



Cross flow heat recovery unit



Tested to VDI 6022



Water connections



Filter change



Levelling foot



# Decentralised ventilation

## SCHOOLAIR-V-4

### Supply and extract air unit with switchover option to secondary air operation, including cross flow heat recovery unit and heat exchanger for vertical installation on the façade

Ready-to-operate decentralised ventilation unit that provides good comfort levels and is used for the ventilation of internal spaces such as classrooms, conference rooms and day nurseries

- Acoustically optimised EC fans with low specific fan power, SFP = 0 to EN 16798-3
  - Cross flow heat recovery unit (heat recovery efficiency 52 %)
  - Highly efficient heat exchanger for heating and cooling as a 4-pipe system
  - Heat exchanger connection is on the right when seen from the room
  - Condensate drip tray with or without condensate drain
  - Heat recovery all year round (optional)
  - Reduced fine dust and pollen contamination due to integral filters that conform to VDI 6022 – filter class ISO ePM1 65% and extract air ISO coarse 50%
  - Easy filter change, no tools required
  - Motorised shut-off dampers, normally closed (NC)
  - Installation without interruption of school operations
- Optional equipment and accessories
- Modular control system FSL-CONTROL III, specially for decentralised ventilation systems
  - Wood panelling as outer casing in various colours, with TROX ventilation grilles for supply air and extract air (assembly kit)

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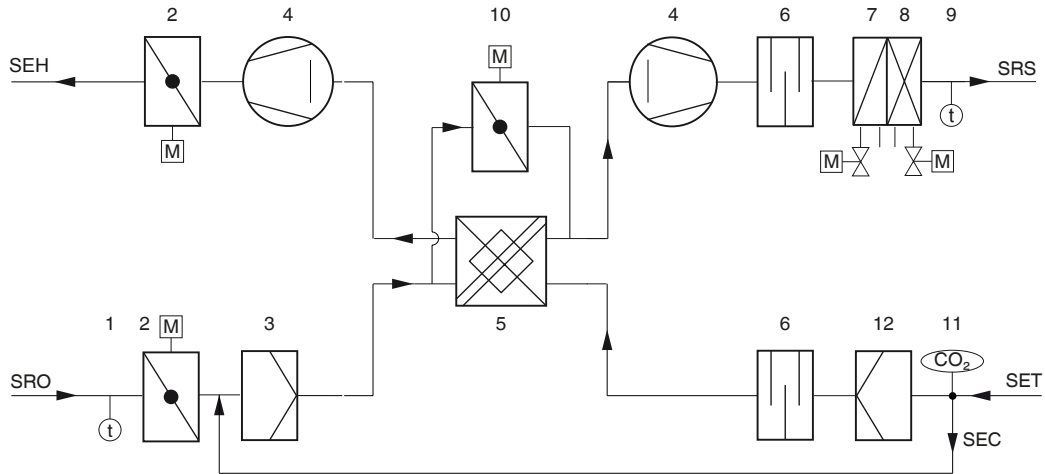
## Function

### Functional description

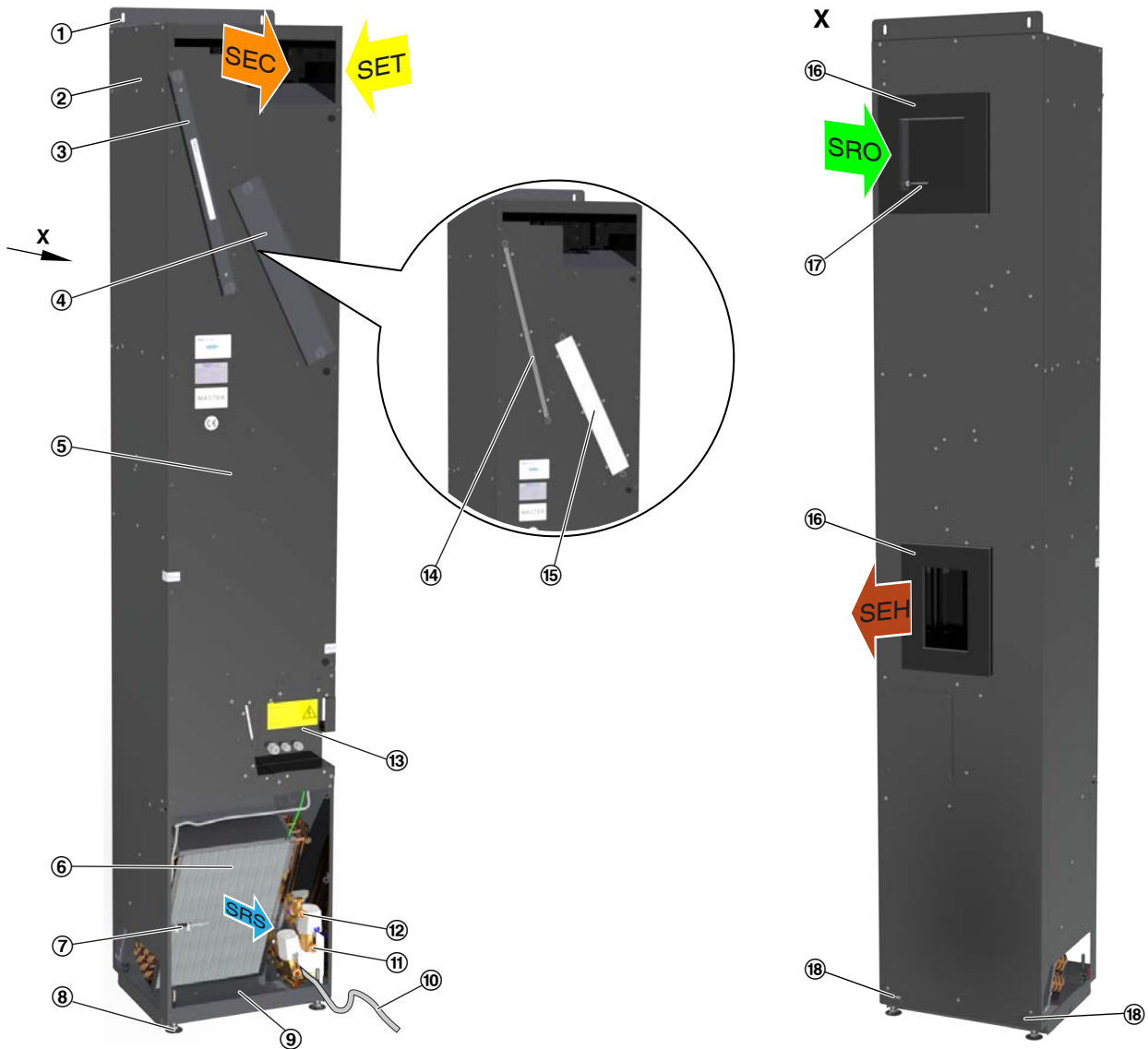
Decentralised supply and extract air units for room ventilation and for dissipating cooling and heat loads. An EC centrifugal fan takes in the fresh air which then flows through the motorised shut-off damper and the fresh air filter. The fresh air then flows through the rotary heat exchanger, which can be switched off 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 (optional in the case of 4-pipe systems). The extract air first passes through the extract air 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 indoor air quality is sufficient, FSL-CONTROL III closes the outdoor air dampers and changes to secondary air operation, which is more energy

efficient in any case. Here, the control system compares the setpoint values of the indoor air quality with the actual values measured at the CO<sub>2</sub> sensor and switches automatically between fresh air and secondary air operation. If the power fails, the fresh air and exhaust air dampers are closed to ensure fire protection and frost protection and to avoid draughts. This is ensured by a capacitor in each actuator. 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 after the air enters the room. 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.

Function



- 1 Fresh air temperature sensor (optional)
- 2 Shut-off damper with actuator (exhaust air and fresh air)
- 3 Fresh air filter
- 4 Fan (supply air and extract air)
- 5 Recuperative cross flow plate heat exchanger:
- 6 Sound attenuator
- 7 Heating coil
- 8 Cooling coil (only SCHOOLAIR-V-4)
- 9 Supply air temperature sensor
- 10 Bypass damper with actuator
- 11 CO<sub>2</sub> sensor (optional)
- 12 Extract air filter
- SEH Single room exhaust air
- SET Single room extract air
- SRO Single room fresh air
- SRS Single room supply air
- SEC Secondary air (optional)



- 1 Mounting bracket (sliding)
- 2 Casing
- 3 Extract air filter cover
- 4 Outdoor air filter cover
- 5 Cover plate
- 6 Heat exchanger, 4-pipe
- 7 Supply air temperature sensor
- 8 Feet
- 9 Condensate drip tray
- 10 Supply voltage connecting cable
- 11 Control valve
- 12 Lockshield
- 13 Controls inspection access panel
- 14 Extract air filter ISO coarse 50%
- 15 Fresh air filter ISO ePM1 65%
- 16 Seal on the façade side
- 17 Fresh air temperature sensor (optional)
- 18 Lower fixing holes
- SEH Single room exhaust air
- SET Single room extract air
- SRO Single room fresh air
- SRS Single room supply air
- SEC Secondary air (optional)

## Technical data

Width	397 mm
Height	2350 mm
Depth	359 mm
Volume flow rate	150, 200, 250 m <sup>3</sup> /h (boost 320 m <sup>3</sup> /h)
Nominal volume flow rate	250 m <sup>3</sup> /h
Sound power level	31 – 46 dB(A)
Heat recovery efficiency	52 %
Maximum operating pressure, water side	6 bar
Maximum operating temperature	75 °C
Supply voltage	230 V AC ±10 %, 50/60 Hz
Power rating	226 VA
Weight	85 kg

## Quick sizing

## SCHOOLAIR-V (example of 4-pipe construction – active heating)

Supply air flow rate	m <sup>3</sup> /h	150	200	250	320
Total cooling capacity	W	680	900	1130	1440
Room cooling capacity	W	401	534	668	844
Air temperature inside the unit	°C	32	32	32	32
Relative humidity	%	40	40	40	40
Water content of the dry air	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	22.0	21.1	21.0
Water side pressure drop	kPa	3	5	8	12
Total heating capacity	W	2680	3630	4700	5760
Room heating capacity	W	772	1075	1486	1678
Air temperature inside the unit	°C	-12	-12	-12	-12
Supply air temperature	°C	35.4	36.1	37.8	35.7
Hot water flow rate	l/h	70	100	160	200
Water temperature, inlet	°C	60	60	60	60
Water temperature, outlet	°C	26.5	28.2	34.3	34.8
Water side pressure drop	kPa	2.5	3	5	7
Sound power level L <sub>WA</sub>	dB(A)	31	36	41	46
Sound pressure level with 8 dB system attenuation	dB(A)	23	28	33	38
Active power P <sub>el</sub>	W	24	34	44	70

**SCHOOLAIR-V (example of 4-pipe construction – isothermal supply air)**

Supply air flow rate	m <sup>3</sup> /h	150	200	250	320
Total cooling capacity	W	790	1050	1300	1570
Room cooling capacity	W	411	534	668	759
Air temperature inside the unit	°C	34	34	34	34
Relative humidity	%	36	36	36	36
Water content of the dry air	kg	11.9	11.9	11.9	11.9
Supply air temperature	°C	17.8	18	18	18.9
Condensation	g/h	0	0	0	0
Chilled water flow rate	l/h	100	160	160	200
Water temperature, inlet	°C	16	16	16	16
Water temperature, outlet	°C	22.8	21.6	21.6	22.8
Water side pressure drop	kPa	3.5	7	11	11
Total heating capacity	W	2020	2730	3430	4150
Room heating capacity	W	130	214	276	150
Air temperature inside the unit	°C	-12	-12	-12	-12
Supply air temperature	°C	23.6	24.2	24.3	22.4
Hot water flow rate	l/h	60	90	130	160
Water temperature, inlet	°C	50	50	50	50
Water temperature, outlet	°C	20.9	23.7	27.1	27.5
Water side pressure drop	kPa	2	3.5	6	8.5
Sound power level L <sub>WA</sub>	dB(A)	31	36	41	46
Sound pressure level with 8 dB system attenuation	dB(A)	23	28	33	38
Active power P <sub>el</sub>	W	24	34	44	70

## Specification text

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.

### SCHOOLAIR-V-4/KO/397×2350×359/C3

Under sill units for installation vertically on the façade

Please note: The described under sill ventilation unit variant is equipped with a single room control system arranged in the unit for autonomous classroom operation.

The supplied controllers contain the standard control parameters for operation according to our control system description.

School ventilation unit – vertical installation - master unit

Under sill ventilation unit TROX SCHOOLAIR-V-4L with supply and extract air function, heat recovery and switchover option to secondary air operation (air quality dependent), as well as heating and cooling function for vertical installation on the façade:

- Device casing made of galvanised sheet steel, cover and sheet metal connections via deep-drawn threads and stainless steel cross-head screws, all necessary internal air ducts sealed and lined, internal electrical cable penetrations sealed, exposed surfaces powder-coated (RAL 9005, jet black)
- Sound- and heat-insulating lining on intake and discharge side made of mineral wool faced with glass fibre scrim (material classification A, non-combustible according to DIN 4102, T1), erosion resistant up to airflow velocities of 20 m/s, or closed cell insulation material
- The device meets the hygiene requirements of VDI 6022
- Levelling feet, +40 mm
- Slotted bracket on top with 2 slotted holes (6.5 x 13.5 [mm]) for fixing to the wall
- 2 slotted holes (6.5 x 13.5 [mm]) in the lower part of the unit (behind the heat exchanger) for fixing to the wall
- Connection to the outdoor air and exhaust air openings (provided by others) of the façade by means of perimeter closed cell sealing tape on the rear side of the unit, d = 10 mm, the intake and discharge resistance of the construction provided by others should not exceed 20 Pa at a nominal volume flow rate
- Extract air removal at the front, at the top
- Use of 2 energy-saving EC centrifugal fans, supply and extract air fans classified in category SFP 1 (< 500 W/(m³/s)) according to EN 16798-3:2017-11, electrical power consumption of the entire unit at a nominal volume flow rate of 250 m³/h < 44 W; a power rating of 226 VA has to be considered for the connecting cable
- Suitable for 3 speed levels (150, 200 and 250 m³/h as well as boost level with 320 m³/h), signalling via device-internal single room control system, volume flow rate level correction by adjusting the control voltage is subsequently possible
- Meets the requirements of EU Regulation 1253/2014 (ErP directive)
- Sound power level in supply-extract air operation at 150/200/250/320 m³/h = 31/36/41/46 dB(A) (corresponds to a sound power level of = 23/28/33/38 dB(A) at a room attenuation of 8 dB). The measurement data refer to sound power measurements of a single unit in a reverberation chamber according to accuracy class 1. Depending on the installation situation, deviations are possible
- Integral recuperative cross flow heat exchanger for heat recovery, salt water resistant aluminium design, with high efficiency due to special plate structure, plate spacing and package length, including condensate drip tray and discharge into the condensate drip tray of the heat exchanger
- With electromotive bypass which causes a large partial air volume flow to bypass the heat recovery unit, actuator 24 V (modulating), signalling via device-internal single room control system
- Motorised shut-off dampers in the outdoor/exhaust air area, normally closed when there is no power by means of energy storage, actuator 230 V, open/close, signalling via device-internal single room control system
- Automatic switching to secondary air mode (only with an air quality sensor) if the indoor air quality (measured, for example, at the integral CO<sub>2</sub> sensor) lies within the limits defined beforehand. The fresh air damper closes, the self-powered secondary air damper opens and the extract air fan is switched off
- Electrical components contained in the unit are completely wired with FSL-CONTROL III, control components are integrated in the unit. Cable for connecting the unit (connection not part of the supply package) to the power supply (L, N, PE) with wire end ferrules led approx. 1 m out of the unit: As a transfer point to the electrical installation provided by others:
  - Supply voltage (230 V): 3 wires, 3 x 1.5 mm<sup>2</sup> (L, N, PE)
- Connection possibility for bus communication (optional), connection of control panel, etc. after opening the customer area of the controls. As a transfer point to the controls provided by others:
  - Rail mount terminals type Wago 260 for the connection (provided by others) of
    - Digital inputs DI
    - Digital outputs DO
    - Master-slave connection RS485
    - Central BMS connection (optional) RS485
    - Control panel
    - RJ45 socket as service access to the user interface
- The following sensors are arranged in the unit to control the single room control system (the actual room temperature is recorded at the control panel):
  - Indoor air quality sensor CO<sub>2</sub>

- Supply air temperature measurement downstream of the heat exchanger
- Outdoor air temperature measurement in the outdoor air intake
- 4-pipe aluminium cooper tube heat exchanger for air heating or air cooling, matched to project-specific data, easily removable for cleaning (depends on the connection to the main pipe - by others, not included in the TROX supply package), drainage and venting option per heating/cooling circuit, installed on the right when seen from the room. We recommend a connection to the pipe network (provided by others) with flexible hoses (not included in the TROX supply package) so that the heat exchanger can be easily removed for cleaning
- Transfer points are the manually pre-assembled control components
  - Valves in the return: transfer with G ½" external thread, flat seal
  - Lockshields in the flow: transfer with G ½" external thread, flat seal
- Easy-to-clean condensate drip tray with condensate drain Ø 12 x 1 [mm] made from galvanised sheet steel (powder-coated RAL 9005)
- Outdoor air filter as Mini Pleat filter class ePM1 (fine dust filter):
  - Filter class to ISO 16890: ISO ePM1 65 %
  - Eurovent-certified
  - ePM1 filter media made from high-quality, wet-strengthened glass fibre paper are pleated, the spacers are made from thermoplastic hot-melt adhesive and ensure uniform spacing (4 mm) between the pleats
  - The frame is made of moisture-resistant non-woven fibre, with lugs (for pulling it out) and must not reduce the flow cross section (filter size = flow cross section).
  - Filter area >= 2.96 m<sup>2</sup>
- Extract air filter class G3 (coarse dust filter) as flat filter medium, filter class according to ISO 16890: ISO coarse 50 %
- Quick change of the filters is possible, since the filter insert can be opened without tools after opening the outer casing (by others) with the user-friendly quarter-turn fasteners (accessibility must not be restricted by the under sill trim that is provided by others)
- Closed cell sealing tapes for sealing and adaptation to the outer casing (by others) are not included in the TROX supply package
- The under sill trim provided by the customer is perforated in areas to be specified for the supply air, as well as for extract air and secondary air removal, and must not restrict maintenance work and unit assembly and disassembly on the front of the unit
- Clear distance between the front edge of the unit and the inner edge of the under sill trim approx. 30 mm
- The front of the device must be completely accessible after disassembly of the outer casing

#### Units – dimensions and weight

- Width: approx. 397 mm
- Height: approx. 2350 mm (without levelling feet, without fixing brackets)
- Depth: approx. 359 mm (without façade sealing, without cable glands)

- Approx. 85 kg

#### FSL-CONTROL III controller

Including control system FSL-CONTROL III, as described below: FSL-CONTROL III is described as stand-alone single room control equipment with a simple timer. Optional expansions, such as connection to the central BMS provided by others via Modbus TCP / Modbus RTU, BACnet MS/TP or BACnet IP, humidity sensors, return flow temperature sensors, electromotive valve actuators or pressure-independent control valves are included in the product range, but must be replaced with the standard components in the following description. A room temperature signal is also required. Various room control panels and sensors are available for this purpose. The corresponding optional equipment text modules can be found in the appendix of the following standard equipment for room-autonomous operation. We recommend commissioning by our technical service. You will find related text modules below.

TROX control module FSL-CONTROL III (order code ...-C3-MA ...):

- Single room controller for mounting on DIN mounting rail in the unit or in a separate control casing
- 42 digital or analogue inputs and outputs
- MicroSD card (at least 2 GB) as integral flash memory. The trend data is stored here and can be accessed via the RJ45 service socket.
- Equipped at the factory with a software package for master units specially developed for decentralised ventilation units. The software enables simple master-slave communication via Modbus RTU
- Up to 10 slave devices can be connected to one master device
- The software provides 3 types of operation (Off, Automatic and Manual), 3 operating modes (Occupied, Unoccupied and Standby) and 4 operating mode overrides (Boost, Class, Night Ventilation and Fan Forced Circuit)
- Basic distinction between room temperature control by controlling heating and cooling valves or modulating bypass damper or supply air temperature control for isothermal ventilation
- CO<sub>2</sub>-guided air quality control
- Year-round heat recovery use
- Filter monitoring
- Configurable DI, e.g. for connection (by others) of PIR sensors, window contacts, holiday switching, etc.
- Alarm signals type A (= switch-offs) and type B (= notifications)

#### Real time clock (RTC)

Real Time Clock (RTC/real time clock) (order code ...-T/...):

- Component of the Master Software Package
- Enables a simple timer
  - 7 days with 10 switching points each
  - Automatic summer / winter time changeover
  - Temporal activation of night purge

#### CO2 sensor



CO<sub>2</sub> sensor (order code.../C/...):

- Sensor arranged in the extract air intake of the master unit for recording the indoor air quality and corresponding control of the outdoor air flow rate
- Measurement via an NDIR sensor, which works on an infrared basis and compensates for any contamination by its 2-beam measurement principle
- Measuring range 0 – 2000 ppm

#### Supply air temperature sensor

Supply air temperature sensor (order code .../Z/...):

- Supply air temperature sensor with NTC thermistor as sensing element, resistance 10 kΩ at 25 °C, measuring range 0 – 50 °C
- Especially fast response time due to perforated measuring tip

#### Fresh air temperature sensor

Outdoor air temperature sensor (order code .../A/...):

- Outdoor air temperature sensor with NTC thermistor as sensing element, resistance 10 kΩ at 25 °C, measuring range -30 – 50 °C

#### Water side components

Water-side components (order code .../HV-R-.../KV-R-...):

- Valve actuator: 1 × thermoelectric actuator for opening and closing valves, with position indicator, including pluggable connecting cable, supply voltage 24 V DC, control voltage 0 – 10 V DC, power consumption 1 W, degree of protection: IP 54
- Straight-way valve: 1 × straight-way valve ½", mounted (finger-tight), PN 16, DN10, K<sub>vs</sub> 0.4 (alternatively: 0.25, 0.63 or 1.0 m<sup>3</sup>/h – please specify the required K<sub>vs</sub> value), threaded connection G 1/2B, fluid temperature 1 to 110 °C
- Lockshield: 1x lockshield on both sides ½", mounted (finger-tight), nominal width DN 15; ½", straight through valve with male thread on both sides, flat sealing, for control and shut-off, operating temperature 120 °C max.

#### Optional control accessories

Optional equipment to increase the comfort of the FSL-CONTROL III:

TROX control panels for FSL-CONTROL III

At least one room temperature signal is required per room.

There are several variants of TROX control panels available, optionally with or without step switching. Additionally we offer a room temperature sensor RTF without control elements.

Alternative control panels provided by the customer must be connected via bus communication:

Digital control panels for surface mounting

For the operation and adjustment of the ventilation units.

- Supplied loose as an accessory. Connection to master unit via Modbus serial line. Project-specific software including setpoint value adjuster, various status displays, selector switch, CO<sub>2</sub> traffic light. Touch-sensitive colour display 3.5" 320 × 240 pixels. Sensor: NTC 10 kΩ. Degree of protection: IP 20. Type: Schneider TM172DCLWT. Dimensions (H × B × T): 120 × 86 × 25 mm, weight: 340 g, colour: white. Installation: wall mounting or on standard flush box. Supply: 24 V DC. Power consumption: 3.2 VA/1.3 W. Optional further design frames available for a surcharge on request.

Control panels with selector switch for surface mounting:

Control panel with selector switch, for surface mounting, type Honeywell

- Supplied loose as accessory, with room temperature sensor, setpoint adjuster (blue or white), override button, LED and 3-step switch as well as off and automatic, assembly on 60 mm flush box or directly on the wall, NTC thermistor as sensor element, resistance 20 kΩ at 25 °C, dimensions (B × H × T): 99 × 104 × 30 mm, operating temperature: 6 - 40 °C

Control panel with selector switch, for surface mounting, type Thermokon

- Supplied loose as an accessory, with room temperature sensor, setpoint adjuster (blue or white), override button, LED and 3-step switch as well as off and automatic, casing made from pure white PVC0 (RAL 9010) assembly on 60 mm flush box or directly on the wall, NTC thermistor as sensor element, resistance 20 kΩ at 25 °C, dimensions (B × H × T): 84.5 × 84.5 × 25 mm, operating temperature: -35 – 70 °C

Control panels without selector switch for surface mounting:

Control panel without selector switch, for surface mounting, type Schneider

- Supplied loose as additional part, with mode display, push button and setpoint adjustment, sensor NTC 10 kΩ, protection level: IP 20, wall mounting or on 70 mm flush-mounted box, dimensions (B × H × T) 84 × 116 × 24 mm, colour light grey/white

Control panel without selector switch, for surface mounting, type Thermokon

- Supplied loose as additional part, with mode display, push button and setpoint adjustment, sensor NTC 20 kΩ, protection level: IP 20, dimensions (B × H × T) 84.5 × 84.5 × 25 mm

Room temperature sensor for surface mounting:

Room temperature sensor TROX RTF, surface mounting

- Supplied loose as additional part, room sensor without control elements, measuring range: -35...70°C, sensor NTC 10 kΩ, screw terminal, d=1.5 mm, protection level IP 20, assembly wall mounted or on 70 mm flush-mounted box, dimensions (B × H × T) 85 × 85 × 30 mm, casing ABS in RAL 9010

Control panels without selector switch for flush mounting:

For manual operation of the ventilation units with a high-quality look and the matching design frame from a wide range of switch programmes, the unit is suitable for particularly design-oriented facilities.

Control panel without selector switch, for flush mounting, type Thermokon, switch from Berker S.1 range, polar white

- Supplied loose as additional part, with mode display, push button and setpoint adjustment, sensor NTC 20 kΩ, protection level: IP 20

Control panel without selector switch, for flush mounting, type Thermokon, switch from Berker Q.3 range, white

- Supplied loose as additional part, with mode display, push button and setpoint adjustment, sensor NTC 20 k $\Omega$ , protection level: IP 20

Control panel without selector switch, for flush mounting, type Thermokon, switch from Busch-Jäger future range<sup>®</sup> linear, white

- Supplied loose as additional part, with mode display, push button and setpoint adjustment, sensor NTC 20 k $\Omega$ , protection level: IP 20

Further switch programmes on request.

Control panels without selector switch and without setpoint value adjuster for flush mounting:

Control panel without selector switch and without setpoint value adjuster, for flush mounting, type Thermokon, switch from Gira E2 range

- Supplied loose as additional part, with mode display and button, sensor NTC 20 k $\Omega$ , protection level: IP 20

Further switch programmes on request

Electromotive valve actuator:

As an alternative to the standard installed thermoelectric actuator

- 1 x electromotive actuator for opening and closing valves, supply voltage AC/DC 24 V, maximum power consumption 2.5 VA, signalling of control signal 3-point DC 0...10 V, permissible operating fluid temperature 1...110 °C

Pressure-independent control valve:

As an alternative to the standard installed straight-way small valve

- 1 x pressure-independent control valve, manually pre-assembled with modulating open and close control in combination with an externally adjustable dynamic volume flow controller, with full valve authority, nominal width DN 10, ½", valve casing straight through with male thread on both ends, flat seal, fluid temperature 0 – 120 °C

Interface for connection to central building management system (BMS) provided by others: Modbus TCP interface including web server (order code .../MT/...)

To increase comfort, we recommend integration into a central building management system provided by others. FSL-CONTROL III offers the possibility to be connected to a central BMS provided by others using Modbus TCP protocol. Additionally incl. web server for simplified configuration, commissioning and remote monitoring of the device. The central BMS is not included in the supply package from TROX, only the interfaces listed above are available here.

- Modbus TCP interface (Ethernet)

BACnet IP interface including web server (order code .../BI/...)

To increase comfort, we recommend integration into a central building management system provided by others. FSL-CONTROL III offers the possibility to be connected to a central BMS provided by others using BACnet IP protocol. Additionally incl. web server for simplified configuration, commissioning and remote monitoring of the device. The central BMS is not included

in the supply package from TROX, only the interfaces listed above are available here.

- BACnet IP interface (Ethernet)

Modbus RTU (order code .../MR/...)

To increase comfort, we recommend integration into a central building management system provided by others. FSL-CONTROL III offers the possibility to be connected to a central BMS provided by others using Modbus RTU protocol. The central BMS is not included in the supply package from TROX, only the interfaces listed above are available here.

- Modbus RTU interface (RS485)

BACnet MS/TP (order code .../BM/...)

To increase comfort, we recommend integration into a central building management system provided by others. FSL-CONTROL III offers the possibility to be connected to a central BMS provided by others using BACnet MS/TP. The central BMS is not included in the supply package from TROX, only the interfaces listed above are available here.

- BACnet MS/TP interface (RS485)

### Commissioning of the decentralised ventilation units

Commissioning / parameter setting of decentralised ventilation units without connection to the central building management system

- Visual inspection of the unit connections carried out by others for compliance with the respective installation specifications from the installation and configuration instructions: air connections, heating/cooling connection, electrical connections, integration into the installed outer casing, connections of external components
- Checking and, if necessary, adapting the project parameters pre-set in the factory with regard to customer-specific adaptations
- Functional test of the individual components (control elements, fans, valves, dampers, sensors)
- Checking the project-specific control functions including any special functions such as volt-free switch contacts
- Documentation of the device settings as well as their use in a service report. The service report must be signed by your company as the customer or your representative
- The invoice is made as a flat rate, derived from the number of devices and distance

Commissioning / parameter setting of decentralised ventilation units with connection to the central building management system

- Visual inspection of the unit connections carried out by others for compliance with the respective installation specifications from the installation and configuration instructions: air connections, heating/cooling connection, electrical connections, integration into the installed outer casing, connections of external components, central building management system connections
- Checking and, if necessary, adapting the project parameters pre-set in the factory with regard to customer-specific adaptations
- Functional test of the individual components (control elements, fans, valves, dampers, sensors)
- Checking the project-specific control functions including any special functions such as volt-free switch contacts

- Function test of the communication to the central BMS in cooperation with the ordered controls company:
    - Checking that the settings that are provided by others comply with the specifications in the installation and configuration instructions
    - Input test of the data points sent by the customer
    - Output test of the output data points
    - Trial operation of the operating conditions switchable by the central BMS
  - Documentation of the device settings as well as their use in a service report. The service report must be signed by your company as the customer or your representative
  - The invoice is made as a flat rate, derived from the number of devices and distance
- Instruction in operation and maintenance
- One-off instruction for the operation of the decentralised ventilation units consisting of:
    - Description of the equipment functions on the unit that has already been put into operation
    - Description of the room control panel and the room conditions that can be influenced by it
    - Description of maintenance work
  - The invoice is a flat rate and is carried out by the responsible sales representative

Order code

SCHOOLAIR-  
V - 0 - 4 / KM / <sup>397 ×</sup>  
2350 ×  
359 / C3 / MA - T / MR / C / Z / A / HV - R - 0.4 / KV - R - 0.4

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

**1 Type**

SCHOOLAIR-V vertical under sill ventilation unit

**2 Variant**

No entry required: Standard  
 HE High heat recovery efficiency  
 HV High volume flow rate and rotary heat exchanger for heat recovery

**3 Heat exchanger**

2 2-pipe  
 4 4-pipe  
 EH Electric air heater (SCHOOLAIR-V-HV)

**4 Construction**

KO Without condensate drain  
 KM With condensate drain (SCHOOLAIR-V, SCHOOLAIR-V-1800, SCHOOLAIR-V-HV)  
 KR With condensate drain, extract air on the right when viewed from the room (SCHOOLAIR-V-HE)  
 KL With condensate drain, extract air on the left when viewed from the room (SCHOOLAIR-V-HE)

**5 Dimensions [mm]**

B × H × T  
 397 × 2160 × 359 (2-pipe)  
 397 × 2350 × 359 (4-pipe)  
 600 × 1800 × 359 (2-, 4-pipe 1800 version)  
 600 × 2000 × 408 (2-, 4-pipe HE version)  
 605 × 2200 × 413 (2-, 4-pipe HV version)

**6 Control system**

OR Without control  
 C3 With FSL-CONTROL III

**7 Control function**

MA Master  
 SL Slave

**8 Real-time clock, only master**

No entry required: None  
 T With

**9 Interface**

No entry required: None

MT With Modbus TCP  
 MR With Modbus RTU  
 BI With BACnet IP  
 BM With BACnet MS/TP

**10 Air quality sensor, only master**

No entry required: None  
 C With CO<sub>2</sub> sensor  
 V With VOC sensor

**11 Supply air temperature sensor**

Z With

**12 Fresh air temperature sensor, only master**

No entry required: None  
 A With

**13 Heating valve**

Only 2-pipe systems

HV With

**14 Lockshield – heating circuit**

R With

**15 k<sub>vs</sub> value – heating valve**

0.25 Straight-way valve  
 0.40 Straight-way valve  
 0.63 Straight-way valve  
 1.00 Straight-way valve  
 F0.50 Pressure independent control valve

**16 Cooling valve**

Only 4-pipe systems  
 KV With

**17 Lockshield – cooling circuit**

R With

**18 k<sub>vs</sub> value – cooling valve**

0.25 Straight-way valve  
 0.40 Straight-way valve  
 0.63 Straight-way valve  
 1.00 Straight-way valve  
 F0.50 Pressure independent control valve

**Order example: SCHOOLAIR-V-4/KO/397×2160×359/C3-MA-T/C/Z/A/HV-R-0.40**

SCHOOLAIR-V	Vertical under sill ventilation unit
4	With 4-pipe heat exchanger
KO	Without condensate drain
C3	With FSL-CONTROL III
MA	Master construction
T	With real time clock
C	With CO <sub>2</sub> sensor
Z	With supply air temperature sensor
A	With fresh air temperature sensor
HV-R-0.40	With straight-way valve (heating circuit) $k_{vs}$ 0.40 and lockshield
KV-R-0.40	With straight-way valve (cooling circuit) $k_{vs}$ 0.40 and lockshield

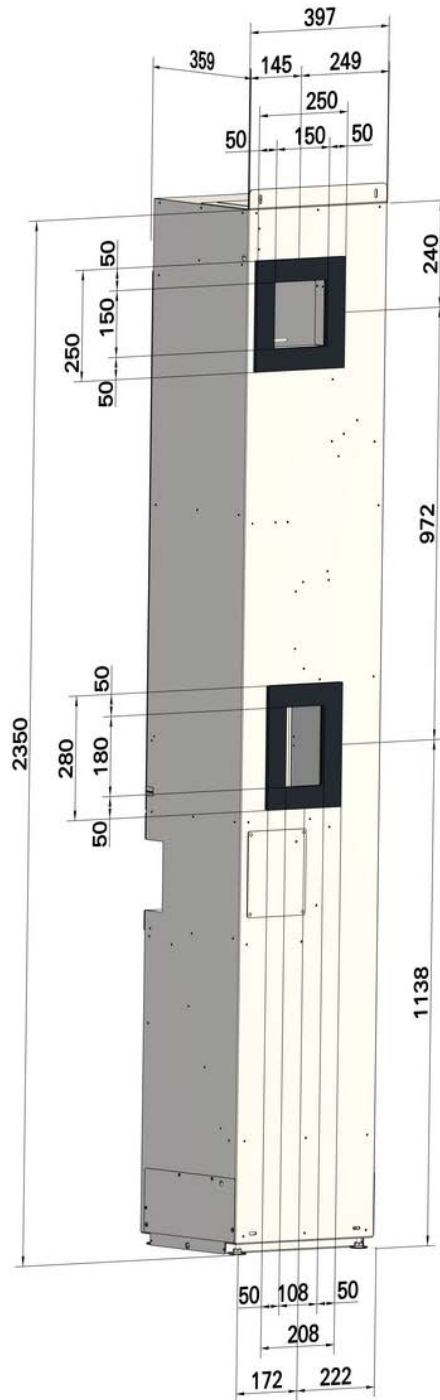
**Order example: SCHOOLAIR-V-4/KO/397×2160×359/C3-SL-Z/HV-R-0.40**

SCHOOLAIR-V	Vertical under sill ventilation unit
4	With 4-pipe heat exchanger
KO	Without condensate drain
C3	With FSL-CONTROL III
SL	Slave construction
Z	With supply air temperature sensor
HV-R-0.40	With straight-way valve (heating circuit) $k_{vs}$ 0.40 and lockshield
KV-R-0.40	With straight-way valve (cooling circuit) $k_{vs}$ 0.40 and lockshield

**Order example: SCHOOLAIR-V-4/KM/397×2160×359/C3-MA-BI/C/Z/HV-R-F0.50**

SCHOOLAIR-V	Vertical under sill ventilation unit
4	With 4-pipe heat exchanger
KM	With condensate drain
C3	With FSL-CONTROL III
MA	Master construction
BI	With BACnet IP interface
C	With CO <sub>2</sub> sensor
Z	With supply air temperature sensor
HV-R-F0.50	With pressure-independent control valve (heating circuit) and lockshield
KV-R-F0.50	With pressure-independent control valve (cooling circuit) and lockshield

## Dimensions



## Product details

Installation example



Installation example



Installation example



### Installation and commissioning

- Under sill installation, floor-standing
- Level adjustment using the 4 levelling feet (+40 mm)
- Fixing bracket on the top side of the unit and 2 fixing points near the bottom for screw-fixing the unit to the wall
- Fresh air and exhaust air connections are provided by 2 ventilation openings in the façade system or external wall (to be provided by others), the openings should preferably be sloping towards the outside
- Weather protection for the fresh air and exhaust air openings to be provided by others
- 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 right-hand side of the unit when seen from the room
- We recommend using flexible hoses to connect the unit to the pipework as they facilitate removing the heat exchanger for cleaning.
- The under sill trim must not obstruct installation or deinstallation of the unit or maintenance access on the front of the unit