Rotary heat exchanger for heat recovery

Conforms to VDI 6022

Outdoor air and exhaust air connections

Electrical connections

Levelling foot and plinth

Decentralised ventilation

SCHOOLAIR-S-HV

Floor-standing supply air and extract air unit with rotary heat recovery unit and electric air heater

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

- Acoustically optimised EC fans with low specific fan power, SFP = 0 to EN 16798-3
- Rotary heat recovery unit (80% heat recovery efficiency) with moisture recovery in winter
- Electric air heater with 3000 W max. heating capacity
- Heat recovery all year round
- Reduced fine dust and pollen contamination due to integral filters that conform to VDI 6022 – filter class ISO ePM1 60% and extract air ISO coarse 90%
- Doors can be opened with an SW 10 Allen key, key holes are covered to prevent manipulation
- Easy filter change, no tools required
- Motorised shut-off dampers, normally closed (NC)
- Optimised dimensions allow for integration with existing furniture
- Installation without interruption of school operations

Optional equipment and accessories

- Modular control system FSL-CONTROL III, specially for decentralised ventilation systems

Function	2	Order code	10
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Function

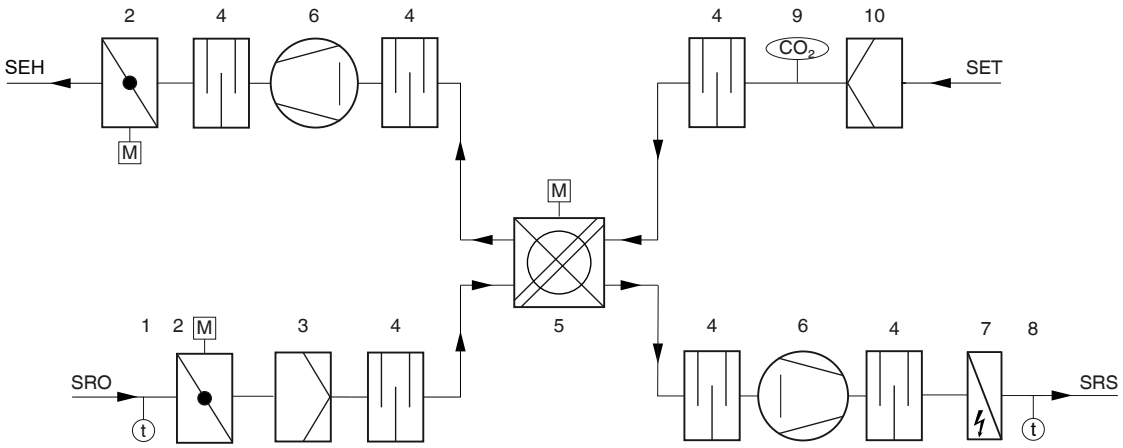
Function

Decentralised supply and extract air units for room ventilation, isothermal units that compensate for the heat loss due to ventilation according to the technical data.An EC centrifugal fan takes in the outdoor air which then flows through the motorised shut-off damper and the outdoor air filter.The outdoor air then flows through the rotary heat recovery unit, which can be switched off if it is more energy efficient.If necessary, the air is heated by the heat exchanger before it is discharged towards the ceiling with a high propulsive force.The extract air first passes 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 power fails, the outdoor 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 ceiling with a medium velocity, and the selected air outlet ensures good overall room ventilation.

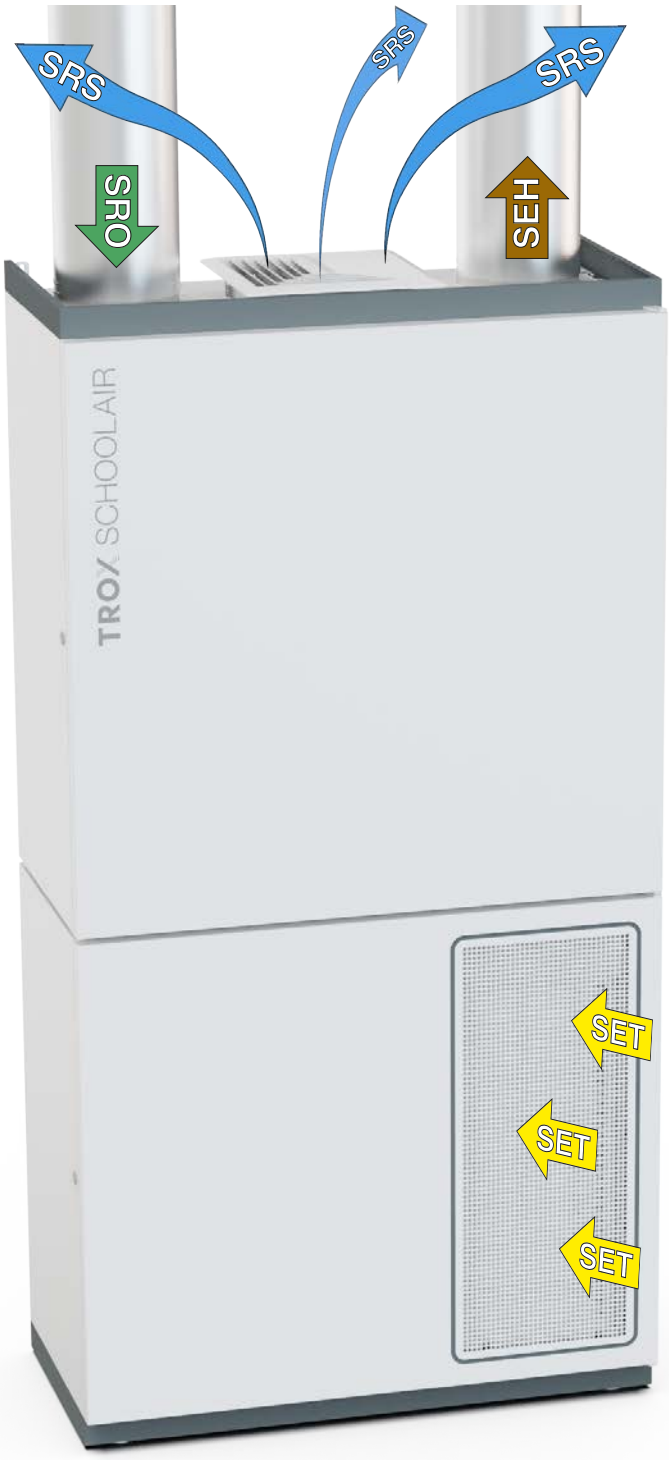
Once the air reaches the opposite wall, it moves downwards and eventually through the entire space. By the time the airflow reaches the occupied zone it has a very low velocity.

Function



SEH Single room exhaust air
SET Single room extract air
SRO Single room outdoor air
SRS Single room supply air

1 Outdoor air temperature sensor (optional)
2 Shut-off damper with actuator (outdoor air and exhaust air)
3 Outdoor air filter ISO ePM1 60%
4 Sound attenuator
5 Rotary heat exchanger for heat recovery
6 Fans (supply air and extract air)
7 Electric air heater
8 Supply air temperature sensor
9 C02 sensor (optional)
10 Extract air temperature sensor (optional)
11 Extract air filter ISO coarse 90%



SEH Single room exhaust air
SET Single room extract air
SRO Single room outdoor air
SRS Single room supply air

Technical data

Width	1200 mm
Height	2300 mm
Depth	600 mm
Volume flow rate	300, 500, 800 m³/h (boost 1050 m³/h)
Nominal volume flow rate	800 m³/h
Sound pressure level at nominal flow rate and 8 dB room attenuation	35 dB(A)
Sound power level	24 – 53 dB(A)
Heat recovery efficiency	80 %
Supply voltage	230 V AC ±10 %, 50/60 Hz
Power rating	3640 VA
Weight	360 kg

Specification text

This specification text describes the general properties of the product. Texts for variants can be generated with our Easy Product Finder design program.

SCHOOLAIR-S-HV-EH/1200×2300×600/0/C3
Floor-standing decentralised ventilation unit
Please note:
The described floor-standing ventilation unit is equipped with an integral single room control system for independent room control. The parameters for standard control of a classroom according to our control system description are stored in the controller
Ventilation unit for schools – floor-standing – master unit
Decentralised ventilation unit TROX SCHOOLAIR-S-HV-0-EH for supply and extract air, with rotary heat recovery unit and electric air heater, for floor-standing installation:

- Just one unit fulfils the increased fresh air requirement for an entire classroom
- Installation in front of any wall
- Two-part unit casing made of galvanised sheet steel, consisting of upper and lower part, all necessary internal air duct ducts sealed and lined, internal electric cable bushings sealed
- Exposed surfaces are powder-coated in two colours – casing in RAL 9010 GU30 (alternatively RAL 7012 GU30), plinth and trim frame (top) in RAL 7012 GU30 (alternatively RAL 9010 GU30)
- Sound- and heat-insulating lining on suction 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 air velocities of 20 m/s, or closed cell insulation material
- The unit meets the hygiene requirements of VDI 6022
- Easy assembly of the two-part casing on site thanks to internal (i.e. not visible) connection points
- Levelling feet, ±10 mm, to compensate for construction tolerances
- Optically covered adjustable slotted hole bracket for fixing to the wall from 0 - 80 mm wall distance (anti-tilt device)
- Connection to the on-site fresh air and exhaust air ducts by means of round connection pieces (250 mm) with lip seal. The intake and discharge resistance of the on-site construction should not exceed 40 Pa at nominal volume flow rate
- Extract air removal at the bottom front of the unit
- Air discharge is at the top of the unit; the TROX DLQ 400 supply air diffuser ensures complete room ventilation, no matter where in the room the ventilation unit is installed
- The inspection access doors are hinged and fitted with special fasteners to facilitate maintenance. The area in front of the unit must be kept clear for maintenance and repair. An opening angle of at least 90° has to be ensured (1200 mm swivel radius)
- 2 centrifugal fans (plug fans) with energy-efficient EC motors, classified as SFP 0 (< 300 W/(m³/s)) according to EN 16798-3:2017-11; the connecting cable requires a power rating of 3640 VA
- Suitable for 3 speed levels (300, 500 and 800 m³/h as well as boost level of 1050 m³/h), signalling by means of integral single room control system; the volume flow rate can be corrected at a later stage by adjusting the control voltage
- Upstream and downstream sound attenuators minimise the sound power levels and increase the efficiency of the fans at the same time
- The technical requirements of EU directive 1253/2014 for non-residential ventilation systems are fulfilled and documented in accordance with the directive
- Integral rotary heat exchanger for heat recovery, with high heat recovery efficiency (> 80%), modulating control by integral single room control system
- No condensate pipes required
- Motorised shut-off dampers in the outdoor and exhaust air ducts, normally closed when there is no power (capacitors), 230 V open/close actuator, signalling via integral single room control system
- Automatic room air quality measurement with integral CO_2sensor (optional)
- Integral electrical components are completely wired with FSL-CONTROL III, control components are integrated. Cable for connection (installation by others) to the power supply (L, N, PE), with wire end ferrules, approx. 1 m routed out of the unit as transfer point to the on-site electrical installation:
  - Supply voltage (230 V): 3 wires, 3 × 2.5 mm² (L, N, PE)
- Integration with bus system as an option, connection of control panels etc. in the customer area of the control system. As a transfer point to the on-site instrumentation and control (I&C) system: Connection is made on the top of the unit
  - Rail mount terminals type Wago 260 for the connection (by others) of
    - Digital inputs DI
    - Digital outputs DO
    - Master-slave connection RS485
    - Central BMS connection (optional) RS485
    - Room control panel
  - RJ45 socket as service access to the user interface
- The following sensors are included in the unit as part of the single room control system (the actual room temperature is captured at the control panel):
  - Indoor air quality sensor CO_2
  - Supply air temperature measurement downstream of the heat exchanger
  - Outdoor air temperature measurement in the outdoor air intake
- - The outdoor air filter is a pocket filter with non-woven glass fibre, ISO ePM1 (fine dust filter):
  - Filter class to ISO16890: ISO ePM1 60%
  - Eurovent certification for fine dust filters
  - Meets the hygiene requirements of VDI 6022
  - High energy efficiency class according to Eurovent

  - Non-woven glass fibres, sewn
  - Enlarged filter area due to filter pockets
  - Low initial differential pressure and high dust holding capacity, ideal airflow conditions due to wedge-shaped filter pockets
  - Quick installation and filter change thanks to easy and safe handling
  - Filter area ≥ 3m²
- Extract air filter with pleated filter medium, hence large filter area
  - Filter class to ISO 16890: ISO Coarse 90%
  - Low differential pressures at high volume flow rates
  - Filter media made of synthetic fibres
  - Moisture-resistant frame made of non-woven fibres
  - Tested to ISO 16890
- Quick filter change because the filters can be accessed without any tools once the inspection access doors of the casing have been opened
- Differential pressure measurement for filter monitoring, evaluation by means of integral single room control system
- The heat exchanger is an electric air heater
  - Maximum heat output: 3000 W, continuously controlled
  - Max. surface temperature restricted to 60°C, thus preventing dust smouldering
  - Including control loop with temperature sensor, NTC 10 kΩ, and power controller
  - Recommended supply air temperature: 25 °C max.
  - Including safeguards:
    - Airflow monitor
    - Thermal cut-out, mechanical, auto reset
    - Safety temperature monitor, mechanical, no auto reset

Unit dimensions and weight:
Width: 1200 mm
Height: 2300 mm (including brackets to secure the unit to a wall)
Depth: 600 mm
Footprint: 0.72 m²
Weight: approx. 360 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_2-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_2 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

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. Control panels provided by others have to be integrated with the bus

Digital control panels for surface mounting:
For operation and adjustment of the ventilation units.

- Supplied loose as an accessory. Connection to the master via Modbus serial line. Project-specific software including setpoint value adjuster, various status displays, selector switch, CO_2 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: Surface mounting or on a standard flush box. Supply voltage: 24 V DC. Power consumption: 3.2 VA/1.3 W. Other design frames are available upon request and for a surcharge.

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

- Supplied loose as an accessory, with room temperature sensor, setpoint adjuster (blue or white), override button, LED and 3-step switch as well as switches for Off and Automatic, for mounting on a 60 mm flush box or for surface mounting, NTC thermistor as sensor, resistance 20 kΩ at 25 °C, dimensions (B × H × T): 99 x 104 x 30 mm, operating temperature: 6 to 40 °C

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

- Supplied loose as an accessory, with room temperature sensor, setpoint adjuster, override button, LED and 3-step switch as well as switches for Off and Automatic, casing made of PVC0, pure white (RAL 9010), for mounting on a 60 mm flush box or for surface mounting, NTC thermistor as sensor, resistance 20 kΩ at 25 °C, dimensions (B × H × T): 84.5 × 84.5 × 25 mm, operating temperature: -35 to 70 °C

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

- Supplied loose as an accessory, with mode display, push button and setpoint adjuster, sensor NTC 10 kΩ, protection level: IP 20, surface mounting or on a 70 mm flush box, dimensions (B × H × T) 84 × 116 × 24 mm, light grey/white

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

- Supplied loose as an accessory, with mode display, push button and setpoint adjuster, NTC thermistor as sensor, 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 an accessory, room temperature sensor without any control elements, measuring range -35 to 70 °C, NTC thermistor as sensor, 20 kΩ, screw terminal, d = 1.5 mm, protection level IP 20, surface mounting or on a 70 mm flush box, dimensions (B × H × T): 85 × 85 × 30 mm, casing made of ABS, 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 an accessory, with mode display, push button and setpoint adjuster, NTC sensor 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 an accessory, with mode display, push button and setpoint adjuster, NTC sensor 20 kΩ, protection level: IP 20

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

- Supplied loose as an accessory, with mode display, push button and setpoint adjuster, NTC sensor 20 kΩ, protection level: IP 20

Other 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 an accessory, with mode display and push button, NTC sensor 20 kΩ, protection level: IP 20

Other switch programmes on request

Interface for establishing a connection to a central BMS (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-S – HV – 0 – EH – 0 / 1200 × 2300 × 600 / 0 – 0 / C3 / MA – T / MR / C / Z / A
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

1 Type
SCHOOLAIR-S floor-standing ventilation unit

2 Variant
HV for high volume flow rates, with rotary heat exchanger for heat recovery

3 Heat recovery
0 as standard

4 Heat exchanger
EH with electric air heater

5 Construction
0 as standard

6 Nominal size [mm]
Width × height × depth
1200 × 2300 × 600

7 Surface – casing
0 RAL 9010, pure white, GU 30
P1 RAL 7012 (basalt grey), GU 30 or alternatively RAL CLASSIC at choice, GU 30

8 Surface – plinth and trim frame (top)
0 RAL 7012 (basalt grey), GU 30
P2 RAL 9010 (pure white), GU 30, or alternatively any other RAL CLASSIC color, GU 30

9 Control system
OR without control system
C3 with FSL-CONTROL III

10 Control function
MA Master
SL Slave

11 Real time clock
Only with control function MA
0 without real time clock
T with real time clock

12 Interface
0 without interface
MT with Modbus TCP
MR with Modbus RTU
BI with BACnet IP
BM with BACnet MS/TP

13 Air quality sensor
Only with control function MA
0 without air quality sensor
C with CO_2 sensor
V with VOC sensor

14 Supply air temperature sensor
Z with supply air temperature sensor

15 Outdoor air temperature sensor
Only with control function MA
0 without outdoor air temperature sensor
A with outdoor air temperature sensor

Order example: SCHOOLAIR-S-HV-0-EH/1200×2300×600/0/0/C3/MA-T/C/Z/A

S	floor-standing ventilation unit
HV	for high volume flow rates, with rotary heat exchanger for heat recovery
EH	with electric air heater
0	casing powder-coated RAL 9010
0	plinth and trim frame powder-coated RAL 7012
C3	with FSL-CONTROL III
MA	Master
T	with real time clock
C	with CO_2 sensor
Z	with supply air temperature sensor
A	with outdoor air temperature sensor

Order example: SCHOOLAIR-S-HV-0-EH/1200×2300×600/P1/P2/C3/MA-T/MT/C/Z/A

S	floor-standing ventilation unit
HV	for high volume flow rates, with rotary heat exchanger for heat recovery
EH	with electric air heater
P1	casing powder-coated RAL 7012
P2	plinth and trim frame powder-coated RAL 9010
C3	with FSL-CONTROL III
MA	Master construction
T	with real time clock
MT	with Modbus TCP interface
C	with CO_2 sensor
Z	with supply air temperature sensor
A	with outdoor air temperature sensor

Variants

SCHOOLAIR-S-HV, colour variants

- Other surface finishes

Dimensions


825
187
Ø250
190
Ø250
631
334
□400
1168
2300
909
987
45
40
400
1200
600

Product details

Installation and commissioning

- Floor-standing installation
- Level adjustment using the 4 feet (±10 mm)
- 2 adjustable brackets at the top are intended to screw-fix the unit to the wall and prevent it from tilting
- Connection to the outdoor air and exhaust air openings (by others) with circular spigots (250 mm) with lip seal
- Outdoor air and exhaust air connections are provided by two 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 outdoor air and exhaust air openings to be provided by others
- Free area of ventilation openings: 0.10 m² each
- Depending on the installation situation it may be necessary to fit a suitable partition between the outdoor air and exhaust air ducts.
- Installation and connections to be performed by others; fixing, connection and sealing material to be provided by others
- The electrical connection is at the top on the left-hand side of the unit when seen from the room