DUPLEX Inter
II. generation
Brand new decentral ventilation unit with heat recovery

Determination
Indoor ventilation units DUPLEX Inter are designed for balanced-pressure ventilation in classrooms, open plan offices, facilities, restaurants, retail units and everywhere else where direct installation in occupancy areas with minimum noise is required.

Basic description
The units have high heat recovery efficiency, very low noise levels, low installed power input and minimum installation and design planning requirements.

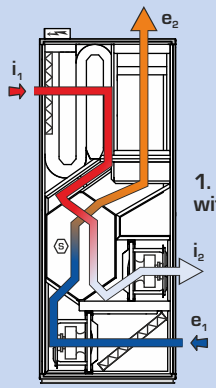
The units are fitted with the top-of-the-range ATREA RD5 control module for running all necessary functions. Depending on the required acoustic properties they are supplied with 680 m^3/h or 850 m^3/h capacity limits (factory default settings).

Patent-protected DUPLEX Inter units include flexibly mounted EC fans, a counterflow heat recovery exchanger, a slide-out supply air filter, a heat recovery exchanger bypass, self-powered shut-off dampers and a control box. The drainless condensate pan is heated using an electric cell with automatic switching function. The top section has splitter sound attenuators, adjustable jet supply air ceiling louvers, an extraction air filter and an external CO2 sensor as a standard feature. The bottom of the unit has a spacing frame made of anti-vibration rubber.

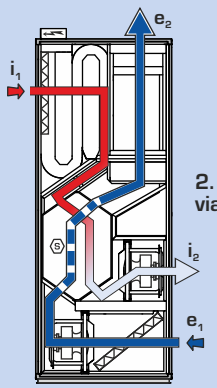
Compliance with European standards
- Commission (EU) Regulation No. 1253/2014 (Ecodesign) for 2018
- Housing characteristics according to EN 1886
- EC motors compliant with ErP 2015
- SFP in the range of 0.27 ÷ 0.37 $W/m^3/h$ as required by Passiv Haus

Advantages of DUPLEX Inter units
- Low noise to allow installation directly in occupancy areas of buildings (LAeq,T below 30 dB(A)) with the most stringent acoustic requirements
- Completely autonomous based solely on CO_2 concentration
- A ductless system without any ductwork in the building
- Demanding condensate drainage eliminated (!)
- Digital control system RD5 supplied as a standard feature, allowing remote administration through the Internet
- Perfect airing thanks to air stream reach up to 10 metres
- Very easy installation without the need for trade-specific design or specialist HVAC and power installation
- High heat recovery efficiency of up to 93 %
- The bypass closes the heat recovery exchanger inlet to allow night-time cooling
- Automatic freeze control
- Optional air supply reheating
- When the unit is set back from external walls with windows, duct sound attenuators may be installed to reduce noise transmission through the external wall
- Ecodesign 2018 compliant
- Power connection by using only a flexible conductor plugged into existing power sockets (16 A)
- An integrated electric pre-heater

OPERATING MODES



1. equal pressure ventilation with heat recovery



2. night precooling via by-pass in summer time

- e_1 ... fresh air inlet
- e_2 ... fresh air outlet
- i_1 ... exhaust air inlet
- i_2 ... exhaust air outlet

SELECTION SOFTWARE

For the detailed design of DUPLEX series units, accessories and control systems we recommend using our dedicated design software. You can find it on our website at www.atrea.com or request a CD at our office.

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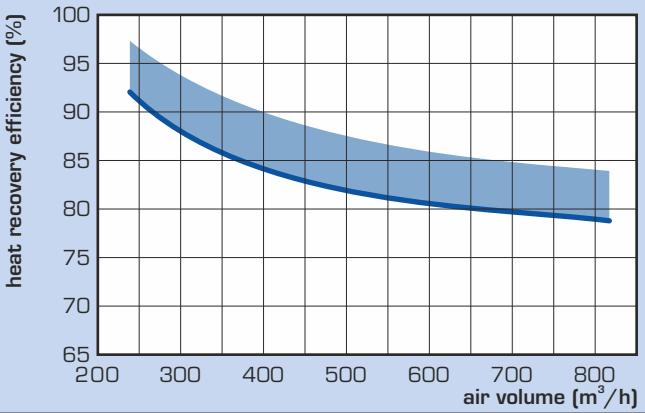
PERFORMANCE GRAPHS

TECHNICAL DATA

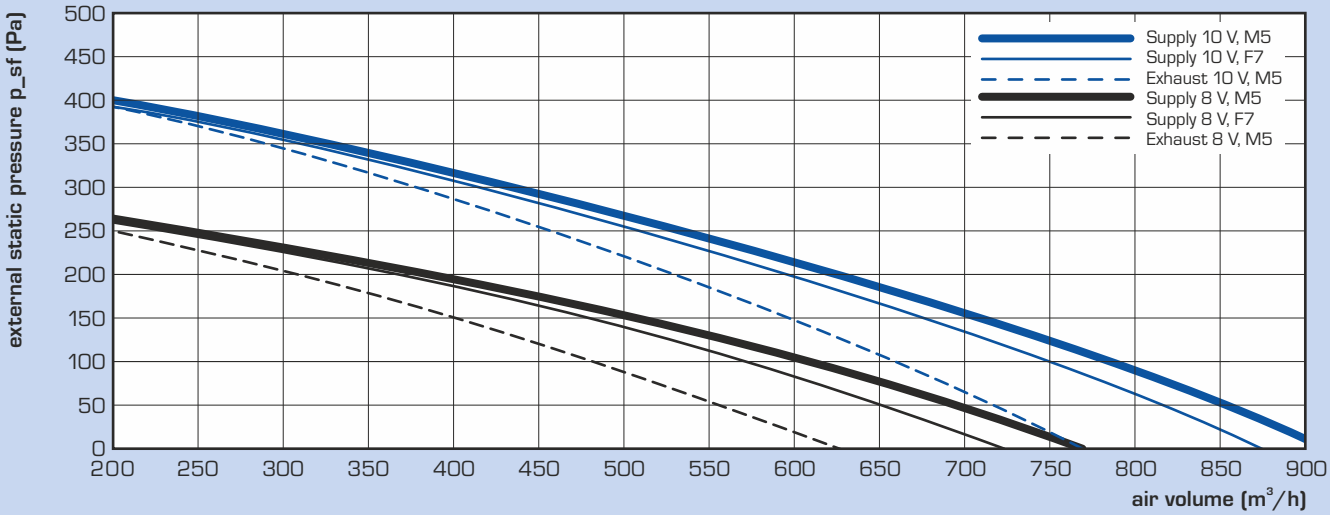
DUPLEX Inter		850
Heat recovery efficiency [1]	%	up to 93 %
Power consumption – fans	W	see graph
Electric preheater	W	900
Voltage	V	230
Frequency	Hz	50
Fan speed – max	min^{-1}	1 910
Filter class	-	M5 / M5, optional F7
Electric reheater	W	on request
Built-in control system – auto	-	CO_2
100 % by-pass	-	standard
Air stream reach (0,15 m/s)	m	8–10

[1] According to air volume

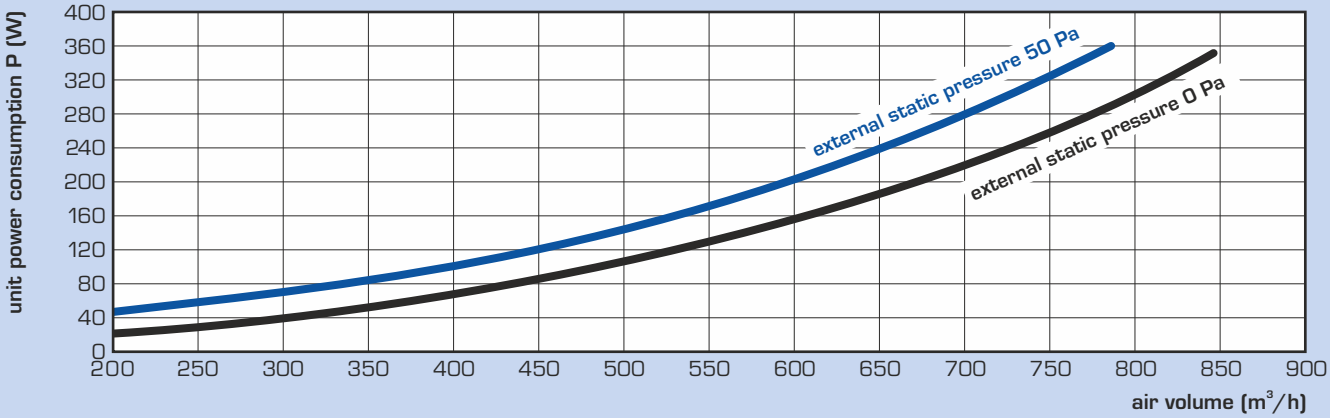
HEAT RECOVERY EFFICIENCY



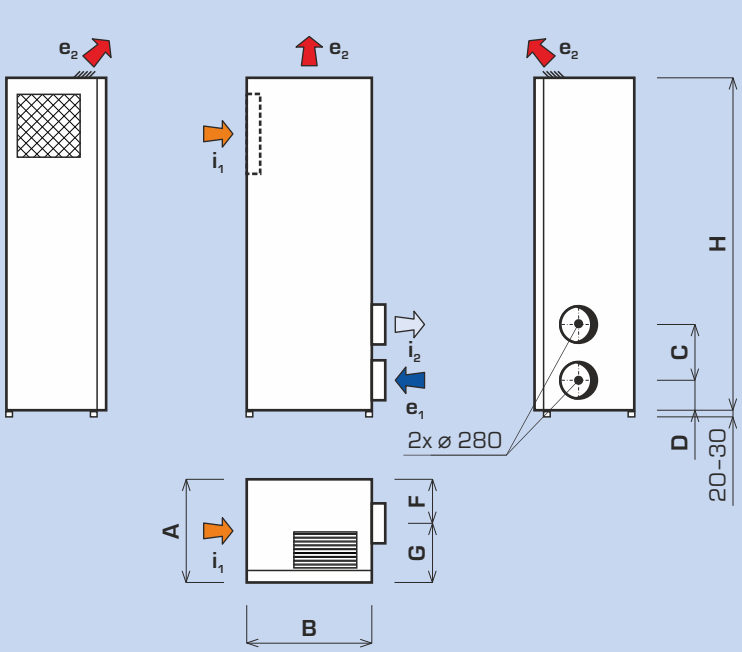
PERFORMANCE SUMMARY

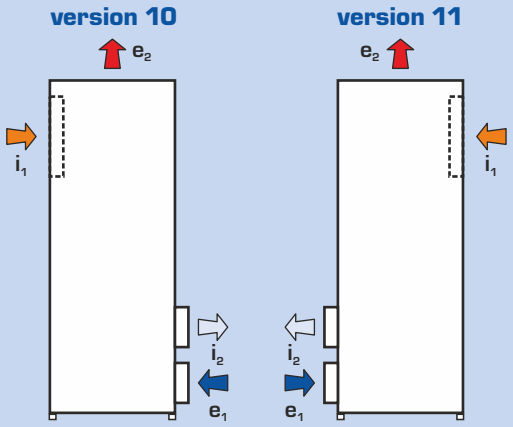


POWER INPUT CHARACTERISTICS



BASIC DIMENSIONS





- e_1 fresh air inlet
- e_2 fresh air outlet
- i_1 exhaust air inlet
- i_2 exhaust air outlet

Unit		H	A	B	C	D	E	F	G
850 Inter	mm	2 000	665	800	445	192	280	325	340

BASIC COMPONENTS

Legend:

1 Counter-flow plastic exchanger
2 EC fan (exhaust)
3 EC fan (supply)
4 Supply air filter
5 Exhaust air filter
6 Supply muffler
7 Exhaust muffler
8 External terminal board and signaling diode
9 RD5 control system
10 Alternative condensate drain
11 Built-in CO_2 sensor

HANDLING SPACE

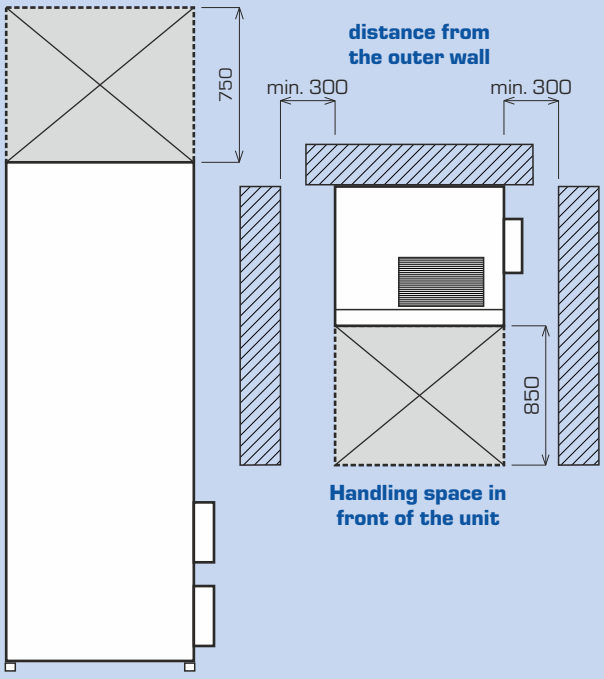
Handling space

DUPLEX Inter units must be installed with the prescribed handling space around the unit in mind.

Handling space in front of the unit must be maintained for opening the front door, replacing filters and providing servicing and installation access to each unit part.

Each drawing shows the minimum handling space.

Handling space above the unit



Handling space in front of the unit

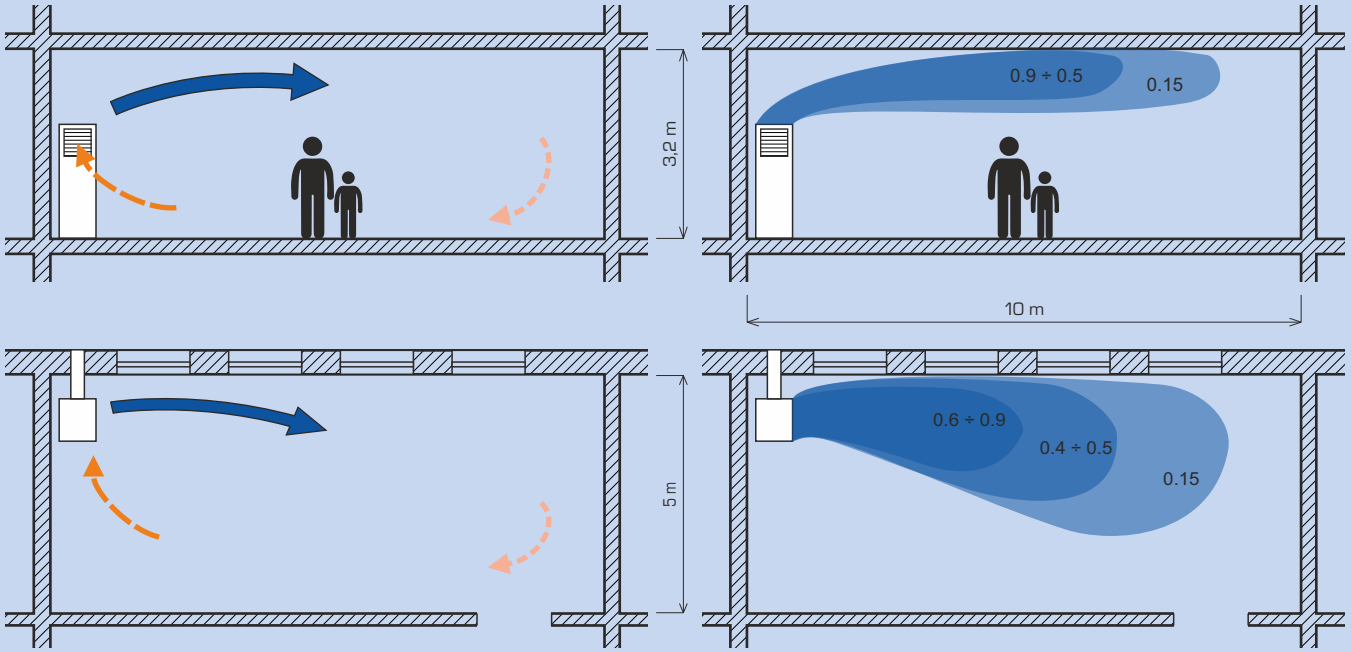
UNIT INSTALLATION

TYPICAL LOCATION OF THE UNIT IN A CLASSROOMS

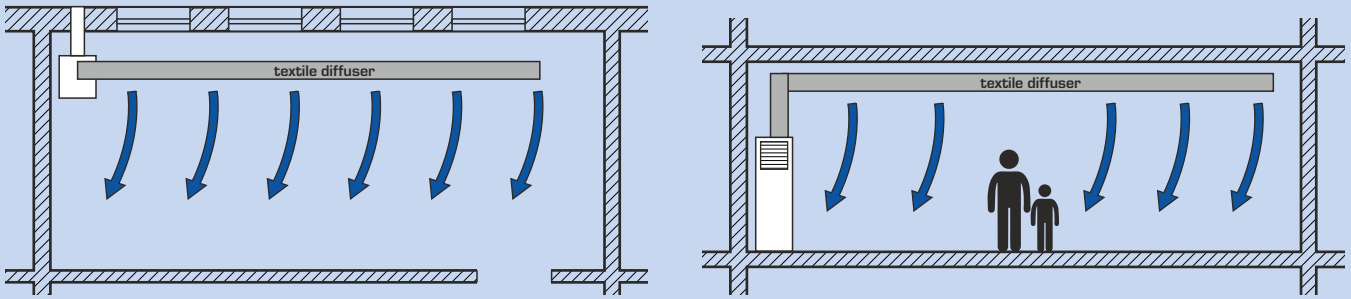
AIR DISTRIBUTION CHARACTERISTICS

ISOTHERMAL FLOW VELOCITY PROFILE (m/s)

V = 620 m³/h



AIR DISTRIBUTION VARIANT VIA TEXTILE DIFFUSER

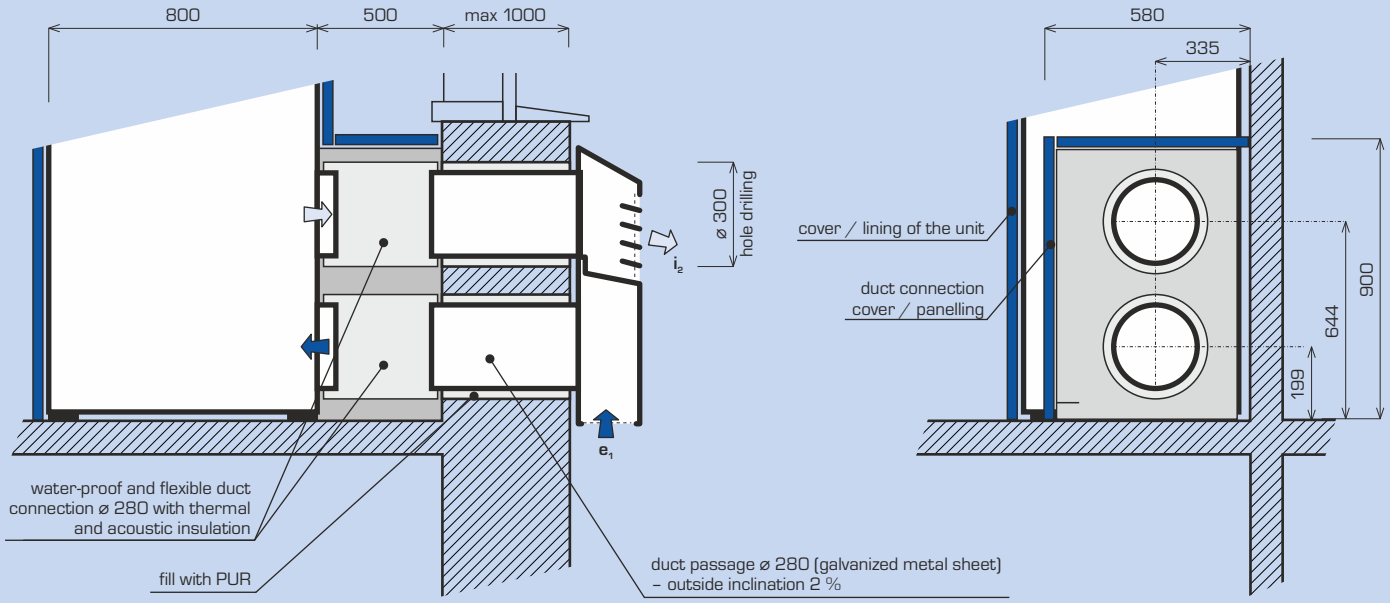


INSTALLATION AND FACADE PASSAGES DETAILS

Unit section
DUPLEX Inter unit
*Unit casing

Ducting section
*Set – duct connection cover
*Duct connection panelling

Outlet section
*Set – Facade outlet
(incl. facade passages)



* Optional accessory

INSTALLATION AND OPTIONAL ACCESSORIES

OPTIONAL ACCESSORIES – SURFACE FINISHES

The basic DUPLEX Inter version without a surface finish. The following finish options are available:

1) Painted sheet metal – white (RAL 9010) or silver (RAL 9006).

2) Laminated panelling – this optional feature has two separate sections – the unit panelling and duct cover panelling. Both are made from 18 mm thick laminated panels designed for installation on the unit and cover. All installation fixtures including angle mouldings for the cover section are included. There are three basic finishes to choose from.

Oak natural

8925 BS – Lissa Oak

Beech natural

Bávaria 381 BS

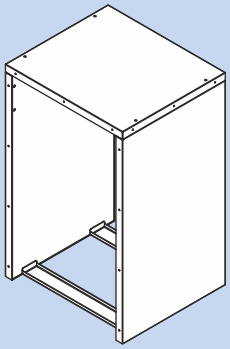
Oak Bardolino

H1145ST10

3) Painted finish – a choice of 20 standard finishes (see the catalogue of finishes; a finish sample on the front page) or custom made.

Note: All finishes cover only three sides of the unit; the rear is without a finish.

OPTIONAL ACCESSORIES – DUCT CONNECTION COVER

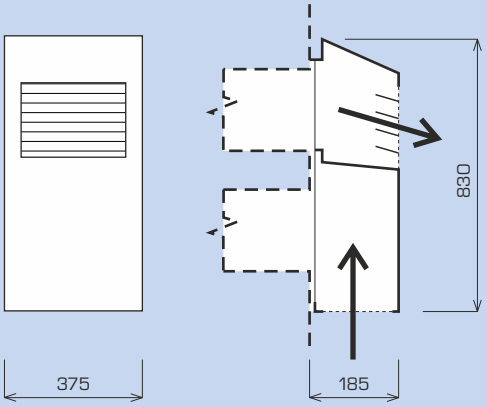


- Stable, freestanding element to cover the ducts to facade outlets of 500 mm length
- The colour versions available can be the same as the unit including the laminated panelling and painted finishes.
- No need to be fixed to a wall or floor – just by gap between the wall and the unit.
- On-site installation, intended for vertical faucet.

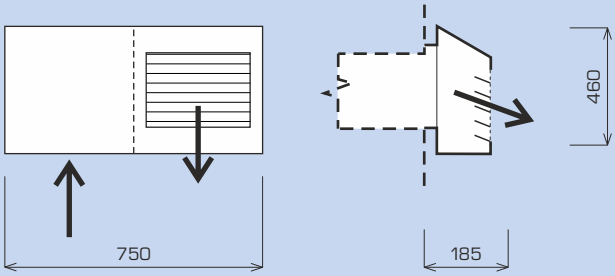
Note: The ducting on the rear is not covered.

OPTIONAL ACCESSORIES – COMBINED FACADE OUTLETS

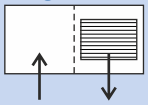
VERTICAL



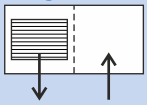
HORIZONTAL



Configuration 10



Configuration 11

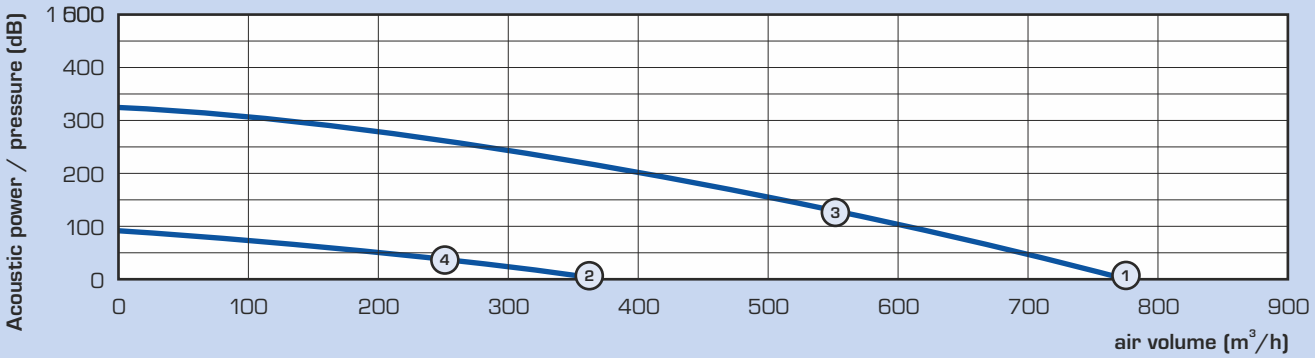


- Outlet contains two duct outlets
- Installation is done by hanging on the pipe passages by screwing one bolt into the facade of the building (not included)
- The basic design is without surface treatment, before laying it is necessary to surface the outlet

ACOUSTICS

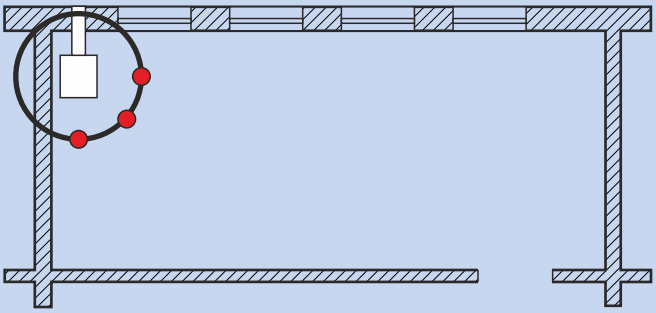
ACOUSTIC POWER $L_w(A)$ AND ACOUSTIC PRESSURE $L_p(A)$

DUPLEX 850 Inter



		Working point	63	125	250	500	1000	2000	4000	8000	∑(A) (dB)
Surround (unit, e_2, i_1)	L_p 1 m (dB)	**1** (770 m³/h, 0 Pa)	44	43	41	32	<25	<25	<25	<25	**36**
		2 (360 m³/h, 0 Pa)	41	35	<25	<25	<25	<25	<25	<25	**24**
		3 (550 m³/h, 125 Pa)	50	47	37	26	<25	<25	<25	<25	**35**
		4 (260 m³/h, 30 Pa)	43	36	<25	<25	<25	<25	<25	<25	**23**
Acoustic power i_2	L_w (dB)	**1** (770 m³/h, 0 Pa)	47	48	51	47	46	40	32	32	**50**
		2 (360 m³/h, 0 Pa)	33	34	35	29	29	<25	<25	<25	**33**
		3 (550 m³/h, 125 Pa)	53	56	52	50	48	49	39	29	**53**
		4 (260 m³/h, 30 Pa)	40	42	39	33	32	29	<25	<25	**37**
Acoustic power e_1	L_w (dB)	**1** (770 m³/h, 0 Pa)	45	47	49	45	40	38	33	34	**48**
		2 (360 m³/h, 0 Pa)	30	30	31	32	27	25	<25	<25	**32**
		3 (550 m³/h, 125 Pa)	48	54	50	47	46	40	36	29	**50**
		4 (260 m³/h, 30 Pa)	35	39	33	29	28	<25	<25	<25	**32**

Note: – The acoustic pressure values in the vicinity of the unit apply only when installed with the original ductwork cover, measured at a distance of 1 metre from the unit.
– The acoustic pressure values are determined by the joint action of the unit's housing, the supply outlet and the extraction outlet on the unit.



A plan showing microphones placed 1 metre away from the unit.

EXAMPLES OF REALIZATIONS

ES Nehvizdy

ES Huntířov

OPTIONAL ACCESSORIES

DUPLEX INTER – BASIC UNIT

DUPLEX 850 Inter

DUPLEX Inter

The basic compact unit configuration includes supply and extractor fans with free-running impeller and anti-vibration mounting, a removable counterflow heat recovery exchanger from thin-walled plastic panels, slide-out supply and extraction air filters (filter class M5 or F7) and a drain pan with DN 32 hose for condensate drainage. The top panel provides easy access to all integrated components, while the side panel facilitates condensate drain handling and control system access.

Fans

Me.xxx; Mi.xxx

DUPLEX 850 Inter units feature high-efficiency fans with free-running impeller and backward-curved blades. The fans comply with the requirements of the ErP 2015 European standard.

Heat recovery exchanger

S4 / S5

The counterflow-type heat recovery exchanger is made of plastic and is highly efficient. The efficiency rates of plastic heat recovery exchangers in DUPLEX Inter are up to 93 %.

Bypass damper ("B")

B.x

A plate heat recovery exchanger bypass including actuator. When the bypass opens, the flow through the heat recovery exchanger automatically closes to eliminate heat transfer.

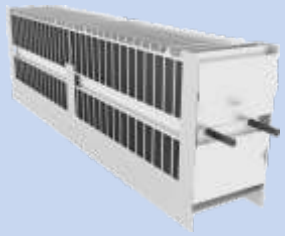
Electric pre-heater

0.9 kW electric pre-haters EDO.INT 0.9 RD5 are included as standard in the basic configuration of DUPLEX Inter unit. Preheating is operated by the unit's control system in such a way so as to prevent heat recovery exchanger freezing.

CO_2 concentration sensor

DUPLEX Inter units include a CO_2 concentration sensor with IR detection as a standard basic configuration feature. The sensor is located in the top section of the unit near the suction inlet. It enables coupled control based on current room occupancy.

BUILT-IN ELECTRIC RE-HEATERS EDO-PTC



- Designed for **integration in the unit** as an optional accessory to be installed at the set position inside the unit including the mounting frame
- Electric re-heater **EDO.INT 0,6 RD5** is determined for supply air re-heating with power of 0.6 kW

OVERVIEW OF ORDER NUMBERS FOR DUPLEX INTER

DUPLEX 850 Inter (version 10, galvanized, for housing) – 2nd gen.	Ord. No. A350100
DUPLEX 850 Inter (version 11, galvanized, for housing) – 2nd gen.	Ord. No. A350101
Housing of the unit, white painted sheet metal (version 10, 850 Inter) – 2nd gen	Ord. No. A350126
Housing of the unit, white painted sheet metal (version 11, 850 Inter) – 2nd gen	Ord. No. A350127
Housing of the unit, silver painted sheet metal (version 10, 850 Inter) – 2nd gen	Ord. No. A350128
Housing of the unit, silver painted sheet metal (version 11, 850 Inter) – 2nd gen	Ord. No. A350129
Housing of the unit, painted finish – choice of finishes	See separate documentation
Housing of the unit, painted finish – custom made finish	See separate documentation
Panelling of the unit, laminated panels 18 mm thick	See separate documentation
Duct connection set 500 mm including fixtures	Ord. No. A350141
Set – duct connection cover 500 mm (galvanized, for housing)	Ord. No. A350142
Duct connection cover 500 mm, laminated panels 18 mm thick (ver. 10 and 11, beech natural)	Ord. No. A350143
Duct connection cover 500 mm, laminated panels 18 mm thick (ver. 10 and 11, oak natural)	Ord. No. A350144
Duct connection cover 500 mm, laminated panels 18 mm thick (ver. 10 and 11, oak bardolino)	Ord. No. A350145
Duct connection cover 500 mm, white painted sheet metal (versions 10 and 11)	Ord. No. A350146
Duct connection cover 500 mm, silver painted sheet metal (versions 10 and 11)	Ord. No. A350147
Duct connection cover 500 mm, painted finish (versions 10 and 11)	Ord. No. A350148

	**CP Touch controller** – touch-screen – 4 color versions (white, ivory, grey, anthracite)	Ord. No. A170130 Ord. No. A170131 Ord. No. A170132
	Integrated electric reheater 0,6 kW	Ord. No. A350010
	**Integrated electric preheater 0,9 kW**	Ord. No. A350011
	**Filter cassette 850 INT – M5**	Ord. No. A350090
	**Filter cassette 850 INT – F7**	Ord. No. A350091
	**Filter cloth10 ks 850 INT – M5**	Ord. No. A350093
	**Filter cloth 10 ks 850 INT – F7**	Ord. No. A350094
	**E_2 outlet – D315 outlet transition piece**	Ord. No. A350033
	E_2 outlet – D250 outlet transition piece	Ord. No. A350034
	A set of integrated external wall outlet supply + extraction – vertical (versions 10 and 11, including external wall duct sleeves up to 1000 mm long)	Ord. No. A350140
	A set of integrated external wall outlet supply + extraction – horizontal (versions 10, including external wall duct sleeves up to 1000 mm long)	Ord. No. A350149
	A set of integrated external wall outlet supply + extraction – horizontal (versions 11, including external wall duct sleeves up to 1000 mm long)	Ord. No. A350150

CONTROL SYSTEM

As a standard feature DUPLEX Inter units include the top-of-the-range RD5 digital control system enabling remote access through a web-based server.

The RD5 type digital control module is the latest in operation control. It provides all basic functions and also includes a wide range of other inputs and outputs for connection to sensors. All optional components including the power supply are connected through the terminal board on the top section of the unit.

Also included as standard is a built-in smoke detector which disconnects the unit if smoke is drawn in.

Advantages of ATREA's control systems:

- Selection of a suitable a effective control system type in accordance with the actual function of specific applications to minimize costs
- Control systems are integrated in the unit, with most components already factory-connected and tested, which eliminates most risks resulting from wrong connections
- In standard solutions there is no need for designing the control system layout and the manufacturer's standardized layouts can be used instead
- Ease of connection, easy-to-follow arrangement, failure indication
- Qualified technical support and consulting

RD5 CONTROL SYSTEM FOR DUPLEX INTER UNITS

Control system „RD5“

Standard functions of the RD5 control system
- EC fan speed control (according to mode settings)
- Automatic bypass damper position control (heat and cold recovery)
- Critical condition assessment and prevention based on temperature readings
- Weekly ventilation programme and temperature setting
- A built-in web server and Ethernet interface for communication with remote access through the Internet
- Power inputs for switching using 230 V voltage (4 inputs – 3 delayed, 1 immediate)
- An option to connect two CO_2 or relative humidity sensors, up to two sensors with a contact or 0–10 V input
- Outputs for controlling the electrical pre-heater and heater (impulse switching by 10 V) or hot-water air heater (controlled by 0–10 V signal)
- Operation of the unit in selected modes – balanced-pressure ventilation / night pre-cooling / overpressure ventilation
- Automatic switching between modes according to temperature settings
- Power control according to current CO_2 concentration including automatic power increase
- Automatic switching between heating and non-heating seasons
- Web server / ModBUS communication as a standard feature

BACnet / KNX converter
- An optional converter for connection to a parent system using a BACnet or KNX protocol

CO_2 concentration
- Optional sensor-based automatic operation – CO_2 concentration (one sensor supplied), another air quality, relative humidity or VOC sensor can be connected (optional accessory)

EPS
- Optional EPS signal connection (electronic fire alarm signal) for disconnecting the unit in the event of fire alarm

Smoke detector
- A built-in smoke detector is also a standard feature of the unit

CP Touch (touch-screen)

Web server (as standard)

CO_2 sensor (1× as standard)