



CRVS/COP

Central ventilation system of housing units

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System description

CRVS/COP central ventilation system provides air ventilation to individual apartments located inside apartment building. As part of this system, centrally located Duovent Heat Recovery unit delivers an adequate amount of fresh air while tempering temperature of the incoming air. Leaving the main Duovent distribution unit, the tempered air is further distributed thru a system of ductwork to terminal boxes, such as VarioflowBOX ECO. Terminal boxes control fresh air entering and exhausting from apartments by modulating from 0% to 100%. The actual air flow to each apartment is based on project design and it is controlled by a wall mounted controller located inside each apartment. **Ventilated Kitchen hoods cannot be connected to CRVS/COP system.** Kitchen hood needs to be a self-contained re-circulating type of hood fitted with a grease collecting filter.

The central Duovent Heat Recovery unit comes equipped with Digireg® MAR control system. Digireg MAR controls Duovent's performance and function and also accommodates for unit's remote on/off switching. Each Duovent unit comes with a touch screen control panel which provides access to air temperature and air volume adjustments. In order to maintain constant operating pressure, **the central Duovent Heat Recovery unit comes equipped with a constant operating pressure regulator (COP).** The COP regulator maintains pre-adjusted set of air pressure while modulating air flow to meet constant air pressure requirement on both, the supply air side (SUP) and the return air side (ETA). F7 type filters are installed where outside air enters the unit, M5 type filters are installed where return air enters the unit.

The amount of supply air being delivered comparing to the amount of exhaust air processed either by the terminal box or the central Duovent unit should be equal ($V_{ETA} = V_{SUP}$). This configuration should provide equal air pressure inside each apartment.

Design recommendations

The central Duovent Heat Recovery unit should be equipped with either a hot water coil or electric heater for heating purposes or with chilled water coil or DX coil for any cooling needs. It is highly recommended to provide and install sound attenuators or silencers downstream of the central Duovent unit in order to reduce the sound level emitted by the unit.

Air pressure within the central ventilation system should be designed so the static pressure differential before and after the terminal unit is anywhere between 50–250 Pa (marked as PE and PS in schematics). System with higher air pressure should use terminal unit "HP" model which allows for pressures between 150–600 Pa. If terminal boxes are being used for unintended air pressures the air flow regulator will not function properly and sound noise will occur. The pressure regulator inside the ductwork system should be placed so there is a straight piece of ductwork before the regulator (min length of $1 \times D$) and there is straight piece of ductwork after the regulator (min length of $3 \times D$).

It is necessary to maintain tightness of ductwork, ductwork connections and associated accessories as part of the central ventilation system. The minimum tightness class of the system should be class C, according to EN12237 (or EN1507 for rectangular piping).

Service recommendations

In order to maintain Duovent's efficiency it is necessary to replace filters on regular bases. Each Duovent is equipped with a manostat that will generate alarm code when air restriction across filters is noted and replace filter alarm will be automatically generated on touch screen controller. Terminal boxes VarioflowBOX are maintenance-free but we do recommend to inspect and clean air flow regulators once in every 2 years to remove any restriction blocking air nozzles. For this reason, there should be an adequate access provided to all terminal units.

Ventilation system components

Description of individual items as shown in the diagram of the CRVS/COP ventilation system:

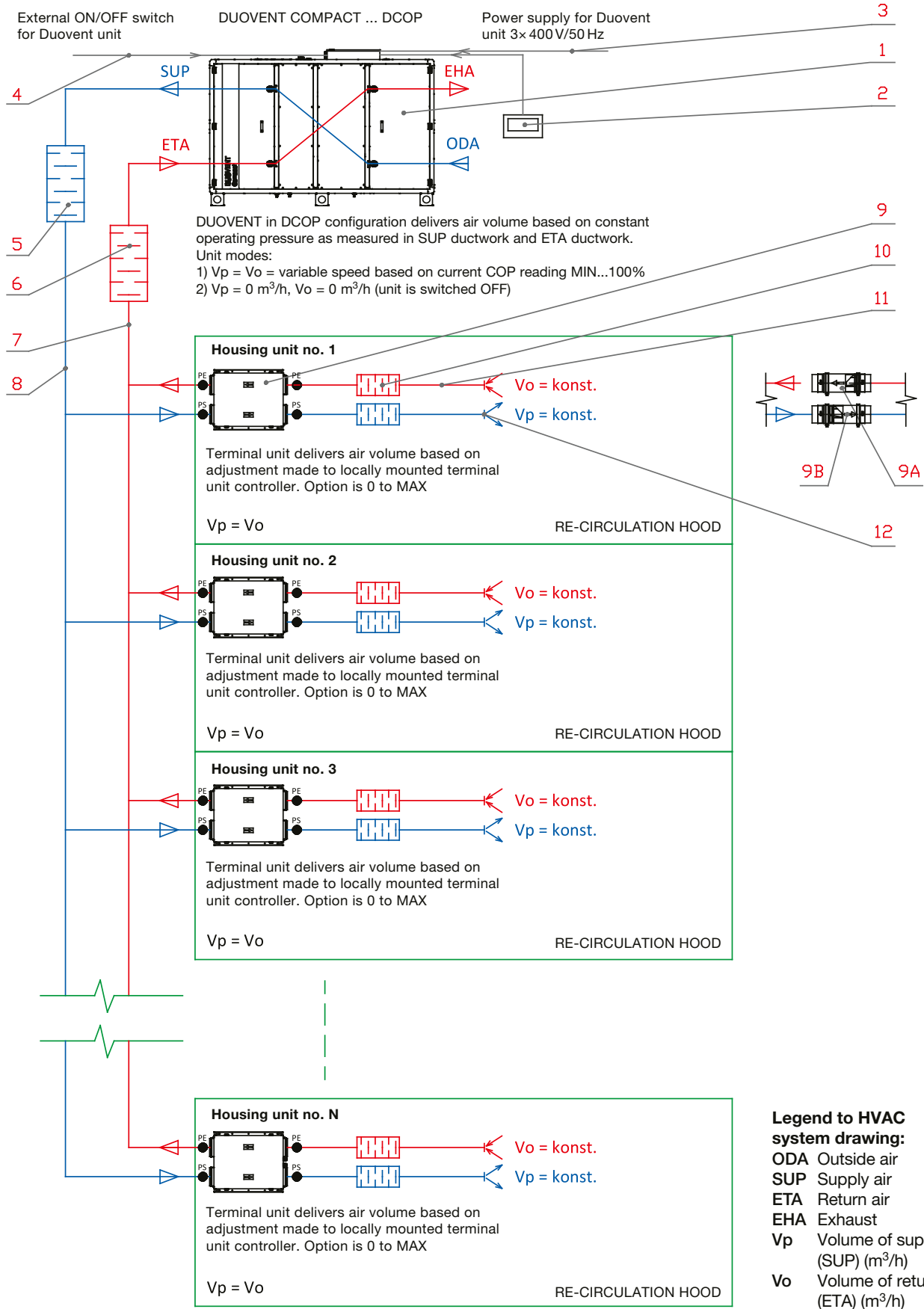
1 Compact DUOVENT unit, model DV, DV TOP or RV. Duovent heat recovery unit comes fitted with Digireg® MAR control system. For more information refer to: "Commercial ventilation units with heat recovery" catalogue available at: www.elektrodesign.cz



2 Digireg CP digital touch screen controller. Digireg CP comes included with Duovent unit and provides easy access for air temperature and air pressure adjustments. In addition, Duovent unit can be switched ON/OFF and we can set 7-day programmable schedule.



3 Duovent's main power supply. Power supply cable, including power breakers and actual power cable connection to Duovent unit is not part of delivery from ELEKTRODESIGN Ventilátory, s.r.o. Table below provides recommended power cable size and main breaker size based on what type of Digireg is being used. Information that leads to the type of Digireg control system is part of technical specification that comes with the unit.



Ventilation system components

4 Remote ON/OFF power switch for Duvovent® Compact unit. Remote switch is not part of delivery from ELEKTRODESIGN Ventilatory, s.r.o. If needed, external ON/OFF control of the unit can be realized by adding a switch that can be connected to predetermined terminals located inside Digireg® control box. Remote control of the unit is not mandated since the unit can be switched ON/OFF from Digireg® CP unit controller (see item 2).

5, 6 Ductwork noise silencer and sound attenuators. Recommended type **MAA** or **IAA**.



7, 8 Sheet metal ductwork and fittings made out of galvanized sheet metal. Ductwork comes as rectangular ductwork or spiral round pipe.



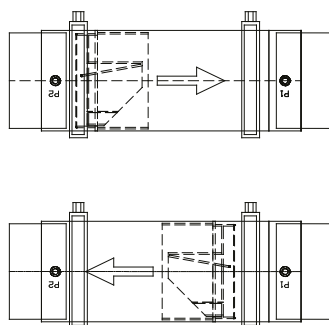
9 Terminal boxes **VarioflowBOX Eco** or **VarioflowBOX Eco HP**. The boxes can be delivered in sizes 100, 125, 160 mm. Designed to either hang below ceiling or to be mounted on a wall. Mounting brackets are part of the unit. Terminal box is equipped with removable lid that allows for easy service access. Each box contains electrical air flow regulator with a throttling control element for airflow adjustments. Individual VarioflowBOX comes with pre-set range of air volume which can be regulated with a remote controller mounted inside each apartment. See all technical parameters as listed in the table below:

Type	main switch	supply cable	main breaker
	[A]	type	type
M1-E2	30	CYKY-J 3x4	1Px25A
M1-E8	30	CYKY-J 5x4	2Px32A
M1-E8-2	30	CYKY-J 5x4	3Px32A
M3-E15	40	CYKY-J 5x6	3Px40A
M3-E24	63	CYKY-J 5x10	3Px63A
M3-E36	80	CYKY-J 5x16	3Px80A
M3-E72	120	2xCYKY-J 5x16	2x3Px80A
M3-Vx	30	CYKY-J 5x4	3Px32A

Terminal unit:
VarioflowBOX Eco
VarioflowBOX Eco HP



9A, 9B **RDR-BOX Eco** or **RDR-BOX Eco HP** Terminal box with constant air flow regulator can be used as alternate to VarioflowBOX Eco in situation where separate installation of supply (SUP) and outlet (ETA) air is required. Each box is made out of galvanized sheet metal and it is equipped with inspection hole and mounting clips. Each box contains a mechanical air flow regulator with a throttling control element for supply air side and return air side. Individual RDR-BOX Eco comes with pre-set range of air volume which can be regulated with a remote controller mounted inside each apartment. See all technical parameters as listed in the table for **VarioflowBOX Eco** and **VarioflowBOX Eco HP**.



Type	Vmin [m³/h]	Vmax [m³/h]	Adjustable air flows [m³/h]	Accuracy of flow control
VarioflowBOX Eco 100/90	50	90	50/60/70/75/80/90	
VarioflowBOX Eco 125/180	120	180	120/150/180	+ 20 % / -15 %
VarioflowBOX Eco 160/300	180	300	180/210/240/250/270/300	

Type	Vmin [m³/h]	Vmax [m³/h]	Adjustable air flows [m³/h]	Accuracy of flow control
VarioflowBOX Eco HP 100/90	25	90	25/50/75/90	
VarioflowBOX Eco HP 125/170	90	170	90/100/125/150/170	+ 20 % / -15 %
VarioflowBOX Eco HP 160/300	180	300	180/200/250/300	

Values in the tables applies also for **RDR-BOX Eco** and **RDR-BOX Eco HP** of relevant size.

10 Ductwork for air distribution inside apartments. Ductwork of **ED Flex® System** or galvanized spiral pipe **SPIRO**. **ALUFLEX®**, **SEMIFLEX®**, **SONOFLEX®**, **TERMOFLEX®** flexible ductwork.



11 Ductwork sound attenuator and silencer. Recommended types **MAA**, **MTS**, **Sonoultra**.

12 Grilles and diffusers. Recommended types **BDOP**, **KO**, **KOC**, **KI**, **KIC**, **IT**, **IT-PRO**, **VST**, **CTVK**, **WDZA**, **WDZA-F**, **RKO**.