



# Vallox 150 EFFECT SE

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**VALLOX 150 Effect SE**

## DIGIT SED ELECTRONIC CONTROLLER WITH LCD DISPLAY



**VALLOX 150 Effect SE MLV**

### MODELS:

VALLOX 150 Effect SE L  
VALLOX 150 Effect SE R  
VALLOX 150 Effect SE MLV L  
VALLOX 150 Effect SE MLV R

- Supply and extract air ventilation with heat recovery
- Silent operation
- Energy-efficient unit; high-efficiency cross-counter flow heat recovery cell and integrated direct current fans
- Electronic DIGIT SED control
- Week clock control as a Standard feature
- Humidity control (Option)
- Carbon dioxide control (Option)
- Maintenance reminder
- Summer / winter automation
- Fireplace / booster switch function at the controller
- Good filtering
- Fixed air flow measurement outlets
- The MLV model is especially designed for use with ground heat systems.
- Silencing unit (option)

Electrical connection	230 V, 50 Hz, ≈ 5.92 A	
Class of protection	IP 34	
Fans	Extract air 0.175 kW 0.76 A	146 dm <sup>3</sup> /s (100 Pa)
	Supply air 0.175 kW 0.76 A	130 dm <sup>3</sup> /s (100 Pa)
Heat recovery	Cross-counter flow cell, $\eta > 80\%$	
Heat recovery bypass	Summer / winter automation	
<b>VALLOX 150 Effect SE</b>	10,3 A	
Preheating unit (Standard)	Electric, 1000 W	
Post-heating unit (Option)	Electric, 1000 W or VKL water radiator	
<b>VALLOX 150 Effect SE MLV</b>	5,92 A	
Preheating unit (Standard)	MLV heating / cooling radiator unit	
Post-heating unit (Option)	VKL water radiator or electric 1000 W	
Filters	Supply air	G4 and F7
	Extract air	G4
Weight	102 kg	
Ventilation adjustment Options	<ul style="list-style-type: none"> <li>- control via control panel</li> <li>- week clock control</li> <li>- CO<sub>2</sub> and %RH control (Option)</li> </ul>	
Options	<ul style="list-style-type: none"> <li>- CO<sub>2</sub> sensor</li> <li>- %RH sensor</li> <li>- filter guard (supply and/or extract air)</li> <li>- LON converter</li> <li>- Postheating VKL water radiator for MLV-model</li> <li>- Electric post-heating unit for MLV unit</li> <li>- Silencer element</li> </ul>	

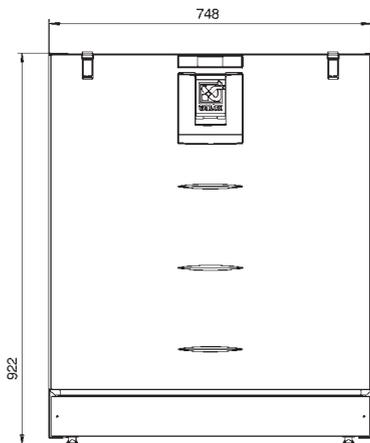
**TECHNICAL SPECIFICATION**



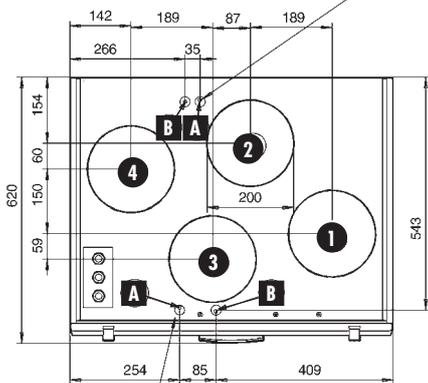
# VALLOX 150 Effect SE

## DIMENSIONS AND MAIN PARTS

### Dimensions and duct outlets

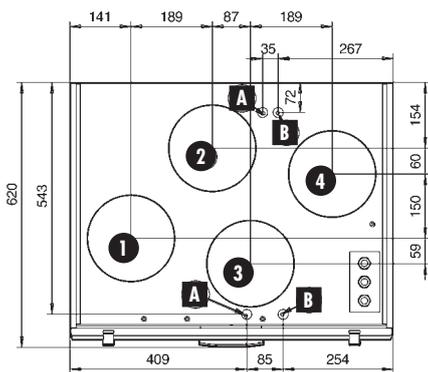


MLV radiator (liquid-circulating preheating) lead-throughs



### Model R

VKL radiator (liquid-circulating post-heating) lead-throughs

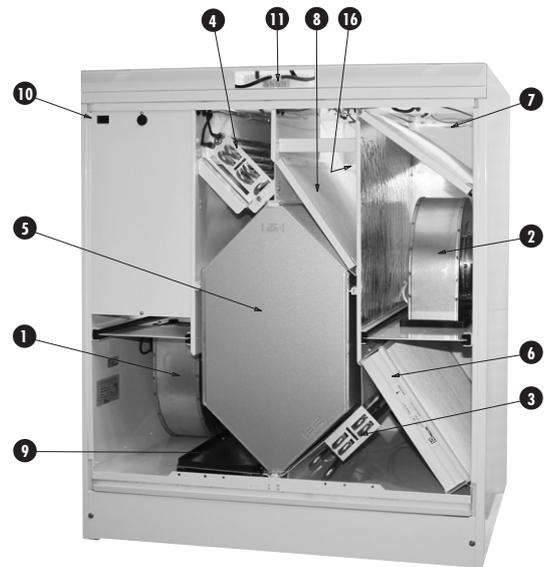


### Model L

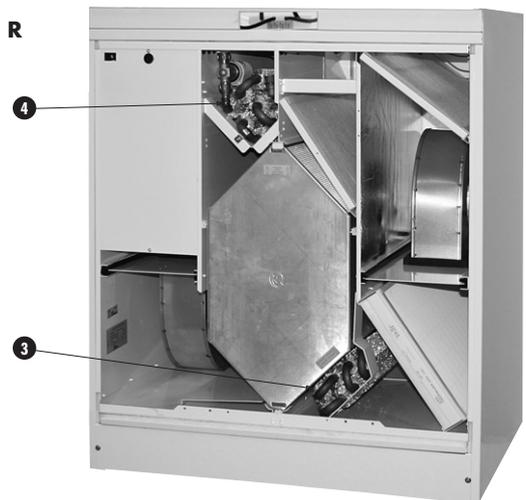
Inner diameter of female outlets  $\varnothing$  200 mm

- 1 Outdoor air to the unit
  - 2 Extract air from the dwelling
  - 3 Supply air to the dwelling
  - 4 Exhaust air out
  - A Return water/liquid
  - B Supply water/liquid
- Weight of unit 102 kg

### VALLOX 150 Effect SE model R



### VALLOX 150 Effect SE MLV model R



### DIGIT SED ELECTRONIC CONTROLLER WITH LCD DISPLAY



12



13



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### Main parts

- 1 Extract air fan
- 2 Supply air fan
- 3 Preheating radiator (electric 1000 W or liquid, standard)
- 5 Heat recovery cell
- 6 Outdoor air filter F7
- 7 Outdoor air filter G4
- 8 Extract air filter G4
- 9 Summer / winter damper
- 10 Safety switch
- 11 Measurement outlets
- 12 Control panel DIGIT SED

### Options

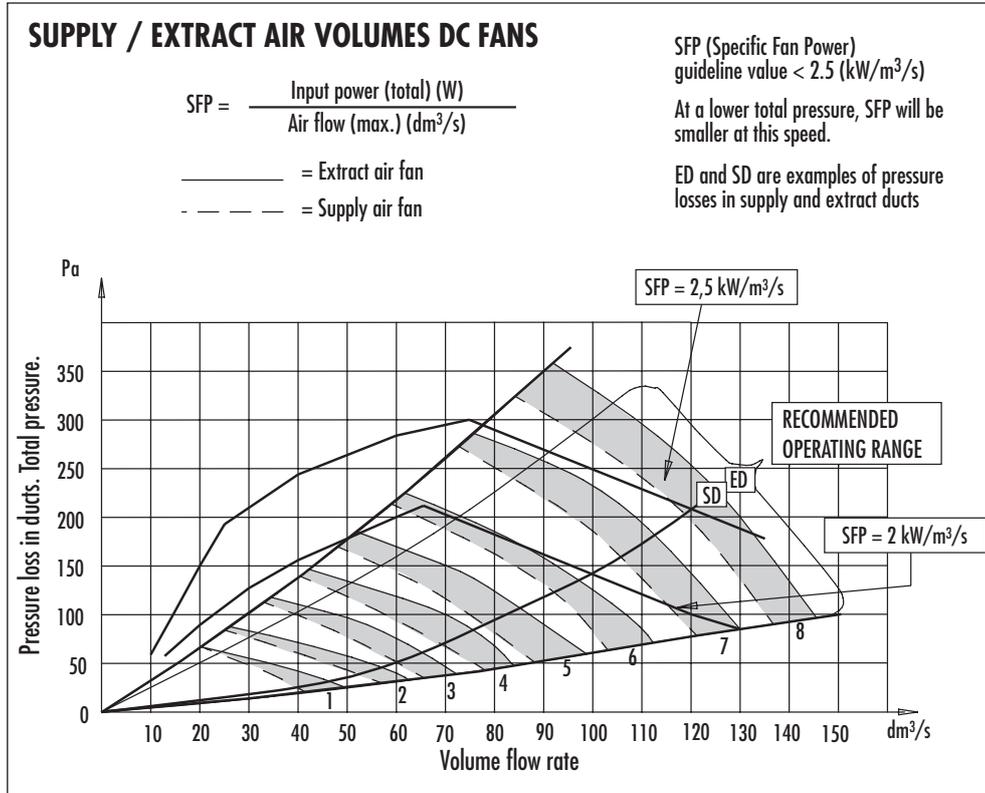
- 4 Post-heating radiator electric 1000 W or water
- 13 Carbon dioxide sensor
- 14 Humidity sensor
- 15 LON converter
- 16 Filter guard (supply and/or extract air)

# VALLOX 150 Effect SE

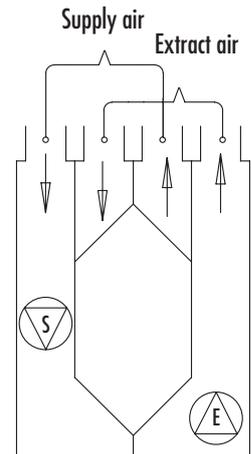


## PERFORMANCE

### Air volumes



Measuring points after the connection outlet.  
 Fan curves indicate the total pressure available for duct losses.



### Sound values

Adjustment position Air flow (dm <sup>3</sup> /s)	Sound power level from the ventilation unit to supply air ducts by octave band L <sub>w</sub> , dB				Sound power level from the ventilation unit to extract air ducts by octave band L <sub>w</sub> , dB				
	ADJUSTMENT POSITION / AIR FLOW				ADJUSTMENT POSITION / AIR FLOW				
	2 51	4 74	6 96	8 126	2 70	4 85	6 110	8 143	
Medium frequency of the octave band, Hz	63	69	75	82	81	71	76	80	82
	125	61	68	72	77	57	64	71	75
	250	44	51	58	64	45	52	58	64
	500	38	42	48	54	39	43	47	53
	1000	38	42	43	47	38	42	45	48
	2000	30	34	41	46	32	37	46	49
	4000	20	27	31	36	21	29	34	39
	8000			25	30			20	31
L <sub>w</sub> dB	70	76	83	82	72	77	81	83	
L <sub>wA</sub> dB(A)	47	53	58	63	46	52	58	62	
Adjustment position Air flow (dm <sup>3</sup> /s)	A-weighted sound pressure level dB (A) coming from the unit through the envelope in rooms where the unit has been installed (10 m <sup>2</sup> sound absorption)				<b>VALLOX 150 Effect SE</b>				
	ADJUSTMENT POSITION / AIR FLOWS (supply / extract)								
	2 58/63	4 80/83	6 109/109	8 140/138					
L <sub>pA</sub> dB(A)	31	36	42	47					

Fan speeds	Extract air flow (dm <sup>3</sup> /s)	The total input power of the fans W
1	40	35
2	60	50
3	70	70
4	80	90
5	95	125
6	110	180
7	125	260
8	145	340

**Note!** When the system is being adjusted, post-heating must be selected (winter setting).



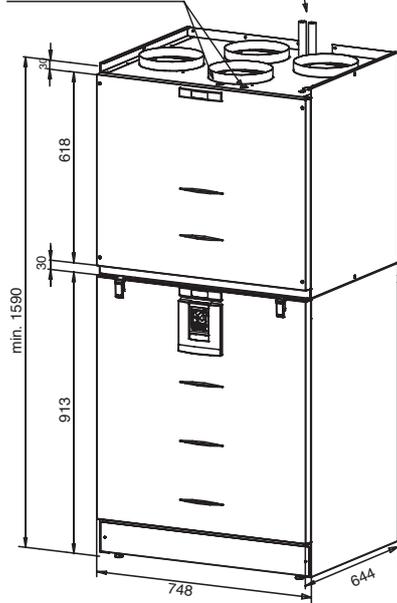
# VALLOX 150 Effect SE

## PERFORMANCE / VALLOX SILENCER UNIT

**Note!**  
During installation, circa 70 mm mounting space is needed above the silencing part.

The pipes of the MLV radiator are not included in the delivery

VKL radiator lead-throughs



### Air flows

#### SUPPLY/EXTRACT AIR VOLUMES WITH SILENCER UNIT

The silencer unit decreases both supply and extract air flow by 2 to 3% (cf. supply/extract air volume curve on page 3).

### Sound values for silencer unit + 150 Effect SE

Adjustment position Air flow (dm <sup>3</sup> /s)	Sound power level by octave band in supply air ducts after the silencer unit L <sub>W</sub> (dB)								Sound power level by octave band in extract air ducts after the silencer unit L <sub>W</sub> (dB)									
	ADJUSTMENT POSITION/AIR FLOW								ADJUSTMENT POSITION/AIR FLOW									
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8		
	41	49	61	71	81	97	110	121	54	64	68	76	86	100	117	126		
Medium frequency of the octave band, Hz	63	52	58	63	63	64	67	70	72	59	63	68	71	69	72	74	74	
	125	43	47	52	55	59	63	66	69	45	49	53	56	59	62	66	68	
	250	34	35	38	41	44	48	52	55	31	35	39	41	45	49	53	54	
	500	22	25	28	30	33	36	40	42	23	26	28	30	33	36	40	42	
	1000	15	19	22	24	25	27	29	31	17	20	21	23	25	28	30	32	
	2000							17	19							10	17	22
	4000																	14
8000																		
L <sub>W</sub> dB	53	58	63	64	65	69	71	74	59	63	68	71	70	72	75	75		
L <sub>WA</sub> dB(A)	30	34	38	41	44	48	51	54	33	37	41	43	45	48	52	53		
Adjustment position Air flow (dm <sup>3</sup> /s)	A-weighted sound pressure level dB (A) coming from the unit through the envelope in the rooms where the unit has been installed (10m <sup>2</sup> sound absorption)																	
	ADJUSTMENT POSITION/AIR FLOWS (supply/extract)																	
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8		
	46/50	57/63	65/72	76/82	85/92	100/107	114/124	126/134										
L <sub>pA</sub> dB(A)	30	33	35	39	41	45	48	50										



### Control

VALLOX 150 Effect SE can be controlled with a control panel coming with the unit (3 at most) and with Optional CO<sub>2</sub> (5 at most) and %RH sensors (2 at most). Fan speeds of the unit can be controlled via remote monitoring with a voltage signal. In case of disturbances, a potential-free relay contact signal is issued.

With an Optional VALLOX LON converter, the whole operation of the unit can be controlled via remote monitoring.

### Week clock control

The week clock in the control panel of the unit can be used to programme the desired fan power Option (1...8) for each hour in the day.

### Control panel

#### 1 Start button

With this button, you switch the unit on and off. When the indicator is lit, the unit is on.

#### 2 Carbon dioxide adjustment

With this button, you set carbon dioxide adjustment on and off. When the indicator is lit, the adjustment is on.

#### 3 Humidity adjustment

With this button, you set humidity adjustment on and off. When the indicator is lit, the adjustment is on.

#### 4 Post-heating

Press this button to switch post-heating on and off. Preheating also switches on. When the indicator is lit, post-heating is on. The summer function is active when the indicator is not lit.

#### 5 Scrolling up

With this button, you can scroll the displays upward.

#### 6 Scrolling down

With this button, you can scroll the displays downward.

#### 7 Increase button

With this button, you can increase values.

#### 8 Decrease button

With this button, you can decrease values.



Keyboard

3 Fan speed (3).

21 C Supply air temperature (21 °C).

Post-heating is on.

10:20 Time.

Filter guard alert.

Maintenance reminder alert.

Fireplace / booster switch on. The fireplace / booster switch is activated in this display by simultaneously pressing down the + and – buttons for 2 seconds.

Week clock control on.

Fan speed can be changed in this display with the + and – buttons



Main display

### Mounting, removing and wiring of control panel

The control panel is wired straight from the electrical connection box. The control panel can also be connected in series with a CO<sub>2</sub> sensor or another control panel. (See External electrical connections on page 8).

### Control panel addresses

If two or more control panels are connected to the system, the addresses of the control panels need to be changed.

#### E.g. 3 control panels.

- Connect the first control panel to the unit and change its address to 3.
- Connect the second control panel to the unit and change its address to 2.
- Connect the third control panel and make sure that its address is 1.

**If control panels have the same address, they go to bus fault state. In this case, remove one of the control panels and change the address of the other panel. The above mentioned situation can arise in connection with the later installation of an additional control panel.**



Panel address  
1

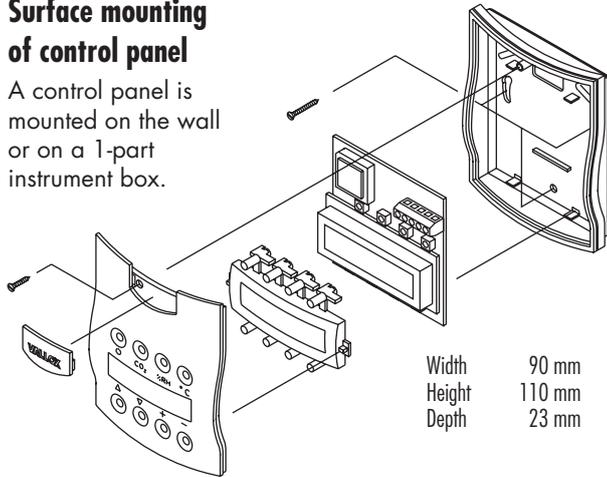


# VALLOX 150 Effect SE

## MOUNTING THE CONTROL PANEL AND SENSORS

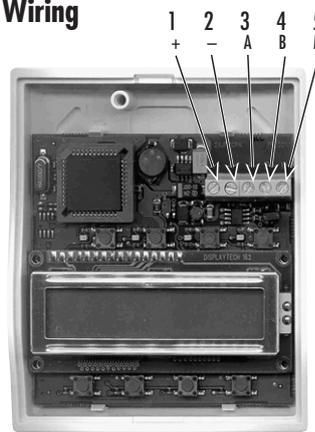
### Surface mounting of control panel

A control panel is mounted on the wall or on a 1-part instrument box.



Width 90 mm  
Height 110 mm  
Depth 23 mm

### Wiring



Electronics board of control panel

Cable:

NOMAK 2 x 2 x 0.5 mm<sup>2</sup> + 0.5 mm<sup>2</sup>

#### NOTE!

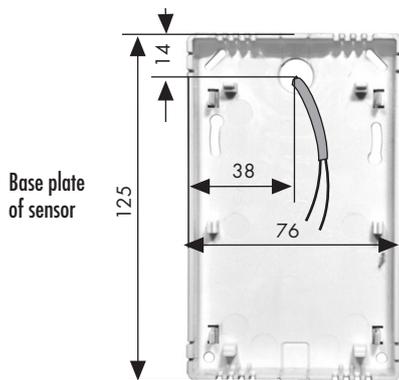
Faulty coupling of the (+) wire destroys the control panel!

1 = orange 1	= +	} ca. 21 VDC
2 = white 1	= -	
3 = orange 2	= A	
4 = white 2	= B	
5 = metal	= signal ground	

### Mounting and wiring of humidity sensor

The sensor is wired straight from the electrical connection box of the unit.

#### Surface mounting



Base plate of sensor

#### Wiring

Electronics board of %RH sensor

Cable: 2 x 0,5 mm<sup>2</sup>



### HUMIDITY SENSORS

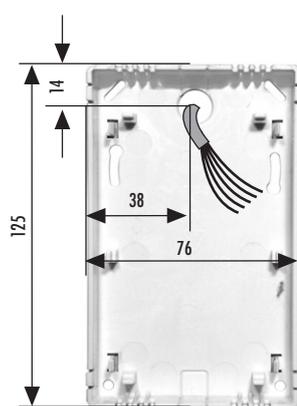
- When mounting two or more humidity sensors, connect them to the terminal block of the connection box by connecting the first humidity sensor to %RH1, in place of the resistor 6K8 in the terminal block (remove the resistor in this case), and the second humidity sensor to %RH2. See the electrical diagram.



### Mounting and wiring of carbon dioxide sensor

The CO<sub>2</sub> sensor is connected directly from the connection box of the unit, or in series with another CO<sub>2</sub> sensor or control panel (see External electrical connections on page 8).

#### Surface mounting



Base plate of the CO<sub>2</sub> sensor

#### Wiring



Electronics card of the CO<sub>2</sub> sensor (model may vary)

Cable:

NOMAK 2 x 2 x 0.5 mm<sup>2</sup> + 0.5 mm<sup>2</sup>

#### NOTE!

Faulty coupling of the (+) wire destroys the carbon dioxide sensor!

1 = orange 1	= +	} ca. 21 VDC
2 = white 1	= -	
3 = orange 2	= A	
4 = white 2	= B	
5 = metal	= signal ground	

### CARBON DIOXIDE SENSORS

- Carbon dioxide sensors are connected individually.
- When the first carbon dioxide sensor has been connected to the system, the unit is switched on. After this, the unit gives the sensor an address. Follow the same steps for other carbon dioxide sensors.

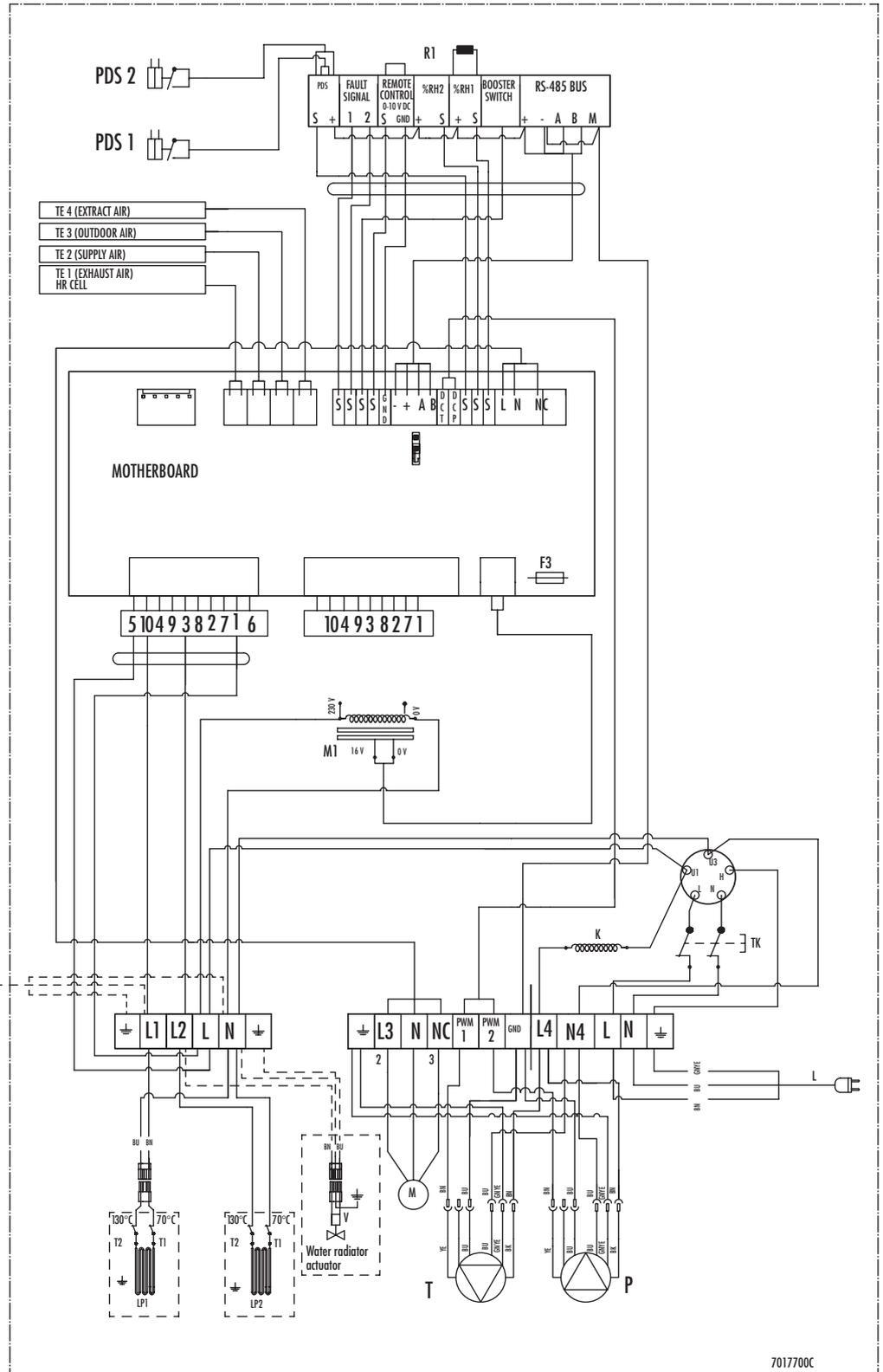
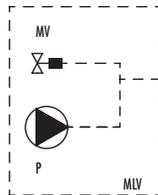


# VALLOX 150 Effect SE

## INTERNAL CONNECTION DIAGRAM, integrated fans

- S = Supply fan
- E = Extract fan
- M1 = Direct-current transformer with protective voltage coil
- H = Interference suppressor
- L = Earthed cord
- TK = Safety switch
- T1 = Overheating protector 70 °C (automatic reset)
- T2 = Heating radiator safety thermostat 130 °C (reset, switch the unit off)
- K = Choke
- LP1 = Preheating radiator
- LP2 = Post-heating radiator
- V = Water radiator thermostat valve
- M = Damper motor
- TE = Temperature sensors
- R1 = Auxiliary resistor 6.8 kohm
- PDS1 = Supply air duct filter guard (option)
- PDS2 = Extract air duct filter guard (option)
- MV = Solenoid valve
- P = Circulation pump

Wire colours:  
 BU = blue  
 BN = brown  
 BK = black  
 GNYE = yellow-green

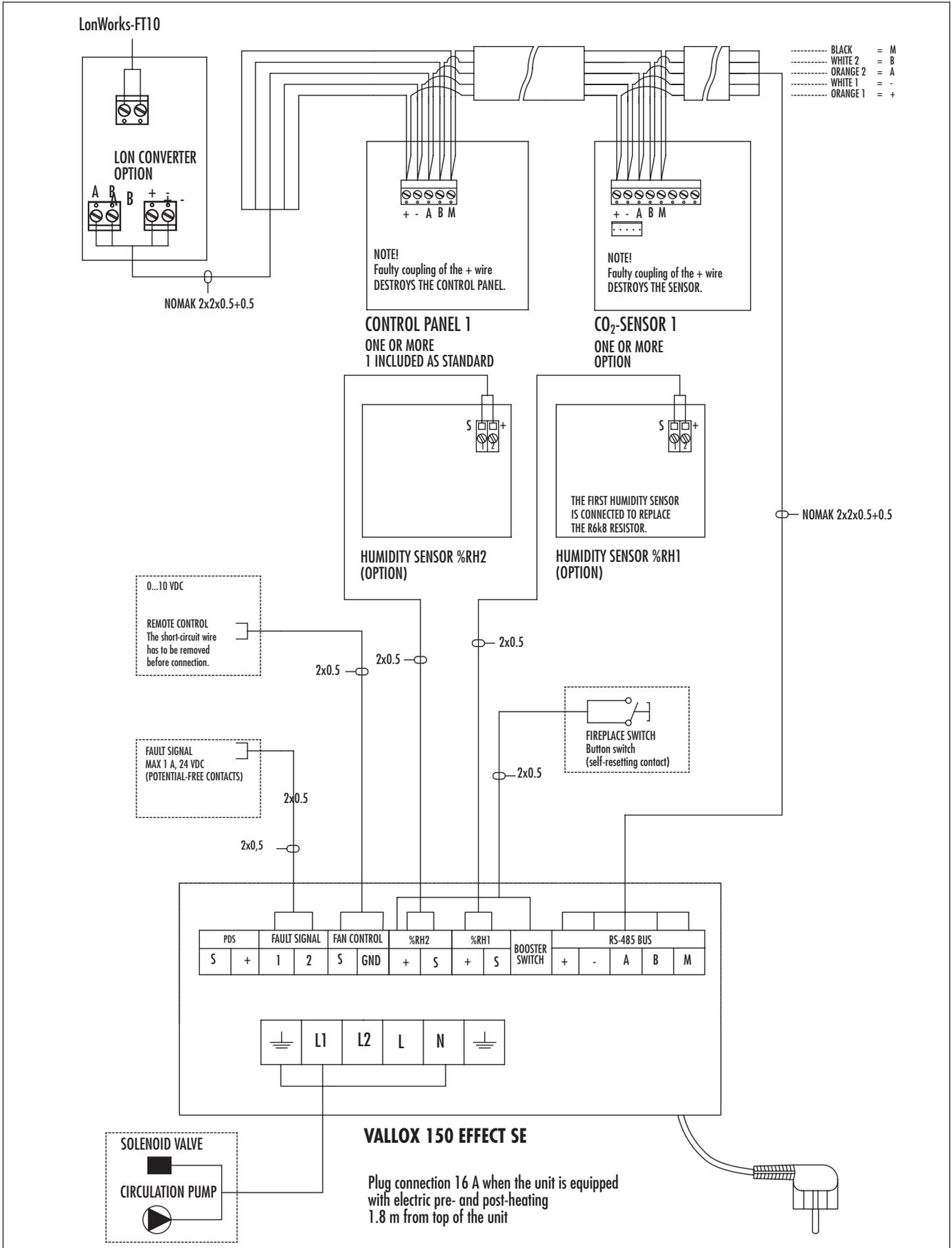


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# VALLOX 150 Effect SE

## EXTERNAL ELECTRICAL DIAGRAM





### Filtering

Efficient filtering of outdoor air (G4 + F7) prevents harmful particles from entering the ductwork and rooms via the unit. Good filtering of extract air (G4) diminishes the contamination of the unit and ensures efficient heat recovery and extract air fan operation. Clogging of the supply/ extract air filters can be monitored by equipping the unit with a pressure difference switch.

### Heat recovery and heating

With efficient heat recovery most of the heat from contaminated extract air can be transmitted to outdoor air coming inside. The efficiency of the heat recovery cell is circa 80%. If outdoor air does not get sufficiently warm in the heat recovery cells, it can be heated with a water or electric post-heating unit.

The unit features an automatic heat recovery bypass function, which eliminates needless heating of outdoor air during summer.

### Antifreezing

The automatic antifrost function of the heat recovery cell intermittently stops the supply air fans when the temperature of exhaust air goes under the set threshold value. In order to minimise momentary stoppages of the supply air fans the unit is also equipped with an electric preheating unit or a liquid-circulating preheating radiator (MLV).

### Electric preheating unit (standard equipment)

- In VALLOX 150 Effect SE unit
- Power 1.0 kW, 4.3 A

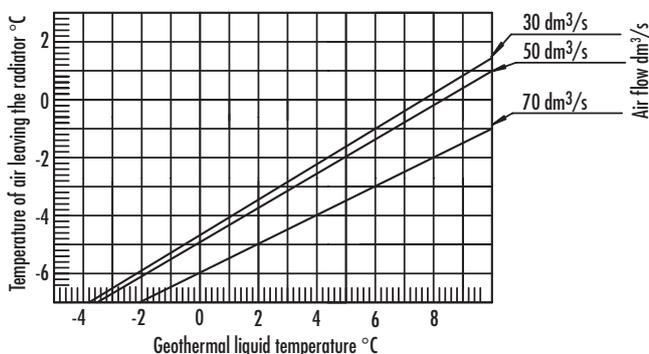
### MLV heating/cooling preheating unit (Standard)

- In VALLOX 150 Effect SE MLV unit

#### MLV radiator heating power (500...1500 W)

The outdoor temperature starting preheating is set at the control panel. The value set must be lower than that of the liquid coming from the ground collector.

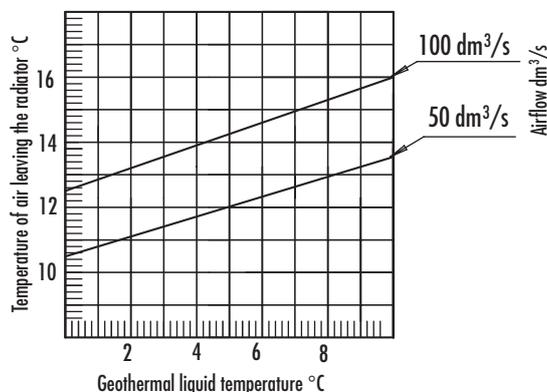
Ethylene glycol 25%  
 $t_i = -12\text{ °C}$  (supply air temperature)  
 $V_n = 0.075\text{ dm}^3/\text{s}$  (liquid volume flow rate)



#### MLV radiator cooling power (800-2000 W)

Supply air temperature is chosen at the control panel. Because of the risk of humidity damage supply air temperature in a duct with no condensation insulation should not go below +16...20 °C in hot weather.

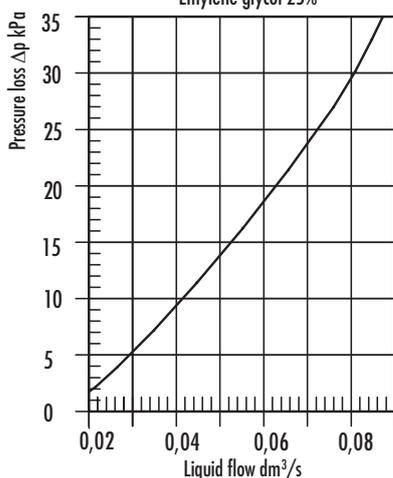
Ethylene glycol 25%  
 $t_i = 25\text{ °C}$  (supply air temperature) Relative humidity RH 50%  
 $V_n = 0.075\text{ dm}^3/\text{s}$  (liquid volume flow rate)



#### MLV radiator pressure loss in liquid circulation

(MLV radiator causes a small pressure loss also in air flow.)

Ethylene glycol 25%

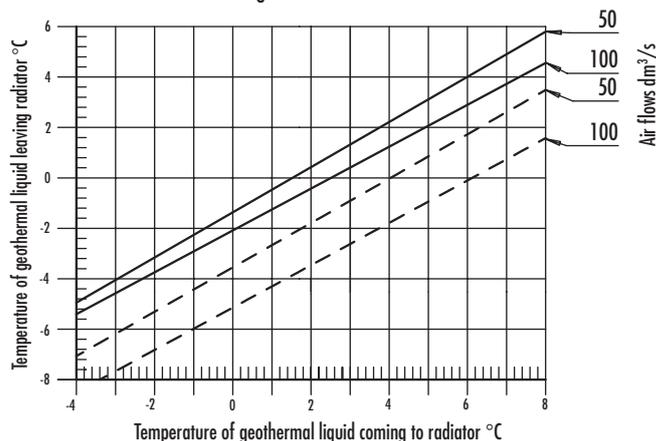


#### Cooling of geothermal liquid of MLV radiator

Ethylene glycol 25% Flow 0.075 dm³/s

Air coming in -12 °C \_\_\_\_\_

Air coming in -30 °C - - - - -





# VALLOX 150 Effect SE

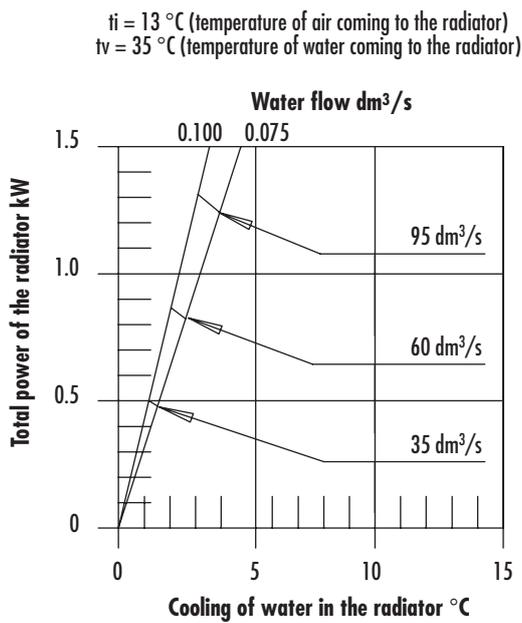
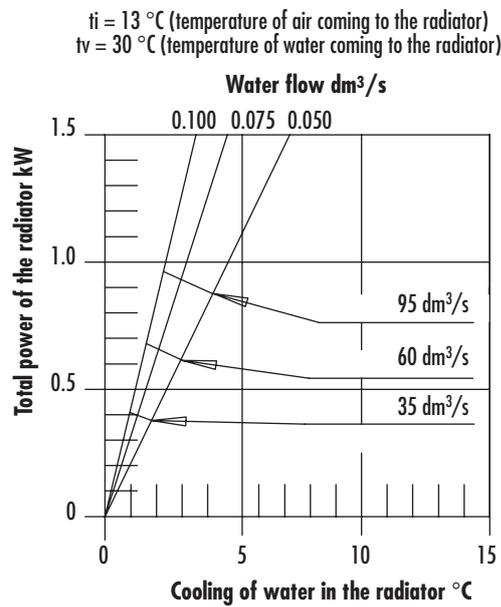
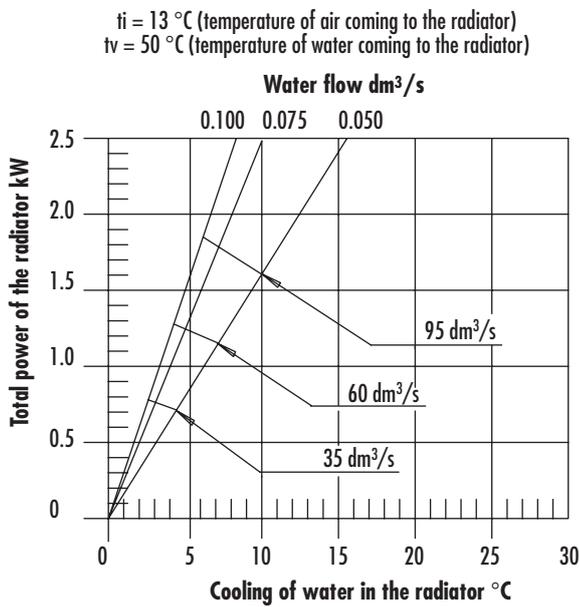
## POST-HEATING

### Electric post-heating unit (option equipment)

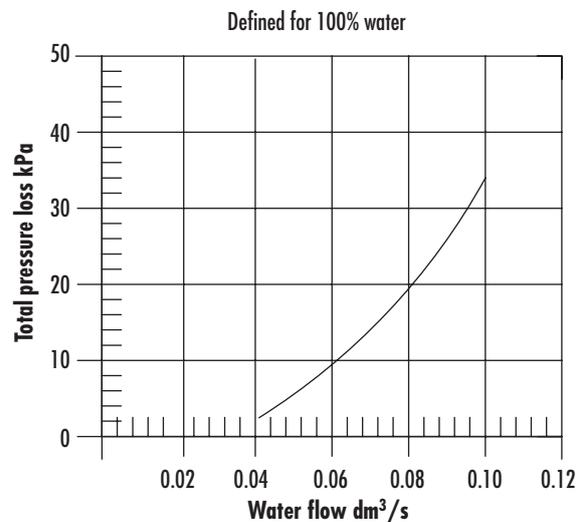
- Option in VALLOX 150 Effect SE and 150 Effect SE MLV units.
- Power 1.0 kW, 4.3 A.

### Water post-heating unit (option equipment)

#### Performance of the water post-heating radiator (VKL) in VALLOX 150 Effect SE and VALLOX 150 Effect SE MLV



#### VKL water radiator pressure loss in water circulation

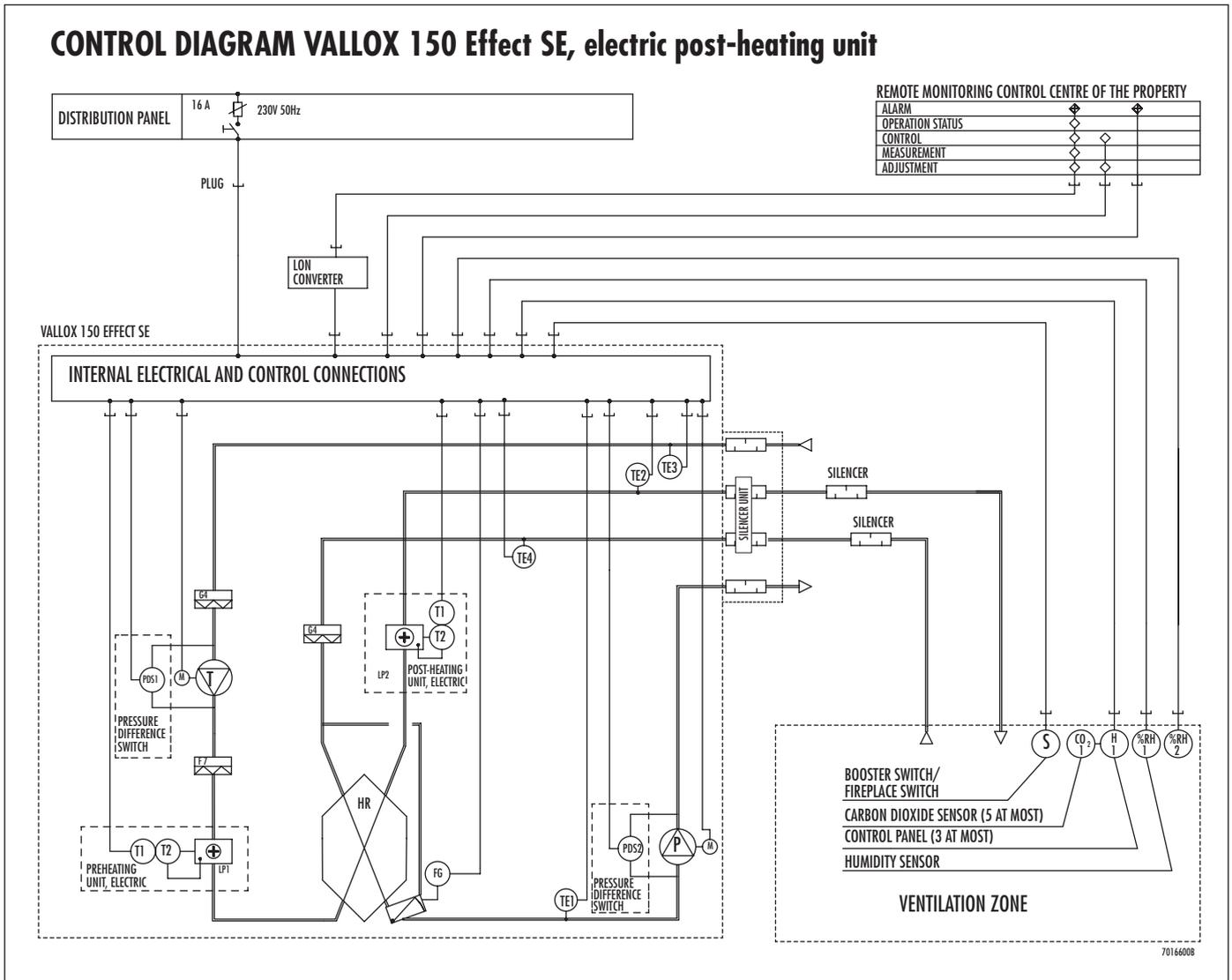


# VALLOX 150 Effect SE



## CONTROL DIAGRAM/ Electric post-heating unit

### CONTROL DIAGRAM VALLOX 150 Effect SE, electric post-heating unit



### Parts list VALLOX 150 Effect SE

Code	Name	Technical data (factory settings in parentheses)	Standard / Option	Code	Name	Technical data (factory settings in parentheses)	Standard / Option
CO <sub>2</sub>	Carbon dioxide sensor, 5 at most Carbon dioxide control	Adjustment range 500...2000 ppm (900) Adjustment range 1...15 min. (10)	Option	%RH	Humidity sensor, 2 at most Humidity control	Automatic / Adjustment range 1...99% (99) Adjustment range 1...15 min. (10)	Option
G4	Filter	Supply air, extract air	Standard	TE1	Temperature sensor, HR antifreeze, preheating control	Exhaust air temperature Adjustment range -6...+15 °C (HR bypass) Adjustment range -6...+15 °C (preheating)	Standard
F7	Filter	Supply air	Standard	TE2	Temperature sensor	Supply air temperature	Standard
FG	Damper motor	HR bypass automation, 24 V, 2 W, 8 Nm	Standard	TE3	Temperature sensor	Outdoor air temperature	Standard
H	Control panel, 3 at most	User interface	Standard	TE4	Temperature sensor	Extract air temperature	Standard
LP1	Preheating unit	Electric radiator 1 kW	Standard	T	Supply air fan DC	qv=130 dm <sup>3</sup> /s (150 Pa)	Standard
LP2	Post-heating unit	Electric radiator 1 kW	Option	T1	Heating unit overheat protection	Automatic + 70 °C	included in LP1 and LP2
HR	Heat recovery cell	Cross-counter flow, efficiency = 80%	Standard	T2	Heating unit overheat protection	Manual reset +130 °C	included in LP1 and LP2
PDS1	Pressure difference switch Pressure guard on the supply air side	Adjustment range 0...500 Pa (320)	Option	S	Fireplace / booster switch function	Functions as either a fireplace or booster switch (fireplace switch)	Option
PDS2	Pressure difference switch Pressure guard of the extract air filter	Adjustment range 0...500 Pa (320)	Option	LON	LON converter	Remote monitoring control	Option
P	Extract air fan	DCqv = 140 dm <sup>3</sup> /s (150 Pa)	Standard				



# VALLOX 150 Effect SE

## DESCRIPTION OF OPERATION / Electric post-heating unit

### Control of operation

Power supply to the unit can be controlled with a contactor in the distribution panel if needed, e.g. with a timer programme. After starting, the unit first operates at base fan speed. After that power is adjusted based either on the measurement data from air quality sensors and/or on manual control at the control panel.

### Fan speed adjustment

#### Manual control

Fan speed of the ventilation unit is controlled in 8 steps at control panel **H**.

#### Week clock control

The fan power of the ventilation unit is controlled in 8 steps using the week clock in control panel **H**. The week clock can be used to programme the desired fan power option and the setpoint for supply air temperature for each day of the week and each hour in the day.

### Carbon dioxide and humidity control

The fan power of the ventilation unit is controlled in multiple steps depending on load and based on the measurement results of the air quality sensors (**CO<sub>2</sub>** and **%RH** sensors) located in the ventilation zone. The aim is to keep carbon dioxide and/or humidity content below the threshold set at control panel **H**. It is also possible to select an automatic search for the humidity content threshold at control panel **H**. One or more modes of control may be used simultaneously – the mode demanding boosting is the dominant one. Fan speed varies depending on load between the base and maximum fan speeds. The base and maximum fan speeds can be set at the desired level at the control panel.

### Voltage signal control

The fan power of the ventilation unit is controlled in 8 steps with a voltage signal of 0...10 VDC. However, fan power cannot be raised above the set maximum fan speed.

Voltage signal control is used to control base fan speed. This means that fan speed can be raised when necessary, but not lowered, by the manual, **CO<sub>2</sub>** and **%RH** controls.

### Voltage signal values

Voltage values for each fan speed:		
0	0,20...1,25	VDC
1	1,75...2,25	VDC
2	2,75...3,25	VDC
3	3,75...4,25	VDC
4	4,75...5,25	VDC
5	5,75...6,25	VDC
6	6,75...7,25	VDC
7	7,75...8,25	VDC
8	8,75...10,00	VDC

### Supply air temperature

Supply air temperature can be controlled with either constant temperature control or cascade control.

### Supply air constant temperature control

The control unit directs the operation of post-heating unit **LP2** on the basis of the measurement data given by temperature sensor **TE2**, aiming at keeping supply air temperature at the temperature value set on control panel **H** (+10...+30 °C).

### Supply air cascade control

The control unit directs the operation of post-heating unit **LP2** on the basis of the measurement data given by extract air sensor **TE4**, aiming at keeping extract air temperature at the temperature value set on control panel **H** (+10...+30 °C).

### Heat recovery bypass

Heat recovery is enabled whenever post-heating has been switched on. Automatic heat recovery bypass is active whenever post-heating has been switched off and outdoor temperature is more than the set threshold value (to be set between +0...+25 °C). In this case, the control unit directs the operation of damper motor **FG** on the basis of measurement results given by outdoor temperature sensor **TE3** and extract air temperature sensor **TE4**. The aim is to get as cool supply air to the ventilation zone as possible. However, heat recovery is on whenever outdoor temperature is below the threshold set, or whenever outdoor air is warmer than extract air.

### Heat recovery antifreeze

The control centre of the unit controls the operation of preheating unit **LP1** on the basis of the measurement data given by temperature sensors **TE1** and **TE3**, thus preventing freezing alerts and the intermittent stopping of supply air fan **T**. If the capacity of preheating unit **LP1** is not sufficient, the control centre keeps stopping supply air fan **T** on the basis of the measurement data of temperature sensors **TE1** and **TE3**, thus preventing the **HR** cell from freezing. As soon as the risk passes, the fan restarts automatically. The threshold temperature (-6...+15 °C) and the difference area (1...10 °C) for antifreeze can be set at the control panel **H**. When fan **T** stops, power supply from radiator **LP1** is stopped and post-heating radiator **LP2** continues to heat. For preheating to work, its threshold temperature has to be set by at least one degree higher than the threshold temperature controlling the stopping of the fan. Temperatures are adjusted at control panel **H**.

### Heating unit overheat protection

Overheat protection thermostats **T1** and **T2** monitor the surface temperature of heating units **LP1** and **LP2**. When surface temperature exceeds the threshold, overheat protection is triggered and power supply to the heating unit is stopped. Overheat protection **T1** is reset automatically, whereas overheat protection **TS2** is reset by switching the unit off.

### Alarms

Pressure difference switches **PDS1** and **PDS2** monitor the pressure difference of the supply and exhaust air sides. If the pressure difference rises too high because of dirty filters or clogged ducts, an alarm will be issued. This is indicated by a symbol (⊠) in the main display of the control panel. If the unit is not equipped with pressure difference switches, the symbol (⊠) appearing in the main display of the control panel reminds of the need for maintenance of the unit. The reminder interval can be set between 1...15 months. The factory setting is 4 months. This function is active all the time. The fault signal relay in the unit gives potential-free alarm indications on the following fault conditions.

- Alarm of high carbon dioxide content (> 5000 ppm) switches the relay at 1-second intervals.
- In other fault situations, such as sensor faults, the contacts of the relay close.

### Booster or fireplace switch function

The booster or fireplace switch function of the ventilation unit is controlled either at control panel **H** and/or separate switch **S**, which can be connected to the connection box of the unit. The mode of operation of the switch is selected at control panel **H**. The booster switch function raises fan speed to the set maximum fan speed for 45 minutes. The fireplace switch stops the extract air fan for 15 minutes and produces overpressure in the ventilation zone.

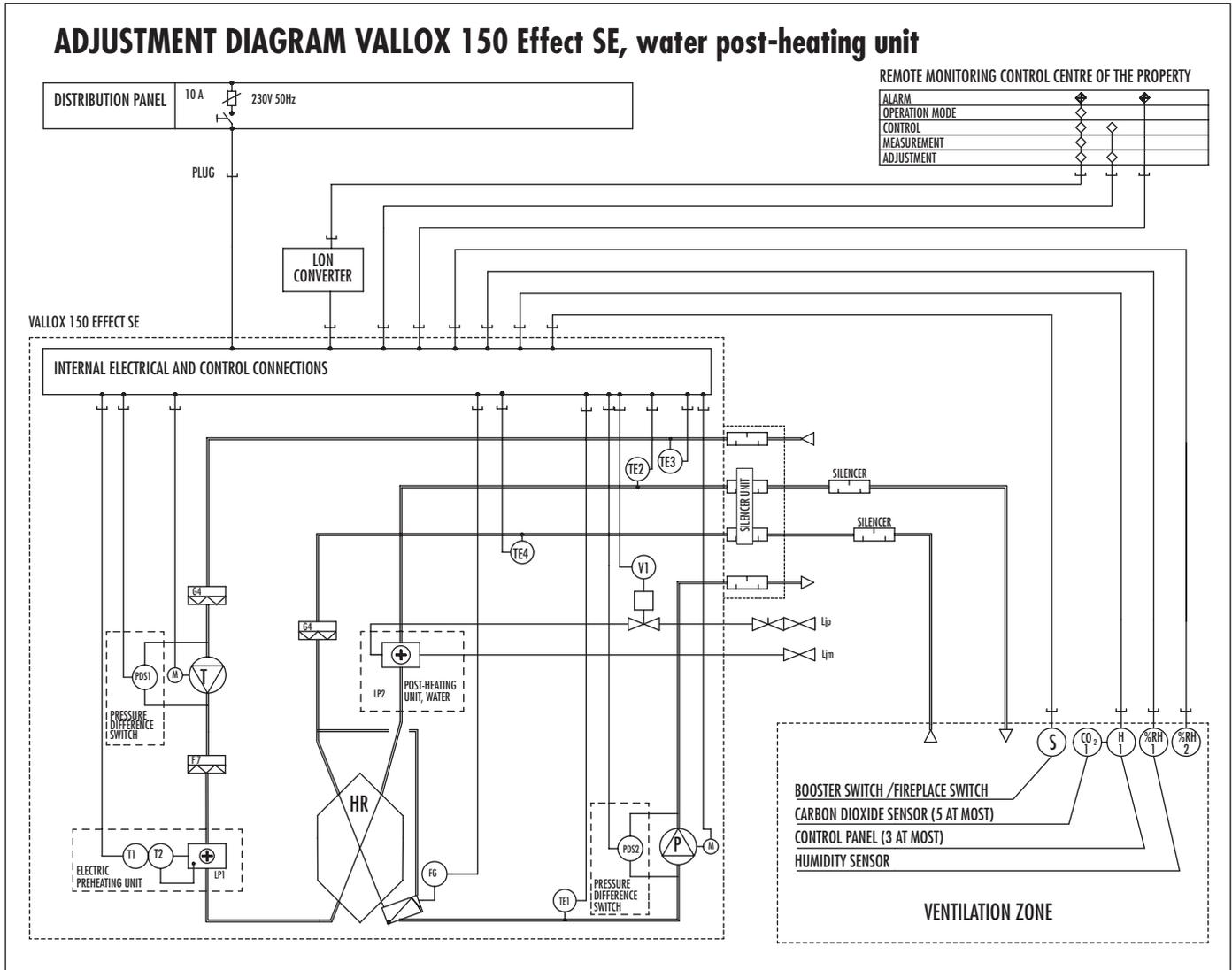
**LON remote monitoring control can be implemented with a VALLOX LON converter. See a separate brochure.**

# VALLOX 150 Effect SE



## CONTROL DIAGRAM/ Water-circulating post-heating unit

### ADJUSTMENT DIAGRAM VALLOX 150 Effect SE, water post-heating unit



### Parts list VALLOX 150 Effect SE VKL

Code	Name	Technical data (factory settings in parentheses)	Standard / Option
CO <sub>2</sub>	Carbon dioxide sensor, 5 at most Carbon dioxide control	Adjustment range 500...2000 ppm (900) Adjustment range 1...15 min. (10)	Option
G4	Filter	Supply air, extract air	standard
F7	Filter	Supply air	Standard
FG	Damper motor	HR bypass automation, 24 V, 2 W, 8 Nm	Standard
H	Control panel, 3 at most	User interface	Standard
LP1	Preheating unit	Electric radiator 1 kW	Standard
LP2	Post-heating unit	Water radiator	Option
HR	Heat recovery cell	Cross-counter flow, efficiency = 80%	Standard
PDS1	Pressure difference switch Pressure guard on the supply air side	Adjustment range 0...500 Pa (320)	Option
PDS2	Pressure difference switch Pressure guard of the extract air filter	Adjustment range 0...500 Pa (320)	Option
P	Extract air fan DC	DC <sub>qv</sub> = 140 dm <sup>3</sup> /s (150 Pa)	Standard
V1	Water radiator thermostat valve		Standard

Code	Name	Technical data (factory settings in parentheses)	Standard / Option
%RH	Humidity sensor, 2 at most Humidity control	Automatic / Adjustment range 1...99% (99) Adjustment range 1...15 min. (10)	Option
TE1	Temperature sensor, HR antifreeze, preheating control	Exhaust air temperature Adjustment range -6...+15 °C (HR bypass) Adjustment range -6...+15 °C (preheating)	Standard
TE2	Temperature sensor	Supply air temperature	Standard
TE3	Temperature sensor	Outdoor air temperature	Standard
TE4	Temperature sensor	Extract air temperature	Standard
T	Supply air fan DC	qv=130 dm <sup>3</sup> /s (150 Pa)	Standard
T1	Heating unit overheat protection	Automatic + 70 °C	included in LP1
T2	Heating unit overheat protection	Manual reset +130 °C	included in LP1
S	Fireplace / booster switch function	Functions as either a fireplace or booster switch (fireplace switch)	Option
LON	LON converter	Remote monitoring control	Option



# VALLOX 150 Effect SE

## DESCRIPTION OF OPERATION / Water-circulating post-heating unit

### Control of operation

Power supply to the unit can be controlled with a contactor in the distribution panel if needed, e.g. with a timer programme. Upon starting, the unit first operates at base fan speed. After that power is adjusted based either on the measurement data from air quality sensors and/or on manual control at the control panel.

### Fan speed adjustment

#### Manual control

Fan speed of the ventilation unit is controlled in 8 steps at control panel H.

#### Week clock control

The fan power of the ventilation unit is controlled in 8 steps using the week clock in control panel H. The week clock can be used to programme the desired fan power option and the setpoint for supply air temperature for each day of the week and each hour in the day.

#### Carbon dioxide and humidity control

The fan power of the ventilation unit is controlled in multiple steps depending on load and based on the measurement results of the air quality sensors (CO<sub>2</sub> and %RH sensors) located in the ventilation zone. The aim is to keep carbon dioxide and/or humidity content below the threshold set at control panel H. It is also possible to select an automatic search for the humidity content threshold at control panel H. One or more modes of control may be used simultaneously – the mode demanding boosting is the dominant one. Fan speed varies depending on load between the base and maximum fan speeds. The base and maximum fan speeds can be set at the desired level at the control panel.

#### Voltage signal control

The fan power of the ventilation unit is controlled in 8 steps with a voltage signal of 0...10 VDC. However, fan power cannot be raised above the set maximum fan speed.

Voltage signal control is used to control base fan speed. This means that fan speed can be raised when necessary, but not lowered, by the manual, CO<sub>2</sub> and %RH controls.

#### Voltage signal values

Voltage values for each fan speed:		
0	0,20...1,25	VDC
1	1,75...2,25	VDC
2	2,75...3,25	VDC
3	3,75...4,25	VDC
4	4,75...5,25	VDC
5	5,75...6,25	VDC
6	6,75...7,25	VDC
7	7,75...8,25	VDC
8	8,75...10,00	VDC

### Supply air temperature

Supply air temperature can be controlled with either constant temperature control or cascade control.

#### Supply air constant temperature control

The control unit directs the operation of post-heating unit LP2 on the basis of the measurement data given by temperature sensor TE2, aiming at keeping supply air temperature at the temperature value set on control panel H (+10...+30 °C).

#### Supply air cascade control

The control unit directs the operation of post-heating unit LP2 on the basis of the measurement data given by extract air sensor TE4, aiming at keeping extract air temperature at the temperature value set on control panel H (+10...+30 °C).

#### Heat recovery bypass

Heat recovery is enabled whenever post-heating has been switched on. Automatic heat recovery bypass is active whenever post-heating has been switched off and outdoor temperature exceeds the setpoint (to be set

between 0...+25 °C). In this case, the control unit directs the operation of damper motor FG on the basis of measurement results given by outdoor temperature sensor TE3 and extract air temperature sensor TE4. The aim is to get as cool supply air to the ventilation zone as possible. However, heat recovery is on whenever outdoor temperature is below the threshold set, or whenever outdoor air is warmer than extract air.

#### Heat recovery antifreeze

The control centre of the unit controls the operation of preheating unit LP1 on the basis of the measurement data given by temperature sensors TE1 and TE3, thus preventing freezing alerts and the intermittent stopping of supply air fan T. If the capacity of preheating unit LP1 is not sufficient, the control centre keeps stopping supply air fan T on the basis of the measurement data of temperature sensors TE1 and TE3, thus preventing the HR cell from freezing. As soon as the risk passes, the fan restarts automatically. The threshold temperature (-6...+15 °C) and the difference area (1...10 °C) for antifreeze can be set at control panel H. When fan T stops, power supply from radiator LP1 stops and the actuated valve V1 of post-heating radiator LP2 starts to open and remains open.

For preheating to work, its threshold temperature has to be set by at least one degree higher than the threshold temperature controlling the stopping of the fan. Temperatures are adjusted at control panel H.

#### Heating unit overheat protection

Overheat protection thermostats T1 and T2 monitor the surface temperature of heating unit LP1. When surface temperature exceeds the threshold, overheat protection is triggered and power supply to the heating unit is stopped. Overheat protection T1 is reset automatically, whereas overheat protection T2 is reset by switching the unit off.

#### Water radiator freezing protection

Based on the measurement data of outdoor temperature sensor TE3 (outdoor air < 0 °C) and supply air temperature sensor TE2 (supply air < 7 °C), the control centre of the unit stops fans T and P and leaves valve V1 open, thereby decreasing the freezing risk in water circulating heating unit LP2. A freezing alert appears in the display of the control panel. The fans restart automatically as soon as the risk of freezing passes (supply air > 10 °C).

#### Alarms

Pressure difference switches PDS1 and PDS2 monitor the pressure difference on the supply and extract air sides. If the pressure difference rises too high because of dirty filters or clogged ducts, an alarm will be issued. This is indicated by a symbol (⊗) in the main display of the control panel. If the unit is not equipped with pressure difference switches, the symbol (⊕) appearing in the main display of the control panel reminds of the need for maintenance of the unit. The reminder interval can be set between 1 and 15 months. The factory setting is 4 months. This function is always active.

The fault signal relay in the unit gives potential-free alarm indications on the following fault conditions:

- When the antifreeze function of the water-circulating radiator is on, the contacts of the the relay open and close at 10-second intervals.
- Alarm of high carbon dioxide content (> 5000 ppm) switches the relay at 1-second intervals.
- In other fault situations, such as sensor faults, the contacts of the relay close.

#### Booster or fireplace switch function

The booster or fireplace switch function of the ventilation unit is controlled either at control panel H and/or separate switch S, which can be connected to the connection box of the unit. The mode of operation of the switch is selected at control panel H. The booster switch function raises fan speed to the set maximum fan speed for 45 minutes. The fireplace switch stops the extract air fan for 15 minutes and produces overpressure in the ventilation zone.

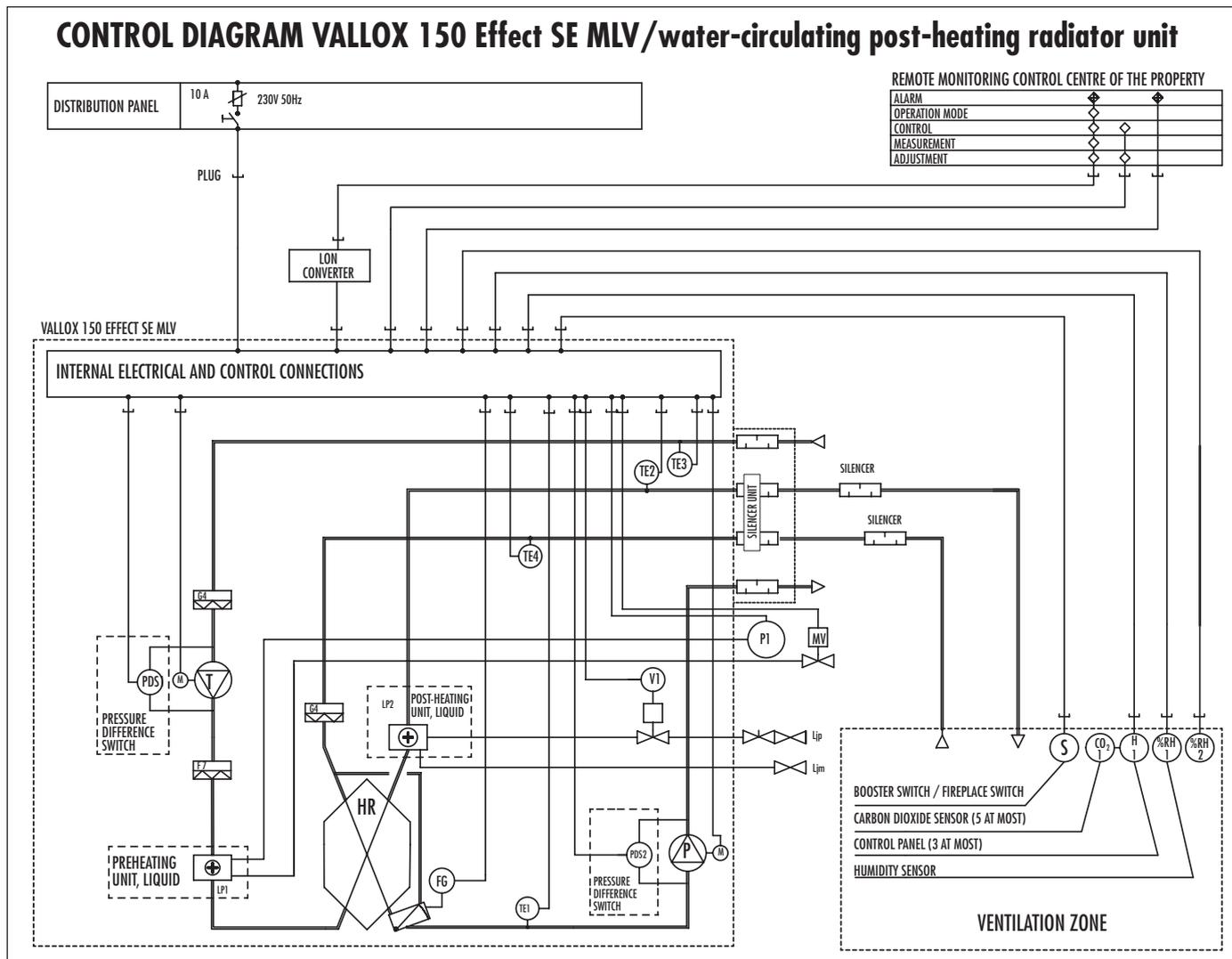
LON remote monitoring control can be implemented with a VALLOX LON converter. See a separate brochure.

# VALLOX 150 Effect SE



## CONTROL DIAGRAM/MLV radiator/post-heating – water

### CONTROL DIAGRAM VALLOX 150 Effect SE MLV/water-circulating post-heating radiator unit



### Parts list VALLOX 150 Effect SE MLV with water-circulating post-heating radiator

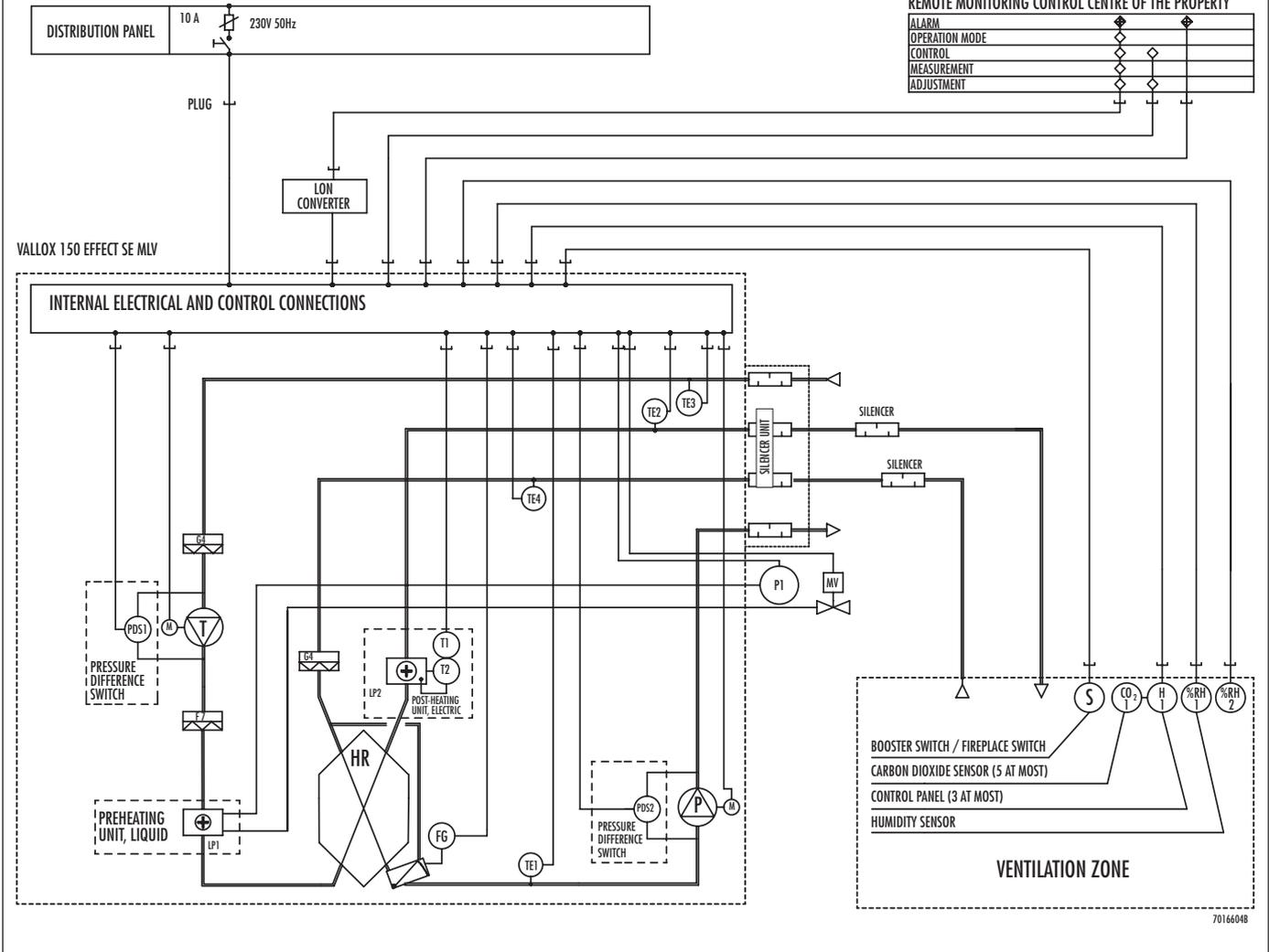
Code	Name	Technical data (factory settings in parentheses)	Standard/ Option	Code	Name	Technical data (factory settings in parentheses)	Standard/ Option
CO <sub>2</sub>	Carbon dioxide sensor, 5 at most Carbon dioxide control	Adjustment range 500...2000 ppm (900) Adjustment interval 1...15 min (10)	Option	TE1	Temperature sensor, HR cell antifreeze	Exhaust air temperature Adjustment range -6...+15 °C (HR)	Standard
G4	Filter	Supply air, extract air	Standard	TE2	Temperature sensor	Supply air temperature	Standard
F7	Filter	Supply air	Standard	TE3	Temperature sensor, preheating control	Outdoor air temperature Adjustment range -6...+15 °C (preheating)	Standard
FG	Damper motor	Automatic heat recovery bypass 24 V, 2 W, 8 Nm	Standard	TE4	Temperature sensor	Extract air temperature	Standard
H	Control panel, 3 at most	User interface	Standard	T	Supply air fan DC	qv = 130 dm <sup>3</sup> /s (150Pa)	Standard
LP1	Preheating unit	Liquid radiator	Standard	V1	Water radiator thermostat valve		Standard
LP2	Post-heating unit	Liquid radiator	Option	MV	Solenoid valve		Not included in delivery
HR	Heat recovery cell	Counter-current, efficiency = 80%	Standard	PI	Circulation pump		Not included in delivery
PDS1	Pressure difference switch Pressure guard on supply air side	Adjustment range 0...500 Pa (320)	Option	S	Fireplace/booster switch function	Either fireplace or booster switch function (fireplace switch) can be selected.	Option
PDS2	Pressure difference switch Pressure guard on extract air side	Adjustment range 0...500 Pa (320)	Option	LON	LON converter	Remote monitoring control	Option
P	Extract air fan DC	qv = 140dm <sup>3</sup> /s (150 Pa)	Standard				
%RH	Humidity sensor, 2 at most Humidity control	Automatic/Adjustment range 1...99% (99) Adjustment interval 1...15 min. (10)	Option				



# VALLOX 150 Effect SE

## CONTROL DIAGRAM / MLV radiator / post-heating – electric

### CONTROL DIAGRAM VALLOX 150 Effect SE MLV / electric post-heating radiator unit



### Parts list VALLOX 150 Effect SE MLV with electric post-heating radiator

Code	Name	Technical data (factory settings in parentheses)	Standard/Option	Code	Name	Technical data (factory settings in parentheses)	Standard/Option
CO <sub>2</sub>	Carbon dioxide sensor, 5 pcs Carbon dioxide control	Adjustment range 500...2000 Pa (900) Adjustment interval 1...15 min. (10)	Option	TE1	Temperature sensor, HR cell antifreeze	Exhaust air temperature Adjustment range -6...+15 °C (HR)	Standard
G4	Filter	Supply air, extract air	Standard	TE2	Temperature sensor	Supply air temperature	Standard
F7	Filter	Supply air	Standard	TE3	Temperature sensor, preheating control	Outdoor air temperature Adjustment range -6...+15 °C (preheating)	Standard
FG	Damper motor	Automatic heat recovery bypass 24 V, 2 W, 8 Nm	Standard	TE4	Temperature sensor	Extract air temperature	Standard
H	Control panel, 3 at most	User interface	Standard	S	Supply air fan DC	qv = 130 dm <sup>3</sup> /s (150 Pa)	Standard
LP1	Preheating unit	Liquid radiator	Standard	T1	Electric heating unit overheat protection	Automatic + 70 °C	Included in LP2
LP2	Post-heating unit	Electric radiator, 1000 W	Option	T2	Electric heating unit overheat protection	Manual reset +130 °C	Included in LP2
HR	Heat recovery cell	Counter-current, efficiency = 80%	Standard	MV	Solenoid valve		Not included in delivery
PDS1	Pressure difference switch Pressure guard on supply air side	Adjustment range 0...500 Pa (320)	Option	PI	Circulation pump		Not included in delivery
PDS2	Pressure difference switch Pressure guard on extract air side	Adjustment range 0...500 Pa (320)	Option	T	Fireplace/booster switch function	Either fireplace or booster switch function (fireplace switch) can be selected.	Option
P	Extract air fan DC	qv = 140dm <sup>3</sup> /s (150 Pa)	Standard	LON	LON converter	Remote monitoring control	Option
%RH	Humidity sensor, 2 at most Humidity control	Automatic/Adjustment range 1...99% (99) Adjustment interval 1...15 min. (10)	Option				



## DESCRIPTION OF OPERATION / MLV radiator

### Control of operation

Power supply to the unit can be controlled with a contactor in the distribution panel if needed, e.g. with a timer programme. Upon starting, the unit first operates at minimum power. After that power is adjusted based either on the measurement data from air quality sensors and/or on manual control at the control panel.

### Fan speed adjustment

#### Manual control

Fan speed of the ventilation unit is controlled in 8 steps at control panel **H**.

#### Week clock control

The fan power of the ventilation unit is controlled in 8 steps using the week clock in control panel **H**. The week clock can be used to programme the desired fan power option and the setpoint for supply air temperature for each day of the week and each hour in the day.

#### Carbon dioxide and humidity control

The fan power of the ventilation unit is controlled in multiple steps depending on load and based on the measurement results of the air quality sensors (CO<sub>2</sub> and %RH sensors) located in the ventilation zone. The aim is to keep carbon dioxide and/or humidity content below the threshold set at control panel **H**. It is also possible to select an automatic search for the humidity content threshold at control panel **H**. One or more modes of control may be used simultaneously – the mode demanding boosting is the dominant one. Fan speed varies depending on load between the base and maximum fan speeds. The base and maximum fan speeds can be set at the desired level at the control panel.

#### Voltage signal control

The fan power of the ventilation unit is controlled in 8 steps with a voltage signal of 0...10 VDC. However, fan power cannot be raised above the set maximum fan speed.

Voltage signal control is used to control base fan speed. This means that fan speed can be raised when necessary, but not lowered, by the manual, CO<sub>2</sub> and %RH controls.

#### Voltage signal values

Voltage values for each fan speed:		
0	0,20...1,25	VDC
1	1,75...2,25	VDC
2	2,75...3,25	VDC
3	3,75...4,25	VDC
4	4,75...5,25	VDC
5	5,75...6,25	VDC
6	6,75...7,25	VDC
7	7,75...8,25	VDC
8	8,75...10,00	VDC

### Supply air temperature

Supply air temperature can be controlled with either constant temperature control or cascade control.

#### Supply air constant temperature control

The control unit directs the operation of post-heating unit **LP2** on the basis of the measurement data given by temperature sensor **TE2**, aiming at keeping supply air temperature at the temperature value set at control panel **H** (+10...+30 °C).

The cooling function of the **MLV** radiator starts when the post-heating radiator has been switched off and supply air temperature exceeds the setpoint for supply air.

#### Supply air cascade control

The control unit directs the operation of post-heating unit **LP2** on the basis of the measurement data given by extract air sensor **TE4**, aiming at keeping extract air temperature at the temperature value set at control panel **H** (+10...+30 °C).

### Heat recovery bypass

Heat recovery is always active when post-heating is switched on. Automatic heat recovery bypass is active when post-heating is switched off and outdoor temperature exceeds the threshold set (can be set at 0...+25 °C). However, heat recover is always active when outdoor temperature is less than the threshold set.

### Heat recovery antifreezing

Controlling preheating in a liquid-circulating **MLV** radiator is different from that in an electric preheating radiator. The liquid radiator switches on based on the measurement data from outdoor air temperature sensor **TE3**. The control centre of the unit starts the pump and opens the solenoid valve when post-heating is on and outdoor air temperature goes below the setpoint for preheating. The setpoint must be lower than the temperature of the liquid coming from the ground collector. If the capacity of preheating unit **LP1** is not sufficient, the control centre keeps stopping supply air fan **T** on the basis of the measurement data on temperature sensor **TE1**, thus preventing the heat recovery cell from freezing. As soon as the risk passes, the fan restarts automatically. The threshold temperature (-6...+15 °C) and the difference area (1 ... 10 °C) for antifreezing can be set at control panel **H**.

### Heating unit overheat protection (electric post-heating unit)

Overheat protection thermostats **T1** and **T2** monitor the surface temperature of heating unit **LP1**. When surface temperature exceeds the threshold, overheat protection is triggered and power supply to the heating unit is stopped. Overheat protection **T1** is reset automatically, whereas overheat protection **T2** is reset by switching the unit off.

### Water radiator freezing protection

Based on the measurement data of outdoor temperature sensor **TE3** (outdoor air < 0 °C) and supply air temperature sensor **TE2** (supply air < 7 °C) the control centre of the unit stops fans **T** and **P** and leaves valve **V1** open, thereby decreasing the freezing risk in water circulating heating unit **LP2**. A freezing alert appears in the display of the control panel. The fans restart automatically as soon as the risk of freezing passes (supply air > 10 °C).

### Alarms

Pressure difference switches **PDS1** and **PDS2** monitor the pressure difference on the supply and extract air sides. If the pressure difference rises too high because of dirty filters or clogged ducts, an alarm will be issued. This is indicated by a symbol (X) in the main display of the control panel. If the unit is not equipped with pressure difference switches, the symbol (M) appearing in the main display of the control panel reminds of the need for maintenance of the unit. The reminder interval can be set between 1...15 months. The factory setting is 4 months. This function is always active.

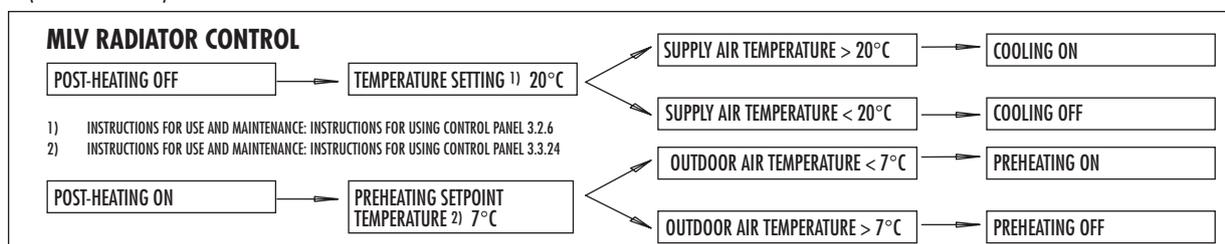
The fault signal relay in the unit gives potential-free alarm indications on the following fault conditions:

- When the antifreeze function of the water-circulating radiator is on, the contacts of the the relay open and close at 10-second intervals.
- Alarm of high carbon dioxide content (> 5000 ppm) switches the relay at 1-second intervals.
- In other fault situations, such as sensor faults, the contacts of the relay close.

### Booster or fireplace switch function

The booster or fireplace switch function of the ventilation unit is controlled either at control panel **H** and/or separate switch **S**, which can be connected to the connection box of the unit. The mode of operation of the switch is selected at control panel **H**. The booster switch function raises fan speed to the set maximum fan speed for 45 minutes. The fireplace switch stops the extract air fan for 15 minutes and produces overpressure in the ventilation zone.

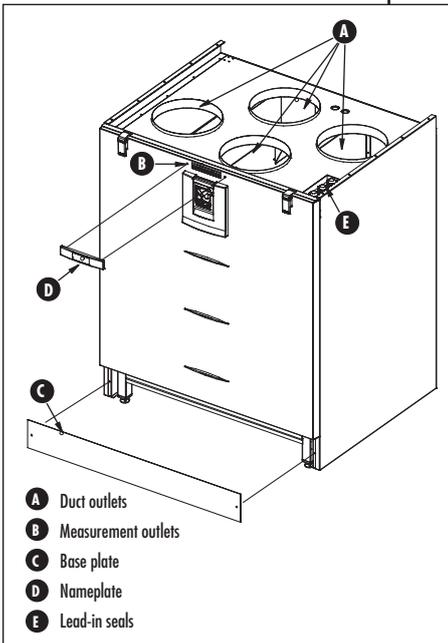
**LON remote monitoring control can be implemented with a VALLOX LON converter. See a separate brochure.**





# VALLOX 150 Effect SE

## INSTALLATION INSTRUCTIONS



- A Duct outlets
- B Measurement outlets
- C Base plate
- D Nameplate
- E Lead-in seals

### Location of the ventilation unit

- The unit is mounted indoors, in a place where temperature does not fall below +10 °C.
- The unit is mounted in a place where the sound pressure level coming through the envelope is not acoustically disturbing (storerooms, corridors, technical rooms, and in some cases rooms where people spend time).
- The unit is equipped with an adjustable base. If the unit is mounted on the wall, attention needs to be paid to the weight of the unit (102 kg) and to vibration isolation.
- The unit is splash protected (IP 34) and can thus also be mounted in a damp room.

### Electrical connections

- The unit has a plug connection. The electrical connection box of the unit is located inside the unit next to the connection outlet of the exhaust air ductwork.
- The cables to be connected to the unit are wired through the lead-in seals located next to the connection outlet of the exhaust air ductwork.

### Installation

- Remove the door of the unit (latches on top edge).
- Remove the cover of the electrical connection box (2 screws 3.5 x 9.5).
- Mount and connect necessary cables to the terminal block as specified in the connection instructions.
- These instructions include the internal and external electric diagrams.

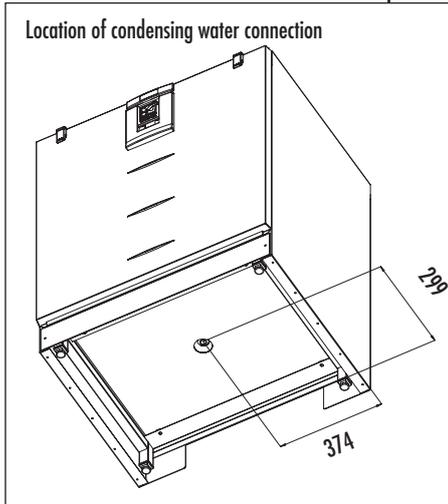
### Channel outlets of the unit

- The unit is equipped with four ø200 external connection outlets. Necessary connecting pieces (e.g. inner or bent connectors) can be attached to external connection outlets.

Fix the ducts steadily and tightly to the relevant outlets. (NOTE! Unit models L/R). Implement duct insulation if needed as defined in the ventilation plan.

### Air flow measurement outlets

- The fixed measurement outlets are located behind the nameplate.
- Via the measurement outlets, the total pressure of the supply and extract air ductwork can be measured with a differential pressure instrument. Pressure readings and the unit's air volume tables (p. 3) show volume air flows at various adjustment positions.
- The red measurement hose is on the pressure side and the black hose on the suction side of the fan.



Location of condensing water connection

### Condensing water connections

The delivery includes a water seal. With a pipe connected to the water seal, water condensing from extract air can be led to a floor drain (not straight to the drain). The pipe must not rise after the water seal.

As the condensing water connection is located in the middle of the unit, the unit has to be mounted level with the horizontal.

### Pipe connections

- If the unit is equipped with a liquid-circulating post-heating or MLV preheating /cooling unit, it is connected to the liquid circuit using a plastic or copper pipe with a recommended inner diameter of 10...13 mm.

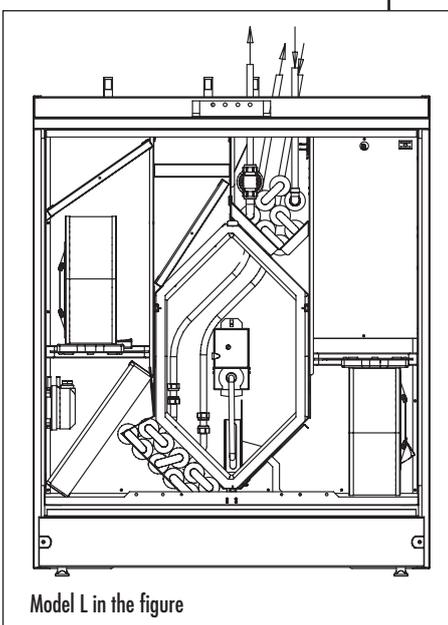
The outer diameter of the the MLV radiator's plastic pipes coming from the unit is 12 mm.

**Note! When using a plastic pipe pay attention to the temperature stability of the pipe!**

- MLV radiator is connected to plastic pipes. When needed, the connections can be reached by taking the heat recovery cell away.
- The following figures describe different ways of connecting the MLV radiator and the VKL post-heating radiator.

### NOTE!

**WATER-CIRCULATING POST-HEATING RADIATOR INCLUDES A CONTROL VALVE.**



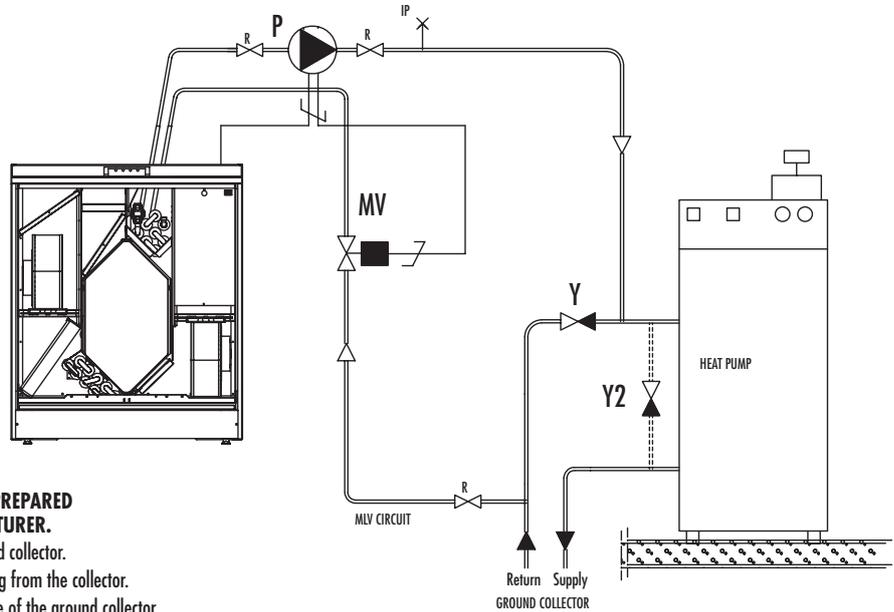
Model L in the figure



## RADIATOR CONNECTIONS

### Connection of MLV preheating/cooling radiator to the ground collector of ground-source heat pump

- P** Circulation pump  
Because of the risk of condensing the pump should be suitable for pumping liquid that is colder than the ambient temperature (e.g. Magna1 25-60). When choosing a circulation pump, take into account the pressure loss in the whole system.
- MV** Solenoid valve  
The valve has to be suitable for the liquid in the ground collector (for example ELV05006, Stig Wahlström).
- Y** Non-return valve
- R** Stop valve
- IP** Air bleeder  
Air bleeder is placed after the pump and at the highest point in the network.
- Y2** Non-return valve  
The pressure loss of the valve has to be lower than that of the heat pump.



#### ALWAYS PRIMARILY FOLLOW THE CONNECTION PLAN PREPARED BY THE HVAC PLANNER OR THE HEAT PUMP MANUFACTURER.

See the adjoining example of connecting an MLV unit to the ground collector.

The supply pipe of the MLV circuit is connected to the pipe returning from the collector.

The liquid returning from the MLV circuit is taken to the return pipe of the ground collector.

If the internal pressure losses of the heat pump in the ground collector are known to be high, it is recommended to bypass the heat pump.

The liquid then circulates when the heat pump is stopped. In this case the pressure loss of the bypass non-return valve has to be lower than that of the heat pump.

When the requirements for starting the heating or cooling function are met, the control function of the unit opens the solenoid valve (MV) and starts the pump (P).

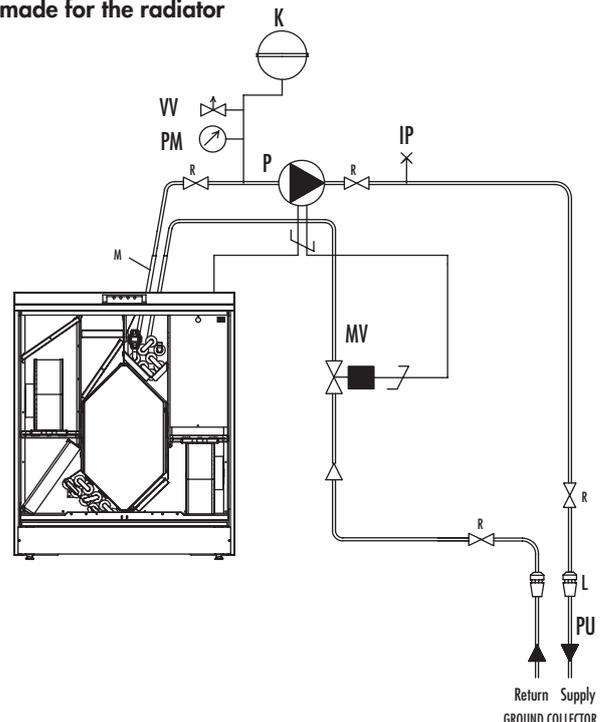
The components of the MLV circuit mentioned in the diagram are not included in the delivery. Observe the freeze resistance of the liquid used in the ground collector.

The connection pipes of the MLV radiator have to insulated against condensation. If the heat pump has an open expansion tank, it must be situated at the highest point of the network.

**Note!** Because of the risk of humidity damage, supply air temperature in a duct with no condensation insulation should not go below +16...20 °C.

### Connection of MLV preheating/cooling radiator to ground collector made for the radiator

- P** Circulation pump  
Because of the risk of condensing the pump should be suitable for pumping liquid that is colder than the ambient temperature (e.g. Magna1 25-60).  
When choosing a circulation pump, take into account the pressure loss in the whole system.
- MV** Solenoid valve  
The valve has to be suitable for the liquid in the ground collector (for example ELV05006, Stig Wahlström).
- IP** Air bleeder  
Air bleeder is placed after the pump and at the highest point in the network.
- PU** Pipe of ground collector  
(for example plastic pipe 32/10 100 m)
- VV** Relief valve
- PM** Pressure gauge
- K** Diaphragm expansion tank
- L** Connector
- R** Stop valve



The MLV radiator is connected to the pipe returning from the ground collector and going to the MLV circuit. When the requirements for starting the heating or cooling function are met, the control function of the unit opens the solenoid valve (MV) and starts the pump (P).

The components of the MLV circuit mentioned in the diagram are not included in the delivery. The radiator has Ø12 mm plastic pipes (M) coated with an oxygen diffusion barrier. Observe the freeze resistance of the liquid used in the ground collector.

The connection pipes of the MLV radiator have to insulated against condensation.

**Note!** Because of the risk of humidity damage, supply air temperature in a duct with no condensation insulation should not go below +16...20 °C.

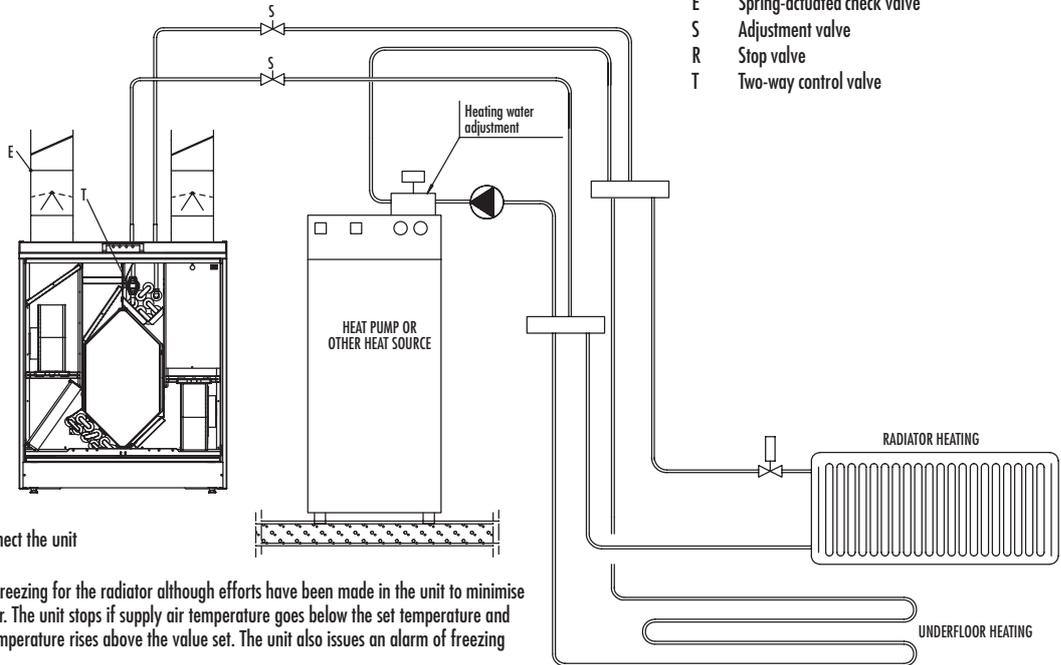


# VALLOX 150 Effect SE

## RADIATOR CONNECTIONS

### VKL post-heating radiator connection

#### Sample connection: Direct connection to underfloor heating or radiator network



- E Spring-actuated check valve
- S Adjustment valve
- R Stop valve
- T Two-way control valve

It is sometimes convenient to connect the unit directly into the heating network.

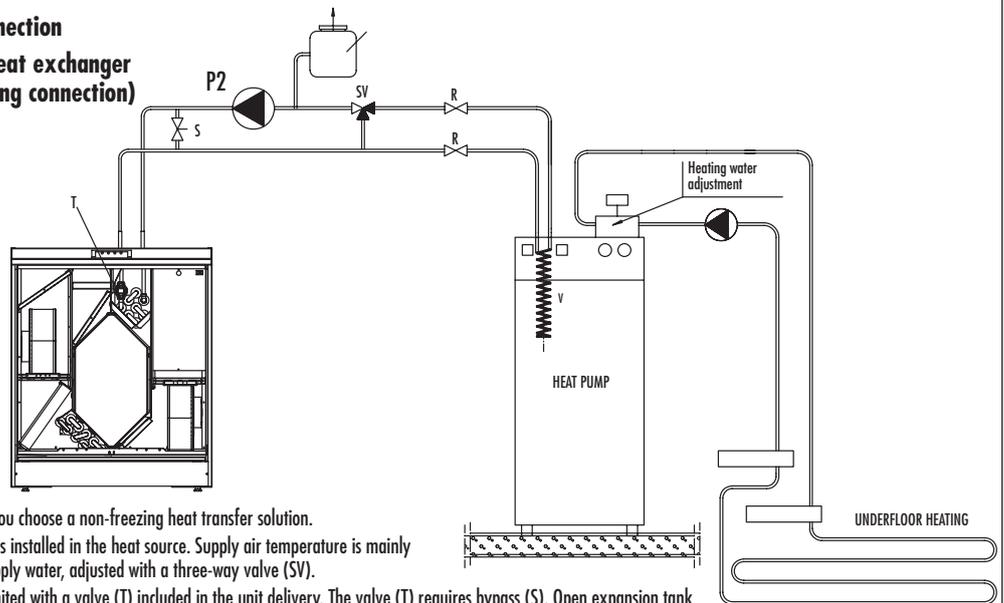
The connection involves a risk of freezing for the radiator although efforts have been made in the unit to minimise the risk of freezing of the radiator. The unit stops if supply air temperature goes below the set temperature and automatically starts as soon as temperature rises above the value set. The unit also issues an alarm of freezing risk at the controller.

It is recommended to have e.g. a spring-actuated check valve (E) in the outdoor air duct (and possibly also in the exhaust air duct). This valve closes the duct from the unit to outdoor air and prevents cold air from flowing into the unit while it is stopped. The base volume of water flow into the radiator of the unit can be adjusted with valves (S), which can also act as stop valves. No water must be led into the radiator of the unit until the system has been adjusted for operation and heating is on in the heating network, or other measures have been taken to ensure that the radiator will not freeze. Water circulation in the heating network connected to the unit and the circulation pump must not be stopped during the heating season. With the exception of valve (T), the components of the VKL circuit mentioned in the diagram are not included in the delivery.

### VKL post-heating radiator connection

#### Sample connection: separate heat exchanger for ventilation unit (non-freezing connection)

- P2 Circulation pump
- A Open expansion tank
- R Stop valve
- V Heat exchanger
- SV Three-way valve
- T Two-way control valve
- S Bypass



You need no other anti-freeze protection if you choose a non-freezing heat transfer solution.

In the sample connection the exchanger (V) is installed in the heat source. Supply air temperature is mainly adjusted according to the temperature of supply water, adjusted with a three-way valve (SV).

Air temperature can also be adjusted and limited with a valve (T) included in the unit delivery. The valve (T) requires bypass (S). Open expansion tank (A) has a capacity of circa 2.5 litres and is mounted on the suction side of the pump. Stop valves (R) are also installed in the pipe system. Pump (P2) is a standard heat pipe pump (pump power 0.075 l/s and pressure 5...35 kPa).

With the exception of valve (T), the components of the VKL circuit mentioned in the diagram are not included in the delivery.



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