

DUPLEX EC

Compact unit ventilators
with heat recovery
and electronically controlled fans



CP 08 RD CONTROLLER

3-line graphic display

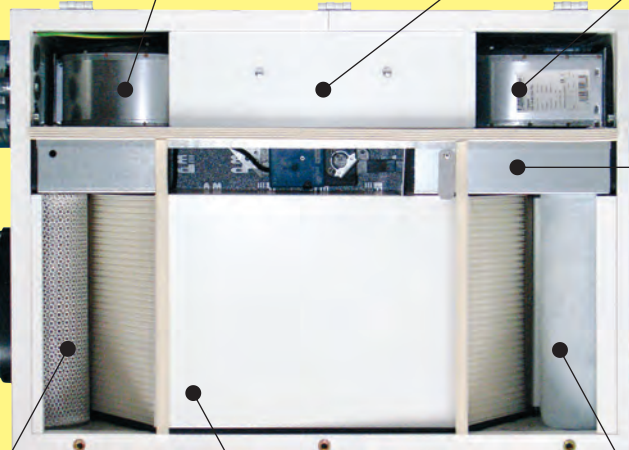


Mode setting, programming the unit operation

Low-voltage cable interconnection

DUPLEX EC UNIT

Power supply 230 V



Supply fan

Junction box and control module

Return fan

Oval port

By-pass chamber with built-in damper and actuator

Oval port

Oval port

Expanded-metal return air prefilter

Counterflow heat recovery core with 90 % efficiency

Supply air G4 filter



RESIDENTIAL VENTILATION & HEATING

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DESCRIPTION, TECHNICAL DATA

DESCRIPTION

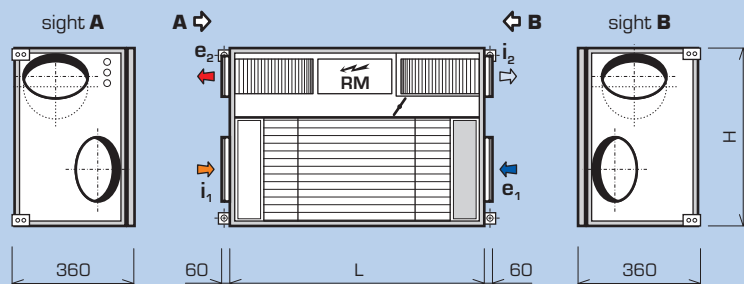
Application

The patented DUPLEX units of the EC series are designed for comfort ventilation of all types of residential buildings, mainly for low-energy and passive family houses and high-rise residential buildings.

Basic description

In a casing made of white-painted sheet metal with polyurethane insulation ($U = 0,95 \text{ Wm}^{-2}\text{K}^{-1}$) without thermal bridges the unit contains a counterflow plastic heat recovery core (efficiency of 90 %), two centrifugal fans with electronic EC control, supply air G4 filter, return air prefilter, automatic bypass damper, control module and a junction box. Condensate drain is located according to a unit installation position. Oval connection ports are ready for connecting round flexible transitions without thermal bridges. An access door is fitted with quick locks.

DIMENSIONS

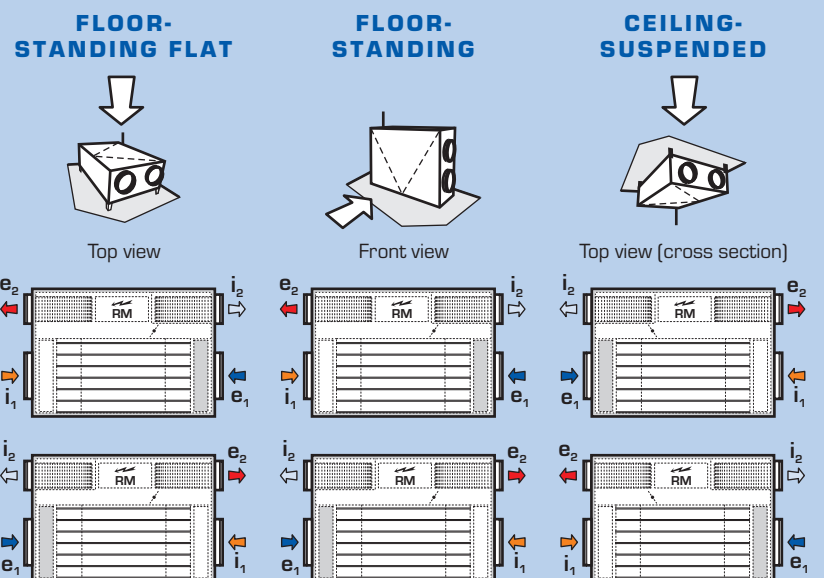


TECHNICAL DATA

DUPLEX		230 EC	330 EC	500 EC
Supply air - max. *	m ³ /h	230	330	500
Return air - max. *	m ³ /h	230	330	500
Max. heat recovery efficiency	%	90	90	90
Height	mm	360	360	360
Depth H	mm	530	530	735
Length (without ports) L	mm	750	750	830
Connection port diameter	mm	∅ 125 (circle)	∅ 160 (oval)	∅ 200 (circle / oval)
Weight	kg	27	27	31
By-pass	-	YES (automatic control)		
Power supply	V	230 / 50 Hz		
Supply air filtration class	-	G4 (alter: F7)		
Condensate drain	mm	1x ∅ 14 (alter ∅ 26)		

* correct values according to respective performance curves

INSTALLATION POSITIONS



FEATURES

- 1) standardly built-in EC type fans are characterized by very low power input and 14-step speed control with constant airflow for equal-pressure space ventilation
- 2) higher unit air volume flow enables occasional intensive air exhaust or summer ventilation
- 3) excellent thermal insulation parameters of unit casing with total avoidance of thermal bridges
- 4) a built-in by-pass is a standard part of units and need no additional space
- 5) a standard digital control system enables comfort weekly schedule setting, connecting other inputs (e.g. IAQ or humidity sensor), and automatic by-pass damper control based on temperature
- 6) three possible installation positions (ceiling-suspended, wall-mounted, floor-standing) enables to install a unit in any house or apartment space
- 7) energy-optimized heat recovery exchanger reaches very economical ratio of used electric energy and air volume flow cost ($w = 0,38 \text{ W/m}^3/\text{h}$)
- 8) energy efficiency reaches up to 17,0
- 9) small unit size enables installation even under bathroom or corridor ceiling
- 10) general-purpose design enables both left and right position installation

AIR-HANDLING SYSTEM ADVANTAGES

- 1) guarantee of mandatory continuous air changes with possibility of occasional increasing based on an external bathroom or kitchen contact
- 2) savings up to 90 % ventilation cost
- 3) avoiding mold propagation
- 4) avoiding thermal discomfort in apartments by using air supply with minimum temperature drop
- 5) utilizing all internal and external heat gains from an apartment for preheat of ventilation air and covering its remaining transfer losses
- 6) supply of totally filtered air (G4-F7) significantly limits occurrence of allergies and respiratory illnesses of residents
- 7) using unit max. air volume flow (via by-pass) rooms can be effectively cooled in summer season, even with night precooling
- 8) enabling automatic control of CO₂ and relative humidity
- 9) a complete modular system enables simple installation, even with self-help

LEGEND

- ➡ e₁ fresh outdoor air inlet
- ➡ e₂ fresh filtered supply air outlet
- ➡ i₁ stale return air inlet
- ↪ i₂ exhaust air outlet

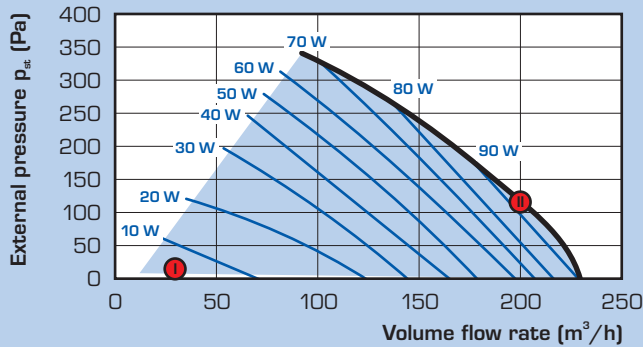
SELECTION SOFTWARE

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.

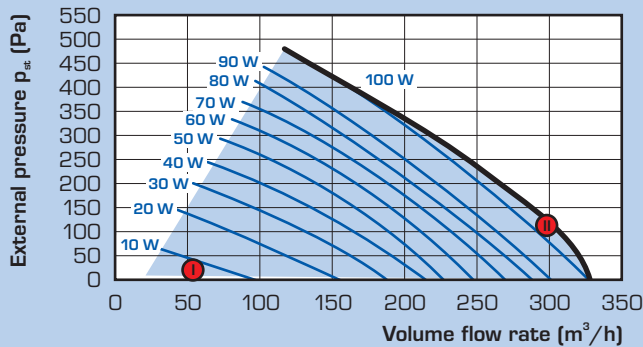


PERFORMANCE PARAMETERS

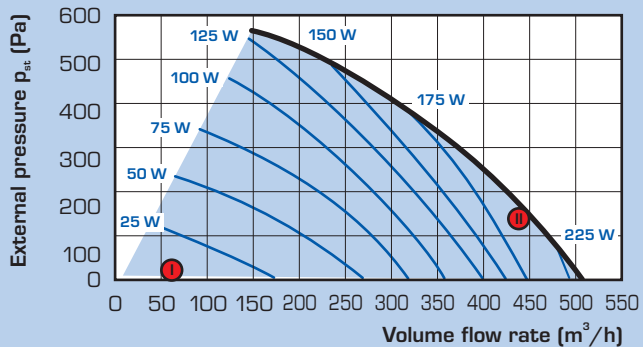
DUPLEX 230 EC



DUPLEX 330 EC



DUPLEX 500 EC



Legend:

— Available pressure – efficiency*
 — power input for each fan

* a maximum pressure reserve curve is shown, the units have constant flow control, i.e. each fan is automatically and independently controlled to provide a required flow rate

SOUND POWER LEVEL L_w (dB)

		dB(A)	125 Hz	250 Hz	500 Hz	1 kHz	2kHz
DUPLEX 230 EC							
intake	I.	25,4	36,2	28,3	17,1	15,6	15,6
	II.	61,3	71,9	66,9	55,9	46,9	42,9
outlet	I.	34,5	41,9	36,9	31,9	25,9	19,9
	II.	74,0	75,9	73,9	68,9	67,9	66,9
To ambient	I.	35,9	37,6	37,9	31,6	29,7	26,2
	II.	52,5	58,8	55,1	50,3	44,0	42,7

DUPLEX 330 EC							
intake	I.	30,6	41,9	33,9	24,9	18,9	18,9
	II.	65,4	76,9	70,9	58,9	50,9	44,9
outlet	I.	38,2	46,9	39,9	34,9	31,9	23,9
	II.	76,0	80,9	76,9	73,9	67,9	66,9
To ambient	I.	37,4	37,6	34,3	35,2	29,7	29,8
	II.	59,2	67,9	64,2	56,4	47,3	44,9

DUPLEX 500 EC							
intake	I.	29,6	39,9	31,9	23,9	21,4	19,0
	II.	63,8	74,9	68,9	55,9	53,9	46,9
outlet	I.	39,4	48,9	41,9	36,9	31,9	25,9
	II.	78,9	82,9	78,9	74,9	69,9	71,9
To ambient	I.	38,6	37,6	34,3	35,2	29,7	32,1
	II.	63,3	71,9	65,2	61,5	52,5	51,0

SOUND PRESSURE LEVEL $L_{p,1}$ (dB)

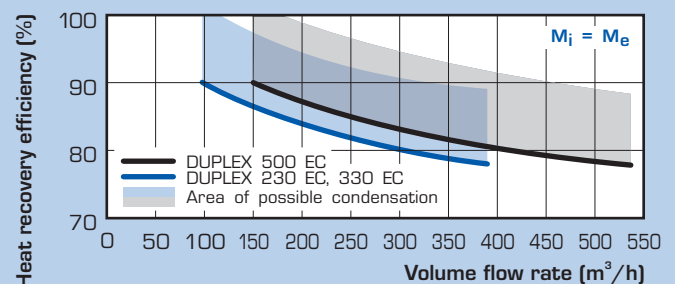
		dB(A)	125 Hz	250 Hz	500 Hz	1 kHz	2kHz
DUPLEX 230 EC							
To ambient	I.	25,3	27,0	27,3	21,1	19,2	15,7
	II.	42,0	48,3	44,5	39,7	33,5	32,2

DUPLEX 330 EC							
To ambient	I.	26,9	27,0	23,8	24,6	19,2	19,2
	II.	48,7	57,4	53,6	45,9	36,8	34,3

DUPLEX 500 EC							
To ambient	I.	27,8	26,7	23,5	24,3	18,9	21,3
	II.	52,5	61,1	54,4	50,7	41,7	40,2

Sound pressure level is stated for distance of 1 m.

RECOVERY EFFICIENCY



AREA AIR-HANDLING SYSTEM FOR LOW-ENERGY AND PASSIVE HOUSES

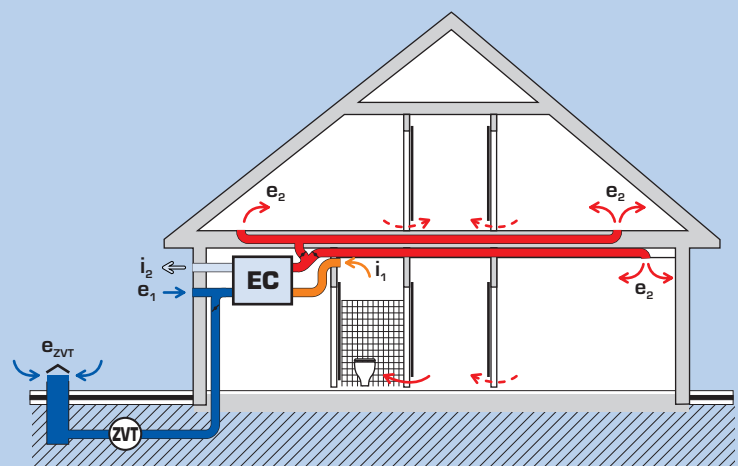
The air-handling system provides controlled equal-pressure ventilation with heat recovery for family houses and high-rise buildings, with supply air reheat, summer precooling, and with efficient utilization of all internal and external energy gains.

The system provides filtered fresh air supply to each room and kitchen as well as exhaust of stale air from bathrooms and kitchen.

For low-energy buildings it supplements the ventilation system with a basic heating system (radiators, floor heating, etc.).

For passive houses without the basic heating system, only supply air reheat via a duct heating coil is installed, sometimes in combination with a fireplace insert or other bivalent heat source, preferably with circulation to keep optimum room RH value.

For passive houses in the Czech Republic and Slovakia we recommend installing an auxiliary heating system or a combination with a fireplace insert or another bivalent source as well as reheating air supplied to the building after heat recovery. A circulation circuit may also be added to the ventilation unit to maintain optimum relative humidity inside the building and avoid over-ventilation.



- e_1 fresh air inlet from facade
- e_{zvt} fresh air inlet from a ground heat exchanger (optional)
- e_2 fresh air supply to rooms

- i_1 stale return air inlet from bathrooms and kitchen
- i_2 exhaust air outlet after heat recovery
- EC unit ventilator of DUPLEX series
- ZVT ground heat exchanger (optional)

DUPLEX EC CONTROLS - DIGITAL SYSTEM

Built-in control module

DUPLEX ECV units contain, as standard, a digital control module that provides all basic functions of the unit and at the same time has a wide range of other inputs and outputs for connecting the unit to optional sensors (e.g. Co₂, humidity etc.), signals from rooms (toilet, bathroom, kitchen etc.), heating systems.

The unit may be controlled by:

- CP 08 RD controller with a graphic display
- without a CP 08 RD controller only via 0 – 10 V voltage, e.g. from a CO₂ sensor. Control via external signals and other automatic functions are maintained

In addition, the control module contains a SD card slot (optional accessory) for easier software updates or possible recording of ventilation unit settings.

Controller CP 08 RD

Controller CP 08 RD is intended for setting basic ventilation modes and displaying the status of the ventilation unit including the indication of errors.

The controller provides user access to general functions or operation mode programming. Controller CP 08 RD may be operated in manual or automatic mode depending on the weekly programme setting. The controller also makes it possible to set a temporary party / holiday mode. All data is displayed on a well-arranged 3-line display. Setting and control is carried out via rotary controller. The controller is designed to be installed into standard electric boxes, the controller's electronics is located under the wall level and the controller thus does not protrude into the surrounding space.

The DUPLEX EC control system with a CP 08 RD controller may also control a simple heating system using the integrated thermostat of the CP 08 RD and the control module functions

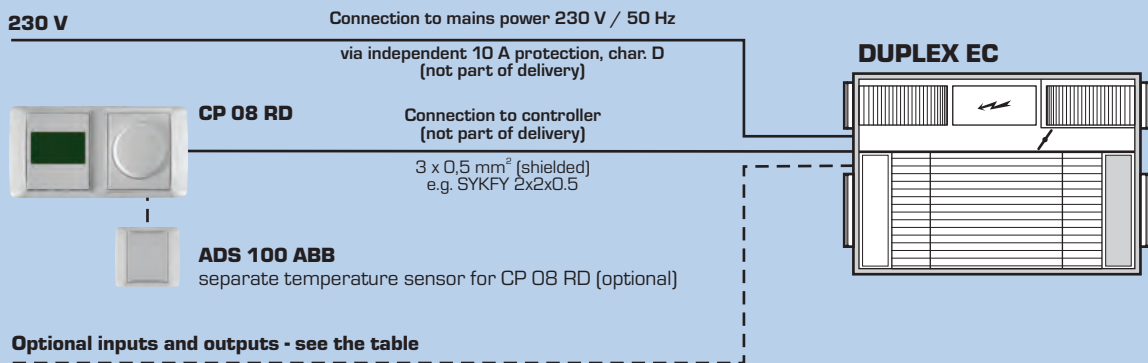


Functions

The control module with the CP 08 RD controller provides the following:

- programming various ventilation capacities for a day or a week
- smooth capacity control of both fans with a constant capacity function
- automatic by-pass damper control (supply air by-pass) depending on the outside air temperature
- electric heater control (optional accessory) to constant supply air temperature between 15 and 50 °C (max. available temperature depends on the capacity of the electric heater installed) or air temperature control depending on the pre-programmed temperature difference against the required room temperature (may be automatically adjusted during the day depending on the setting)
- switching on the hot-water heater (optional accessory), supply air temperature is set on the thermostatic head of the heater or optional direct control of the heating water mixing junction via 0 – 10 V signal, including antifreeze protection of the hot-water heater (the risk of freezing is sensed by capillary).
- antifreeze protection of the heat recovery exchanger
- switching over to the selected capacity level by external signal (e.g. from the toilet, bathroom, kitchen) with optional start-up and run-down times
- control of the closing damper on the inlet and exhaust (dampers are not included in delivery)
- optional automatic operation controlled by sensors – CO₂ concentration, relative humidity or VOC (optional accessory) – input 0 – 10 V or switch-on
- the control module and controller CP 08 RD allows zone ventilation (two zones - dampers)

SYSTEM CONNECTION DIAGRAM



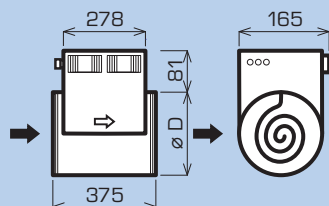
Optional inputs and outputs - functions and applications	ID	recommended cable
Input, switching on intermittent ventilation via 230 V impulse from the toilet and bathroom with the optional setting of start-up and run-down delay times	D1	CYKY 2D x 1,5
	D2	CYKY 2D x 1,5
	D3	CYKY 2D x 1,5
Input, switching on intermittent ventilation by 230 V – kitchen ventilation, no run-down time, max. ventilation period 2 hours	D4	CYKY 2D x 1,5
Input, opening contact, opening switches the unit off – signal may be channeled from e.g. Fire system	STP	SYKFY 2 x 2 x0,5
Input, switching contact of an external thermostat or heater operation permission, heat source control	TR	SYKFY 2 x 2 x0,5
Input 0 – 10 V or switching contact, ventilation capacity control (sensors for Co ₂ , relative humidity, air quality or control via superior system)	IN1	SYKFY 2 x 2 x0,5
	IN2	SYKFY 2 x 2 x0,5
Contact output, underground exchanger damper or supply air damper control	SV	CYKY 40 x 1,5
Output 0 – 10 V, heating water junction control, switching on the electric heater	SK	SYKFY 2 x 2 x0,5
Switching output 24 V, zone ventilation damper – zone 1	SZ1	CYKY 40 x 1,5
Switching output 24 V, zone ventilation damper – zone 2	SZ2	CYKY 40 x 1,5
Switching output 230 V, control of heating branch valve 1	YV1	CYKY 3J x 1,5
Switching output 230 V, control of heating branch valve 2	YV2	CYKY 3J x 1,5
Contact output, heating source operation permission (switching on the pump)	K-K	CYKY 2D x 1,5
Switching output 24 V, closing other extraction branches when external signal from the kitchen switches on	EXT	CYKY 40 x 1,5

OPTIONAL ACCESSORIES

EPO-V ELECTRIC HEATING COILS



allowed location of terminal box

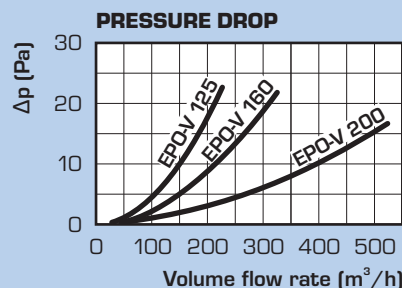


- ADS 120 sensor must be installed (into the duct behind the heater)
- casing made of galvanized sheet metal,
- casing includes terminal strip, internal wiring and accessories
- heating rods made of stainless steel
- equipped with two safety thermostats, with auto reset (60 °C), without auto reset (activates at 120 °C)
- reset button of the safety thermostat

is located on the casing, watch the access when installing the coil; do not place it with lid down

- install the coil downstream of the unit; put approx. 1 m of duct between the coil and unit
- EPO operation is controlled by the CP 08 controller based on supply air setpoint
- minimum coil air speed is 1,5 m/s
- IP 43

Type	input (kW)	voltage (V)	min. flow (m ³ /h)	∅ D (mm)	for DUPLEX unit
EPO-V 125/0,9	0,9	230	70	125	230 EC
EPO-V 160/1,5	1,5	230	110	160	330 EC
EPO-V 200/2,1	2,1	230	170	200	500 EC



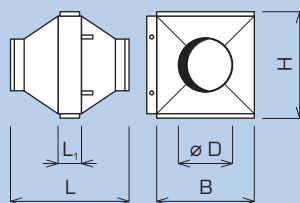
TPO EC THV HOT-WATER COIL



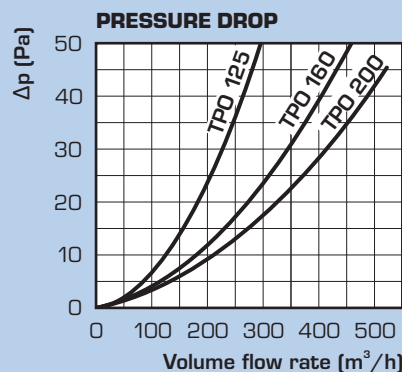
- ADS 120 sensor must be installed (into the duct behind the heater)
- casing made of galvanized sheet metal
- copper tubes with aluminum fins
- max. operating pressure is 10 bar
- max. operating temperature is 100 °C
- the coil comes standardly with:
 - freeze protection capillary thermostat
 - an electric throttling valve with 24 VDC power supply and 0-10 V controls

air flow (m ³ /h)	water flow (l/hod)	pressure loss (kPa)	Q (kW)
100	30	0,12	0,7
150	40	0,19	0,94
200	54	0,31	1,25
250	67	0,46	1,56
300	80	0,62	1,87
350	94	0,81	2,18

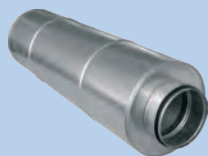
The chart applies to the temperature of heating water 55 / 35 °C, inlet air after recovery 12 °C, outlet air min. 30 °C. In the ATREA selection software parameters for different conditions may be determined.



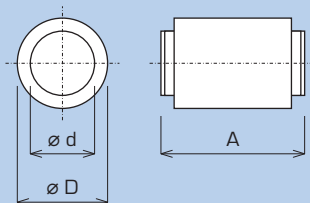
Type	∅ D (mm)	B (mm)	H (mm)	L (mm)	G (")	L ₁ (mm)	for DUPLEX unit
TPO 125 EC THV	125	380	300	485	1/2"	50	230 EC
TPO 160 EC THV	160	380	300	485	1/2"	50	330 EC
TPO 200 EC THV	200	380	300	485	1/2"	50	500 EC



MAA SOUND ATTENUATORS





- attenuator casing of galvanized sheet metal
- simple installation
- possibility to interconnect several attenuators to reach extremely low noise level
- attenuator pressure drop is estimated as double the pressure drop of straight duct




type	A (mm)	∅ d (mm)	∅ D (mm)	dB attenuation in octave band frequency (Hz)					
				125	250	500	1 000	2 000	4 000
MAA 100	600	100	200	8	13	25	40	50	40
MAA 125	600	125	224	7	12	23	39	47	32
MAA 125	900	125	224	3	16	29	53	47	39
MAA 160	600	160	260	4	8	21	37	40	22
MAA 160	900	160	260	4	12	27	46	51	29

ATREA MODULAR AIR-HANDLING SYSTEM




DUPLEX EC UNITS (DIGITAL CONTROL)

	DUPLEX 230 EC	order no. A160200	Unit ventilator with a counterflow heat recovery core, automatic by-pass including actuator, electronically controlled EC motors, built-in digital control module, G4 filters, operation and maintenance manual
	DUPLEX 330 EC	order no. A160201	
	DUPLEX 500 EC	order no. A160207	
	CP 08 RD controller - white	order no. A170280	Controller for units with built-in digital control - a digital version with a display, integrated temperature control and a built-in room temperature sensor. It allows the convenient control of the entire system in automatic mode or via manual setting. A wide range of parameter setting options.
	CP 08 RD controller - ivory	order no. A170281	




OPTIONAL ACCESSORIES - CONTACT INPUT

	HYG 6001	order no. A141303	Room humidity switch - RH sensor to switch the unit ON/OFF based on set RH value
	PS 1000	order no. A141306	Room movement switch - to switch the unit based on occupancy
	QPA 84	order no. A141301	Room IAQ sensor - to switch selected fan speed based on increased concentration (reacts mainly to cigarette smoke)


OPTIONAL ACCESSORIES - DIGITAL INPUTS 0 - 10 V

	RQ 3	order no. A142301	Room sensor to modulate unit fan speed based on IAQ (reacts mainly to cigarette smoke)
	AS CO2-G	order no. A142308	Room sensor to modulate ventilation rate based on current CO ₂ value - 0 - 10 V output and a switch-on contact with adjustable sensitivity
	EE85-2C35	order no. A142309	Channel sensor CO ₂ [0 - 2 000 ppm] with 0 - 10 V output

OPTIONAL ACCESSORIES - HEATING COILS







	EPO-V 125/0,9	order no. A150101	The electric heater for installation into a duct contains heating coils with the power output of 0.9 kW (resp. 1,5 or 2,1 kW), non-spurious switching elements, operational and safety thermostats, instructions for installation, operation and maintenance. Must be installed with an ADS 120 sensor.
	EPO-V 160/1,5	order no. A150102	
	EPO-V 200/2,1	order no. A150103	
	ADS 120	order no. A142203	a pipe sensor downstream of a heating coil (EPO or TPO EC THV)
	TPO 125 EC THV	order no. A160212	A ducted hot-water coil kit including a heating coil, a freeze-up protection capillary thermostat, an electric throttling valve (24 VDC power supply and 0-10 v control signal), and an installation, operation and maintenance manual. Must be installed with an ADS 120 sensor.
	TPO 160 EC THV	order no. A160213	
	TPO 200 EC THV	order no. A160214	

SPARE FILTRATION TEXTILES

	FT 330 EC G4	order no. A160904	Spare filtration textiles with a basic G4 filtration class (5-pc set - 5 replacements) - for DUPLEX 230 EC and 330 EC
	FT 330 EC F7	order no. A160905	Spare filtration textiles with a higher F7 filtration class (5-pc set - 5 replacements) - for DUPLEX 230 EC and 330 EC
	FT 500 EC G4	order no. A160910	Spare filtration textiles with a basic G4 filtration class (5-pc set - 5 replacements) - for DUPLEX 500 EC
	FT 500 EC F7	order no. A160911	Spare filtration textiles with a higher F7 filtration class (5-pc set - 5 replacements) - for DUPLEX 500 EC

AIR DISTRIBUTION, DISTRIBUTION ELEMENTS

ATREA s.r.o. offers a complete air distribution system for DUPLEX units including fittings and terminal elements. For detailed specifications see the „[System of warm-air heating and ventilation of family houses with heat recovery - Designed data, product catalog](#)“.

	Floor ducts	160 x 40 mm air distribution ducts for floor system; 200 x 50 mm including distribution shafts, transitions and complete accessories
	Round ducts	Complete range of sturdy and flexible ducts, with acoustic and thermal insulation, sound attenuators - see the „ATREA catalog“
	Air distribution	Complete range of fitting, facade louvers, transitions, etc. - see the „ATREA catalog“
	Floor grilles	Adjustable grilles for floor supply air outlet to rooms
	Wall diffuser	Special air outlet ø 100 mm for jet air supply from wall under ceiling
	Round diffusers	Wall and ceiling diffusers with lock for supply and return air - see „ATREA catalog“