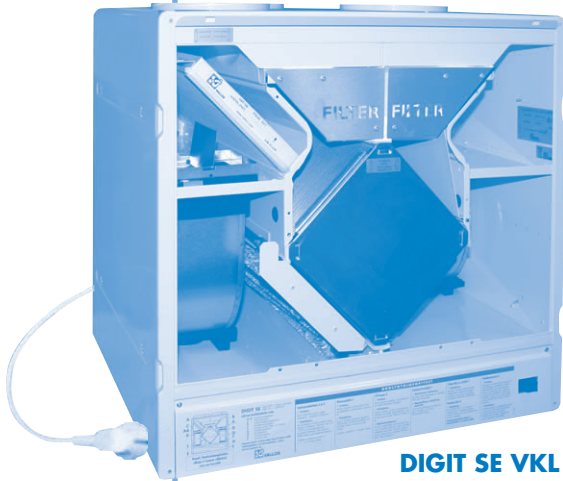




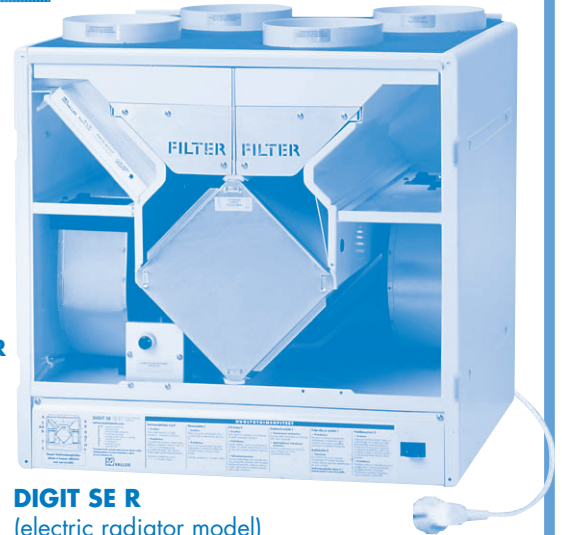
VALLOX DIGIT SE

• 1.09.61E
• 28.8.2008
© VALLOX

Code B 3500 SE



DIGIT SE VKL R
(water radiator model)



DIGIT SE R
(electric radiator model)

The figure shows the R model. In the L model, the duct connections are in reverse order. (See page 2.)

TECHNICAL SPECIFICATION

Technical details

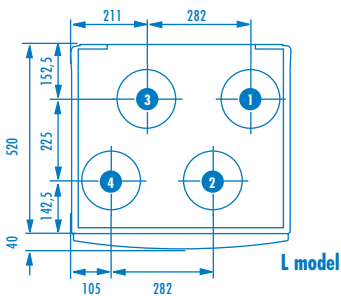
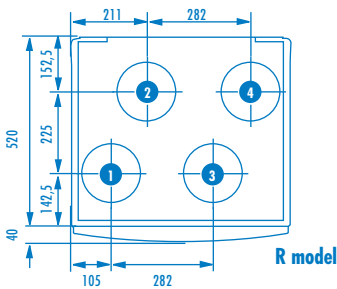
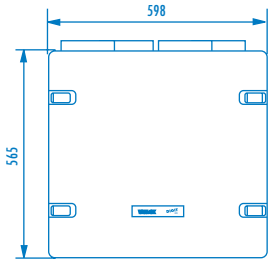
- Power supply: 230V, 50Hz, 1.35kW, 5.9A, VKL model 0.35 kW, 1.5 A (with external preheating max 2kW, in total 3.35kW, 14.7A). Class of protection IP 34.
- Weight 58 kg
- Capacity regulation in eight steps, base and maximum speeds to be set
- Post-heating ON/OFF button, and post-heating setpoint selection on the control panel
- Fireplace switch function at the control panel
- Timing of fan speeds and post-heating control at the control panel
- Week clock control at the control panel
- Ability to control from several places (max. 3 control panels)
- LON remote monitoring control
- Remote monitoring control for fan speeds (0...20mA or 0...10VDC)
- Maintenance reminder notifies of the need for service
- Automatic heat recovery cell (HRC) bypass
- Condensing water piping can be hidden
- Automatic defrosting of the cell
- VKL models incorporate automatic defrosting of the water radiator
- Heat recovery efficiency over 60%
- In case of a failure, the display of the control panel shows a message indicating the reason for the failure.
- Fault signalling relay with potential free points (for remote control)
- Automated features enable the connection of the following:
 - CO₂ control
 - Humidity control
 - Filter guard for both the extract and supply air sides
 - Fireplace / booster switch
 - External preheating control (factory installed)
 - Optional silencer and distribution boxes



VALLOX DIGIT SE / VKL

DIMENSIONS AND MAIN PARTS

Dimensions and duct outlets



Duct outlets, duct inside Ø 160mm + extension joints

- 1 Supply air into the house
- 2 Extract air out of the house
- 3 Outdoor air into the ventilation unit
- 4 Exhaust air out

VALLOX DIGIT SE models

Code: B3500 SE

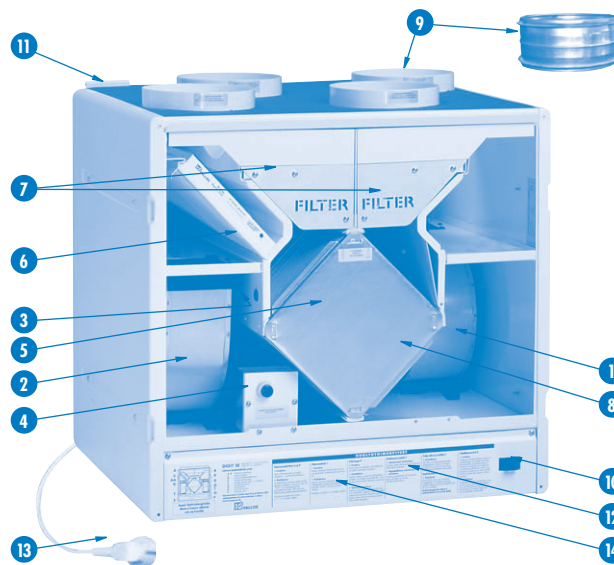
VALLOX DIGIT SE

- Post-heating unit: electric radiator, 1000 W

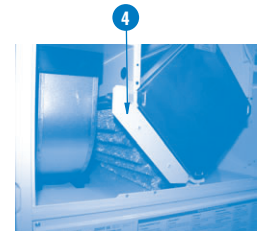
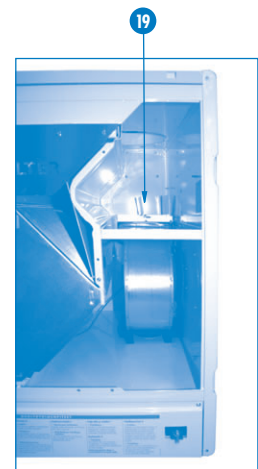
VALLOX DIGIT SE VKL

- Post-heating unit: water radiator

The letter L or R after the name of the unit indicates the handedness of the unit.



VKL MODEL



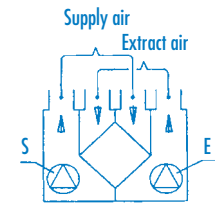
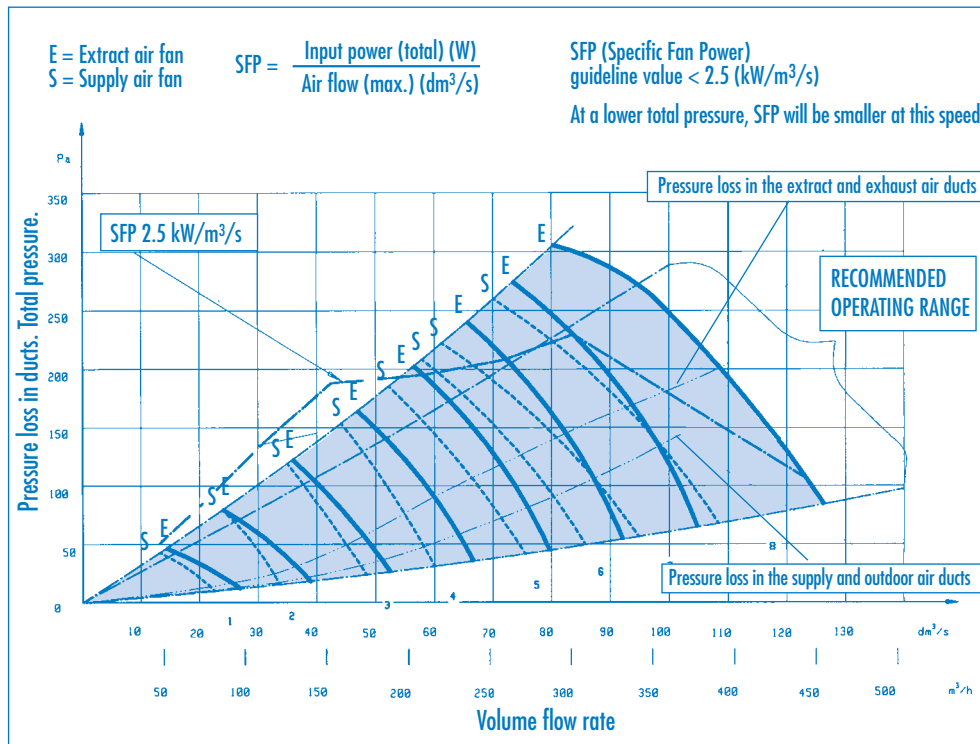
Water radiator
in the VKL model

Main parts:

- 1 Extract air fan 210 W / 0.92 A, alternating current (AC)
- 2 Supply air fan 210 W / 0.92 A, alternating current (AC)
- 3 Electrical quick-connect terminal of the fan
- 4 Post-heating radiator (electricity 1000W, or water)
- 5 Heat recovery cell
- 6 Outdoor air filter EU7
- 7 Outdoor and extract air prefilter EU3
- 8 Summer/winter damper
- 9 Duct connections, duct inside Ø 160mm + extension joints
- 10 Safety switch
- 11 Wall mounting lug
- 12 Protective plate of the electrical enclosure
- 13 Plug cable 1.2m
- 14 Electrical enclosure
- 15 Control panel
- 16 CO₂ sensor (optional)
- 17 Humidity sensor (optional)
- 18 LON converter (optional)
- 19 Self-actuated one-way dampers (only in the VKL model)



Air volumes



Measuring points after the outlet collar.

Fan curves indicate the total pressure available for duct losses.

Fan speeds	Control voltage V	Total input power W
1	60	35
2	80	55
3	100	80
4	120	110
5	140	145
6	160	180
7	180	210
8	230	310

Sound values

Hz	Sound power level from the ventilation unit to supply air ducts by octave band L _w , dB				Sound power level from the ventilation unit to extract air ducts by octave band L _w , dB												
	ADJUSTMENT POSITION / AIR FLOW				ADJUSTMENT POSITION / AIR FLOW												
	2 35 l/s	4 60 l/s	6 86 l/s	8 107 l/s	2 40 l/s	4 67 l/s	6 93 l/s	8 125 l/s									
Medium frequency of the octave band, Hz	63	125	250	500	1000	2000	4000	8000	L _w dB	69	77	83	88	60	67	73	78
	L _{WA} dB(A)	48	57	63	69	40	50	56	61	A-weighted sound pressure level dB (A) coming from the unit through the envelope in rooms where the unit has been installed (10 m ² sound absorption)							
		ADJUSTMENT POSITION / AIR FLOWS (supply / extract)															
		2 33/37 l/s	4 58/62 l/s	6 80/87 l/s	8 98/113 l/s					VALLOX DIGIT SE							
	L _{pA} dB(A)	27	36	42	47												



VALLOX DIGIT SE / VKL

CONTROL PANEL

Control

VALLOX DIGIT SE can be controlled with the control panel coming with the unit (3 at most) and with optional CO₂ (5 at most) and %RH sensors (2 at most). Fan speeds of the unit can be controlled via remote monitoring with a voltage or current 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



Keyboard



Main display

- 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**
With this button, you set post-heating on and off. 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.

3	Fan speed (3).		Maintenance reminder alert.
21 C	Supply air temperature (21 °C).		Fireplace / booster switch on. The fireplace / booster switch is activated in this display by simultaneously pressing down the + and – buttons for 2 seconds.
	Post-heating is on.		10:20 Time.
	Filter guard alert.		Week clock control on.

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

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 CO₂ sensor or another control panel. (See External electrical connections on page 7).

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.

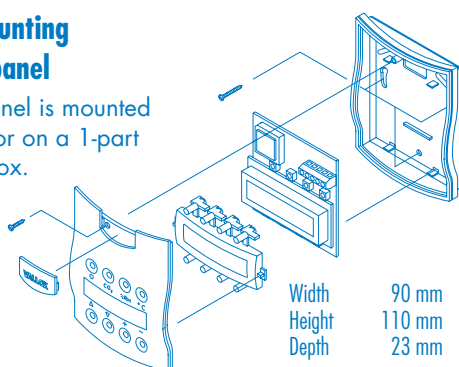
If control panels have the same address, they go to bus fault state. In this case, remove one of the control panels and change the address of the other panel. The above mentioned situation can arise in connection with the later installation of an additional control panel.



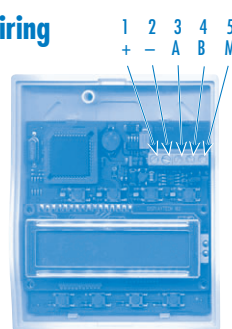
Panel address 1

Surface mounting of control panel

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



Wiring



Electronics board of control panel

Cable:

NOMAK 2 x 2 x 0.5 mm² + 0.5 mm²

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.

<p>Surface mounting</p> <p>Base plate of sensor</p>	<p>Wiring</p> <p>Electronics board of %RH sensor</p> <p>Cable: 2 x 0.5 mm²</p>
--	--

Mounting and wiring of carbon dioxide sensor

The CO₂ sensor is connected directly from the connection box of the unit, or in series with another CO₂ sensor or control panel (see External electrical connections on page 9).

<p>Surface mounting</p> <p>Base plate of the CO₂ sensor</p>	<p>Wiring</p> <p>Electronics card of the CO₂ sensor (model may vary)</p> <p>Cable: NOMAK 2 x 2 x 0.5 mm² + 0.5 mm²</p> <p>NOTE! Faulty coupling of the (+) wire destroys the carbon dioxide sensor!</p> <table border="0"> <tr> <td>1 = orange 1</td> <td>= +</td> <td rowspan="2">} ca. 21 VDC</td> </tr> <tr> <td>2 = white 1</td> <td>= -</td> </tr> <tr> <td>3 = orange 2</td> <td>= A</td> <td></td> </tr> <tr> <td>4 = white 2</td> <td>= B</td> <td></td> </tr> <tr> <td>5 = metal</td> <td>= signal ground</td> <td></td> </tr> </table>	1 = orange 1	= +	} ca. 21 VDC	2 = white 1	= -	3 = orange 2	= A		4 = white 2	= B		5 = metal	= signal ground	
1 = orange 1	= +	} ca. 21 VDC													
2 = white 1	= -														
3 = orange 2	= A														
4 = white 2	= B														
5 = metal	= signal ground														

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.



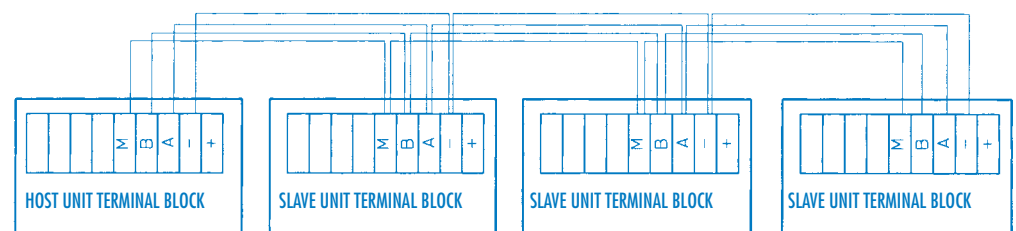
CARBON DIOXIDE SENSORS

- 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.



Connecting two or more units (slave unit)

Connect slave units as specified in the adjoining connection instructions. Slave units do not operate independently, but follow the instructions received from the host unit. Neither control panel nor sensors must be connected to a slave unit.



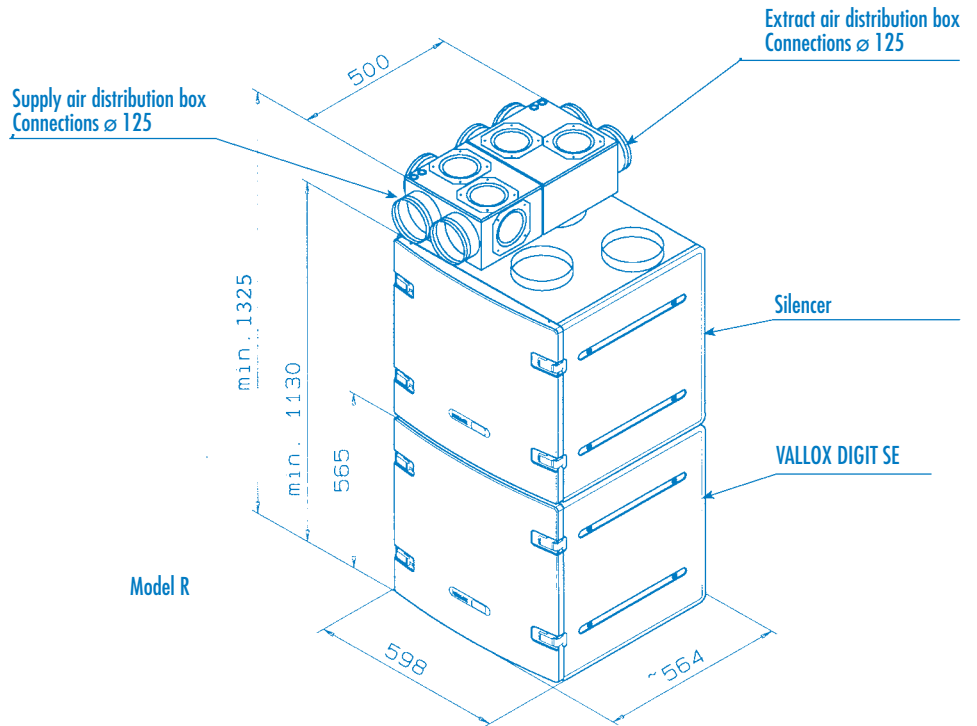
NOTE! + wire must not be connected to a SLAVE UNIT.

SLAVE UNIT must not have a 6K8 resistor in place.



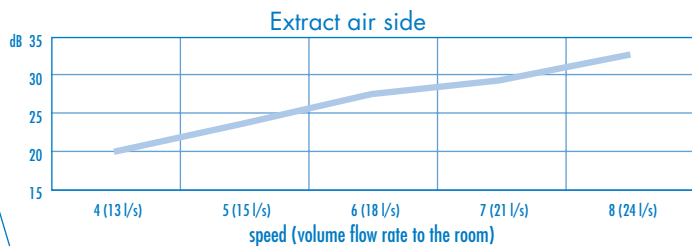
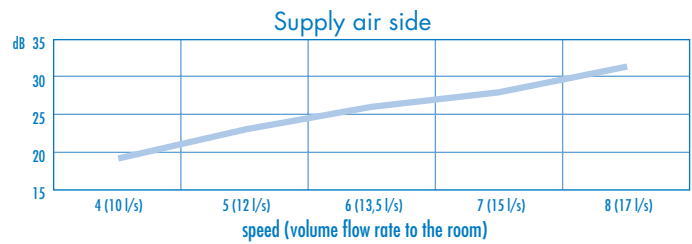
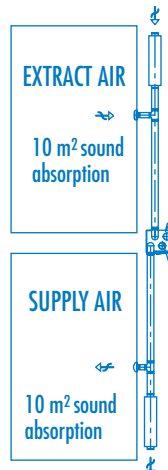
VALLOX DIGIT SE / VKL

VALLOX SILENCER UNIT



Expected sound levels db (A) in a room with a VALLOX silencer

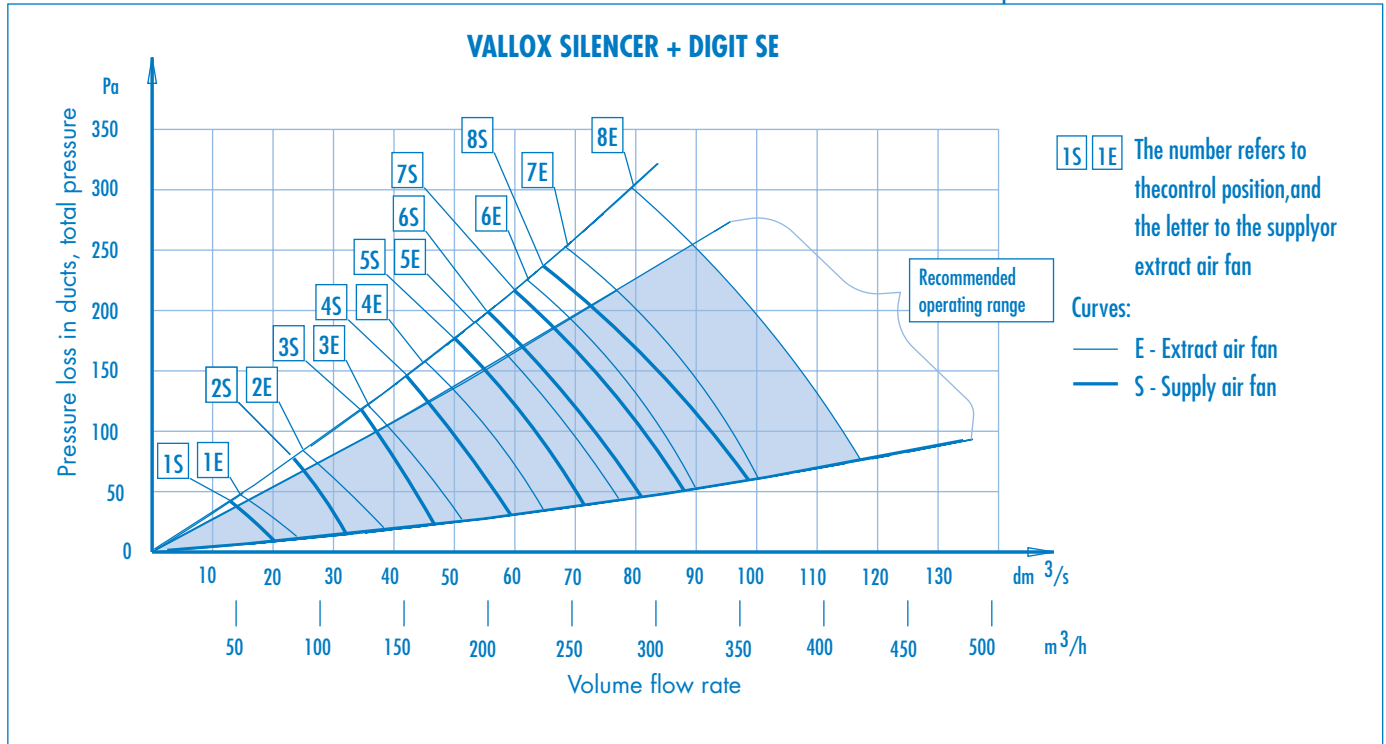
ROOM SOUND LEVEL MEASUREMENT



DIGIT SE / 130 E + VALLOX SILENCER UNIT



Air volumes



Sound values

Supply air duct	Sound power level in the supply air duct by octave band after the silencer, L _w , dB								
	CONTROL POSITION / VOLTAGE V AIR FLOW / dm³/s/PRESSURE Pa	1/60	2/80	3/100	4/120	5/140	6/160	7/180	8/230
			33/16	44/40	57/45	69/52	75/83	80/105	93/99
Medium frequency of the octave band, Hz	63		65	69	72	74	76	78	78
	125		51	59	61	64	66	68	69
	250		33	39	44	47	50	52	54
	500		24	28	32	36	38	41	43
	1000		19	22	24	26	27	28	31
	2000		0	0	0	7	10	15	19
	4000					0	0	0	13
	8000								0
	L _w dB, total		65	70	72	74	77	78	79
	L _{wA} dB (A), total		40	45	48	50	53	54	55

Extract air duct	Sound power level in the extract air duct by octave band after the silencer L _w , dB								
	CONTROL POSITION / VOLTAGE V AIR FLOW / dm³/s/PRESSURE Pa	1/60	2/80	3/100	4/120	5/140	6/160	7/180	8/230
			36/24	47/49	56/42	75/49	85/73	93/95	108/126
Medium frequency of the octave band, Hz	63		57	63	65	68	70	71	74
	125		45	50	54	58	60	62	65
	250		33	40	45	49	51	53	56
	500		12	20	25	28	32	34	37
	1000		0	12	17	21	25	27	30
	2000			0	0	8	17	21	26
	4000					0	0	0	20
	8000								0
	L _w dB, total		57	63	65	68	70	72	75
	L _{wA} dB (A), total		32	38	41	45	47	49	52



VALLOX DIGIT SE / VKL

INTERNAL ELECTRICAL DIAGRAM

VALLOX DIGIT SE / DIGIT SE VKL (B 3500 SE)

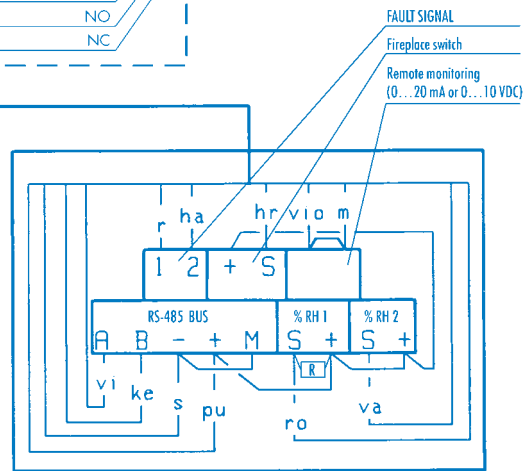
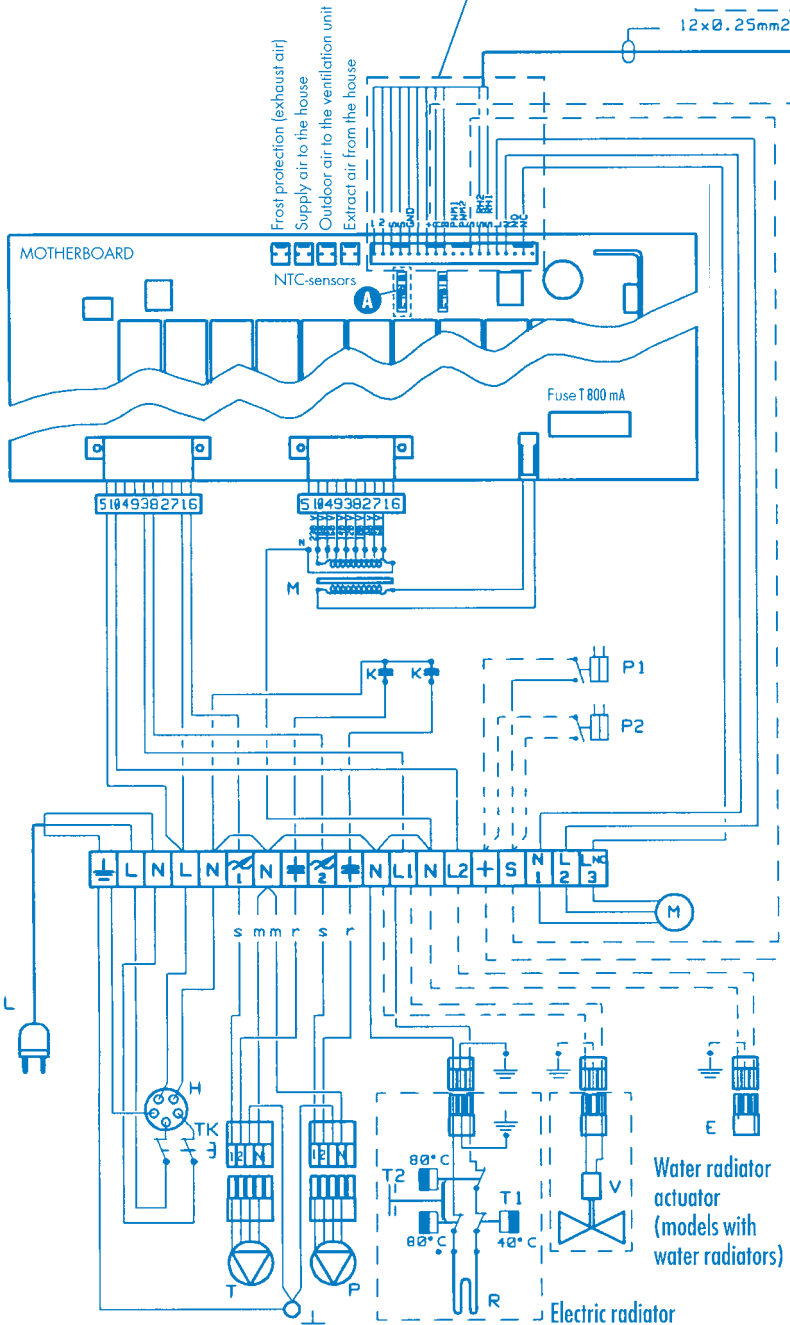
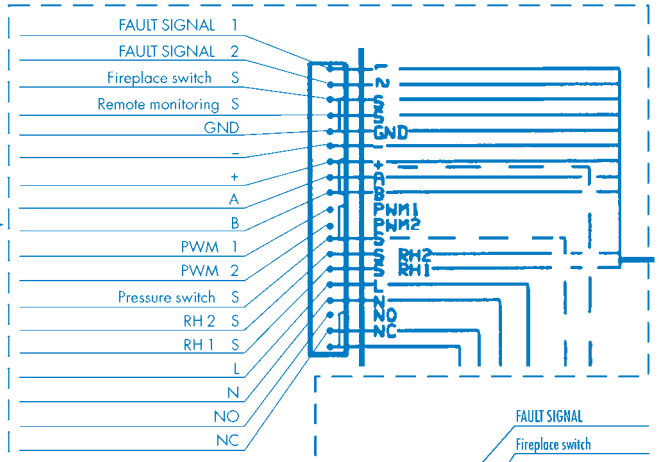
A Fan control with voltage / current signals
Selection with the A jumper



Using jumpers in voltage signal control
(factory setting)



Using jumper in current signal control



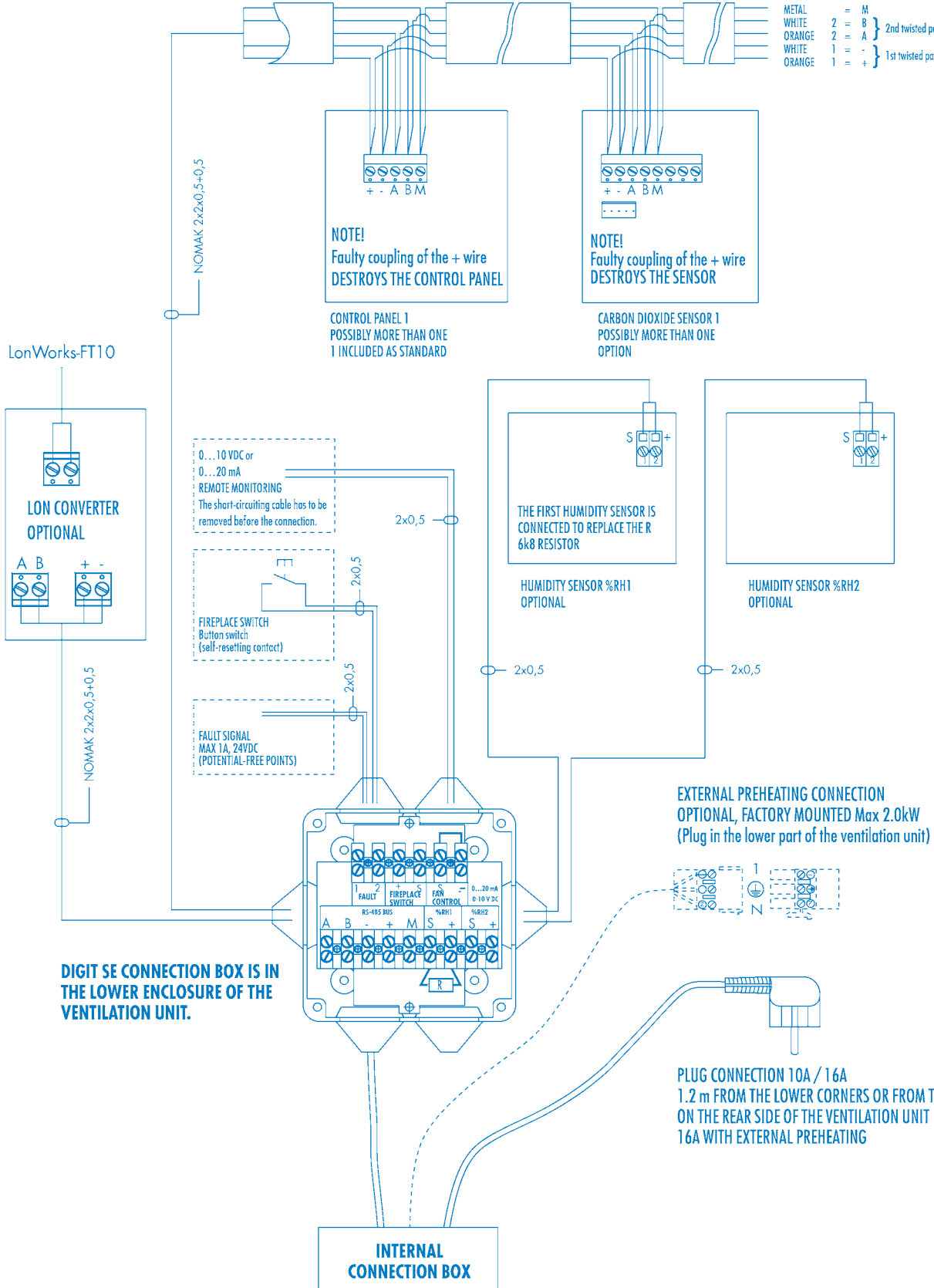
DIGIT SE CONNECTION BOX
(in the lower enclosure of the ventilation unit)

- | | | | |
|----|---|----------------|-----------|
| T | Supply air fan | Wiring colors: | |
| P | Extract air fan | s | Blue |
| M | Autotransformer with a protective voltage coil | m | Black |
| K | Capacitor | r | Brown |
| H | Suppressor | vi | Green |
| L | Connection cable with protective grounding | ke | Yellow |
| TK | Safety switch | pu | Red |
| V | Water radiator thermostatic valve | ro | Rose-pink |
| T1 | Post-heating radiator safety thermostat | va | White |
| T2 | Overheating protector, 2 pcs | ha | Grey |
| R | Post-heating radiator | hr | Grey-pink |
| E | Connection for external preheating radiator, optional (plugs in the lower part of the unit) | vio | Violet |
| M | Damper motor 16 VAC | | |
| P1 | Filter guard, optional (supply) | | |
| P2 | Filter guard, optional (extract) | | |



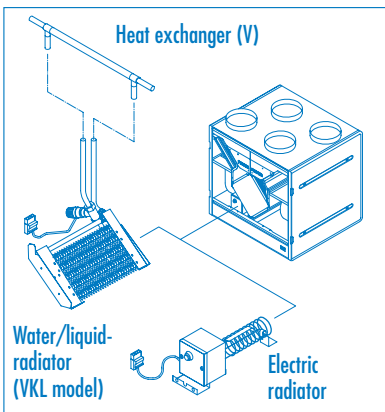
VALLOX DIGIT SE / DIGIT SE VKL (B 3500 SE)

METAL	=	M	} 2nd twisted pair
WHITE	2	B	
ORANGE	2	A	} 1st twisted pair
WHITE	1	-	
ORANGE	1	+	





POST-HEATING



Post heating radiator

Electric radiator 1000W, or water radiator (VKL model)

Post-heating in DIGIT SE VKL operates in a similar fashion to an electric radiator but the actuator is an electric thermostat valve, which is open when dead. The water radiator in the VKL model also has an automatic anti-freezing function, which stops all functions when supply air temperature is below 7 °C and outdoor temperature is below 0 °C. At the same time, the valve remains open and the self-actuated dampers of the fans close. (The control panel shows the fault message FREEZING ALERT.) The unit restarts and the dampers open as soon as supply air temperature exceeds 10 °C.

In the VKL model it is also possible to bring non-freezing heat transfer fluid into the post-heating radiator. In addition, the radiator can be provided with a separate non-freezing heating circuit. It can be built for example with the heat exchanger (V) supplied with the unit. See the mounting examples in the technical specification in the section describing water-circulating radiator connections.

Post-heating regulation

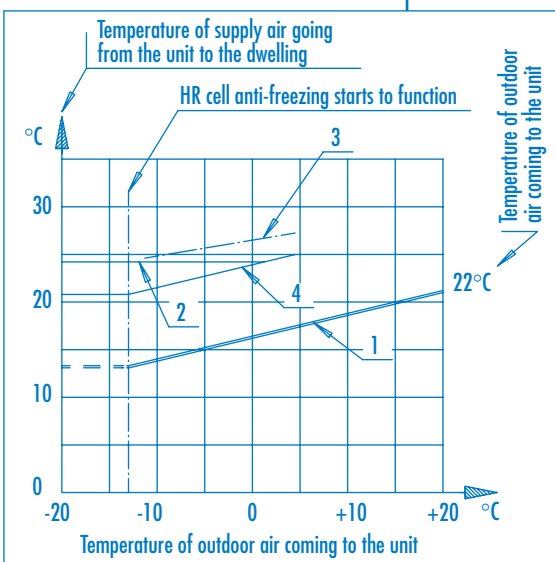
There are two ways to control post-heating.

1. Supply air constant temperature control

- In DIGIT SE, post-heating control is proportional: when the chosen temperature exceeds supply air temperature by more than 2.5°C, the radiator is on 100% of the time; when the temperature differential gets smaller, the on time of the radiator is reduced automatically in two-minute sequences. The temperature range is 10...30°C.
- The heating radiator is on when the (⊞) sign is displayed in the main display of the control panel.
- The main display of the control panel shows the temperature of supply air.
- Temperature control is only active when post-heating has been switched on.

2. Supply air cascade control

- Supply air temperature control can be replaced with cascade control.
- Cascade control changes the mode of regulating the post-heating radiator: the temperature of air blown to the ventilation zone is controlled on the basis of extract air.
- The program aims at keeping supply air temperature at the value that depends on the difference between extract air and the setpoint as follows: if extract air is hotter than the setpoint, the temperature of supply air is lower than the setpoint by the same amount. If extract air is cooler than the setpoint, supply air is hotter by the same amount. For instance, if indoor air temperature is 25°C and the setpoint is 24°C, the aim is to blow 23°C air to the ventilation zone. If temperature in the ventilation zone is 24°C and the setpoint is 25°C, the aim is to blow 26°C air to the ventilation zone.
- The aim is to permanently keep the temperature of air blown to the ventilation zone within the range +10...+30°C.
- Cascade control can be chosen on the control panel, and it is active when post-heating has been switched on.
- The heating radiator is on when the (⊞) sign is displayed in the main display of the control panel.



EXAMPLE: Outdoor air temperature rise in the heat recovery cell with an electric and water radiator

- Curve 1 Supply air temperature without post-heating = only heat recovery.
- Curve 2 Supply air temperature controlled by the thermostat of the electric radiator, adjustment setting 23 °C (air flow less than 75 l/s).
- Curve 3 Supply air temperature with water radiator, water +35 °C and water flow 0.05 dm³/s. Air flow 50 l/s. Valve fully open. Because heat release of water radiator is dependent on many factors, the curves are approximate. Glycol decreases radiator power by circa 10...20% depending on mixture.
- Curve 4 A 1000 W post-heating radiator can heat e.g. 100 l/s air by circa 8 °C at most.

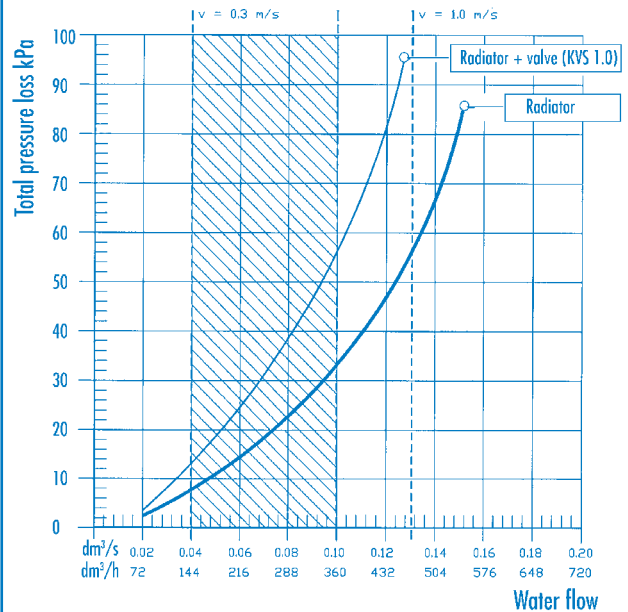


Digit SE minimum supply air temperatures during heating period in underfloor heating connection

Water temperature °C	Water flow dm ³ /s	Supply air temperature °C (and radiator power kW)					
		35 dm ³ /s (kW)	60 dm ³ /s (kW)	80 dm ³ /s (kW)	35 dm ³ /s (kW)	60 dm ³ /s (kW)	80 dm ³ /s (kW)
25	0,03	19	(0,3)	18	(0,45)	17,5	(0,5)
25	0,05	19,5	(0,35)	18	(0,45)	18	(0,6)
30	0,03	21	(0,4)	19	(0,5)	19	(0,7)
30	0,05	21	(0,4)	20	(0,6)	19	(0,7)
35	0,03	23	(0,45)	21,5	(0,65)	20	(0,8)
35	0,05	23,5	(0,5)	22	(0,7)	20	(0,8)

VKL WATER RADIATOR PRESSURE LOSS IN WATER CIRCULATION

The recommended area of operation is ruled.
Includes 12/8 coupling pipes. Defined for 100% water.
With a 50% glycol mixture, pressure loss is 1.6 times larger.



OUTDOOR AIR PREHEATING (optional)

Preheating

DIGIT SE can be equipped with an automatic system that is suitable for controlling external preheating.

The function is installed at factory, and it has to be ordered separately. The preheating radiator A is installed in the outdoor air duct B. It is switched on before the supply air fan stops. The operation is controlled by the same sensor located in exhaust air that also controls the stopping of the supply air fan. The heater is switched on at a temperature higher than the stopping temperature (factory setting +6°C). If preheating cannot keep exhaust air temperature warmer than the stopping temperature, the supply air fan stops. When the risk of freezing has passed, preheating is switched off and the supply air fan starts automatically.

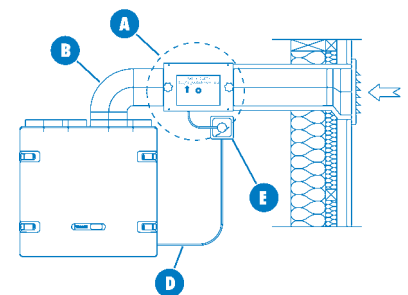
The power of the VALLOX 1000 supply air heater is 1000W. The preheating automatic system can control the power of 2000W at most.

The VALLOX 1000 supply air heater has to be installed in accordance with the instructions printed on the cover of the heater. If, for instance, handedness is changed, it has to be noted that the filter has to be located before the radiator in the air flow. The heater can only be installed in a certain position because of the security devices. The arrow C on the front cover of the heater has to point upwards.

An ELECTRIC WIRE, such as MMJ 3x1.5 S D, is connected to the plug in the lower part of the unit and is led to the outlet E mounted next to the heater.

REMEMBER that preheating requires 16A overheat protection for the power supply of the unit. The heater has to be installed so as to enable maintenance activities.

USING THE HEATER WITHOUT AN ORIGINAL FILTER IS PROHIBITED.



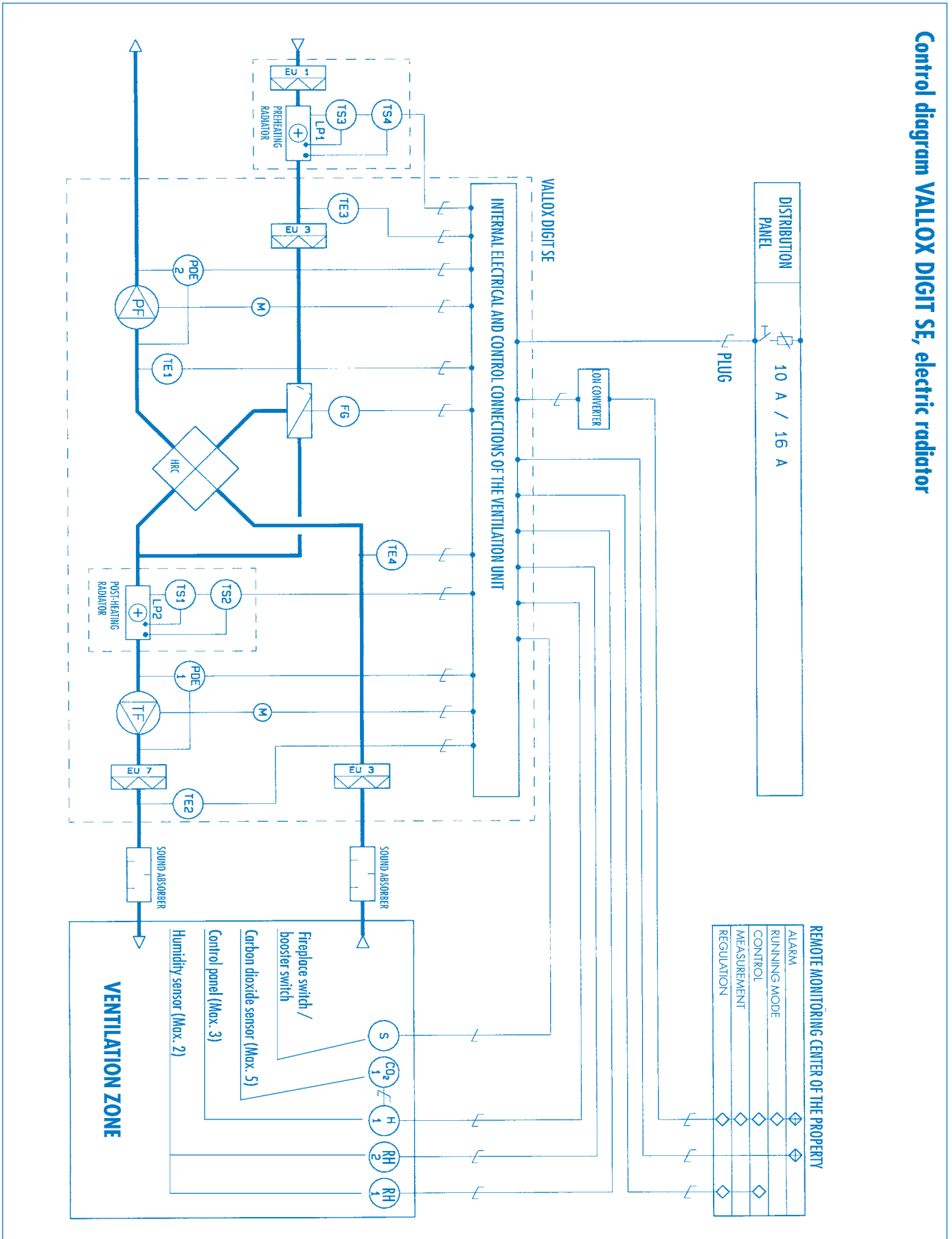
VALLOX 1000 supply air heater



VALLOX DIGIT SE / VKL

CONTROL DIAGRAM DIGIT SE, electric radiator

Control diagram VALLOX DIGIT SE, electric radiator





DESCRIPTION OF OPERATION DIGIT SE, electric 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. After starting, the unit first operates at basic 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

Fan speed 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 capacity of the ventilation unit is controlled in multiple steps depending on loads, and based on the measurement results of the air quality sensors (CO₂ 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**. You may also choose automatic search for the humidity content threshold on the 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 basic and maximum fan speeds. The basic and maximum fan speeds can be set at the desired level at the control panel **H**.

Control through voltage or current signal

The fan power of the ventilation unit is controlled in 8 steps with a voltage signal of 0...10 VDC, or with a current signal of 0...20 mA. However, fan power cannot be raised above the set maximum fan speed. Voltage or current signal control is used to control basic fan speed. Because of this, fan speed can only be raised when necessary, but not lowered by the manual, CO₂ and %RH controls.

Voltage and current signal values (selection in the motherboard)

Voltage values for each fan speed:			Current values for each fan speed:		
0	0.20...1.25	VDC	0	0.5...2.5	mA
1	1.75...2.25	VDC	1	3.5...4.5	mA
2	2.75...3.25	VDC	2	5.5...6.5	mA
3	3.75...4.25	VDC	3	7.5...8.5	mA
4	4.75...5.25	VDC	4	9.5...10.5	mA
5	5.75...6.25	VDC	5	11.5...12.5	mA
6	6.75...7.25	VDC	6	13.5...14.5	mA
7	7.75...8.25	VDC	7	15.5...16.5	mA
8	8.75...10.00	VDC	8	17.5...20.0	mA

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 always active when outdoor air temperature is below the set threshold value, or whenever outdoor air is warmer than extract air.

Heat recovery anti-freezing

Active when the outdoor temperature is below 0 °C. The control / regulation center of the unit directs the operation of the preheater (**LP1**) on the basis of the measurement data supplied by the temperature sensors **TE1** and **TE3**. The

aim is to prevent the risk of freezing and the stopping of the supply air fan (**TF**). If the capacity of the preheater (**LP1**) is not sufficient, or if there is no preheater, the control center intermittently stops the **TF** supply air fan on the basis of the measuring data on the temperature sensors **TE1** and **TE3**, thereby preventing the heat recovery cell from freezing. As soon as the risk of frosting passes, the fan restarts automatically. The threshold temperature for defrosting (-6...+15 °C) and the difference area (+1...+10 °C) can be set on the control panel (**H**). When the **TF** fan stops, power supply to the **LP1** radiators is stopped and the **LP2** post-heating radiator continues to heat.

Overheating protection of the heating unit

The overheat protection thermostats **TS1** and **TS2** monitor the surface temperature in the and **LP2** heating unit. If surface temperature exceeds the threshold, overheat protection is triggered and power supply to the heating unit is stopped. The **TS1** overheating protector is reset manually, and the **TS2** protector automatically.

Alarms

The pressure difference switches **PDS1** and **PDS2** monitor the pressure difference between 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 of servicing 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:

- Alarm of high carbon dioxide content (> 5000 ppm) switches the relay at 1-second intervals. The fans stop. This is acknowledged by switching off the unit.
- In other fault situations, such as sensor faults and filter guard alarms (⊠), the points 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 the VALLOX LON converter.

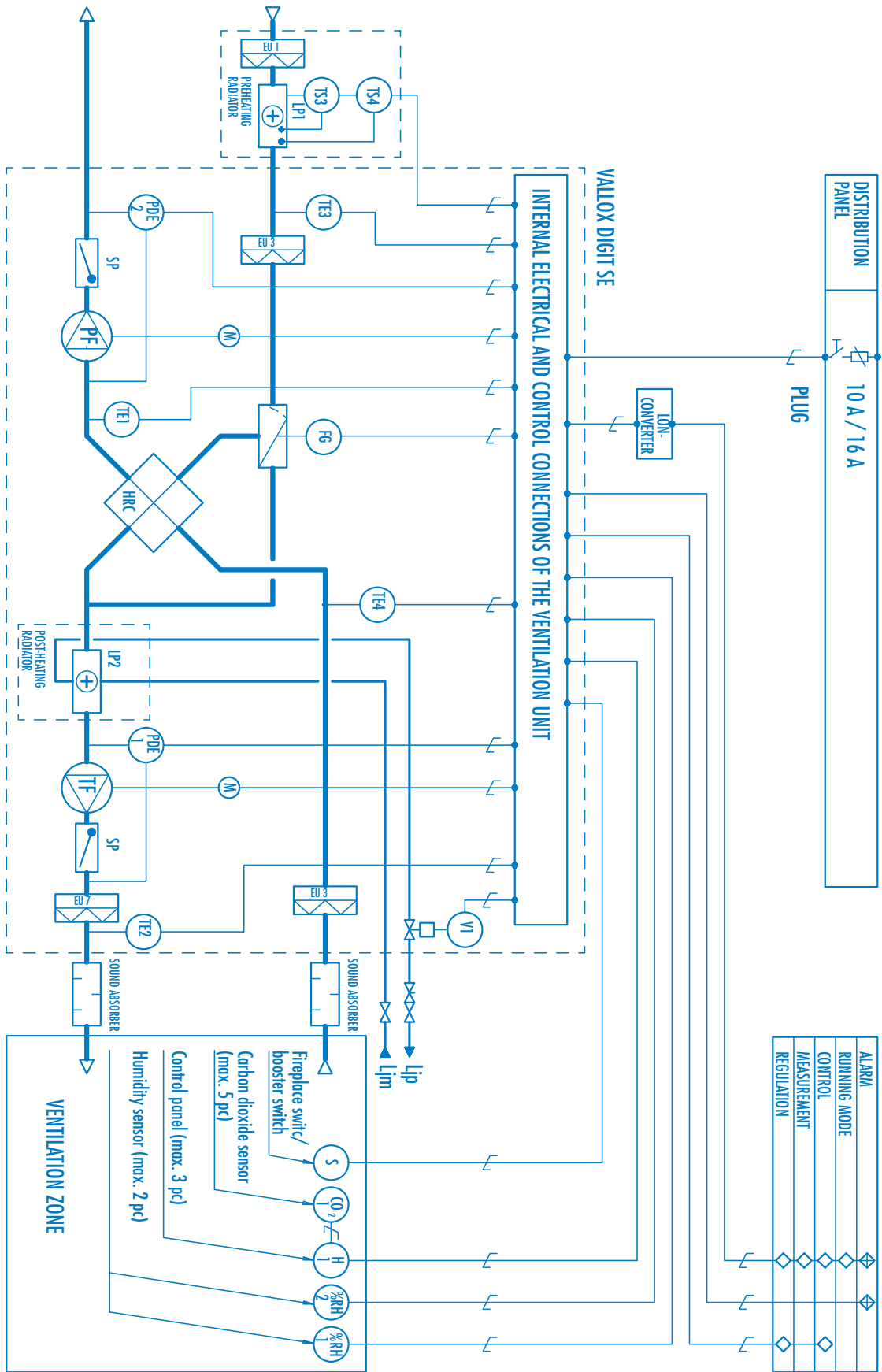
DIGIT SE part list

Code	Name	Technical details (factory settings in parentheses)	Equipment
CO ₂	Carbon dioxide sensor Carbon dioxide control	Adjustment range 500...2000 ppm (900) Adjustment interval 1...15 min (10)	Option
EU3 EU7	Filter	Supply air at least EU7 Extract air at least EU3	Standard
FG	Damper motor	Automatic heat recovery bypass 24 V, 2 W, 4 Nm	Standard
H	Control panel	Setting, operation, display	Standard
LP2	Post-heating radiator	Electric radiator 1 kW	Standard
HRC	Heat recovery cell	1-step, efficiency = 60 %	Standard
PDE1	Pressure difference switch unit Pressure guard for supply air	Adjustment range 0...500 Pa (260)	Option
PDE2	Pressure difference transmitter Pressure guard for extract air	Adjustment range 0...500 Pa (260)	Option
PF	Extract air fan	qv = 125 dm ³ /s (75 Pa)	Standard
%RH	Humidity sensor Humidity control	Automatic / adjustment range 1...99% Adjustment interval 1...15 min. (10)	Option
TE1	Temperature sensor, HRC defrosting, preheating control	extract air temperature Adjustment range -6...+15 °C (HRC) 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
TF	Supply air fan	qv = 115 dm ³ /s (75 Pa)	Standard
TS1	Overheating protector of the electric radiator	Manual reset +95 °C	Standard
TS2	Overheating protector of the electric radiator	Automatic +40 °C	Standard
S	Fireplace / booster switch function	Either fireplace or booster switch operation (fireplace switch) can be selected	Standard
LP1	Preheating radiator	Electric max 2 kW	Option
EU1	Filter	Preheating radiator EU1	Option
TS3	Overheating protector	Preheating radiator	Option
TS4	Overheating protector	Preheating radiator	Option



CONTROL DIAGRAM DIGIT SE VKL

Control diagram VALLOX DIGIT SE VKL, water radiator





DESCRIPTION OF OPERATION DIGIT SE VKL, water 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. After starting, the unit first operates at basic 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

Fan speed 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 capacity of the ventilation unit is controlled in multiple steps depending on loads, and based on the measurement results of the air quality sensors (CO₂ 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. You may also choose automatic search for the humidity content threshold on the 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 basic and maximum fan speeds. The basic and maximum fan speeds can be set at the desired level at the control panel H.

Control through voltage or current signal

The fan power of the ventilation unit is controlled in 8 steps with a voltage signal of 0...10 VDC, or with a current signal of 0...20 mA. However, fan power cannot be raised above the set maximum fan speed. Voltage or current signal control is used to control basic fan speed. Because of this, fan speed can only be raised when necessary, but not lowered by the manual, CO₂ and %RH controls.

Voltage and current signal values (selection in the motherboard)

Voltage values for each fan speed:		Current values for each fan speed:	
0	0.20...1.25 VDC	0	0.5...2.5 mA
1	1.75...2.25 VDC	1	3.5...4.5 mA
2	2.75...3.25 VDC	2	5.5...6.5 mA
3	3.75...4.25 VDC	3	7.5...8.5 mA
4	4.75...5.25 VDC	4	9.5...10.5 mA
5	5.75...6.25 VDC	5	11.5...12.5 mA
6	6.75...7.25 VDC	6	13.5...14.5 mA
7	7.75...8.25 VDC	7	15.5...16.5 mA
8	8.75...10.00 VDC	8	17.5...20.0 mA

Supply air temperature

Supply air temperature can be controlled using either constant temperature adjustment or cascade adjustment.

Supply air constant temperature control

The control unit directs the operation of the control valve SV on the basis of the measuring data on the temperature sensor TE2. The aim is to keep supply air temperature at the temperature value set on the control panel H (+10...+30°C).

Supply air cascade control

The control unit directs the operation of the control valve SV on the basis of the measuring data on the extract air sensor TE4. The aim is to keep extract air temperature at the temperature value set on the control panel H (+10...+30°C).

Heat recovery bypass

When post-heating has been switched on, heat recovery is enabled all the time. Automatic heat recovery bypass is active whenever post-heating has been switched off and outdoor temperature exceeds the preset threshold (range 0...+25°C). In this case, the control unit directs the operation of the damper motor FG on the basis of measuring results given by the outdoor sensor TE3 and the extract air temperature sensor TE4. The aim is to get as cool supply air to the ventilation zone as possible. The indication of a freezing risk appears in the display of the control panel. Heat recovery is, however, on whenever outdoor temperature is below the limit set, or whenever outdoor air is warmer than extract air.

Heat recovery anti-freezing

Active when outdoor temperature is below 0°C. The control/adjustment center of the unit directs the operation of the preheater LP1 on the basis of the measurement data supplied by the temperature sensors TE1 and TE3. The aim is

to prevent the risk of freezing and the stopping of the supply air fan TF. If the capacity of the preheater LP1 is not sufficient, or if there is no preheater, the control center intermittently stops the TF supply air fan on the basis of the measuring data on the temperature sensors TE1 and TE3, thereby preventing the heat recovery cell from freezing. As soon as the risk of frosting passes, the fan restarts automatically. The threshold temperature for defrosting (-6...+15°C) and the difference area (+1...+10°C) can be set on the control panel H. When the fan TF stops, power supply to the LP1 radiator stops and the actuator valve V1 of the LP2 post-heating radiator starts to open or remains open.

Antifreeze protection of the water radiator

Based on the measurement data in outdoor temperature sensor TE3 (outdoor air <0 °C) and supply air temperature sensor TE2 (supply air <7 °C) the control center of the unit stops fans TF and PF. Moreover, valve V1 remains open and self-actuated dampers SP of the fans close. This decreases the freezing risk in the 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

The pressure difference switches PDS1 and PDS2 monitor the pressure difference between 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 of servicing 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 defrost function of the water-circulated radiator is on, the points of the relay close and open at a 10-second interval.
- alarm of high carbon dioxide content (>5000 ppm) switches the relay at 1-second intervals.
- in other fault situations, such as a sensor fault (⊠) and a filter guard alarm, the points 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 the VALLOX LON converter.

VALLOX DIGIT SE VKL part list

Code	Name	Technical details (factory settings in parentheses)	Equipment
CO ₂	Carbon dioxide sensor Carbon dioxide control	Adjustment range 500...2000 ppm (900) Adjustment interval 1...15 min (10)	Option
EU3 EU7	Filter	Supply air at least EU7 Extract air at least EU3	Standard
FG	Damper motor	Automatic heat recovery bypass 24 V, 2 W, 4 Nm	Standard
H	Control panel	Setting, operation, display	Standard
LP2	Post-heating radiator	Water radiator	Standard
HRC	Heat recovery cell	1-step, efficiency = 60 %	Standard
PDE1	Pressure difference switch unit Pressure guard for supply air	Adjustment range 0...500 Pa (260)	Option
PDE2	Pressure difference transmitter Pressure guard for extract air	Adjustment range 0...500 Pa (260)	Option
PF	Extract air fan	qv = 125 dm ³ /s (75 Pa)	Standard
%RH	Humidity sensor Humidity control	Automatic / adjustment range 1...99% Adjustment interval 1...15 min (10)	Option
V1	Actuator valve unit	230V, open when dead	Option
TE1	Temperature sensor, HRC defrosting, preheating control	Exhaust air temperature Adjustment range -6...+15 °C (HRC) 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
TF	Supply air fan	qv = 115 dm ³ /s (75 Pa)	Standard
S	Fireplace / booster switch function	Either fireplace or booster switch operation (fireplace switch) can be selected	Standard
LP1	Preheating radiator	Electric max 2 kW	Option
EU1	Filter	Preheating radiator EU1	Option
TS3	Overheating protector	Preheating radiator	Option
TS4	Overheating protector	Preheating radiator	Option
SP	Damper 2 pcs	Air flow operated	Standard



LOCATION AND WALL MOUNTING

Location of DIGIT SE

VALLOX DIGIT SE is mounted in a place where temperature does not fall below +10°C. A ventilation unit without casing has to be located in a place where the operation is not acoustically disturbing at the greatest speeds; suitable places are storerooms, utility rooms and similar spaces. DIGIT SE can also be located in a damp room, but not in a washroom next to a sauna bath.

Mounting

VALLOX DIGIT SE is mounted on the wall using a wall mounting plate as shown in the adjacent picture. If needed the mounting can be secured at the lower end of the ventilation unit.

Wall structure

The mounting must be observed in the wall structure. Prevent mounting the ventilation unit on an echoing hollow partition wall and on a bedroom wall because of sound conduction.

Condensing water

A water seal is included in the delivery. Through the piping connected to this water seal, the water condensing from extract air is led to a floor drain (and not directly to the wastewater drain). The drain must not rise after the water seal. The ventilation unit has to be mounted horizontally, in order for condensing water to flow freely out of the ventilation unit.

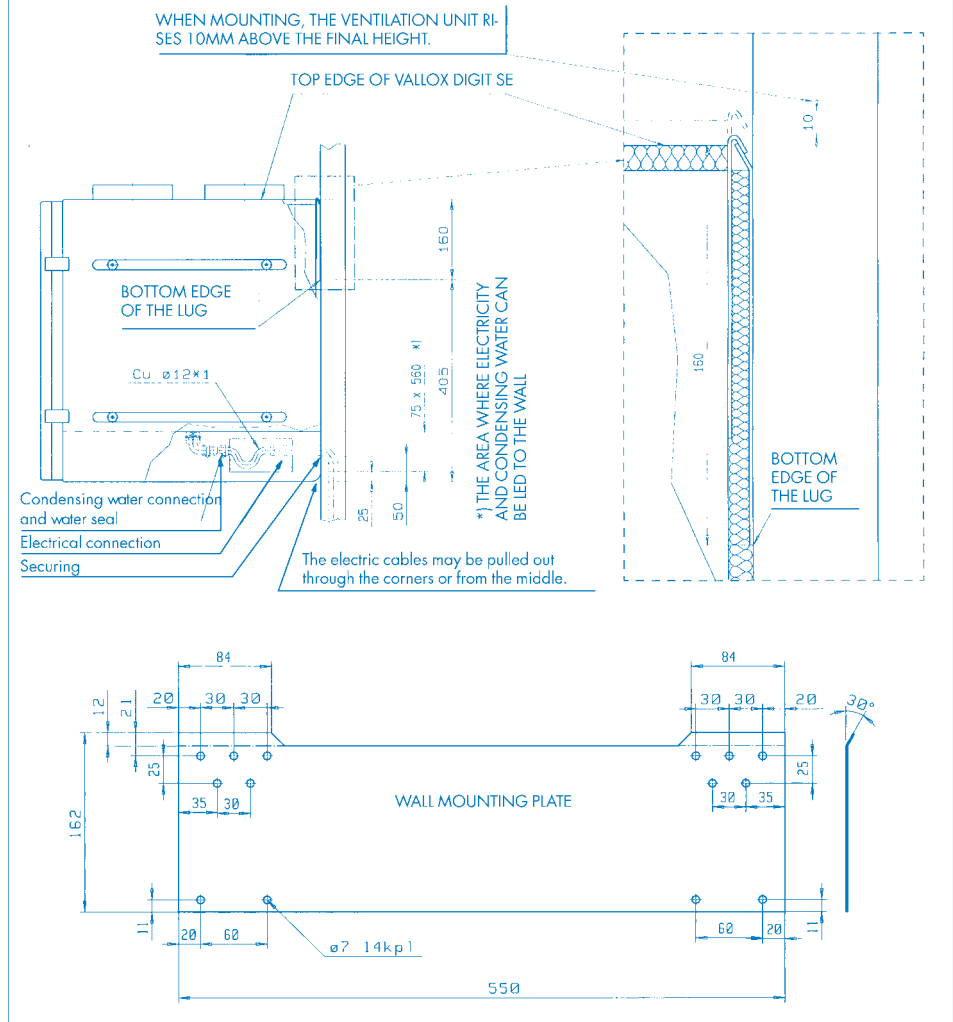
NOTE!

If you mount the ventilation unit above a hot water storage unit, for instance, observe the condensing water draining and external wiring to the connection box of the ventilation unit before mounting.

Example:

You may mount the condensing water piping in advance and attach the connection box beside the ventilation unit.

VALLOX DIGIT SE wall mounting



Service

Leave a clearance at least 15 mm on both sides (or at least on one side) of the ventilation unit for service. This will ensure that there is enough space for the door latches to open and close. Also, leave at least 0.6m free space in front of the ventilation unit.



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