivery in disassembled state for inaccessible spaces

AVAILABLE MODIFICATIONS (CAN BE COMBINED)

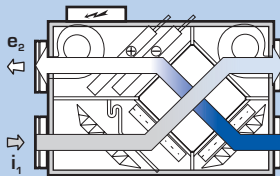
Indoor type

- B with built-in by-pass
- C with built-in mixing damper
- T with built-in hot water heating coil
- CHF with built-in DX cooling coil
- CHW with built-in chilled water cooling coil

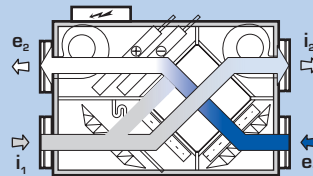
Rooftop type

- N-B with built-in by-pass
- N-C with built-in mixing damper
- N-T with built-in glycol heating coil
- N-CHF with built-in in DX cooling coil
- N-CHW with built-in glycol chilled water cooling coil

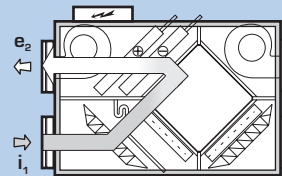
OPERATING MODES OF THE DUPLEX UNITS



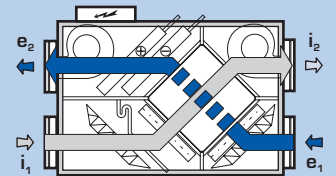
1. Equal-pressure ventilation with heating or cooling



2. Combined mode with air mixing and heating or cooling



3. Circulation heating or cooling



4. Ventilation without heat recovery (via by-pass)

SELECTION SOFTWARE



For detailed selection of Duplex units, accessories and control system we recommend to use our special selection software. To select a heat recovery exchanger you can use our special selection software. Download it from our webpage www.atrea.cz or contact us at our mail address.

Atrea®

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PERFORMANCE CURVES

INDOOR TYPE

DUPLEX	type	2000	3000	4000	6000	8000
supply air - max. ¹⁾	m ³ h ⁻¹	2 000	3 000	5 500	7 000	9 000
exhaust air - max. ¹⁾	m ³ h ⁻¹	2 000	3 000	5 500	7 000	9 000
heat recovery efficiency ²⁾	%	52 - 68				
number of configurations	-	160	160	160	160	32
weight ³⁾	kg	110-185	130-220	160-320	190-380	240-480
number of fans	-	2				
max. power input	kW	according to fan type				
voltage	V	230	230/400		400	
frequency	Hz	50				
speed	rpm ⁻¹	according to fan type				
max. heating capacity "T" ⁴⁾	kW	26	33	56	79	104
max. cooling capacity "CHW" ⁴⁾	kW	12	17	27	47	57
max. cooling capacity "CHF" ⁴⁾	kW	13	18	29	49	59
filtration class (standard)	-	G4				

¹⁾ maximum volume flow through units at zero external pressure

²⁾ according to heat recovery core type and air volume flow

³⁾ according to selected accessories

⁴⁾ according to coil and fluid type

ROOFTOP TYPE

DUPLEX-N	type	2000	3000	4000	6000	8000
supply air - max. ¹⁾	m ³ h ⁻¹	2 000	3 000	5 500	7 000	9 000
exhaust air - max. ¹⁾	m ³ h ⁻¹	2 000	3 000	5 500	7 000	9 000
heat recovery efficiency ²⁾	%	52 - 68				
number of configurations	-	32				
weight ³⁾	kg	210-320	250-410	295-530	345-630	420-760
number of fans	-	2				
max. power input	kW	according to fan type				
voltage	V	230	230/400		400	
frequency	Hz	50				
speed	rpm ⁻¹	according to fan type				
max. heating capacity "T" ⁴⁾	kW	26	33	56	79	104
max. cooling capacity "CHW" ⁴⁾	kW	12	17	27	47	57
max. cooling capacity "CHF" ⁴⁾	kW	13	18	29	49	59
filtration class (standard)	-	G4				

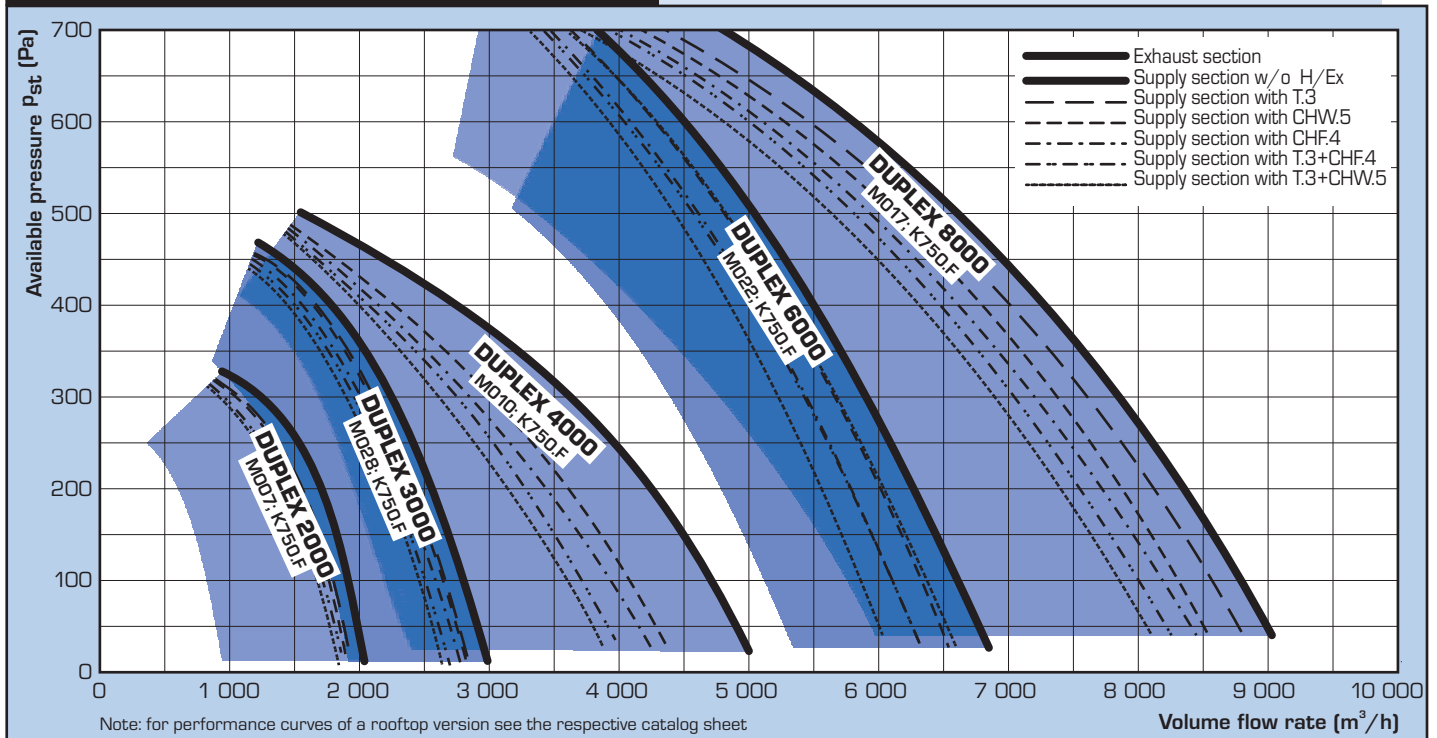
¹⁾ maximum volume flow through units at zero external pressure

²⁾ according to heat recovery core type and air volume flow

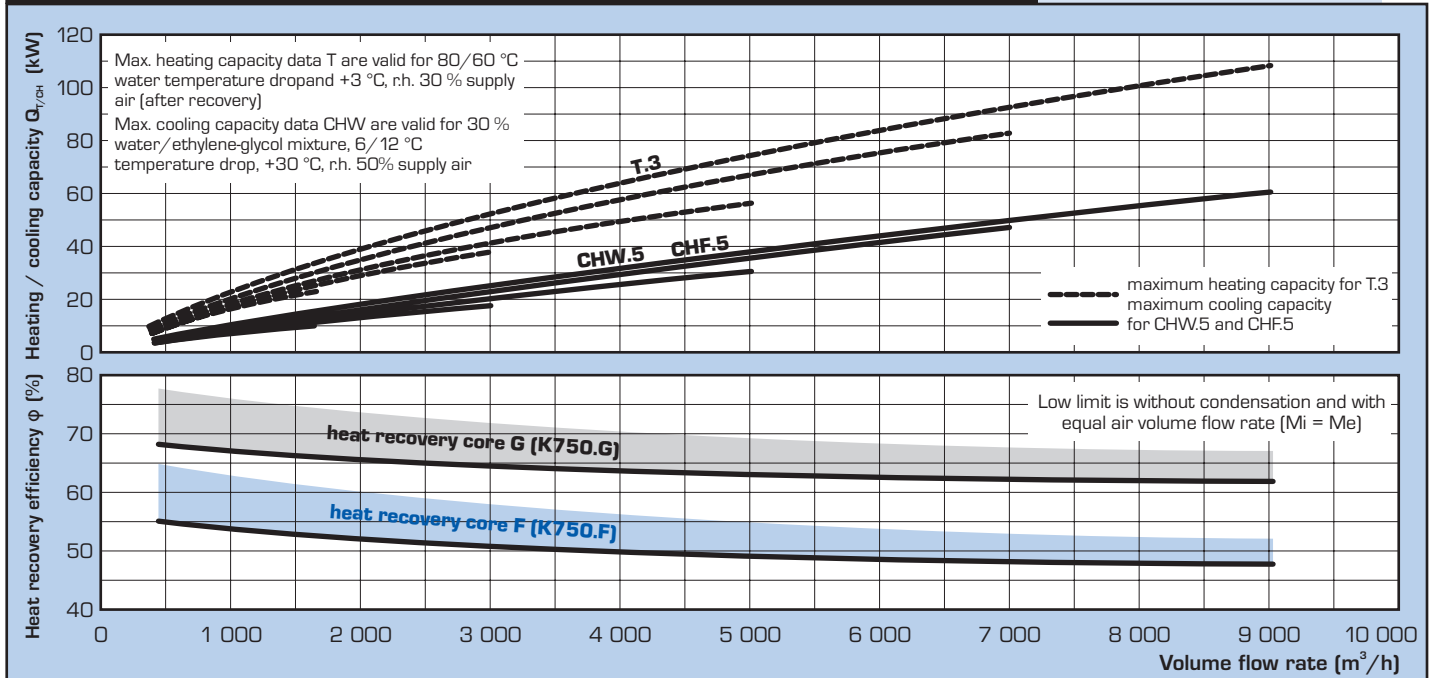
³⁾ according to selected accessories

⁴⁾ according to coil and fluid type

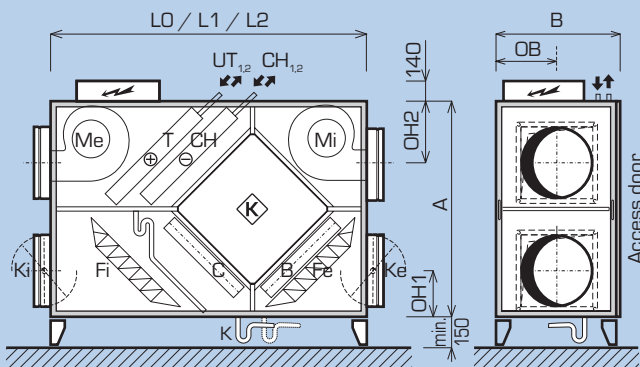
PERFORMANCE CURVES (INDOOR TYPE)



HEATING AND COOLING CAPACITY, HEAT RECOVERY EFFICIENCY



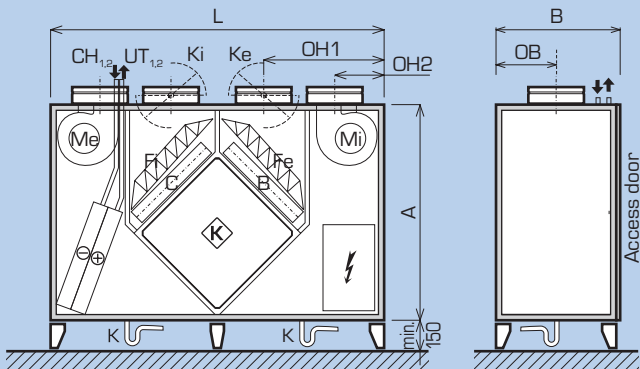
INDOOR TYPE - POSITION 10 TO 43



DUPLEX		2000	3000	4000	6000	8000
distance A	mm	1 270	1 350	1 500	1 500	1 500
distance B	mm	435	565	650	870	1 050
length LO/L1 (without/1 coil)	mm	1 920	1 800	2 000	2 000	2 100
length L2 (with 2 coils)	mm	1 920	1 980	2 200	2 200	2 300
drain connection K	mm	(1 - 2) x ø 32 mm				
connection ports						
diameter D ¹⁾	mm	315	315	400	500	2)
port with damper LH2	mm	220	220	260	310	2)
rectangular Y x X ¹⁾	mm	315x315	315x400	400x400	500x500	500x630
configurations 10 - 23						
inlet port axis OB	mm	200	270	300	420	510
inlet port axis OH1	mm	215	230	285	340	350
outlet port axis OH2	mm	345	360	405	452	450
configurations 30 - 43						
inlet port axis OB	mm	200	330	360	455	-
inlet port axis OH1	mm	215	230	285	340	-
outlet port axis OH2	mm	345	250	335	320	-

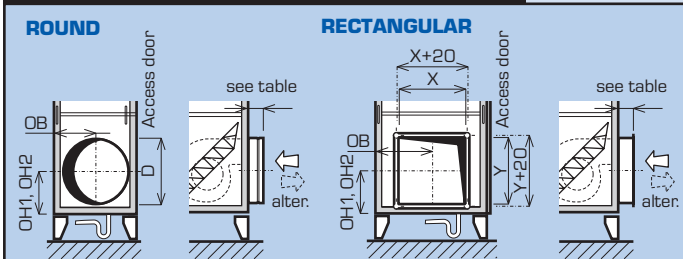
¹⁾ standard diameter of round and rectangular ports, others as option (dimensions according to volume flow and unit size)
²⁾ rectangular ports only

INDOOR TYPE - POSITION 50, 51



DUPLEX		2000	3000	4000	6000	8000
distance A - height	mm	1 400	1 400	1 550	1 650	1 650
distance B - depth	mm	435	565	650	870	1 050
distance L - width	mm	2 300	2 350	2 400	2 700	2 800
inlet port axis OB	mm	200	270	300	420	510
inlet port axis OH1	mm	810	820	900	1 050	1 100
outlet port axis OH2	mm	345	360	355	380	420

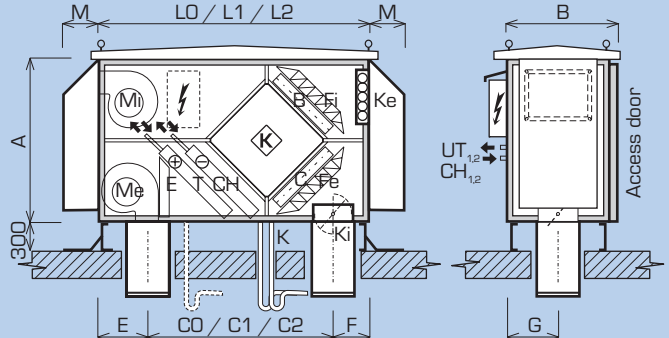
PORT TYPES AND DIMENSIONS



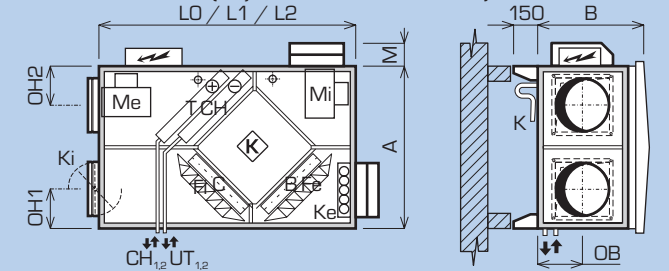
Port		round	rectangular
basic - inlet, outlet	mm	80	80
with damper - inlet only	mm	LH2	110
with flexible connection - inlet, outlet	mm	220	150
with damper and flex. connection - inlet only	mm	LH2 + 140	260

ROOFTOP TYPE

HORIZONTAL POSITION 1; 2



FLAT POSITION 3; 4 (only DUPLEX-N 2000 - 6000)

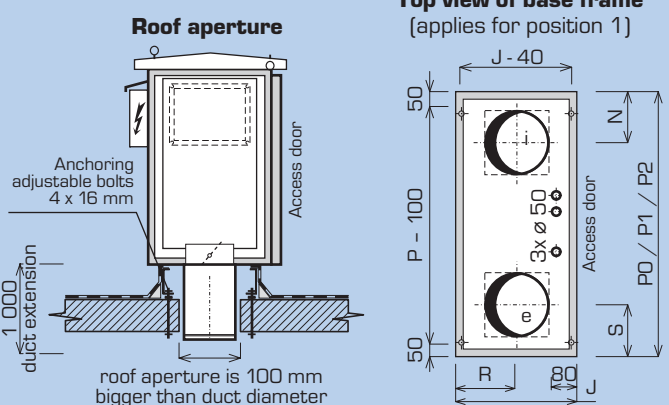


DUPLEX-N		2000	3000	4000	6000	8000
distance A	mm	1 310	1 390	1 540	1 540	1 540
distance B	mm	475	605	690	910	1 090
drain connection K	mm	(2-3) x ø 32 mm				
Inlet hood length M	mm	360	360	450	500	650
connection ports						
diameter D ¹⁾	mm	315	315	400	500	2)
rectangular Y x X ¹⁾	mm	315x315	315x400	400x400	500x500	500x630
configurations 1, 2 (horizontal)						
length LO (without coils)	mm	1 600	1 750	1 900	1 900	2 000
length L1/L2 (1 or 2 coils)	mm	2 400	2 600	2 670	2 670	2 800
distance CO (without coils)	mm	1 005	1 115	1 235	1 130	1 155
distance C1/C2 (1 or 2 coils)	mm	1 805	1 965	2 005	1 900	1 955
distance E	mm	365	385	395	450	510
distance F	mm	230	250	270	320	335
distance G	mm	220	280	320	430	520
configurations 3, 4 (flat)						
length LO (without coils)	mm	1 800	1 800	1 900	1 900	-
length L1/L2 (1 or 2 coils)	mm	2 200	2 200	2 350	2 350	-
distance OB	mm	220	330	375	480	-
distance OH1	mm	240	290	305	360	-
distance OH2	mm	365	270	355	340	-

¹⁾ standard diameter of round and rectangular ports, others as option (dimensions according to volume flow and unit size)
²⁾ rectangular ports only

FIXING, BASE FRAMES

HORIZONTAL POSITION ONLY



DUPLEX-N		2000	3000	4000	6000	8000
PO (without coils)	mm	1 540	1 690	1 840	1 840	1 940
P1 / P2 (with 1 or 2 coils)	mm	2 340	2 540	2 610	2 610	2 740
J	mm	367	500	580	800	980
S	mm	335	355	365	420	480
N	mm	200	220	240	290	305
R	mm	190	250	290	400	490

INSTALLATION CONFIGURATION

POSITION AND CONNECTION PORTS CONFIGURATION

DUPLEX 2000 - 8000 units are available in wide range of basic configuration that makes the installation work in a mechanical room easy. This increases the possibility of installing the unit even in cramped spaces.

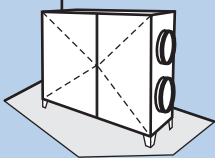
Due to construction reasons and the need for good condensate drainage, it is not possible to deliver all types and sizes in all configurations - for details see data sheets of the respective unit.

The DUPLEX units are characterized by a wide range of connection ports and configurations. All ports can be either round or rectangular, optionally equipped with flexible connections, and the inlet ports can be equipped with shutoff dampers on request.

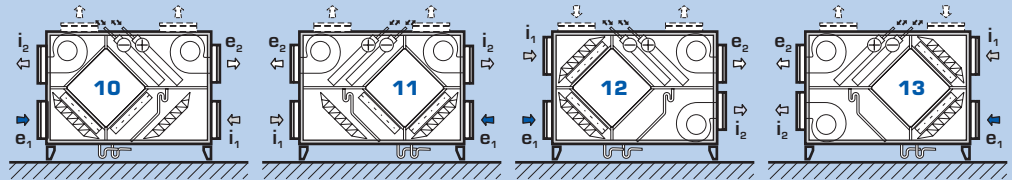
All units can be optionally delivered with ports located on unit side - for details see the data sheet of the respective unit.

INDOOR TYPE

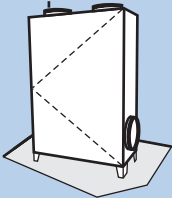
FLOOR-STANDING HORIZONTAL POSITION



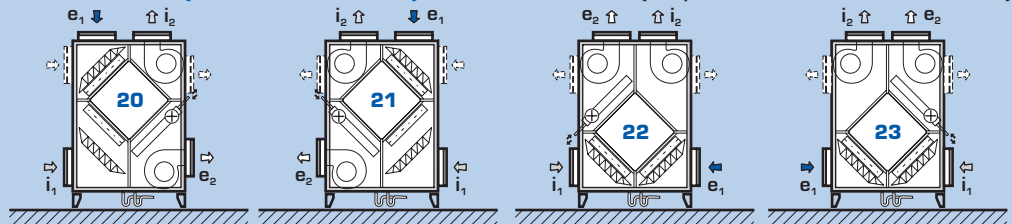
Position 10 to 13 (DUPLEX 2000 - 8000) - access door side view



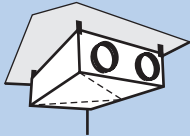
FLOOR-STANDING VERTICAL POSITION



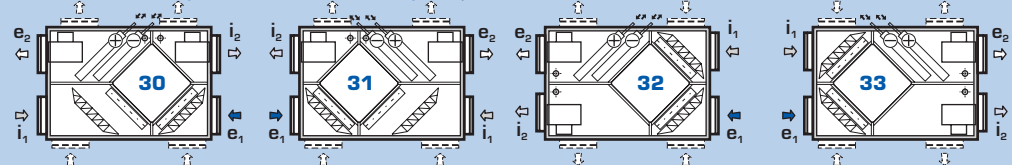
Position 20 to 23 (DUPLEX 2000 - 8000) - access door side view (not possible in CHF, CHW modification)



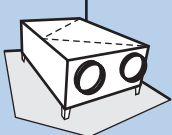
CEILING-SUSPENDED POSITION



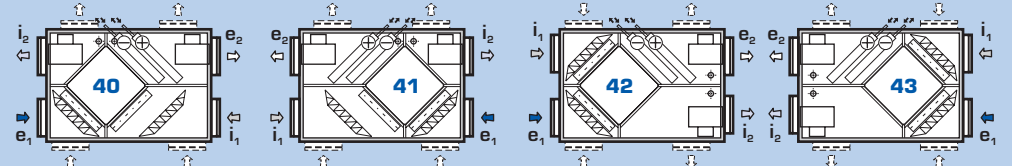
Position 30 to 33 (DUPLEX 2000 - 6000) - top view



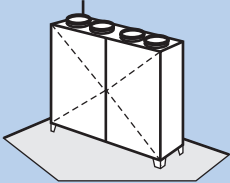
FLOOR-STANDING FLAT POSITION



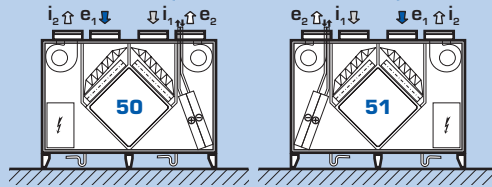
Position 40 to 43 (DUPLEX 2000 - 6000) - top view



UPRIGHT POSITION

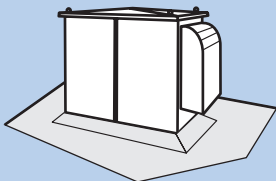


Position 50; 51 (DUPLEX 2000 - 8000) - access door side view

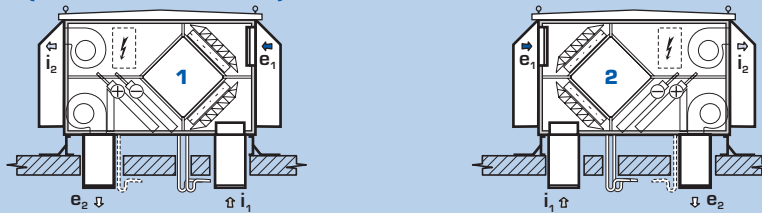


ROOFTOP TYPE

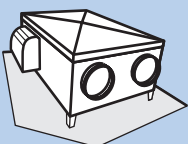
ROOFTOP UNITS - HORIZONTAL



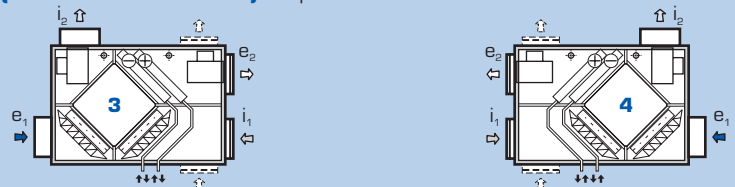
Position 1; 2 (DUPLEX-N 2000 - 8000) - access door side view



ROOFTOP UNITS - FLAT



Position 3; 4 (DUPLEX-N 2000 - 6000) - top view



MANIPULATION SPACE

When installing DUPLEX units it is necessary to allow for recommended free manipulation space around the unit. Minimum space of 150 mm is needed under a unit to install a DN 32 condensate drain pipe. A trap of minimum height of 150 mm must be installed before connecting the pipe to a building sewer. The recommended space is easily ensured when delivered standard base steel legs are used.

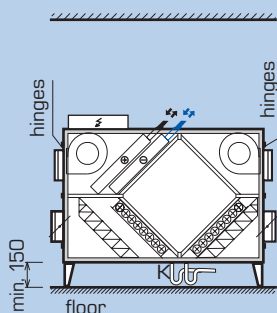
Unit front service space is needed for opening access door, filter removal and access to all components for maintenance. Respective data sheets show the minimum space for hinged door (easier access), and quick lock door (more difficult access). Minimum manipulation space on the control panel side is 600 mm for all units.

Units equipped with heating/cooling coil hydraulic kit require free manipulation on the kit side.

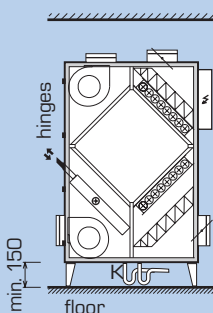
Door-side manipulation space

Accessory-side manipulation space

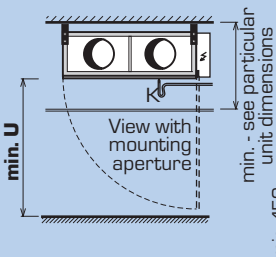
Floor-standing horizontal DUPLEX 2000 to 8000



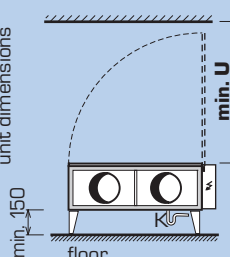
Floor-standing vertical DUPLEX 2000 to 8000



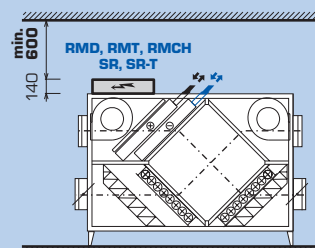
Ceiling-suspended DUPLEX 2000 to 6000



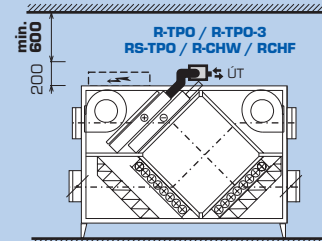
Floor-standing flat DUPLEX 2000 to 6000



Control modules



Hydraulic kits



T =	no coil 1 coil	2 coil	no hinges
DUPLEX 2000	1 150	1 150	440
DUPLEX 3000	1 050	1 200	570
DUPLEX 4000	1 250	1 260	650
DUPLEX 6000	1 250	1 260	870
DUPLEX 8000	1 300	1 260	1 050

U =	no coil / 1 a 2 coils	
	hinges	no hinges
DUPLEX 2000	1 300	440
DUPLEX 3000	1 350	570
DUPLEX 4000	1 520	650
DUPLEX 6000	1 520	870
DUPLEX 8000	1 520	1 050

SOUND POWER LEVEL - L_w

Type	Fan	Oper. point	Sound pow. L _w [dB(A)]	
DUPLEX 2000	M.005	230 V 1600 m ³ /h	e _{1,i} inlet 57,2 e _{2,i} outlet 75,6 unit 63,9	
		150 V 1210 m ³ /h	e _{1,i} inlet 56,5 e _{2,i} outlet 70,0 unit 58,2	
		230 V 1800 m ³ /h	e _{1,i} inlet 57,0 e _{2,i} outlet 75,5 unit 66,5	
	M.006	150 V 1100 m ³ /h	e _{1,i} inlet 52,1 e _{2,i} outlet 66,5 unit 57,8	
		M.007	230 V 2600 m ³ /h	e _{1,i} inlet 59,7 e _{2,i} outlet 80,7 unit 63,5
			115 V 1215 m ³ /h	e _{1,i} inlet 52,3 e _{2,i} outlet 62,4 unit 52,1
DUPLEX 3000	M.026	230 V 1500 m ³ /h	e _{1,i} inlet 63,0 e _{2,i} outlet 75,0 unit 59,0	
		115 V 1080 m ³ /h	e _{1,i} inlet 38,0 e _{2,i} outlet 60,0 unit 50,0	
	M.028	230 V 2500 m ³ /h	e _{1,i} inlet 66,0 e _{2,i} outlet 83,0 unit 66,0	
		150 V 1390 m ³ /h	e _{1,i} inlet 44,0 e _{2,i} outlet 63,0 unit 54,0	
		M.010	400 V 4000 m ³ /h	e _{1,i} inlet 63,7 e _{2,i} outlet 84,4 unit 70,7
			160 V 5390 m ³ /h	e _{1,i} inlet 58,9 e _{2,i} outlet 72,6 unit 61,8

Type	Fan	Oper. point	Sound pow. L _w [dB(A)]	
DUPLEX 4000	M.010	160 V 1535 m ³ /h	e _{1,i} inlet 60,9 e _{2,i} outlet 79,1 unit 64,3	
		230 V 3500 m ³ /h	e _{1,i} inlet 60,0 e _{2,i} outlet 81,6 unit 69,0	
	M.015	115 V 2040 m ³ /h	e _{1,i} inlet 54,4 e _{2,i} outlet 70,9 unit 56,8	
		M.010	400 V 5100 m ³ /h	e _{1,i} inlet 67,0 e _{2,i} outlet 89,1 unit 73,7
			160 V 2820 m ³ /h	e _{1,i} inlet 59,3 e _{2,i} outlet 72,2 unit 60,7
		M.022	400 V 6300 m ³ /h	e _{1,i} inlet 69,0 e _{2,i} outlet 91,0 unit 72,0
160 V 3790 m ³ /h	e _{1,i} inlet 57,0 e _{2,i} outlet 78,0 unit 61,0			
DUPLEX 6000	M.016	400 V 6500 m ³ /h	e _{1,i} inlet 67,7 e _{2,i} outlet 88,8 unit 73,6	
		160 V 3400 m ³ /h	e _{1,i} inlet 55,0 e _{2,i} outlet 73,9 unit 58,2	
	M.017	400 V 7900 m ³ /h	e _{1,i} inlet 74,2 e _{2,i} outlet 91,7 unit 77,3	
		160 V 5390 m ³ /h	e _{1,i} inlet 58,9 e _{2,i} outlet 72,6 unit 61,8	

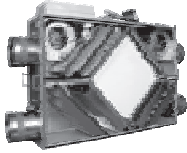
SOUND PRESSURE LEVEL - L_{p1}

Type	Fan	Operation point	S.press. L _{p1} [dB(A)]	
DUPLEX 2000	M.005	230 V 1600 m ³ /h	unit 52,9	
		150 V 1210 m ³ /h	unit 47,2	
	M.007	230 V 1800 m ³ /h	unit 55,5	
		150 V 1100 m ³ /h	unit 46,8	
		M.006	230 V 2600 m ³ /h	unit 52,5
			115 V 1215 m ³ /h	unit 41,1
DUPLEX 3000	M.026	230 V 1500 m ³ /h	unit 48,0	
		115 V 1080 m ³ /h	unit 39,0	
	M.028	230 V 2300 m ³ /h	unit 55,0	
		150 V 1390 m ³ /h	unit 43,0	
DUPLEX 4000	M.010	400 V 4000 m ³ /h	unit 59,8	
		160 V 1535 m ³ /h	unit 53,3	
	M.015	230 V 3500 m ³ /h	unit 58,0	
		115 V 2040 m ³ /h	unit 45,9	
DUPLEX 6000	M.010	400 V 5100 m ³ /h	unit 62,7	
		160 V 2820 m ³ /h	unit 49,7	
	M.022	400 V 5500 m ³ /h	unit 61,0	
		160 V 3340 m ³ /h	unit 50,0	
DUPLEX 8000	M.016	400 V 6500 m ³ /h	unit 62,6	
		160 V 3400 m ³ /h	unit 47,3	
	M.017	400 V 7900 m ³ /h	unit 66,3	
		160 V 5390 m ³ /h	unit 50,8	

The sound pressure level is measured at 1 m from the respective unit.

MODIFICATIONS

DUPLEX - BASIC CONFIGURATION



Basic configuration

The compact unit consists of supply and exhaust centrifugal fans with electric motors in anti-vibration mounting, removable cross-flow air-to-air heat recovery core assembled from thin plastic plates, removable G4 (or F7) supply and exhaust air filters, and a condensate pan with DN 32 flexible hose. The unit casing consists of steel frame and sandwich side panels made of painted aluminum sheets and filled with 22 mm of polyurethane insulation with thermal resistance $R = 1,05 \text{ m}^2\text{KW}^{-1}$, (rooftop units with insulation of 45 mm). The sandwich panels are fixed to the frame. A front door enables easy access to all built-in components and filters.

DUPLEX xxxx



Fans

Variety of fan types of different manufacturers can be used for each DUPLEX unit size. Fans differ in volume flow rate, available pressure, speed, sound level and power consumption. Single-phase, three-phase or special EC (DC) energy-saving fans are available. All fans are direct-driven.

Me.xxxx; Mi.xxxx



Air-to-air heat recovery exchanger

Several heat recovery core types (e.g. K750.F, K750.G) with different heat recovery efficiency and pressure drop are available for any unit size.

K.750x

DUPLEX - DESCRIPTION OF ACCESSORIES



By-pass („B“)

By-pass of the plate heat recovery core on supply air side. By-pass consists of an opposed-blade damper and an actuator.

It is fitted next to the recovery core inside the unit; it does not increase size of the unit. The standard actuator is BELIMO 230 V; other types are available upon request.

B.x



Mixing damper („C“)

Built-in opposed-blade damper including BELIMO 230 V actuator. It enables to mix fresh and stale (internal) air in 0 to 100 % range. Along with a mixing damper the e₁ shutoff damper without spring-return function must always be installed. Should the unit be equipped with a heating coil (DUPLEX-TC) and draft could occur in the duct system during power failure with the damper stuck open, it is necessary to install separate shutoff damper with spring-return function into the duct close to an air intake. The damper is controlled by the unit control.

C.x



Hot water heating coil („T“)

Built-in water-to-air three-row (possibly five-row) heating coil; made of copper pipes and aluminum fins. Designed for systems up to 110 °C and 1,0 MPa. The coil is standardly equipped with flexible connection and a steam-gas capillary thermostat for freeze protection. Units in modification T (with heating coil) must be equipped with e₁ supply air shutoff damper; an actuator with spring-return function (BELIMO LF 230 V) is recommended. A coil hydraulic kit for heating capacity control of R-TPO, R-TPO-3 or RS-TPO type can be supplied with the coil upon request. Attention - the coil of rooftop units must always be protected against freezing by a water-glycol mixture.

T.x



Provision for cooling („CHP“)

Provision for additional installation of cooling coil. This provision comprises space for the cooling coil and the condensate pan. Attention - in case of additional cooling coil installation it is necessary to ensure safe access and a sufficient manipulation space. A ceiling-suspended unit must be taken down to install the coil. Additional coil installation is only possible for floor-standing horizontal and flat, ceiling-suspended, and rooftop configurations. Units in configuration CHP without a heating coil in position 30 to 43 and all rooftop units must be equipped with a droplet eliminator; dimension L2 applies to the units.

CHP



Direct expansion (DX) coil („CHF“)

A built-in coil made of copper pipes and aluminum fins, including a condensate pan with individual condensate drainage and a pressure switch for freeze alarm. Three- or five-row coils are chosen depending on capacity required, refrigerant type and air parameters. The DX coil can be equipped with accessories on request.

Attention - units with the DX coil are only made in floor-standing horizontal and flat, ceiling-suspended, and rooftop configurations. Units in configuration CHF without a heating coil in position 30 to 43 and all rooftop units must be equipped with a droplet eliminator; dimension L2 applies to the units.

CHF.x



Chilled water cooling coil („CHW“)

A built-in coil made of copper pipes and aluminum fins, including a condensate pan with individual condensate drainage. Three- or five-row coils are chosen depending on capacity required, cooling medium type and air parameters. The cooling coil can be equipped with the R-CHW hydraulic kit on request.

Attention - units with the cooling coil are only made in floor-standing horizontal and flat, ceiling-suspended, and rooftop configurations. Units in configuration CHP without a heating coil in position 30 to 43 and all rooftop units must be equipped with a droplet eliminator; dimension L2 applies to the units.

CHW.x

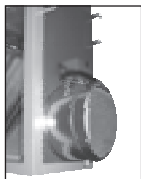
Individual modifications can be freely combined

e.g.: DUPLEX-TC (unit with heating coil and mixing damper)
DUPLEX-T-CHF (unit with heating coil and DX coil)
DUPLEX-TC-CHP (unit with heating coil, mixing damper and provision for cooling) etc.

OTHER OPTIONAL ACCESSORIES (BASIC OVERVIEW)

Ke.xxx; Ki.xxx

Shutoff damper e₁; i₁



Shutoff dampers standardly fitted with BELIMO actuators are located in the air inlet port. The following damper types are available:

- fresh air damper e₁ - mandatory for C modification (with mixing damper)
- fresh damper e₁ LF - mandatory for T modification (with heating coil)
- exhaust air damper i₁

Fe.xxx; Fi.xxx

Air filtration



All DUPLEX units can be equipped with supply air filtration of F7 class instead of standard G4 class. Pressure drop of the filter is then 50 to 100 Pa (clean filter) depending on air flow rate, unit type and dirt accumulated. Prefilters made of multilayer pulled metal can be supplied.

R-TPO.x; RS-TPO.x

Heating coil hydraulic kit



Its function is to control heating capacity of a heating coil. It consists of a three-speed pump, two globe shutoff valves and connection pipes. Further equipment depends on the type:

- R-TPO-4 - four-way mixing valve with an actuator for digital control system
- R-TPO-3 - three-way mixing valve with an actuator for digital control system
- RS-TPO - three-way diverting valve with a thermostatic valve for electric control system

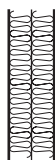
R-CHW.x

Cooling coil hydraulic kit



Its function is to control cooling capacity of a chilled-water cooling coil. It always consists of two globe shutoff valves and connection pipes. Further equipment depends on the type:

- R-CHW-3 - three-way mixing valve with an actuator and a three-speed pump for digital control system
- R-CHW-2 - throttling valve with an actuator for digital control system



Double insulation

It is possible to increase polyurethane insulation to 45 mm thickness ($R = 2,1 \text{ m}^2\text{KW}^{-1}$). Then outer dimensions of the unit are 40 mm larger in all directions compared to catalogue dimensional data.

H.P

Flexible connections

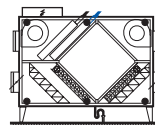


Round and rectangular ports can be equipped with flexible connections upon request.

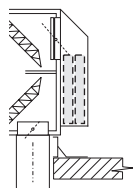
Delivery of disassembled unit

All units can be delivered dismantled on request. The unit is to be assembled by rivets and bolts directly on site, therefore the unit can be installed in inaccessible location.

Hingeless doors



When needed it is possible to deliver door without standard hinges, only with quick locks or spring fasteners - than necessary manipulation space is reduced.



Sound attenuators (DUPLEX-N)

For rooftop units only. The inlet e₁ and outlet e₂ extension can be fitted with a built-in attenuator.

NFT.x

Spare filter textiles (NFT)



Spare filter textiles in sizes depending on unit type. They are available in the filtration of G4 and F7 class.

Hot water heating coil (TPO)



Separately supplied coil for installation into round duct. It is suitable for cramped locations, where it is impossible to put the coil inside the unit, as well as for rooftop units. The coil is standardly equipped with the steam-gas capillary thermostat.

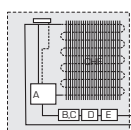
Electric heating coil (EPO-V)



Separately supplied heating coil to be fitted into round or rectangular duct. Capacities and diameters can be found in respective catalogue sheets.

RCHF.x

Accessories for DX coil



It is possible to equip the DX coils with refrigeration circle components: expansion valve with nozzle (A), solenoid valve (B, C), sight glass (D), filter-drier (E), eventually with evaporating pressure controller.

Fe.D

Polarisation filters



Additional supply air filter (DYNAMIC), including 24 V transformer and spare filter textile. For pressure drop data see respective graphs.

CONTROL SYSTEMS

DUPLEX units are delivered with basic control components or with complete control systems. There are three types of control systems available (electric, digital and control for kitchens) according to customer needs and an application. The systems also include variety of sensors (temperature, humidity, air quality, CO₂) for effective operation control.

Features of the control systems

- selection of the most suitable and efficient control system at the lowest cost, depending on the particular application
- control system is integrated with the unit, most components are already wired and checked in factory, thus reducing the risk of incorrect wiring
- no control system project documentation is necessary for standard cases, standardized solutions can be used
- simple wiring, system simplicity, error indication
- qualified technical support and consulting

SUMMARY OF DUPLEX CONTROL SYSTEMS

Type	Characteristics	Use	Simplified diagrams of electrical wiring
„A“ - basic	<ul style="list-style-type: none"> - all electrical components are wired to a junction box terminal strip inside or outside the unit - standard components are fans, damper actuators, capillary freeze protection thermostat of hot water heating coil - more components is included upon customer's request (exact actuator type, sensors, thermostats, pressure switches etc.) 	<ul style="list-style-type: none"> - suitable for applications with separate delivery of control system; e.g. large buildings with central control system etc. 	
„B“ - electric OPS 	<ul style="list-style-type: none"> - simple system - two-speed fan control (MIN, MAX) (exact volume flow rate can individually be set for each fan during commissioning) - on/off control of by-pass and mixing damper - on/off remote control of heating coil: temperature is set on the thermostatic valve of hot water coil or directly on the electric coil 	<ul style="list-style-type: none"> - electric system is suitable for simple applications (e.g. ventilation of locker rooms, gyms, restaurants etc.) - it cannot be used for units with cooling coil - it is recommended for applications with air reheat only (not for warm-air heating) 	
„D“ - for kitchens - RG - OP - SM 	<ul style="list-style-type: none"> - control system designed specially for effective control of kitchens - consist of SM microprocessor module fitted into kitchen hood or ventilation ceiling, OP control panel and RG junction board - control principle consists of automatic setting of volume flow rate depending on heat production of kitchen appliances (i.e. difference of temperatures under the kitchen hood and in the space) 	<ul style="list-style-type: none"> - suitable for kitchens of all types and sizes equipped with kitchen hoods of all types (e.g. DiNER, VARIANT, STANDARD) or by ventilation ceilings (SKV) - hot water or electric heating coil control according to supply air temperature (OP-T) - by-pass control summer / winter operation (OP-T-BP) 	
„E“ - DC-series digital control 	<ul style="list-style-type: none"> - A comfort control system for DUPLEX units - A programmable module software designed especially for DUPLEX units - Supply and exhaust fan speed control - Controlling supply or room temperatures - Optional control of a water and electric heating coil - Optional water and direct cooling - Heat pump performance control - Automatic control of by-pass and 	<ul style="list-style-type: none"> - Suitable for comfort applications - Optional fully automatic operation of the unit via a daily or weekly programme - Possibility to connect air quality, CO₂ concentration and relative humidity sensors etc. - Optional performance control via a 0-10 V signal from a higher-ranking system - Connectable to central control systems using expansion cards (KNX, Modbus, ...) - Settings can be done using the connected graphic controller 	