Hoval

Indoor Climate Systems

TopVent® TW Pro

Design, installation and operation

Air curtain

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1 Use

1.1 Intended use

TopVent® TW Pro units are air curtains for protecting entrance areas against the cold. They have the following functions:

- Heating (with connection to a hot water supply)
  (only TopVent® TW Pro 150-1, 200-1, 150-2, 200-2)
- Recirculation operation
- Air distribution via outlet grid

Intended use also includes compliance with the operating instructions. Any usage over and above this use is considered to be not as intended. The manufacturer can accept no liability for damage resulting from improper use.

1.2 User group

The units are only allowed to be installed, operated and maintained by authorised and instructed personnel who are well acquainted with the units and are informed about possible dangers.

The operating instructions are for operating engineers as well as specialists in building, heating and ventilation technology.

2 Safety

2.1 Symbols

Caution
This symbol warns against risk of injury. Please heed all instructions designated by this symbol to prevent injuries and/or death.

Attention
This symbol warns against property damage. Please heed the respective instructions to prevent risk of damage to the unit and its functions.

Notice
This symbol denotes information about the economic use of the equipment or special tips.

2.2 Operational safety

TopVent® units are state-of-the-art and safe to operate. All control and safety valves are checked at the factory. Nevertheless, hazards may emanate from the units if they are used incorrectly or not used as intended. Therefore:

- The unit may only be installed, operated and serviced by authorised, trained and instructed skilled personnel:
  - Specialists as defined by these operating instructions are those persons who, based on their training, knowledge and experience as well as their knowledge of the relevant regulations and guidelines, can carry out the work assigned to them and recognise potential hazards.
- Please read the operating instructions before unpacking, installing, commissioning and before maintaining the equipment.
- Store the operating instructions so that they are easily accessible.
- Observe any attached information and warning signs.
- Immediately replace damaged or removed informational and warning signs.
- Follow the local safety and accident prevention regulations at all times.
- Observe the particular dangers involved when working on electrical systems.
- When working on the unit, objects (e.g. tools) could be dropped. Block off the area underneath the unit.
- Do not attach additional loads to the unit.
- When working in the unit, take precautions against unprotected, sharp metal edges.
- Observe the dangers involved when working on the hot water supply.
- Wear suitable protective equipment (helmet, gloves, mouth protection, goggles).
- Replacement parts must comply with the technical requirements of the system manufacturer. Hoval recommends the use of original spare parts.
- Unauthorised reconfiguration or modification of the unit is not permitted.
- Shut down the unit immediately, if any defects are ascertained that limit the operational safety.
- Disconnect the power supply and wait at least 5 minutes before opening the unit.

3 Construction and operation

The TopVent® TW Pro serves as an air curtain to protect entrance areas against the cold. The unit is installed over or next to the door. It takes in room air, heats it by means of the heating coil (depending on the unit type) and blows it back into the room at a high speed. This creates a barrier of flowing air, which protects the indoor climate from external influences.

There are 2 unit sizes in 3 different designs each:

Unit size	TW Pro 150	TW Pro 200
without heating coil	TW Pro 150-0	TW Pro 200-0
with single-row heating coil	TW Pro 150-1	TW Pro 200-1
with double-row heating coil	TW Pro 150-2	TW Pro 200-2

Table 1: Available unit types

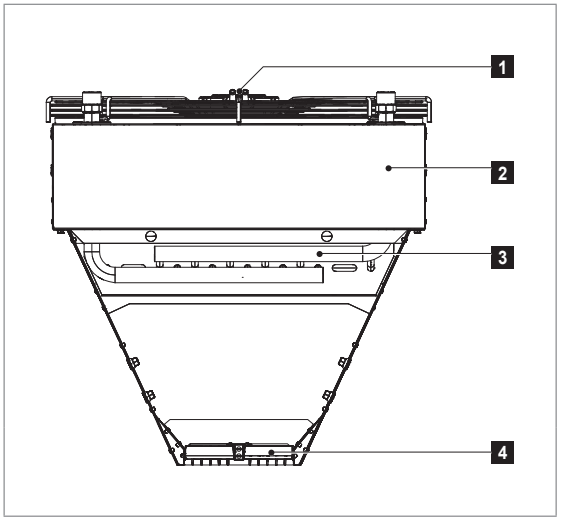
Fig. 1: TopVent TW Pro 150

Fig. 2: TopVent TW Pro 200

3.1 Unit construction

The TopVent® TW Pro consists of the following components:

- Axial fan with energy-saving EC motor, infinitely variable, maintenance-free and quiet with a high degree of efficiency
- Heating coil consisting of copper tubes with aluminium fins
- Compact casing made of galvanised sheet steel
- Outlet grid



1	Fan
2	Casing
3	Heating coil
4	Outlet grid

Fig. 3: Components

3.2 Operating modes

Operating modes with EasyTronic EC

The EasyTronic EC is a room temperature controller with a timer. A maximum of 12 fans can be connected to 1 controller:
→ 6 TopVent® TW Pro 150 units
→ 4 TopVent® TW Pro 200 units

Function
- Recording the room temperature with the integrated temperature sensor
  - Optional: Recording the room temperature with the external temperature sensor
- Room temperature control in on/off mode: If the room temperature falls below the setpoint value, the connected TopVent® units switch on. Upon reaching the setpoint value, the units switch off again.
- Lowering of the room temperature setpoint value via week programme
- Controlling the TopVent® units using a door contact switch: The connected units are switched on via door contact if the door is open (digital input).
- Adjusting the fan speed: The required speed can be infinitely adjusted.
- Pump or valve control: The EasyTronic EC provides a signal for switching a pump or a valve (digital output).
- Alarm display
- Connection to the building management system via Modbus RTU

Fig. 4: EasyTronic EC room temperature controller

EasyTronic EC	
Power supply	110…230 VAC, ±10%, 50/60 Hz
Power consumption	max. 1.3 W
Temperature range	0...50 °C
Dimensions (W x H x D)	128 × 80 × 56 mm
Protection rating	IP 30, class 2
Installation	In a flush-mounted box (spacing between mounting holes 83.5 mm) or on the supplied base

Table 2: EasyTronic EC technical data

Room temperature sensor ET-R	
Temperature range	-30...+70 °C
Dimensions (W x H x D)	93 × 70 × 46 mm
Protection rating	IP 65
Installation	In plastic casing for wall mounting

Table 3: Room temperature sensor ET-R technical data

Operating modes with EasyTronic TV

The EasyTronic TV is a room temperature controller without a timer. A maximum of 12 fans can be connected to 1 controller:
→ 6 TopVent® TW Pro 150 units
→ 4 TopVent® TW Pro 200 units

Function
- Recording the room temperature with the integrated temperature sensor
- Room temperature control in on/off mode: If the room temperature falls below the setpoint value, the connected TopVent® units switch on. Upon reaching the setpoint value, the units switch off again.
- Adjusting the fan speed: The required speed can be infinitely adjusted.

Fig. 5: EasyTronic TV room temperature controller

EasyTronic TV	
Power supply	230 VAC, ±10%, 50 Hz
Working temperature	0...60 °C
Temperature control range	5...30 °C
Dimensions (W x H x D)	99 × 96 × 43 mm
Casing material	ABS
Protection rating	IP 30
Installation	Wall mounting (surface mounting)

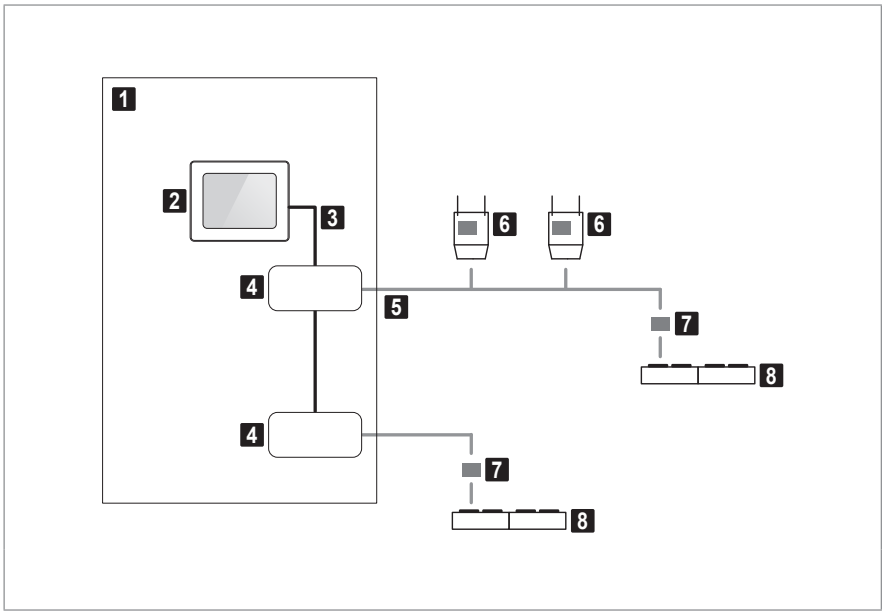
Table 4: Technical data EasyTronic TV

Operating modes with TopTronic® C

In applications where TopVent® TW Pro units are installed together with other Hoval indoor climate units, the control of the air curtains can be integrated into the Hoval TopTronic® C control system. The air curtains can be controlled in a separate control zone or combined with other Hoval indoor climate units in one control zone and support the room heating in recirculation mode.

Please note the following:

- A TW Pro control box is required to control the TopVent® TW Pro units. This is available as an option for the zone control panel. It is supplied loose for on-site installation near the door and connection of the door contact switch.
- A maximum of 9 fans can be connected to 1 TW Pro control box:
  → 4 TopVent® TW Pro 150 units
  → 3 TopVent® TW Pro 200 units
- If several air curtains on different doors are controlled with 1 TW Pro control box, the door contacts must be connected in parallel.
- As an option, the power supply for the TopVent® Pro units can also be integrated into the zone control panel.



1	Zone control panel
2	System operator terminal C-ST
3	System bus
4	Zone controller
5	Zone bus
6	Recirculation units with unit controller
7	Control box TW Pro
8	TopVent® TW Pro

Fig. 6: System structure

4 Technical data

4.1 Type code

TW Pro - 200 - 1

Unit type
TopVent® TW Pro

Unit size
150 or 200

Heating coil
0 without
1 with single-row heating coil
2 with double-row heating coil

Table 5: Type code

4.2 Application limits

Maximum operating pressure	1600	kPa
Maximum heating medium temperature	130	°C
Maximum supply air temperature	60	°C
Maximum extract air temperature	50	°C
The units cannot be used in: ■ areas where there is danger of explosion ■ Places with a corrosive or aggressive environment ■ Damp locations ■ Spaces with a large amount of dust		

Table 6: Application limits

4.3 Electrical connection

Unit type		150-0	200-0	150-1	200-1	150-2	200-2
Power consumption	kW	2 × 0.25	3 × 0.25	2 × 0.25	3 × 0.25	2 × 0.25	3 × 0.25
Current consumption	A	2 × 1.30	3 × 1.30	2 × 1.30	3 × 1.30	2 × 1.30	3 × 1.30
Supply voltage	V AC	230		230		230	
Frequency	Hz	50		50		50	

Table 7: Electrical connection

4.4 Air flow rate

Unit type		150-0	200-0	150-1	200-1	150-2	200-2
Maximum air flow rate	m³/h	8500	12800	7900	11900	7300	10700
Maximum reach	m	8.0		7.5		7.0	
Airflow width	m	1.5	2.0	1.5	2.0	1.5	2.0

Table 8: Air flow rate

4.5 Heat output

Temperature of the heating medium		80/60 °C				60/40 °C			
Unit type	t_{room}	Q	t_S	Δp_W	m_W	Q	t_S	Δp_W	m_W
	°C	kW	°C	kPa	l/h	kW	°C	kPa	l/h
150-1	15	21.2	22.8	6.6	900	11.8	19.3	2.40	500
	20	19.0	27.1	5.4	800	9.4	23.5	1.63	400
200-1	15	31.4	22.7	16.6	1400	18.2	19.4	6.60	800
	20	28.2	27.0	13.7	1200	14.9	23.7	4.63	600
150-2	15	37.8	30.0	9.0	1700	21.3	23.5	3.30	900
	20	33.9	33.7	7.3	1500	17.2	27.0	2.20	700
200-2	15	58.0	30.8	22.6	2500	34.0	24.2	8.90	1500
	20	52.1	34.4	18.6	2300	28.0	27.7	6.22	1200

Legend:
t_{room} = Room air temperature
Q = Heat output
t_S = Supply air temperature
Δp_W = Water pressure drop
m_W = Water quantity

Table 9: Heat output

4.6 Sound level

Type		150-0	200-0	150-1	200-1	150-2	200-2
Sound pressure level [1]	dB(A)	65	66	64	65	62	63
Total sound power level	dB(A)	87	88	86	87	84	85

1) Reference: semi-open space, horizontal installation, measurement performed 5 m away from the unit

Table 10: Sound level

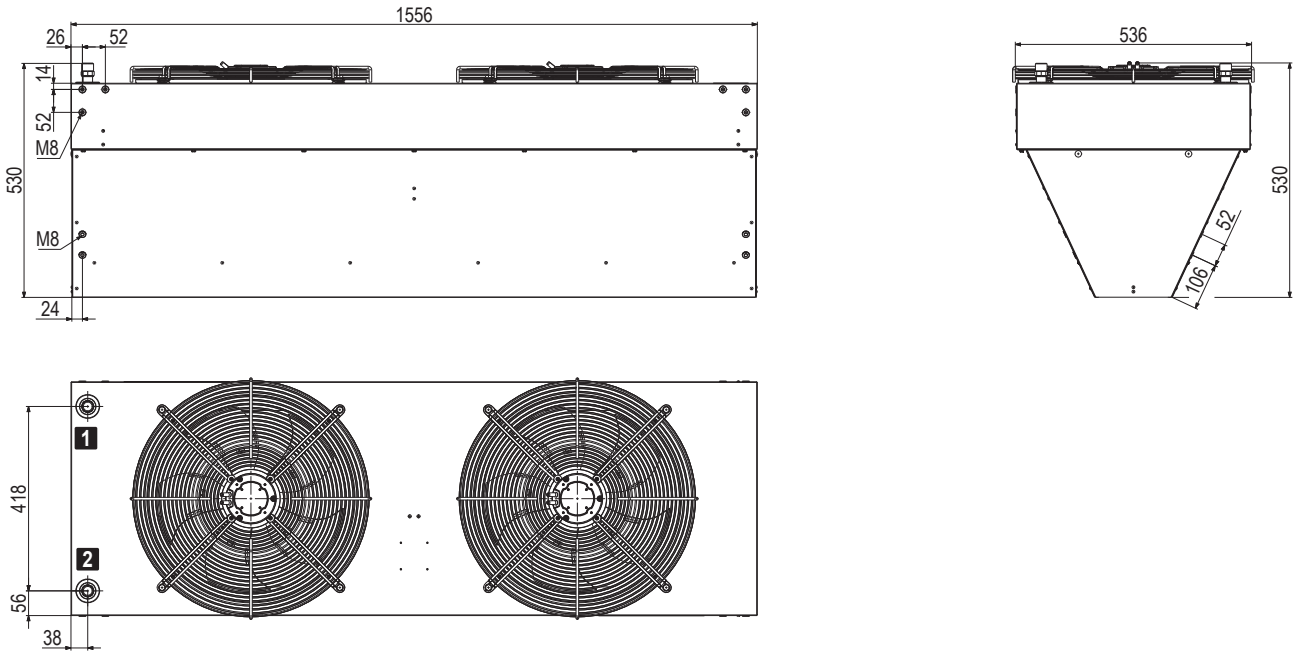
4.7 Specification text

TopVent® TW Pro – Air curtain

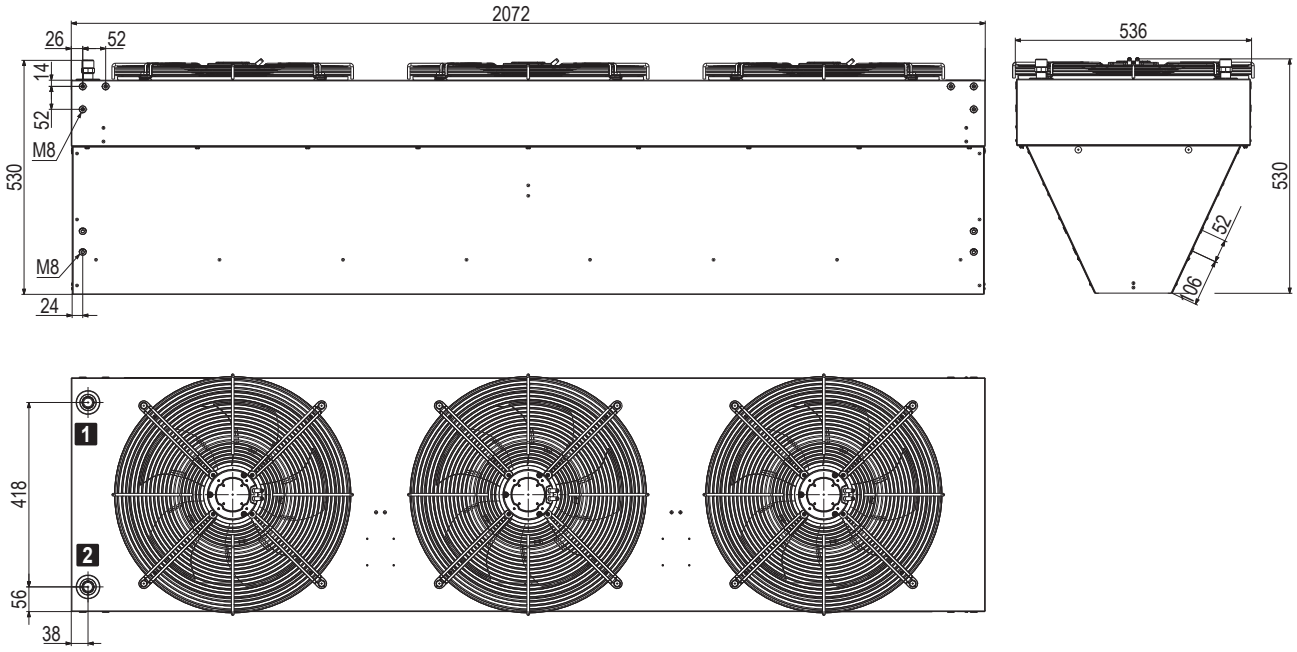
Sturdy casing made of galvanised sheet steel, heat exchanger consisting of copper tubes and aluminium fins; axial fan wit highly efficient EC motor, infinitely variable, maintenance-free and quiet, protection rating IP 54, insulation class F, surface-mounted connection box for connecting the power supply and fan control; including mounting material (4 mounting brackets, 2 flat connectors, 12 M8 threaded bolts).
On site: M8 threaded rod for horizontal or vertical installation of the unit with a minimum distance of 0.4 m to the ceiling or wall.

4.8 Dimensions and weights

TopVent® TW Pro 150



TopVent® TW Pro 200



1 Flow
2 Return

Unit type		150-0	200-0	150-1	200-1	150-2	200-2
Water content of the coil	l	–	–	1.6	2.0	2.8	3.9
Connection (external thread)	"	–	–	R ¾	R ¾	R ¾	R ¾
Weight	kg	43.4	58.3	50.5	66.1	53.6	69.6

Table 11: Dimensions and weights

5 Transport and installation

Caution
Risk of injury from incorrect handling. Transport, assembly and installation work may only be performed by specialists. Observe safety and accident prevention regulations.

5.1 Delivery

TopVent® TW Pro units are packed in cardboard boxes and delivered on a pallet.

- The scope of delivery includes:
  - Topvent® TW Pro unit
  - Mounting material (4 mounting brackets, 2 flat connectors, 12 threaded bolts M8)
- Ensure that the unit is undamaged.
- Report any missing parts, wrong deliveries and possible transport damage immediately in writing.

5.2 Requirements for the installation site

- Position the units over or next to the door. The air flow must cover the entire door width/height.
- The minimum distance to the ceiling or the wall is 0.4 m.
- All air inlet and air outlet openings must be freely accessible.

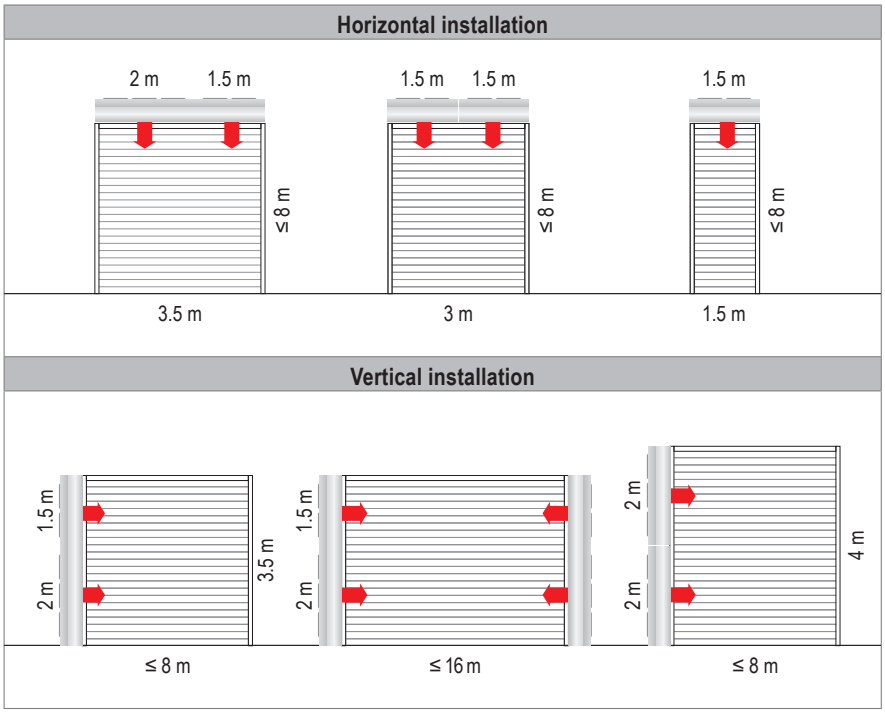


Fig. 7: Examples of horizontal and vertical installation

5.3 Installation

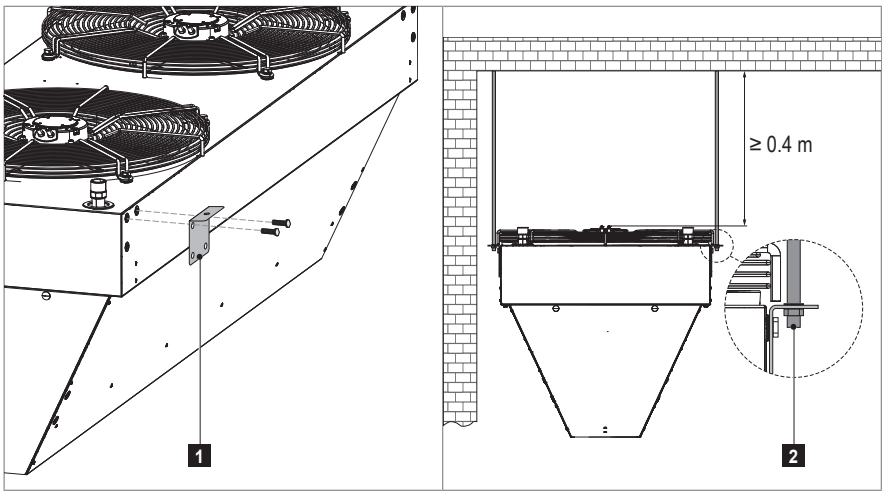
Caution
Risk of injury caused by falling load and improper handling. During installation:
– Wear protective equipment (safety helmet, safety goggles, safety shoes).
– Do not stand under suspended loads.
– Use a forklift with sufficient load-bearing capacity.

Preparation

- Make sure that the following items are on hand for the assembly:
  – Installation platform
  – Threaded rods for mounting the unit

Horizontal installation

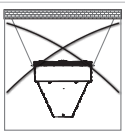
- Fit the 4 mounting brackets 1 to the corners of the unit using 2 M8 bolts each.
- Mount the unit to the ceiling using 4 threaded rods 2.
  – The minimum distance to the ceiling is 0.4 m.



1 Mounting bracket
2 Threaded rod

Fig. 8: Horizontal installation

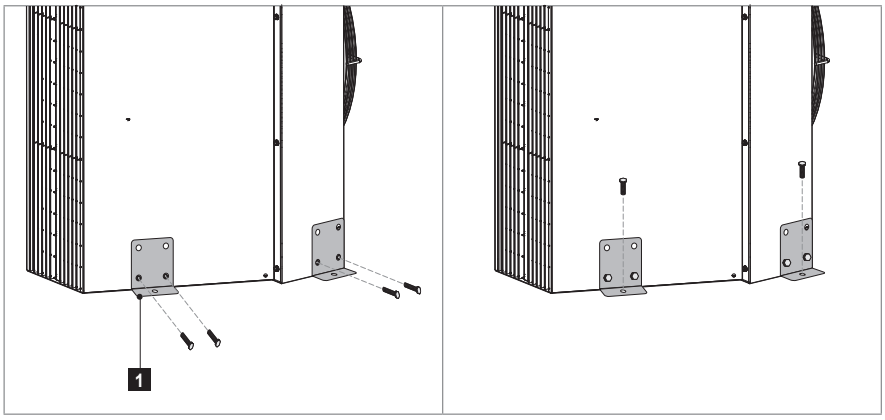
Notice
Hang the unit vertically. Sloping suspensions are not permitted.



Vertical installation

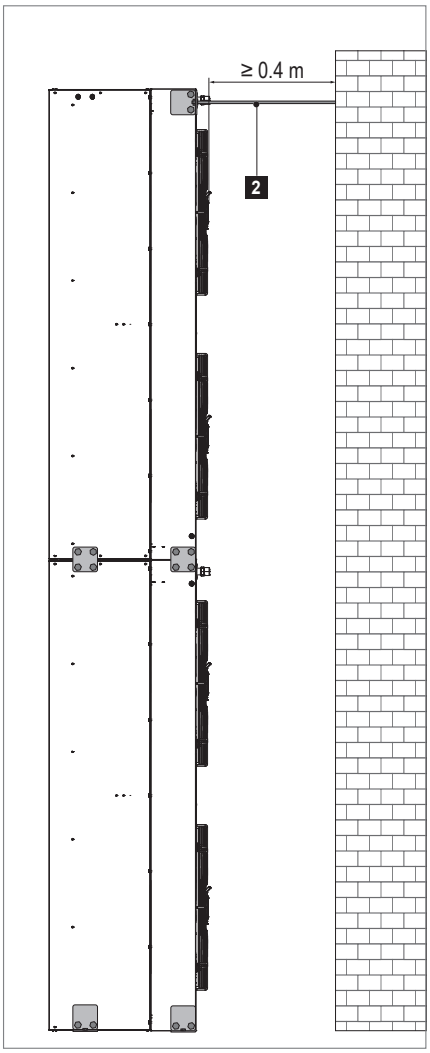
Notice
When installing TopVent® TW Pro units with heating coil vertically, position them so that the coil connections are at the top.

- Fit 4 mounting brackets **1** to the bottom of the unit as shown in Fig. 10.
  - Direct the mounting brackets towards the floor.
  - Fasten each mounting bracket with 2 M8 bolts.
- Fasten the unit to the floor with screws and washers.
- Attach the unit to the wall using 2 mounting brackets and 2 threaded rods **2**.
  - The minimum distance to the wall is 0.4 m.



1 Mounting bracket

Fig. 10: Attaching the unit to the floor



2 Threaded rod

Fig. 9: Attaching the unit to the wall

When mounting several units on top of each other:

- Connect the units to each other as shown in Fig. 11:
  - Use the enclosed flat connectors and M8 bolts.
- Attach the uppermost unit to the wall.

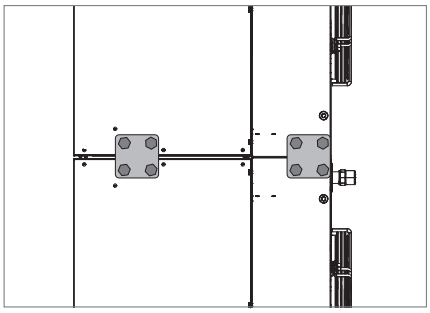
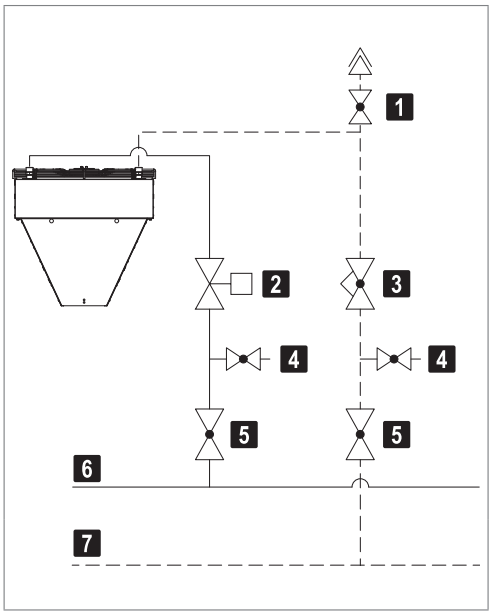


Fig. 11: Connecting units

5.4 Hydraulic installation

- Connect the heating coil according to the hydraulic circuit diagram.
- Depending on local conditions, check whether compensators for linear expansion are required for the supply and return lines and/or articulated connections are required for the units.
- Insulate the hydraulic lines.
- Hydraulically balance the pipework for the the individual units within a control zone to ensure even distribution.

Attention
Danger of damaging the units. Do not fasten any loads to the coil, e.g. by means of the flow or return lines.



1	Air vent with shut-off
2	Control valve
3	Balancing valve
4	Drain valves
5	Shut-off valves
6	Flow
7	Return

Fig. 12: Connecting the heating coil

Requirements for mixing valves for control with TopTronic® C

- Use 3-way mixing valves with the following flow characteristics:
  - Equal percentage control path
  - Linear bypass
- The valve authority must be ≥ 0.5.
- The maximum run time of the valve actuator is 45 s.
- The valve actuator must be continuous, i.e. the stroke changes in proportion to the control voltage (0…10 VDC or 2…10 VDC).
- The valve actuator must be designed with a position response (0...10 VDC or 2…10 VDC).
- The maximum power consumption is 20 VA.

5.5 Electrical installation

Caution
Danger of electric shocks. The electrical installation must only be carried out by a qualified electrician.

Please note the following:
- Observe all relevant regulations.
- Choose the dimensions of the cable cross sections in line with the applicable regulations.
- Route the signal lines separately from the supply lines.
- Secure all connections against working loose.
- Carry out the electrical installation according to the wiring diagram.
- Provide overload and short circuit protection on site.

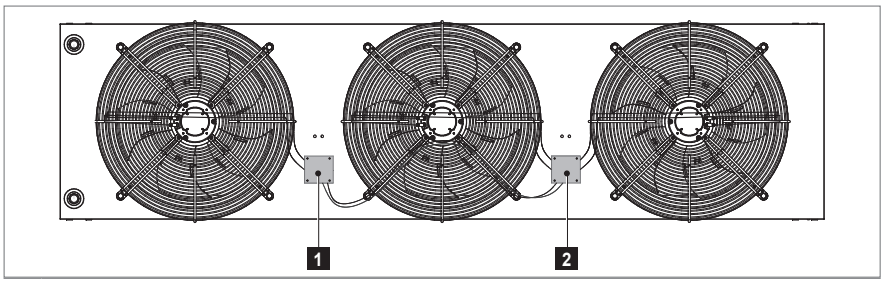
Unit type	TW Pro 150	TW Pro 200
Overload and short circuit protection	C6 / 6 kA	C10 / 6 kA
Residual current circuit breaker	$I_{\Delta n}$ = 30 mA type AC or A	$I_{\Delta n}$ = 30 mA type AC or A
	I_n = 16 A	I_n = 16 A

Table 12: Recommended safety devices

Proceed as follows:
- Unscrew the cover of the connection box on the housing.

Notice
There are 2 connection boxes on TopVent® TW Pro size 200 units. The sealed connection box must not be opened!

- Connect the power supply and the fan control.
- Remount the cover.



1 Connection box for electrical connection
2 Sealed connection box

Fig. 13: TopVent® TW Pro 200 connection boxes

- Options for EasyTronic EC:
  - Wire the external room temperature sensor to the EasyTronic EC.
  - Wire the door contact to the EasyTronic EC.
  - Wire the pump/valve control to the EasyTronic EC.
  - Wire the building management system to the EasyTronic EC.

Designation	Voltage	Cable	Comments
Power supply TopVent® TW Pro	1 × 230 VAC	NYM 3 × 1.5 mm² (min.)	
Power supply EasyTronic EC / TV	1 × 230 VAC	NYM 2 × 1.5 mm² (min.)	
Fan control	0-10 VDC	LiYCY 2 × 0.75 mm²	shielded
External room temperature sensor		J-Y(ST)Y 2 × 2 × 0.8 mm	shielded, max. 30 m length
Door contact	24 VDC	NYM 2 × 1.0 mm²	
Pump / Valve control	Volt-free	NYM ... × 1.5 mm² (min.)	max. 3 A
	max. 230 VAC		
	max. 24 VDC		
Modbus RTU		J-Y(ST)Y 2 × 2 × 0.8 mm	max. 300 m length

Table 13: Cable list for on-site connections with EasyTronic EC / TV

Designation	Voltage	Cable	Comments	Start	Target
Power supply	1 × 230 VAC	NYM 3 × 1.5 mm² (min.)		Zone control panel or on-site	Control box TW Pro
	1 × 230 VAC	NYM 3 × 1.5 mm² (min.)		Control box TW Pro	TopVent® unit
Zone bus		J-Y(ST)Y 2 × 2 × 0.8 mm	max. 500 m length	Zone control panel	Control box TW Pro
Fan control	0-10 VDC	LiYCY 2 × 0.75 mm²	shielded	Control box TW Pro	TopVent® unit
Door contact	Volt-free	J-Y(ST)Y 1 × 2 × 0.8 mm	max. 1 A	On-site	Control box TW Pro
Mixing valve heating	24 VAC	NYM-O 4 × 0.75 mm²		Control box TW Pro	Valve

Table 14: Cable list for on-site connections with TopTronic® C

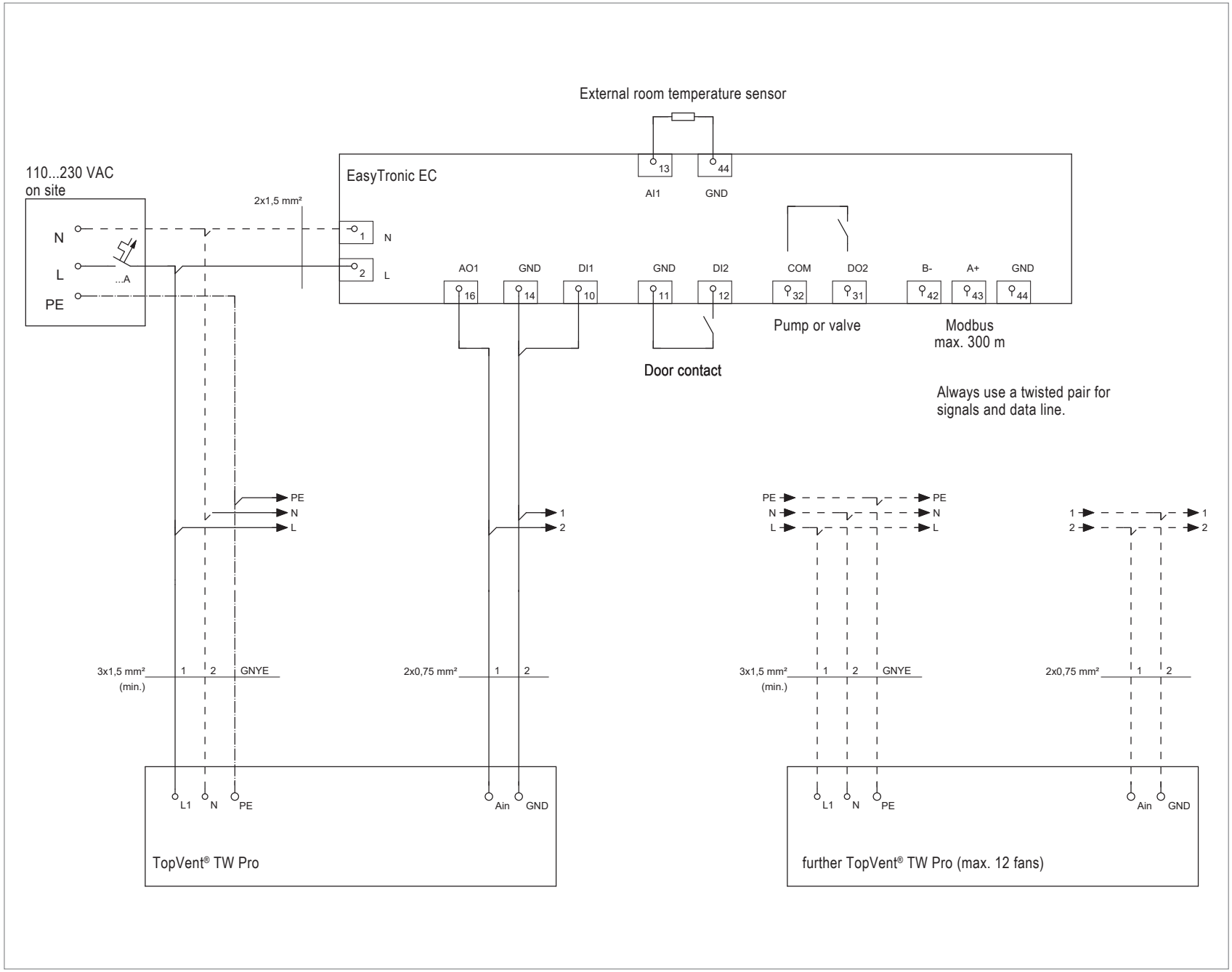


Fig. 14: Wiring diagram TopVent® TW Pro with EasyTronic EC

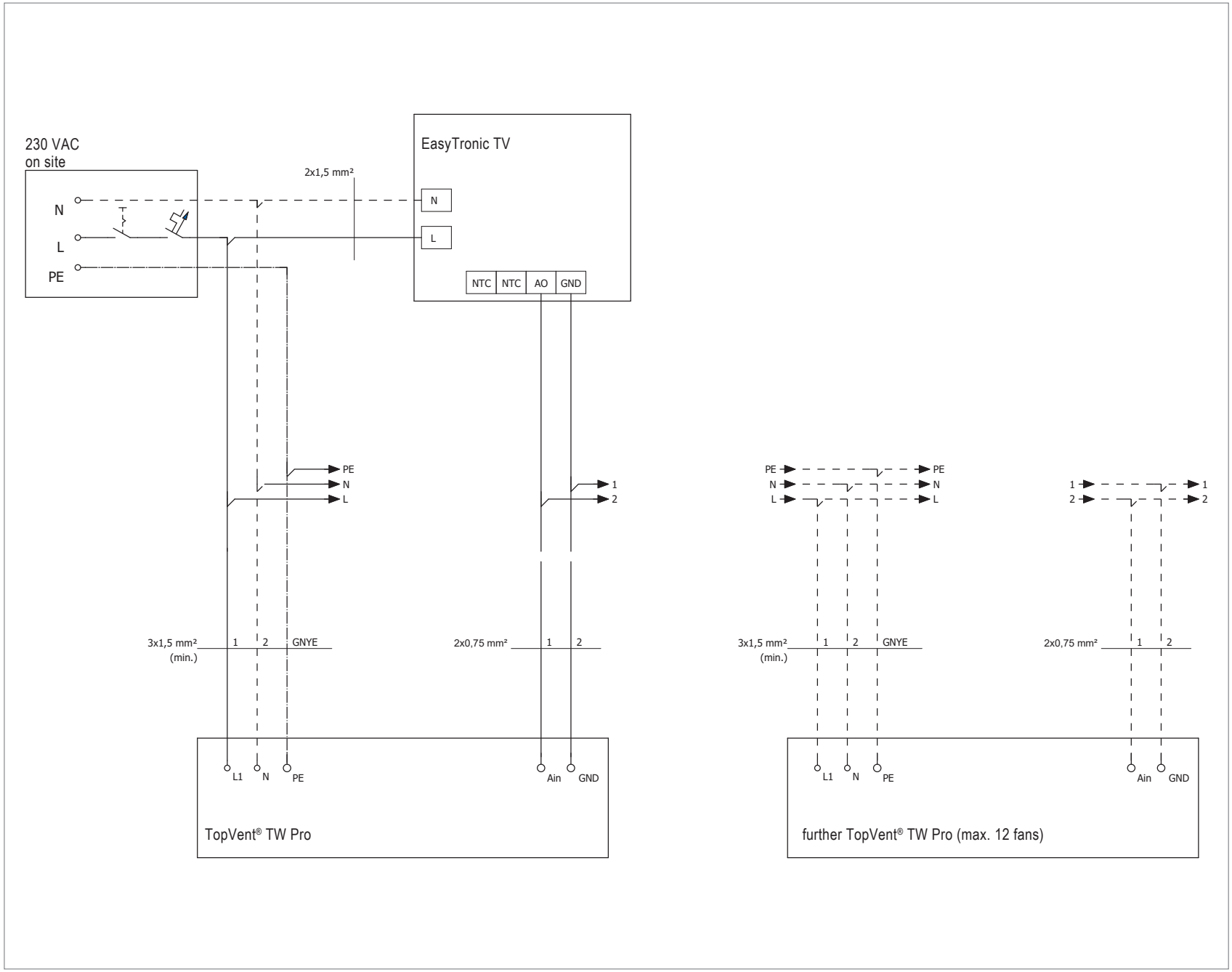


Fig. 15: Wiring diagram TopVent® TW Pro with EasyTronic TV

Installation EasyTronic EC

- Follow the installation instructions included.

Installation EasyTronic TV

- Install the room temperature controller:
  - In the occupied area, at a height of about 1.5 m
  - Not near sources of heat or cold (windows, doors, machines, etc.)
  - Protected from sunlight
- Detach the casing base (e.g. using a screw driver).
- Break through the casing base along the perforation.
- Insert the cables through this opening.
- Connect the cables to the connectors.
- Screw the base onto a flush-mounted box (60 × 60 mm).
- Place the device on the base.
- Set the slide switch to the 'A+T' position.

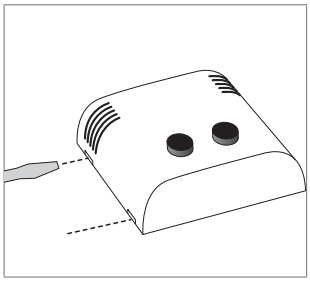


Fig. 16: Opening the casing

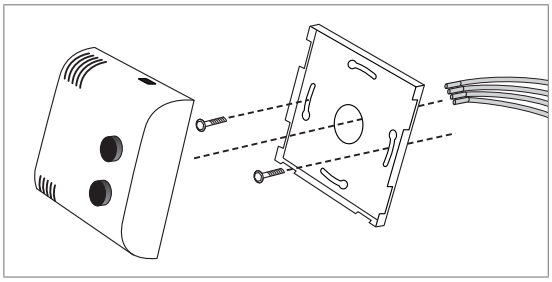


Fig. 17: Installing the EasyTronic TV

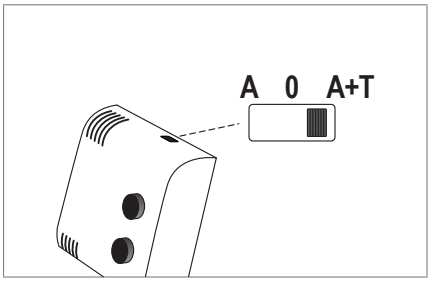


Fig. 18: Position of the slide switch

6 Operation

6.1 Initial commissioning

Attention
Risk of damage to property as a result of performing initial commissioning on your own authority. Initial commissioning must be performed by the manufacturer's customer service technicians.

Preparing for initial commissioning:
Checklist:
- Have all the media connections been made (electric cabling and water piping)?
- Is the heating medium available?
- Are the hydraulics aligned and balanced?
- Are all the control components installed and wired?
- Are all of the respective trade groups (installer, electrician, etc.) present at the scheduled time?
- Are the system operating personnel present for training at the scheduled time?

6.2 Operation

The system runs automatically.
- Observe the operating instructions for the control system.
- Ensure free air outlet.

7 Maintenance and repair

Caution
Risk of injury from incorrect work. Maintenance work must be carried out by trained personnel.

7.1 Safety

Before performing any work on the unit:
- Turn the on-site main switch to the 'Off' position and secure it against being switched back on.
- Wait at least 5 minutes after switching the unit off.

Caution
The use of condensers can pose a danger of fatal injury from directly touching live parts even after the unit is switched off. Only open the unit after waiting 5 minutes.

- Observe the accident prevention regulations.
- Observe the particular dangers involved when working on electrical systems.
- When working in the unit, take precautions against unprotected, sharp metal edges.
- Immediately replace damaged or removed informational and warning signs.
- Following maintenance work, professionally reassemble all dismantled protective devices.

7.2 Maintenance

Maintenance schedule

Activity	Interval
Cleaning the heat exchanger	If required, at least once per year before the heating season
Check function	1 x per year

Cleaning the heat exchanger
- Carefully clean the heat exchanger with compressed air.
  - Dismantle the air inlet grille for cleaning.
  - Ensure that you do not damage the fins.

7.3 Repair

If repairs are necessary, contact the manufacturer's customer service department.

8 Dismantling

Caution
Risk of injury caused by falling load and improper handling.
– Wear protective equipment (fall protection, safety helmet, safety shoes).
– Do not stand under suspended loads.

- Disconnect the power supply to the unit.
- Wait at least 5 minutes after switching the unit off.

Caution
The use of condensers can pose a danger of fatal injury from directly touching live parts even after the unit is switched off. Only open the unit after waiting 5 minutes.

- Drain the heating medium circuit.
- Dismantle all media connections.
- Disconnect the unit from any fastenings.
- Remove the unit.

9 Disposal

- Recycle metal components.
- Recycle plastic parts.
- Dispose of electric and electronic parts via hazardous waste.
- If required, dispose of oil-fouled parts in accordance with local regulations.

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Hoval

Hoval is one of the leading international companies for heating and indoor climate solutions. Drawing on more than 75 years of experience and benefiting from a close-knit team culture, the Hoval Group delivers exciting solutions and develops technically superior products. This leadership role requires a sense of responsibility for energy and the environment, which is expressed in an intelligent combination of different heating technologies and customised indoor climate solutions.

Hoval also provides personal consultations and comprehensive customer service. With around 2500 employees in 15 companies around the world, Hoval sees itself not as a conglomerate, but as a large family that thinks and acts globally.
Hoval heating and indoor climate solutions are currently exported to more than 50 countries.

Responsibility for energy and environment

Your Hoval partner

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