



SCHOOLAIR-V-1800



TESTED TO VDI 6022



LEVELLING FOOT



SCHOOLAIR-V, FILTER

SCHOOLAIR-V

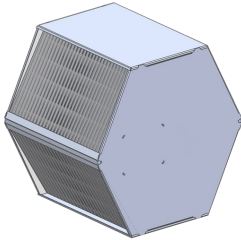
SUPPLY AND EXTRACT AIR UNIT WITH HEAT EXCHANGER AND HEAT RECOVERY UNIT, SECONDARY AIR OPTION, FOR VERTICAL INSTALLATION ON AN EXTERNAL WALL, E.G. ADJACENT TO A WINDOW

Ready-to-operate decentralised ventilation unit that provides good comfort levels, used for the ventilation and extract ventilation of rooms such as classrooms in schools

- Acoustically optimised EC fans with low specific fan powers, SFP-1 according to EN 13779
- Recuperative plate heat exchanger (air/air), including bypass damper with electric actuator (open-close)
- Alternatively: Rotary heat exchanger for heat recovery (air/air), including bypass with electric actuator (modulating or open-close)
- Heat exchanger for heating and cooling as 2-pipe or 4-pipe system
- Unit base of approx. 0.24 m²
- Easy filter change, no tools required
- Condensate drip tray with or without condensate drain
- Motorised shut-off dampers, normally closed (NC)
- Automatic switching to secondary air mode (based on air quality)

Optional equipment and accessories

- Modular control system FSL-CONTROL II, specially for decentralised ventilation systems
- Demand-based fresh air volume, free cooling and night purge, depending on control strategy
- Variable heat recovery
- Powder-coated RAL 9005 (black)



CROSS COUNTER FLOW HEAT RECOVERY UNIT

Application

Application

- Ventilation and extract ventilation of rooms with a depth up to approx. 6 m
- 2-pipe or 4-pipe heat exchangers enable good comfort levels
- Inducing displacement flow
- Energy-efficient solution since water is used for heating and cooling
- For new buildings, refurbishment projects and revitalisation projects
- Vertical installation on the façade system or an external wall
- Typical applications include classrooms in schools, playrooms in daycare facilities, meeting rooms and offices with a high air change rate

Special characteristics

- Decentralised ventilation unit for high volume flow rates
- Motorised shut-off dampers for fresh air and exhaust air, normally closed (NC) in order to prevent uncontrolled airflows
- Demand-based ventilation and extract ventilation is possible by means of monitoring the room air quality and with dedicated control equipment
- The type of heat recovery unit depends on the unit variant: cross flow plate heat exchanger, cross counter flow plate heat exchanger including bypass damper with electric actuator (open-close or modulating) or rotary heat exchanger
- Heat exchanger as 2-pipe or 4-pipe system, with G $\frac{1}{2}$ " union nuts and flat seals
- Meets the hygiene requirements of VDI 6022
- Filter class: F7 for fresh air, G3 for extract air
- Easy filter change with quick release fasteners, no tools required
- Condensate drip tray with or without condensate drain
- Compact construction, hence particularly suitable for refurbishment projects
- Automatic switching to secondary air mode (only with an air quality sensor) if the room air quality (measured with the integral VOC sensor, for example) is between the previously defined range. The unit always starts in secondary air mode, which is more energy efficient.
- Depending on the unit, an enthalpy heat recovery unit may be used

Nominal sizes

- SCHOOLAIR-V 2-pipe system: 397 × 2160 × 359 mm (B × H × T)
- SCHOOLAIR-V 4-pipe system: 397 × 2350 × 359 mm (B × H × T)
- SCHOOLAIR-V-1800 2-pipe system, 4-pipe system: 600 × 1800 × 359 mm (B × H × T)
- SCHOOLAIR-V-HE 2-pipe system, 4-pipe system: 600 × 2000 × 408 mm (B × H × T)
- SCHOOLAIR-V-HV 2-pipe system, 4-pipe system: 600 × 2200 × 408 mm (B × H × T)

TECHNICAL INFORMATION

Function, TECHNICAL DATA, QUICK SIZING, Specification text, Order code, Related products

Functional description

Decentralised supply and extract air units for room ventilation and for dissipating cooling loads and heat loads.

An EC centrifugal fan takes in the fresh air which then flows through the motorised shut-off damper and the F7 filter.

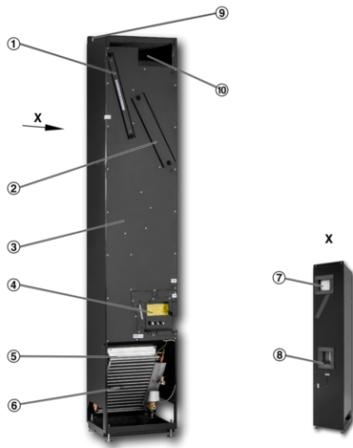
Once the fresh air has passed the fan, it flows through the heat recovery unit; it is possible to bypass the heat exchanger in order to protect it, or when it is sensible with regard to energy efficiency.

If necessary, the air is heated or cooled by the heat exchanger before it is discharged to the room as a displacement flow.

The extract air first passes a G3 filter, then flows through the heat recovery unit, the extract air fan and the motorised shut-off damper before it is discharged to the outside as exhaust air.

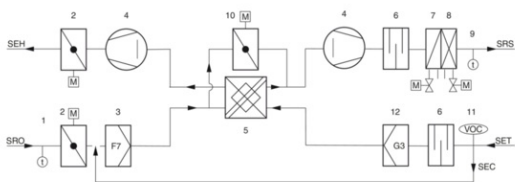
If the room air quality is good, the unit can be operated in secondary mode only.

Schematic illustration of SCHOOLAIR-V



- ① Cover of G3 coarse dust filter chamber
- ② Cover of F7 fine dust filter chamber
- ③ Casing
- ④ Cover of control equipment
- ⑤ Heat exchanger
- ⑥ Supply air temperature sensor (optional)
- ⑦ Fresh air opening with fresh air temperature sensor (optional)
- ⑧ Exhaust air opening
- ⑨ Mounting bracket (sliding)
- ⑩ Extract air opening

Ventilation diagram for SCHOOLAIR-V (optional control equipment)



- SEH Single room exhaust air
- SRO Single room fresh air
- SRS Single room supply air
- SET Single room extract air
- SEC Secondary air cellular office
- 1 Fresh air temperature sensor (optional)

- 2 Shut-off damper
- 3 Fine dust filter F7
- 4 EC fan
- 5 Heat recovery
- 6 Sound attenuator
- 7 Heating coil
- 8 Cooling coil
- 9 Supply air temperature sensor (optional)
- 10 Bypass damper with actuator
- 11 Air quality sensor (optional)
- 12 G3 coarse dust filter

Width	397 mm (2-pipe or 4-pipe), 600 mm (2-pipe or 4-pipe, 1800, HE and HV)
Height	1800 mm (2-pipe or 4-pipe, 1800 version), 2000 mm (HE version), 2160 mm (2-pipe), 2200 mm (HV version), 2350 mm (4-pipe)
Depth	359 mm (2-pipe or 4-pipe, 1800 version) 408 mm (2-pipe or 4-pipe HE and HV versions)
Fresh air flow rate	Up to 500 m ³ /h
Supply air flow rate	Up to 500 m ³ /h
Cooling capacity	Up to 1685 W
Heating capacity	Up to 6020 W
Max. operating pressure, water side	6 bar
Max. operating temperature	75 °C
Sound power level	31 – 50 dB(A)
Supply voltage	230 V AC ±10 %, 50/60 Hz
Weight	From 80 kg

SCHOOLAIR-V-0 (sizing examples)

Supply air flow rate	m³/h	150	200	250	320
Fresh air flow rate	m³/h	150	200	250	320
Total cooling capacity	W	From 680	From 900	From 1130	From 1440
Room cooling capacity	W	From 401	From 534	From 668	From 844
Air temperature inside the unit	°C	32	32	32	32
Rel. humidity	%	40	40	40	40
Water content of the dry air	g/kg	11.9	11.9	11.9	11.9
Supply air temperature	°C	18	18	18	18.1
Condensation	g/h	0	0	0	0
Chilled water flow rate	l/h	80	130	190	250
Water temperature, inlet	°C	16	16	16	16
Water temperature, outlet	°C	23.3	22	21.1	21
Water side pressure drop	kPa	<3	<5	<8	<12
Total heating capacity	W	2780	3700	4490	5470
Room heating capacity	W	862	1136	1303	1422
Air temperature inside the unit	°C	-12	-12	-12	-12
Supply air temperature	°C	37.2	37.0	35.6	33.3
Hot water flow rate	l/h	90	150	200	250
Water temperature, inlet	°C	60	60	60	60
Water temperature, outlet	°C	32.9	38.5	40.4	40.9
Water side pressure drop	kPa	<3	<5	<7	<11
Sound power level L _{WA}	dB(A)	31	36	41	46
Sound pressure level with 8 dB system attenuation	dB(A)	23	28	33	38

SCHOOLAIR-V (1800 mm) (sizing examples)

Supply air flow rate	m³/h	150	230	280	350
Fresh air flow rate	m³/h	150	230	280	350
Total cooling capacity	W	684	1060	1310	1590
Room cooling capacity	W	406	630	786	935
Air temperature inside the unit	°C	32.0	32.0	32.0	32.0
Rel. humidity	%	40.0	40.0	40.0	40.0
Water content of the dry air	g/kg	11.9	11.9	11.9	11.9
Supply air temperature	°C	17.9	17.8	17.6	18.0
Condensation	g/h	0	0	0	0
Chilled water flow rate	l/h	60	120	180	210
Water temperature, inlet	°C	16	16	16	16
Water temperature, outlet	°C	25.8	23.6	22.3	22.5
Water side pressure drop	kPa	1.1	3.8	8	10.4
Total heating capacity	W	2950	4230	4900	5630
Room heating capacity	W	907	1122	1150	1005
Air temperature inside the unit	°C	-12.0	-12.0	-12.0	-12.0
Supply air temperature	°C	40.1	36.6	34.3	30.6
Hot water flow rate	l/h	100	170	200	210
Water temperature, inlet	°C	60	60	60	60
Water temperature, outlet	°C	34.4	38.4	38.8	36.8
Water side pressure drop	kPa	4.8	12.3	16.5	18.1
Sound power level L _{WA}	dB(A)	31	38	42	47
Sound pressure level with 8 dB system attenuation	dB(A)	23	30	34	39

SCHOOLAIR-V-HE (sizing examples)

Supply air flow rate	m³/h	150	200	240	360
Total heating capacity (without heat recovery)	W	2960	3820	4520	6020
Room heating capacity	W	671	781	890	675
Air temperature inside the unit	°C	-16	-16	-16	-16
Supply air temperature	°C	35.4	33.7	33.1	27.5
Quantity of condensate	g/h	510	690	830	1180
Hot water flow rate	l/h	75	110	150	200
Water temperature, inlet	°C	60	60	60	60
Water temperature, outlet	°C	26	30	34	34
Water side pressure drop	kPa	2.9	5.7	10.0	16.7
Sound power level L _{WA}	dB(A)	36	40	43	50
Sound pressure level with 8 dB system attenuation	dB(A)	28	32	35	42

SCHOLLAIR-V-HV (sizing examples)

Supply air flow rate	m³/h	200	300	400	500
Total heating capacity (with heat recovery)	W	1300	1960	2530	3150
Room heating capacity	W	508	772	962	1169
Air temperature inside the unit	°C	10.0	10.0	10.0	10.0
Supply air temperature	°C	28.6	28.7	28.2	28.0
Hot water flow rate	l/h	35	60	85	120
Water temperature, inlet	°C	60	60	60	60
Water temperature, outlet	°C	27.8	31.7	34.1	37.2
Water side pressure drop	kPa	2	5	9.5	17

Supply and extract air unit with heat exchanger and heat recovery unit, secondary air option (based on air quality), for vertical installation on an external wall, e.g. adjacent to a window.

Special characteristics

- Decentralised ventilation unit for high volume flow rates
- Motorised shut-off dampers for fresh air and exhaust air, normally closed (NC) in order to prevent uncontrolled airflows
- Demand-based ventilation and extract ventilation is possible by means of monitoring the room air quality and with dedicated control equipment
- The type of heat recovery unit depends on the unit variant: cross flow plate heat exchanger, cross counter flow plate heat exchanger including bypass damper with electric actuator (open-close or modulating) or rotary heat exchanger
- Heat exchanger as 2-pipe or 4-pipe system, with G½" union nuts and flat seals
- Meets the hygiene requirements of VDI 6022
- Filter class: F7 for fresh air, G3 for extract air
- Easy filter change with quick release fasteners, no tools required
- Condensate drip tray with or without condensate drain
- Compact construction, hence particularly suitable for refurbishment projects
- Automatic switching to secondary air mode (only with an air quality sensor) if the room air quality (measured with the integral VOC sensor, for example) is between the previously defined range. The unit always starts in secondary air mode, which is more energy efficient.
- Depending on the unit, an enthalpy heat recovery unit may be used

Materials and surfaces

- Casing, filter chamber cover, fans and levelling feet are made of galvanised sheet steel
- Heat exchanger with copper tubes and aluminium fins
- Heat recovery unit made of aluminium or plastic (depending on variant)
- Casing powder-coated, black (RAL 9005)
- F7 filter medium made of moisture-resistant glass fibre paper (certified by Eurovent)
- Mineral wool lining to DIN 4102, fire rating class A, faced with glass fibre fabric as a protection against abrasion, effective with airflow velocities up to 20 m/s
- Closed cell sealing strips

Construction

- Powder-coated RAL 9005, black

Technical data

- Width: 397 mm (2-pipe or 4-pipe), 600 mm (2-pipe or 4-pipe, 1800, HE and HV)
- Height: 1800 mm (2-pipe or 4-pipe, 1800 version), 2000 mm (HE version), 2160 mm (2-pipe), 2200 mm (HV version), 2350 mm (4-pipe)
- Depth: 359 mm (2-pipe or 4-pipe, 1800 version) 408 mm (2-pipe or 4-pipe HE and HV versions)
- Fresh air flow rate: up to 500 m³/h
- Supply air flow rate: up to 500 m³/h
- Cooling capacity: up to 1685 W
- Heating capacity: up to 6020 W
- Max. operating pressure: 6 bar
- Max. operating temperature: 75 °C
- Sound power level: 31 – 50 dB(A)
- Supply voltage: 230 V AC ±10 %, 50/60 Hz
- Weight: from 80 kg
- Rating: SCHOOLAIR-V-2L: 136 VA, SCHOOLAIR-V-4L: 117 VA, SCHOOLAIR-V-1800: 141 VA, SCHOOLAIR-V-HE: 208 VA, SCHOOLAIR-V-HV: 495 VA
- Power consumption with nominal air volume: SCHOOLAIR-V-2L: 44 W, SCHOOLAIR-V-4L: 45 W, SCHOOLAIR-V-1800: 46 W, SCHOOLAIR-V-HE: 42 W, SCHOOLAIR-V-HV: 147 W

Sizing data

Fresh air

- V _____ [m³/h]

Supply air

- V _____ [m³/h]

Room cooling capacity

- Q _____ [W]

Room heating capacity

- Q _____ [W]

- L_{WA} _____ [dB(A)]

Decentralised ventilation units are technically advanced products of high quality; they offer a wide range of configuration options. For specification details regarding your project please contact your nearest TROX branch or subsidiary.

SCHOOLAIR - V - 0 - 2 / KM / 397 x 2160 x 359 / R / MA - T / B / V / Z / A / HV - R - 0,4 / KV - R - 0,4

<p>1 Type</p> <p>SCHOOLAIR-V Vertical ventilation unit</p> <p>2 Variant</p> <p>No entry: standard</p> <p>HE High heat recovery percentage</p> <p>HV High volume flow rate</p> <p>3 Heat exchanger</p> <p>2 2-pipe</p> <p>4 4-pipe</p> <p>4 Condensate drip tray</p> <p>No entry: none</p> <p>KM with condensate drain</p> <p>5 Dimensions [mm]</p> <p>B x H x T</p> <p>397 x 2160 x 359 (2-pipe)</p> <p>397 x 2350 x 359 (4-pipe)</p> <p>604 x 1800 x 359 (2- or 4-pipe, length 1800)</p> <p>600 x 2000 x 408 (2- or 4-pipe, construction HE)</p> <p>600 x 2200 x 408 (2- or 4-pipe, construction HV)</p> <p>6 Control</p> <p>No entry: none</p> <p>R With</p> <p>7 Control function</p> <p>MA Master (room module and control module)</p> <p>SL Slave (control module)</p> <p>8 Real time clock</p> <p>No entry: none</p> <p>master only</p> <p>T With</p> <p>9 Interface</p> <p>No entry: none</p> <p>master only</p> <p>B BACnet MS/TP or Modbus RTU</p> <p>L LonWorks LON-FTT10</p>	<p>8 Air quality sensor</p> <p>No entry: none</p> <p>master only</p> <p>V VOC sensor</p> <p>9 Supply air temperature sensor</p> <p>Z With</p> <p>12 Fresh air temperature sensor</p> <p>No entry: none</p> <p>master only</p> <p>A With</p> <p>13 Heating valve</p> <p>HV With</p> <p>14 Lockshield – heating circuit</p> <p>R With</p> <p>15 kVS value – heating valve</p> <p>0,25</p> <p>0,40</p> <p>0,63</p> <p>1,00</p> <p>F0,50</p> <p>16 Cooling valve</p> <p>For 4-pipe systems only</p> <p>KV with</p> <p>Lockshield – cooling circuit</p> <p>R With</p> <p>kVS value – cooling valve</p> <p>0,25</p> <p>0,40</p> <p>0,63</p> <p>1,00</p> <p>F0,50</p>
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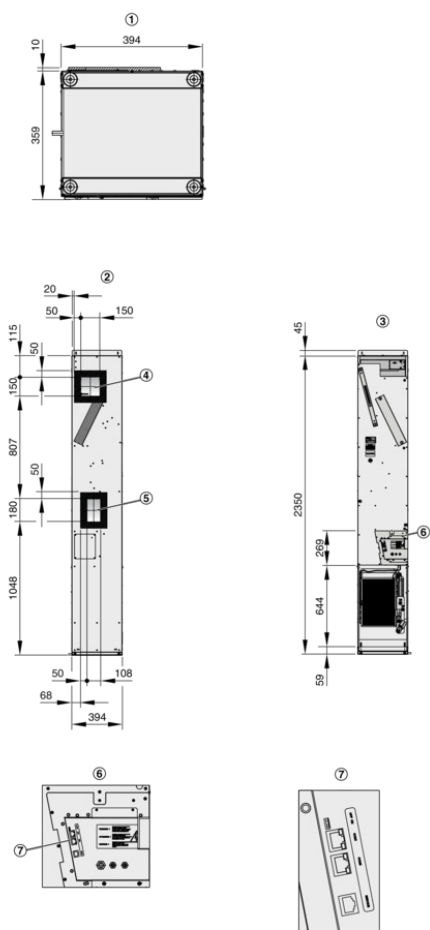
Variants, Dimensions and weight

SCHOOLAIR-V-1800





SCHOOLAIR-V-2350 4L FSL-CONTROL II



Installation examples, Installation details, Basic information and nomenclature



Installation example



Installation and commissioning

- Vertical installation (floor standing) on the façade system or an external wall, e.g. adjacent to a window
- Level adjustment using the 4 levelling feet (+40 mm)
- 1 adjustable mounting bracket to screw-fix the unit to the wall
- Weather protection for the fresh air and exhaust air openings to be provided by others
- The fresh air connection is provided by two ventilation openings in the façade system or external wall (to be provided by others), preferably sloping towards the outside
- Free area of ventilation openings: 0.05 m² for each opening
- Installation and connections to be performed by others; fixing, connection and sealing material to be provided by others
- The water flow and return connections are on the right-hand side of the unit when seen from the room
- Vents and drainage by others
- The electrical connection is on the lower right when seen from the room
- The under sill trim must not obstruct installation or deinstallation of the unit or maintenance access on the front of the unit

Nomenclature

L_{WA} [dB(A)]

Sound power level

t_{Pr} [°C]

Primary air temperature

t_{wv} [C°]

Water flow temperature – cooling/heating

t_R [C°]

Room temperature

t_{AN} [C°]

Secondary air intake temperature

Q_{Pr} [W]

Thermal output – primary air

Q_{tot} [W]

Thermal output – total

Q_w [W]

Thermal output – water side, cooling/heating

V_{Pr} [l/s/m³/h]

Primary air volume flow rate

V_W [l/h]

Water flow rate – cooling/heating

V [l/h]

Volume flow rate

Δt_W [K]

Temperature difference – water

Δp_W [kPa]

Water side pressure drop

Δp_t [Pa]

Total pressure drop, air side

$\Delta t_{Pr} = t_{Pr} - t_R$ [K]

Difference between primary air temperature and room temperature

$\Delta t_{RWV} = t_{WV} - t_R$ [K]

Difference between water flow temperature and room temperature

Δt_{Wm-Ref} [K]

Difference between mean water temperature and reference temperature

Principal dimensions

L_N [mm]

Nominal length

Inducing displacement flow

The supply air is discharged near the external wall and with a medium velocity between 1.0 and 1.5 m/s. Due to the induction effect the supply air velocity is rapidly reduced such that, in cooling mode, the supply air displaces the room air over the entire floor area. The convection from people and other heat sources causes the fresh air from the pool to rise and create comfortable conditions in the occupied zone.

Heat exchanger

The maximum water-side operating pressure for all heat exchangers is 6 bar.

The maximum water flow temperature (heating circuit) for all heat exchangers is 75 °C; if flexible hoses are used, the water flow temperature should not exceed 55 °C. Units for other pressures and temperatures are available on request.

The water flow temperature (cooling circuit) should be at least 16 °C such that it does not permanently fall below the dew point. For units with a condensate drip tray the water flow temperature may be reduced to 15 °C.

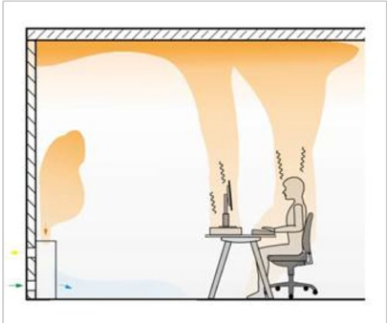
Heat exchanger as 2-pipe system

Air-water systems with a 2-pipe heat exchanger may be used for either heating or cooling. In changeover mode it is possible to use all units within a water circuit exclusively for cooling in summer and exclusively for heating in winter.

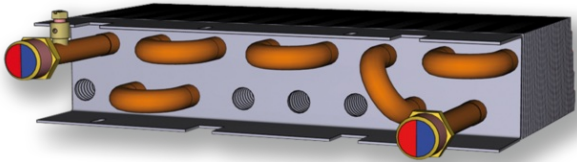
Heat exchanger as 4-pipe system

Air-water systems with a 4-pipe heat exchanger may be used for both heating and cooling. Depending on the season, i.e. especially in spring and autumn, it may be possible that an office has to be heated in the morning and cooled in the afternoon.

Schematic illustration of inducing displacement flow ventilation



Heat exchanger as 2-pipe system



Heat exchanger as 4-pipe system

