• 1.09.280E
• 5.3.2007

Code 3486

VALLOX 180 SE

TECHNICAL SPECIFICATION

DIGIT SED
ELECTRONIC CONTROLLER WITH LCD DISPLAY

- For dwelling-specific ventilation in large detached houses
- Supply and extract air ventilation with heat recovery
- Heat recovery efficiency of the counter-current cell up to 80%
- Electronic control panel with LCD display
- Week clock control as a standard feature
- Humidity control (option)
- Carbon dioxide control (option)
- Maintenance reminder
- Fireplace / booster switch function at the controller
- Silent operation
- Good filtering
- Summer / winter automation
- Fixed air flow measuring outlets

TECHNICAL SPECIFICATION

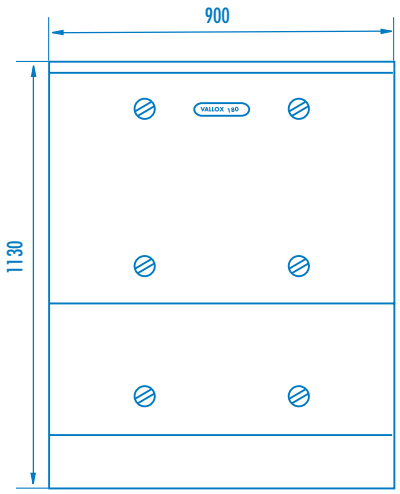
Input power			230 V, 50 Hz, 11 A (+ post-heating unit 4.3 A)
Class of protection			IP34
Fans alternating current (AC)	Extract air	300 W 1.31 A	205 dm³/s 100 Pa
	Supply air	300 W 1.31 A	185 dm³/s 100 Pa
Fans, direct current (DC)	Extract air	2 x 90 W 0.6 A	180 dm³/s 100 Pa
	Supply air	2 x 90 W 0.6 A	165 dm³/s 100 Pa
Heat recovery			Counter-current cell, η> 80%
Heat recovery bypass			Summer / winter automation
Electric preheating unit			2.0 kW 8.7 A
Electric post-heating unit (option)			1.0 kW 4.3 A
Water post-heating radiator (option)			ca 3 kW
Filters	Supply air		G3, F7
	Extract air		G3
Weight / basic unit			146 kg
Ventilation adjustment options			– control via control panel
			– CO_2 and %RH control
			– remote monitoring control (LON converter)
			– remote monitoring control (voltage / current signal)
Options			– electric post-heating unit
			– water post-heating unit
			– CO_2 sensor
			– %RH sensor
			– pressure difference switch
			– LON converter
			– Silencer

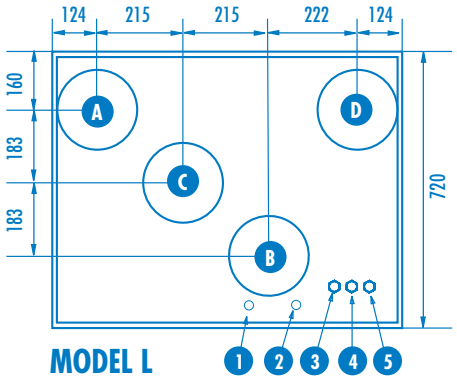
TECHNICAL SPECIFICATION

VALLOX 180 SE

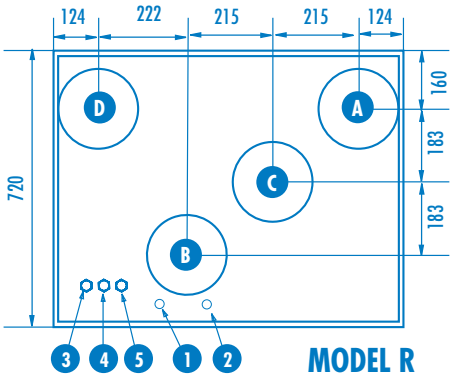
DIMENSIONS AND MAIN PARTS

Dimensions and duct outlets





MODEL L



MODEL R

Duct outlets, inner diameter of collar ø 200 mm

- A Outdoor air to the unit
- B Supply air to the dwelling
- C Extract air from the dwelling
- D Exhaust air outside

Pipe connections

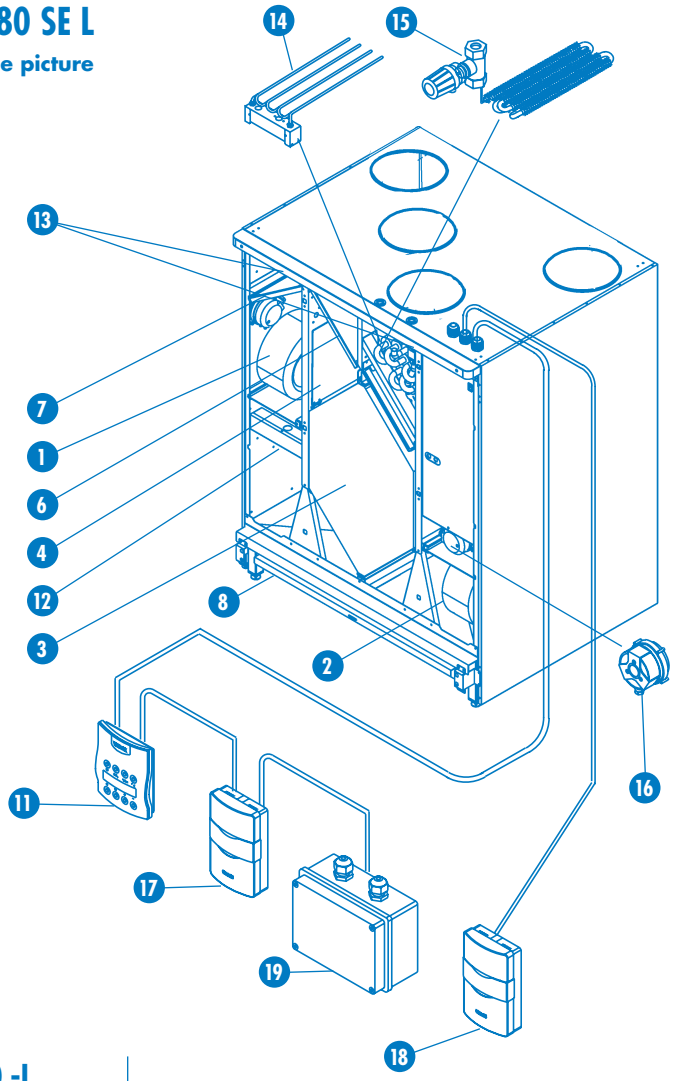
- 1 Water going to the radiator
- 2 Water coming from the radiator

Electrical connections

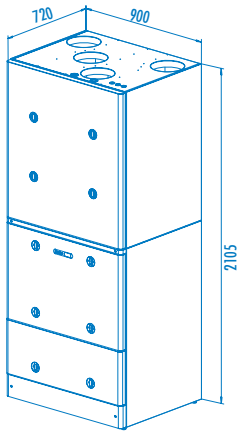
- 3 Connection cable / Humidity sensor
- 4 Connection cable
  - Control panel
  - CO_2-sensor
  - LON controller
- 5 Feed cable / Distribution panel

VALLOX 180 SE L

Model L in the picture



VALLOX 180 -L + silencer unit



Main parts

1. Supply air fans
2. Extract air fans
3. Heat recovery cell
4. Heat recovery bypass
5. Supply air filter F7
6. Extract air filter G3
7. Outdoor air filter G3
8. Condensing water tank
9. Condensing water outlet
10. Electrical connection feed-throughs
11. Control panel
12. Preheating unit, electric
13. Measurement outlets (behind the cover strip)

Options

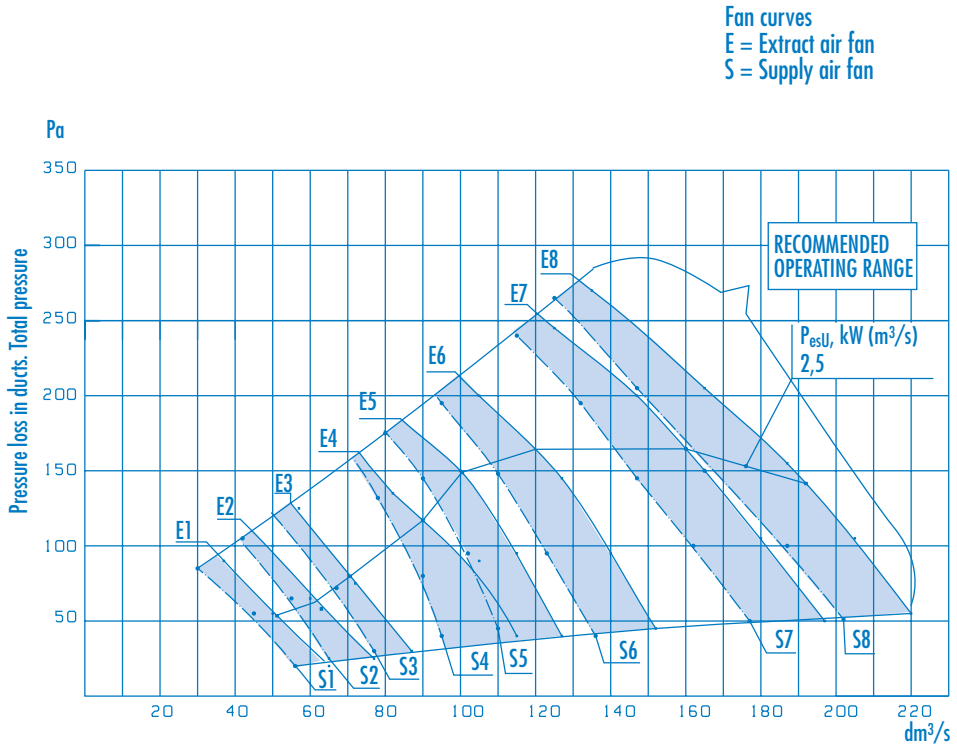
14. Post-heating unit, electric
15. Post-heating unit, water
16. Pressure difference switch
17. Carbon dioxide sensor
18. Humidity sensor
19. LON converter

VALLOX 180 SE

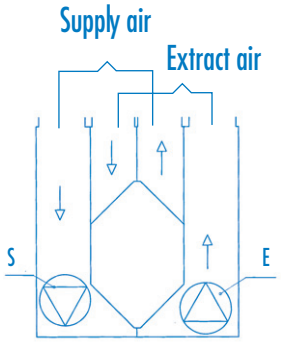
PERFORMANCE / AC FANS

Air volumes

SUPPLY / EXTRACT AIR VOLUMES / AC FANS



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



Fan Speeds	Extract air flow (l/s)	Total input power W
1	35	130
2	50	150
3	70	170
4	100	220
5	120	260
6	140	310
7	160	390
8	180	470

Sound values

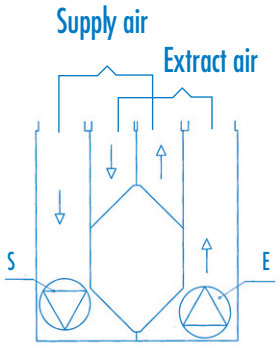
		Sound power level from the ventilation unit to supply air ducts by octave band Lw, dB				Sound power level from the ventilation unit to extract air ducts by octave band Lw, dB			
		ADJUSTMENT POSITION / VOLUME FLOW RATE				ADJUSTMENT POSITION / VOLUME FLOW RATE			
	Hz	2 65 l/s	4 97 l/s	6 128 l/s	8 171 l/s	2 78 l/s	4 111 l/s	6 143 l/s	8 188 l/s
Medium frequency of the octave band, Hz	63	67	74	78	84	72	76	79	83
	125	64	68	73	78	56	64	69	73
	250	43	51	54	60	42	49	56	61
	500	39	46	51	57	36	41	46	52
	1000	38	43	47	52	37	43	48	52
	2000	31	37	42	47	32	39	43	48
	4000		21	27	34	15	27	33	39
	8000				21			22	31
L_W, dB		68	75	79	85	72	76	79	84
L_{WA}, dB(A)		47	53	57	63	46	52	56	61

	Sound pressure level coming from the unit through the envelope in the room where the unit is mounted (10m² sound absorption)				
	ADJUSTMENT POSITION / VOLUME FLOW RATES (supply / extract)				
	2 66/78 l/s	4 98/111 l/s	6 129/142 l/s	8 174/186 l/s	**VALLOX 180 AC**
L_{pA}, dB(A)	36	42	47	52	

VALLOX 180 SE

PERFORMANCE with Silencer / AC FANS

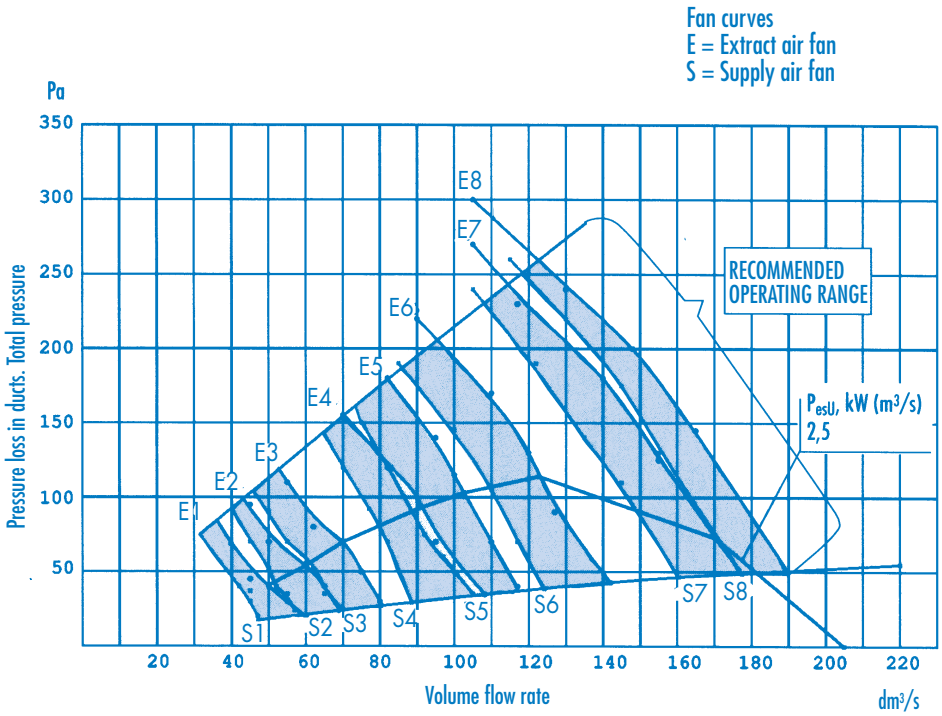
Measuring points after the connection outlet. Fan curves indicate the total pressure available for duct losses.



Fan Speeds	Extract air flow (l/s)	Total input power W
1	35	130
2	50	150
3	70	170
4	100	220
5	120	260
6	140	310
7	160	390
8	180	470

Air volumes

SUPPLY / EXTRACT AIR VOLUMES / AC FANS WITH SILENCER



Sound values

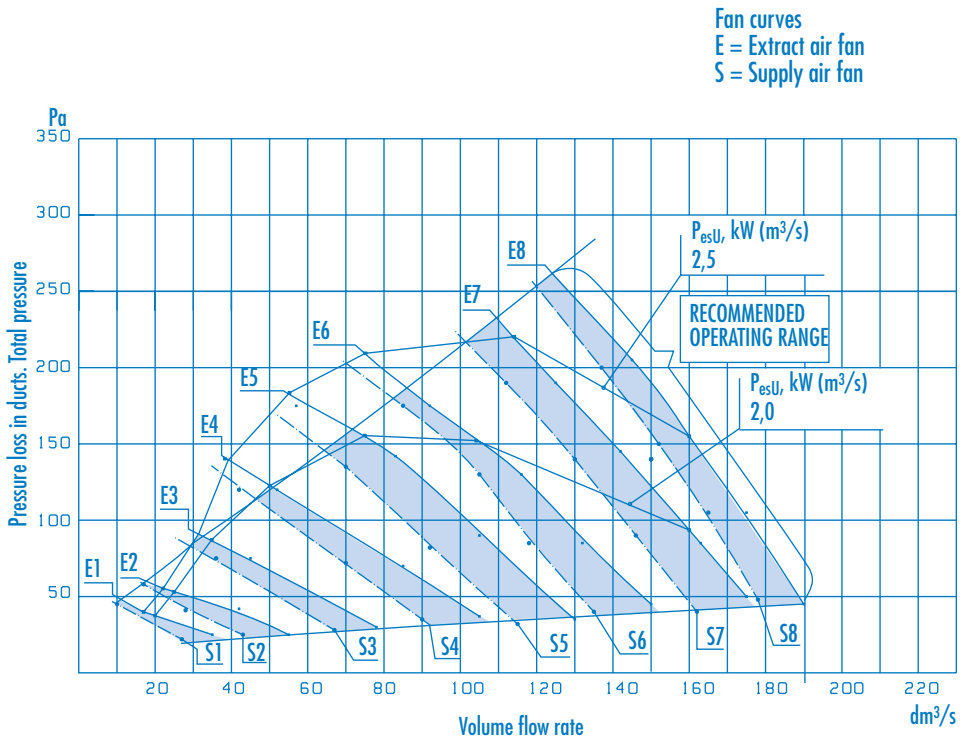
		Sound power level from the ventilation unit to supply air ducts by octave band Lw, dB				Sound power level from the ventilation unit to extract air ducts by octave band Lw, dB			
		ADJUSTMENT POSITION / VOLUME FLOW RATE				ADJUSTMENT POSITION / VOLUME FLOW RATE			
	Hz	2 56 l/s	4 88 l/s	6 117 l/s	8 157 l/s	2 65 l/s	4 97 l/s	6 128 l/s	8 166 l/s
Medium frequency of the octave band, Hz	63	60	65	67	72	61	66	69	73
	125	45	50	55	60	53	60	62	66
	250	25	36	40	46	29	37	43	48
	500	18	27	34	40	10	23	32	38
	1000		14	25	35		13	24	34
	2000			16	28			16	24
	4000				20				
	8000								
L_W, dB		60	65	67	72	61	67	70	72
L_{WA}, dB(A)		35	40	44	49	38	44	47	52

	Sound pressure level coming from the unit through the envelope in the room where the unit is mounted ($10m^2$ sound absorption)			
	ADJUSTMENT POSITION / VOLUME FLOW RATES (supply / extract)			
	2 59/74 l/s	4 88/109 l/s	6 116/141 l/s	8 157/181 l/s
L_{pA}, dB(A)	35	43	49	53

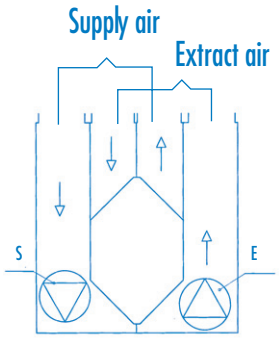
VALLOX 180 AC with silencer unit

Air volumes

SUPPLY / EXTRACT AIR VOLUMES / DC FANS



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



Fan Speeds	Extract air flow (l/s)	Total input power W
1	35	40
2	50	50
3	70	70
4	100	115
5	120	170
6	140	220
7	160	320
8	180	420

Sound values

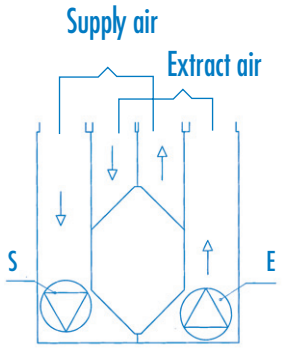
		Sound power level from the ventilation unit to supply air ducts by octave band Lw, dB				Sound power level from the ventilation unit to extract air ducts by octave band Lw, dB			
		ADJUSTMENT POSITION / VOLUME FLOW RATE				ADJUSTMENT POSITION / VOLUME FLOW RATE			
	Hz	2 51 l/s	4 86 l/s	6 124 l/s	8 155 l/s	2 55 l/s	4 95 l/s	6 129 l/s	8 160 l/s
Medium frequency of the octave band, Hz	63	60	66	68	72	63	68	72	76
	125	54	66	69	72	53	63	67	70
	250	42	52	59	60	43	51	57	60
	500	42	49	54	59	40	48	53	57
	1000	38	49	53	56	38	48	51	54
	2000	31	39	44	50	32	42	46	51
	4000	17	22	29	34	13	27	35	40
	8000							26	32
L_W, dB		61	69	72	76	63	69	73	77
L_{WA}, dB(A)		44	54	58	61	43	53	57	60

	Sound pressure level coming from the unit through the envelope in the room where the unit is mounted (10m² sound absorption)				
	ADJUSTMENT POSITION / VOLUME FLOW RATES (supply / extract)				VALLOX 180 DC
	2 54/60 l/s	4 92/96 l/s	6 127/130 l/s	8 160/163 l/s	
L_{pA}, dB(A)	40	47	50	54	

VALLOX 180 SE

PERFORMANCE with Silencer / DC FANS

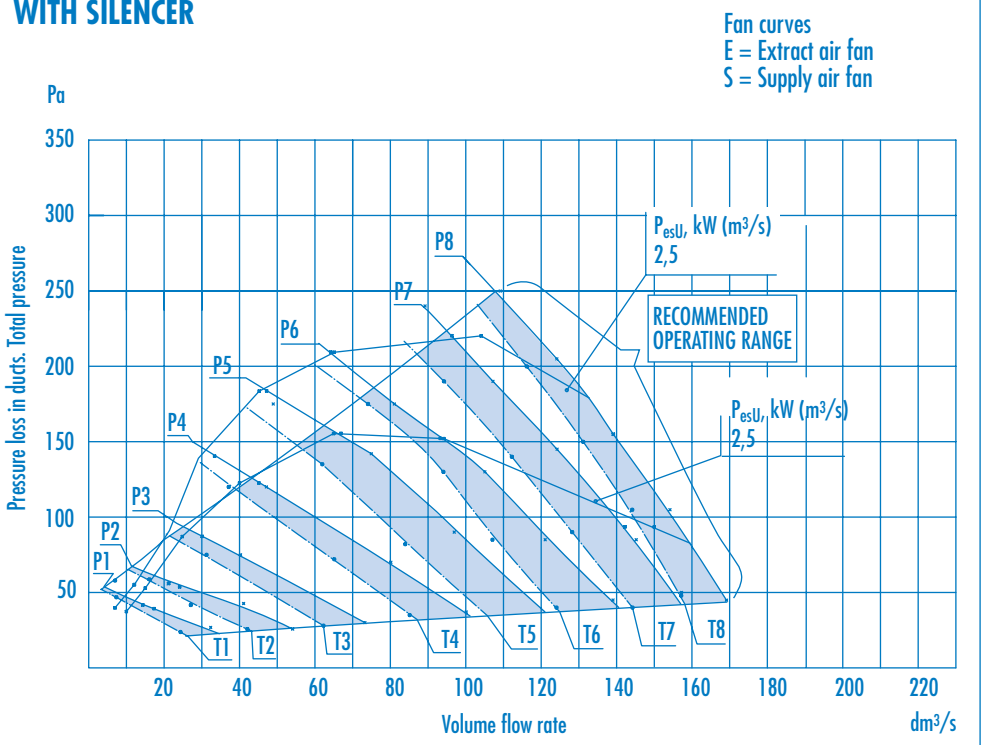
Measuring points after the connection outlet. Fan curves indicate the total pressure available for duct losses.



Fan Speeds	Extract air flow (l/s)	Total input power W
1	35	40
2	50	50
3	70	70
4	100	115
5	120	170
6	140	220
7	160	320
8	180	420

Air volumes

SUPPLY / EXTRACT AIR VOLUMES / DC FANS WITH SILENCER



Sound values

		Sound power level from the ventilation unit to supply air ducts by octave band Lw, dB				Sound power level from the ventilation unit to extract air ducts by octave band Lw, dB			
		ADJUSTMENT POSITION / VOLUME FLOW RATE				ADJUSTMENT POSITION / VOLUME FLOW RATE			
	Hz	2 40l/s	4 80l/s	6 114l/s	8 134 l/s	2 50 l/s	4 88 l/s	6 118/s	8 140 l/s
Medium frequency of the octave band, Hz	63	55	61	63	67	58	63	67	70
	125	42	54	57	60	44	54	58	61
	250	27	37	44	45	27	35	41	44
	500	24	28	34	38		29	23	30
	1000	12	16	27	35		20	18	23
	2000			12	24				15
	4000								
	8000								
L_W, dB		55	62	64	68	58	64	68	71
L_{WA}, dB(A)		31	40	44	47	34	41	45	48

	Sound pressure level coming from the unit through the envelope in the room where the unit is mounted (10m² sound absorption)			
	ADJUSTMENT POSITION / VOLUME FLOW RATES (supply / extract)			
	2 49/55	4 84/88	6 117/120	8 138/1140
L_{pA}, dB(A)	40	47	50	54

VALLOX 180 DC with silencer unit

VALLOX 180 SE

VALLOX DIGIT SED CONTROL PANEL

Control

VALLOX 180 can be controlled with the control panel delivered with the unit (3 control panels at most) or with optional carbon dioxide sensors (max. (5 at most) and humidity 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 point 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**
   With this button, you set post-heating on and off. When the indicator is lit, post-heating is on. Thesummer 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

Main display

- Fan speed
- Supply air temperature
- Post-heating is on
- Filter guard alert
- Maintenance reminder alert
- Fireplace / booster switch on
- Week clock control

Fan speed may 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_2 sensor or another control panel. (See External electrical connections on page 11.)

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

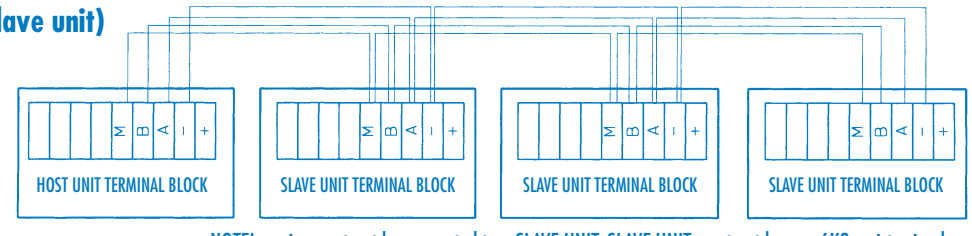
- Connect the first control panel to the unit and change its address to 3.
- Connect the second control panel to the unit and change its address to 2.
- Connect the third control panel and make sure that its address is 1.

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

Connecting two or more units (slave unit)

- Connect slave units as specified in the adjoining connection instructions. Slave units do notoperate independently, but follow the instructions received from the host unit. Neither control panel nor sensors must be connected to a slave unit.



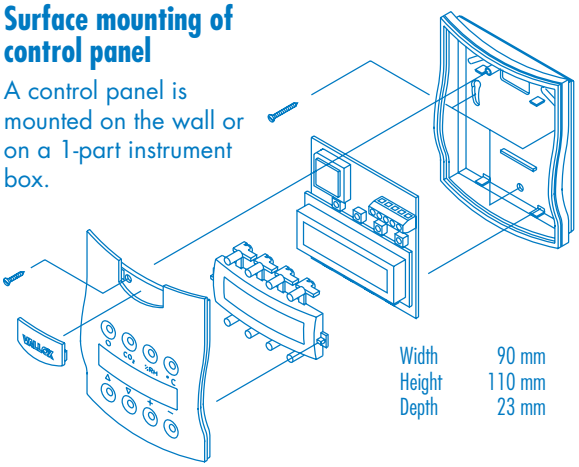
NOTE! + wire must not be connected to a SLAVE UNIT. SLAVE UNIT must not have a 6K8 resistor in place.

VALLOX 180 SE

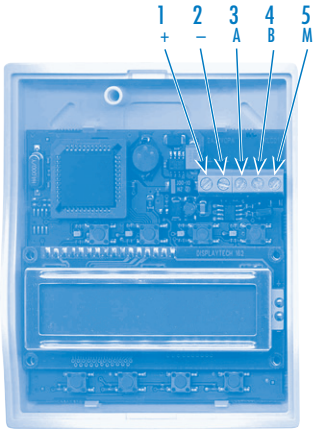
MOUNTING OF CONTROL PANEL AND SENSORS

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



Electronics board of control panel

Wiring

Cabel:
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 M

Humidity sensors

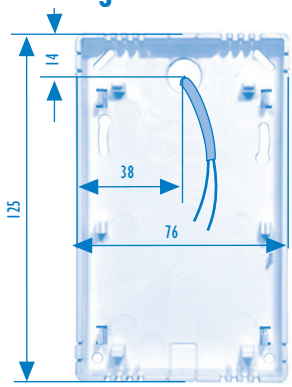
- When mounting two or more humidity sensors, connect them to the terminal block of the connection box by connecting the first humidity sensor to %RH1, in place of the resistor 6K8 in the terminal block (remove the resistor in this case), and the second humidity sensor to %RH2. See the electrical diagram.

Mounting and wiring of humidity sensor

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

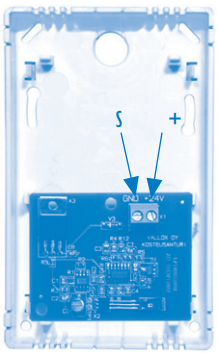
Surface mounting

Base plate of senor



Wiring

Electronics board of %RH sensor



Cable: 2 x 0,5 mm²

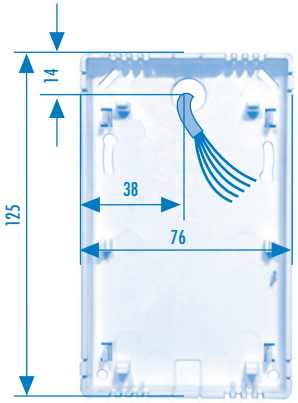
Carbon dioxide sensors

- 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.

Mounting and wiring of carbon dioxide sensor

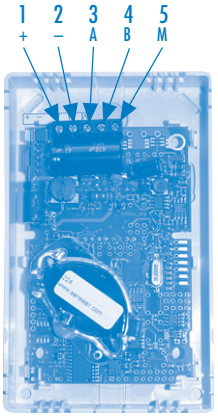
The carbon dioxide sensor can be connected to the unit directly from the connection box, or in series with another carbon dioxide sensor or control panel (see External electrical connections on page 11).

Surface mounting



Base plate of the carbon dioxide sensor

Wiring



Cable:
NOMAK 2 x 2 x 0,5 mm² + 0,5 mm²

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

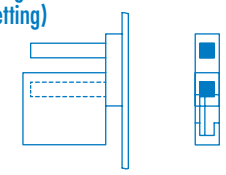
1 = orange 1 = + } ca. 21 VDC
2 = white 1 = –
3 = orange 2 = A
4 = white 2 = B
5 = meta = signal ground M

Electronics card of the CO_2 sensor (model may vary)

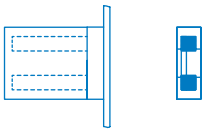
INTERNAL ELECTRICAL CONNETION
Alternating current fans

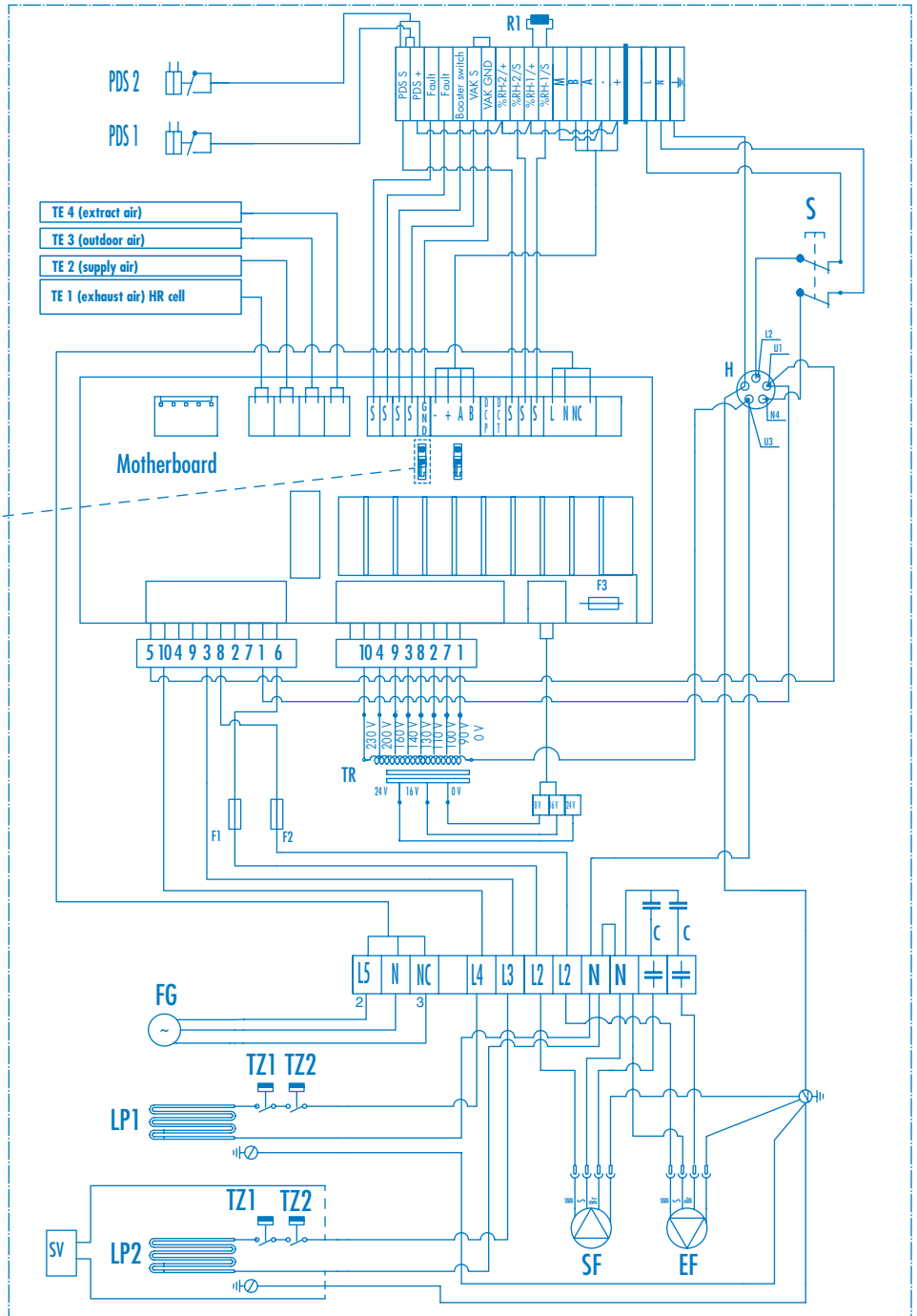
Fan control with voltage / current signal

Use of jumper in voltage signal control (factory setting)



Use of jumper in current signal control





SF	=	Supply air fan 300 W
EF	=	Extract air fan 300 W
TR	=	Transformer 230 V 4 A / 24 V 25 VA
C	=	Capacitor 8 µF
H	=	Disturbance suppression motherboard
FG	=	Damper motor 24 VAC
TE	=	Temperature sensor
R1	=	Auxiliary resistor 6.8 kohm

S	=	Maintenance switch (door switch)
LP1	=	Electric heating unit 2000 W (preheating)
LP2	=	Electric heating unit 1000 W (post-heating, option)
SV	=	Water heating unit actuator (post-heating unit, option)
TZ1	=	Overheat protector +60°C
TZ2	=	Overheat protector + 95° (needs to be reset)
PDS1	=	Pressure difference switch for the supply air ductwork (option)
PDS2	=	Pressure difference switch for the extract air ductwork (option)
F1	=	Supply air fan fuse 2 A
F1	=	Extract air fan fuse 2 A
F3	=	Motherboard fuse 800 mA

3195001B

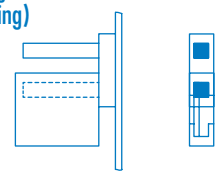
VALLOX 180 SE

INTERNAL ELECTRICAL CONNECTIONS / DC-FANS

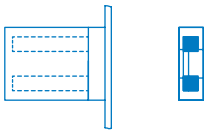
INTERNAL ELECTRICAL CONNETION
Direect current fans

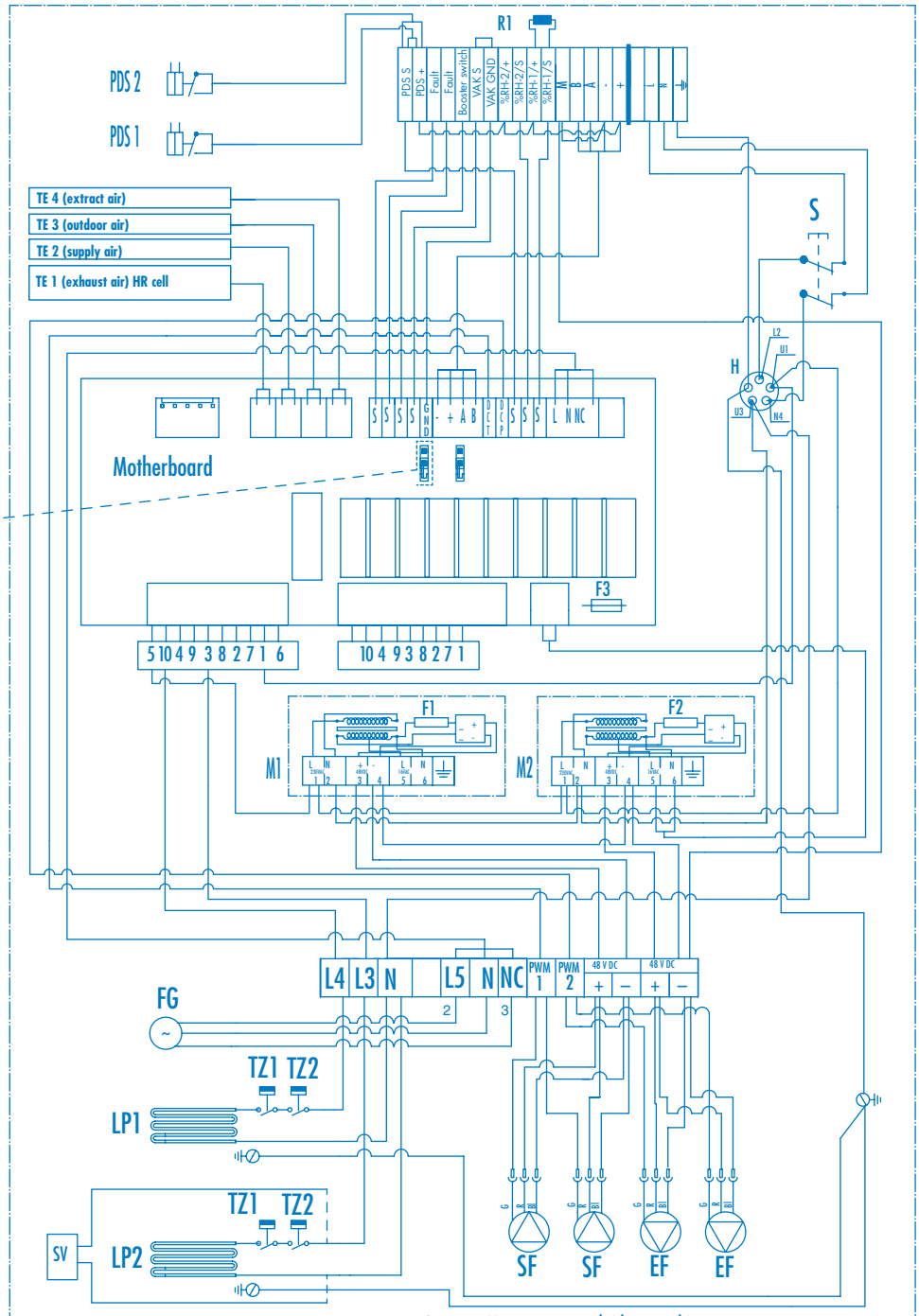
Fan control with voltage / current signal

Use of jumper in voltage signal control (factory setting)



Use of jumper in current signal control





SF = Supply air fan 2 x 95 W DC
EF = Extract air fan 2 x 95 W DC
M1 = Transformer 230 VAC/16 VAC/48 VDC
M2 = Transformer 230 VAC /16 VAC / 48 VDC
H = Disturbance suppression motherboard
FG = Damper motor 24 VAC
TE = Temperature sensor
R1 = Auxiliary resistor 6.8 kohm

S = Maintenance switch (door switch)
LP1 = Electric heating unit 2000 W (preheating)
LP2 = Electric heating unit 1000 W (post-heating, option)
SV = Water heating unit actuator (post-heating unit, option)
TZ1 = Overheat protector +60°C
TZ2 = Overheat protector + 95° (needs to be reset)
PDS1 = Pressure difference switch for the supply air ductwork (option)
PDS2 = Pressure difference switch for the extract air ductwork (option)
F1 = Fuse for the transformer of supply air fans 6.3 A
F1 = Fuse for the transformer of extract air fans 6.3 A
F3 = Motherboard fuse 800 mA

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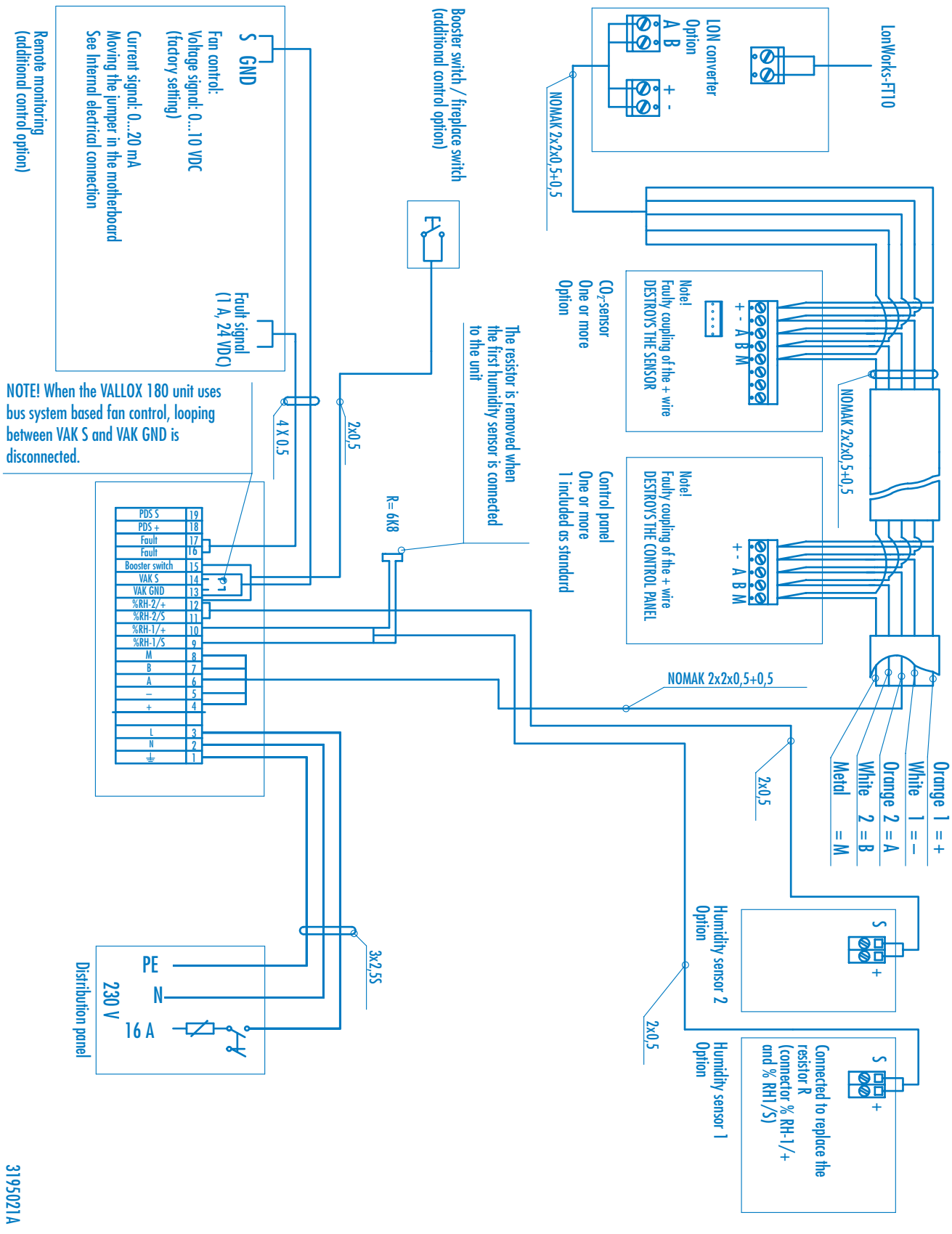
VALLOX 180 SE

EXTERNAL ELECTRICAL DIAGRAM / DC / AC



FILTERING, HEAT RECOVERY

Filtering

Efficient filtering of outdoor air (G3 + F7) prevents harmful particles from entering the ductwork and rooms via the unit. Good filtering of extract air (G3) diminishes the contamination of the unit and ensures efficient heat recovery and extract air fan operation. Clogging of the supply / extract air filters and of the ductwork can be monitored by equipping the unit with a pressure difference switch.

Heat recovery and heating

With efficient heat recovery, most of the heat of 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 (optional).

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

The unit also has a water post-heating unit with an automatic defrost function.

Defrost

The automatic defrosting of the heat recovery cells 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 fan is also equipped with an electric preheating unit.

Electric preheating unit (standard equipment)

• Power 2.0 kW, 8.7 A.

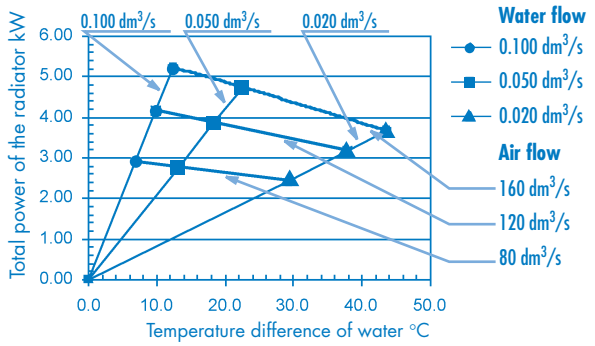
Electric post-heating unit (option)

• Power 1.0 kW, 4.3 A.

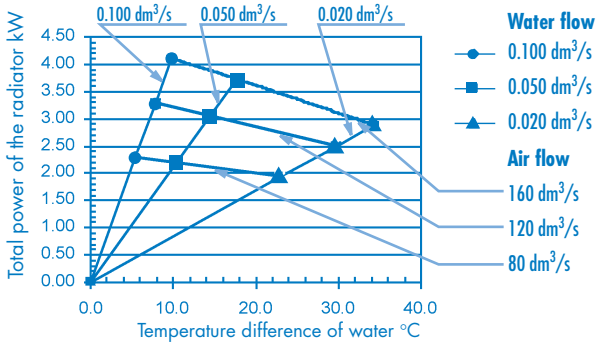
Water post-heating unit VKL (option)

Power of water radiator

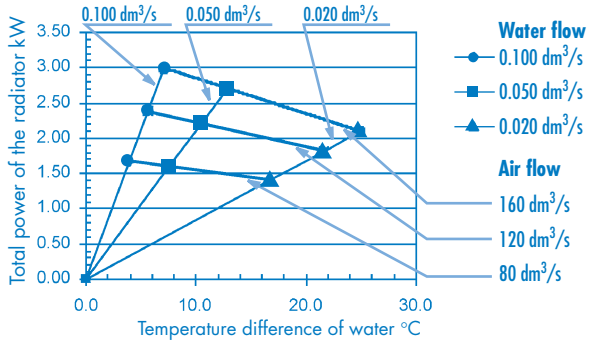
Temperature of air coming to the radiator (ta1) = 15 °C
Temperature of water coming to the radiator (tf1) = 85 °C



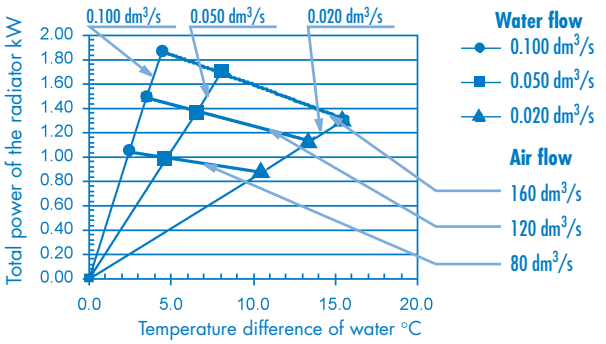
Temperature of air coming to the radiator (ta1) = 15 °C
Temperature of water coming to the radiator (tf1) = 70 °C



Temperature of air coming to the radiator (ta1) = 15 °C
Temperature of water coming to the radiator (tf1) = 55 °C

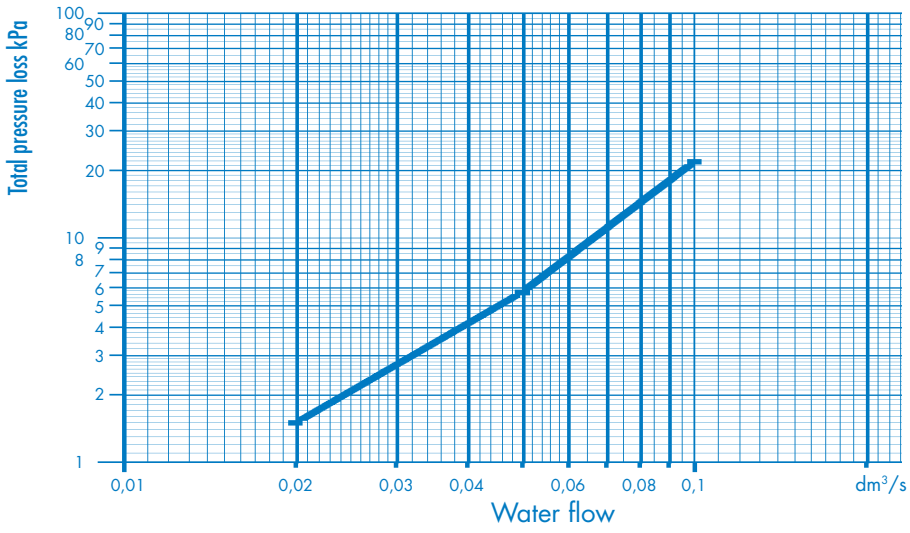


Temperature of air coming to the radiator (ta1) = 15 °C
Temperature of water coming to the radiator (tf1) = 40 °C



VKL WATER RADIATOR PRESSURE LOSS IN WATER CIRCULATION

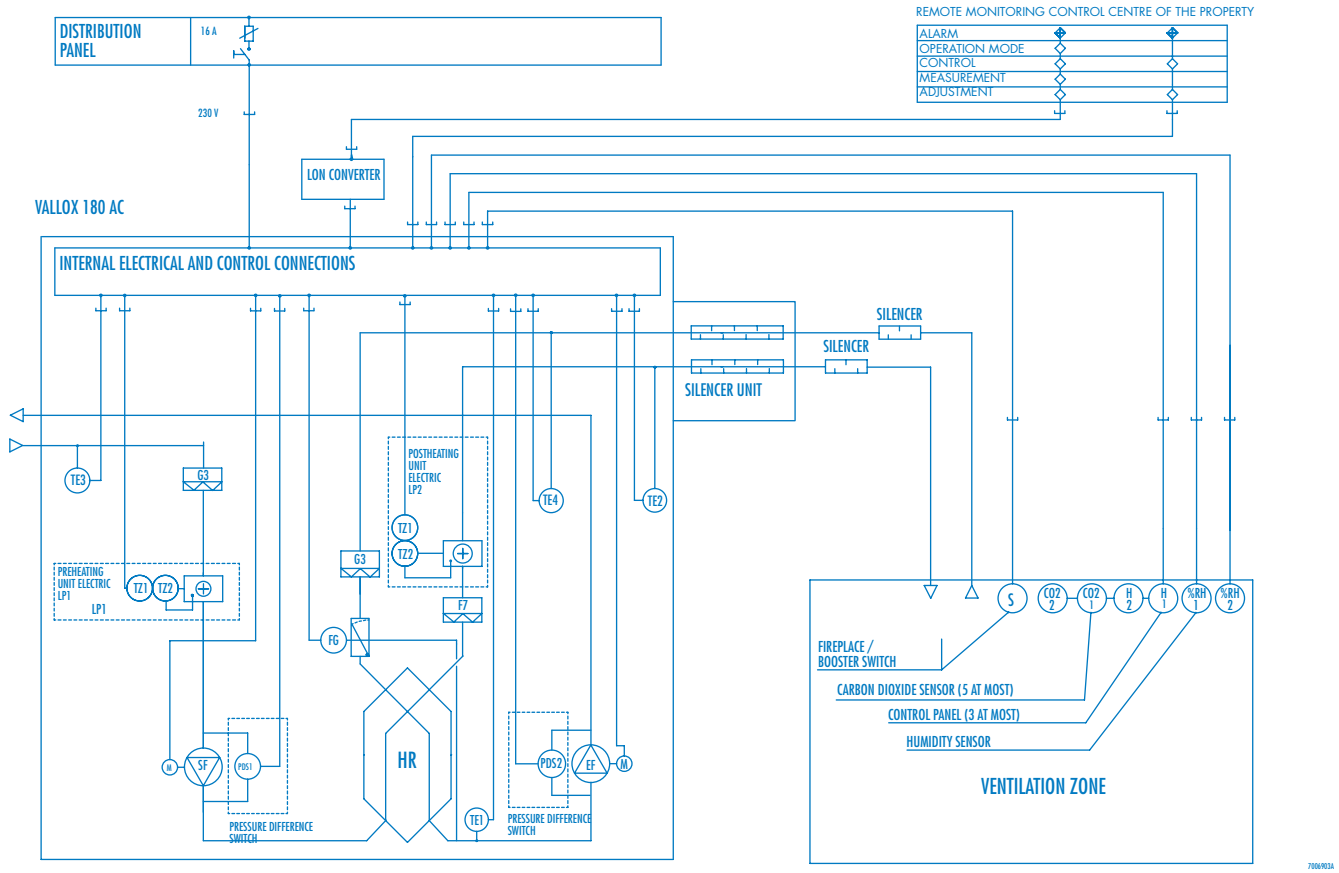
Defined for 100% water



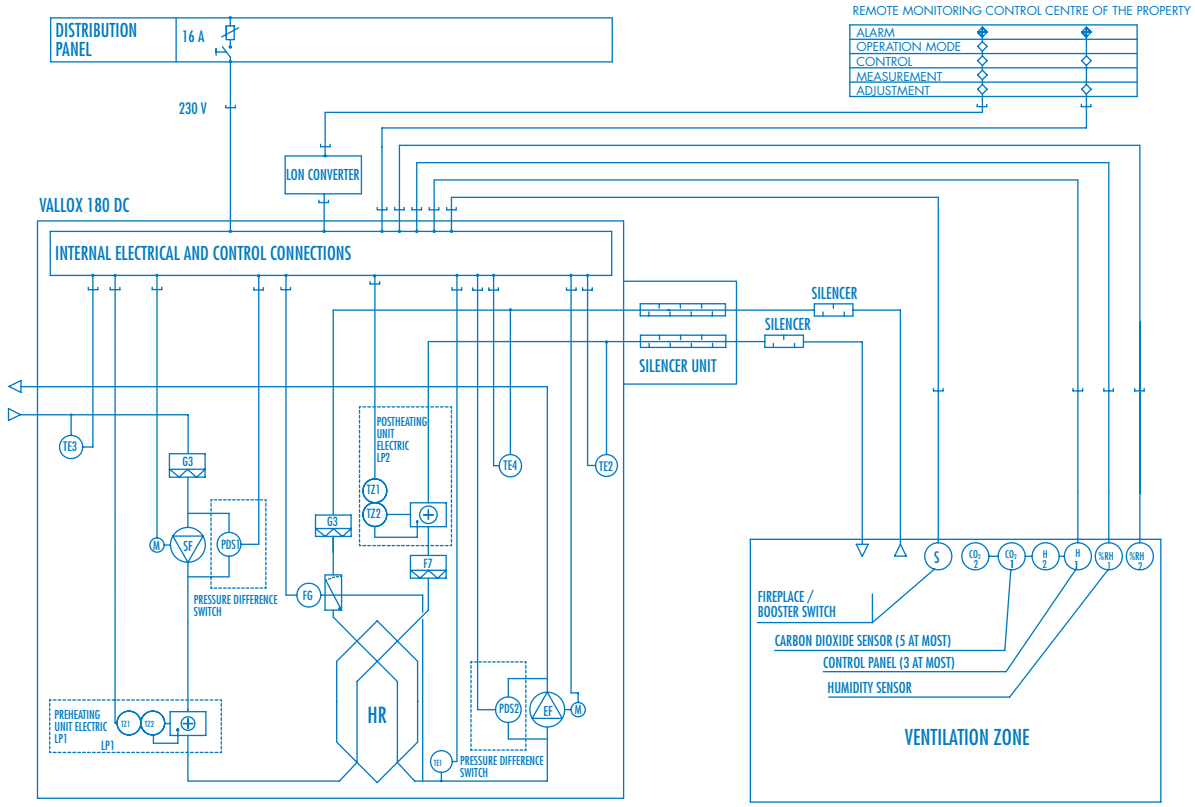
VALLOX 180 SE

CONTROL DIAGRAM for VALLOX 180 / Electric post-heating unit

CONTROL DIAGRAM, AC FANS



CONTROL DIAGRAM, DC FANS



Control of operation

If needed, power supply to the unit can be controlled via a contactor in the distribution panel with a timer program, for instance. After starting, the unit first operates at minimum capacity. After that, capacity is adjusted on the basis of the measurement data given by the air quality sensors, and/or through manual control on the control panel.

Fan speed adjustment

Manual control

Fan speed of the ventilation unit is controlled in 8 steps at the 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 for 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 (CO_2 and %RH sensors) located in the ventilation zone. The aim is to keep carbon dioxide and/or humidity content below the threshold set at 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 status 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 capacity 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 capacity 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, CO_2 and %RH controls.

Voltage and current signals (selection at 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 the post-heating unit LP2 on the basis of the measurement data given by the temperature sensor TE2, aiming at keeping supply air temperature at the temperature value set at the control panel H (+10…+30°C).

Supply air cascade control

The control unit directs the operation of the post-heating unit LP2 on the basis of the measurement data given by the extract air sensor TE4, aiming at keeping extract air temperature at the temperature value set on the 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 the damper motor FG on the basis of measurement 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. However, heat recovery is always active when outdoor air temperature is below the set threshold value.

Heat recovery defrosting

The control centre of the unit controls the operation of the preheating unit LP1 on the basis of the measurement data of the temperature sensor TE1, preventing freezing alerts and the stopping of the supply air fan SF. If the capacity of the preheating unit LP1 is not sufficient, the control centre keeps stopping the supply air fan SF on the basis of the measurement data on the 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 defrosting can be set at the control panel H.

Overheating protection of heating unit

The overheating protection thermostats TZ1 and TZ2 monitor the surface temperature of the heating units LP1 and LP2. If surface temperature exceeds the threshold, overheat protection is triggered and power supply to the heating unit is stopped. The overheat protector TZ1 is reset automatically and TZ2 manually.

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.
- In other fault situations, such as sensor faults, the points of the relay close.

Booster or fireplace switch function

An extra switch S may be connected to the connection box of the ventilation unit to work as a booster or fireplace switch. The operation mode of the switch is selected at the control panel H. The booster switch function raises fan speed to maximum 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.

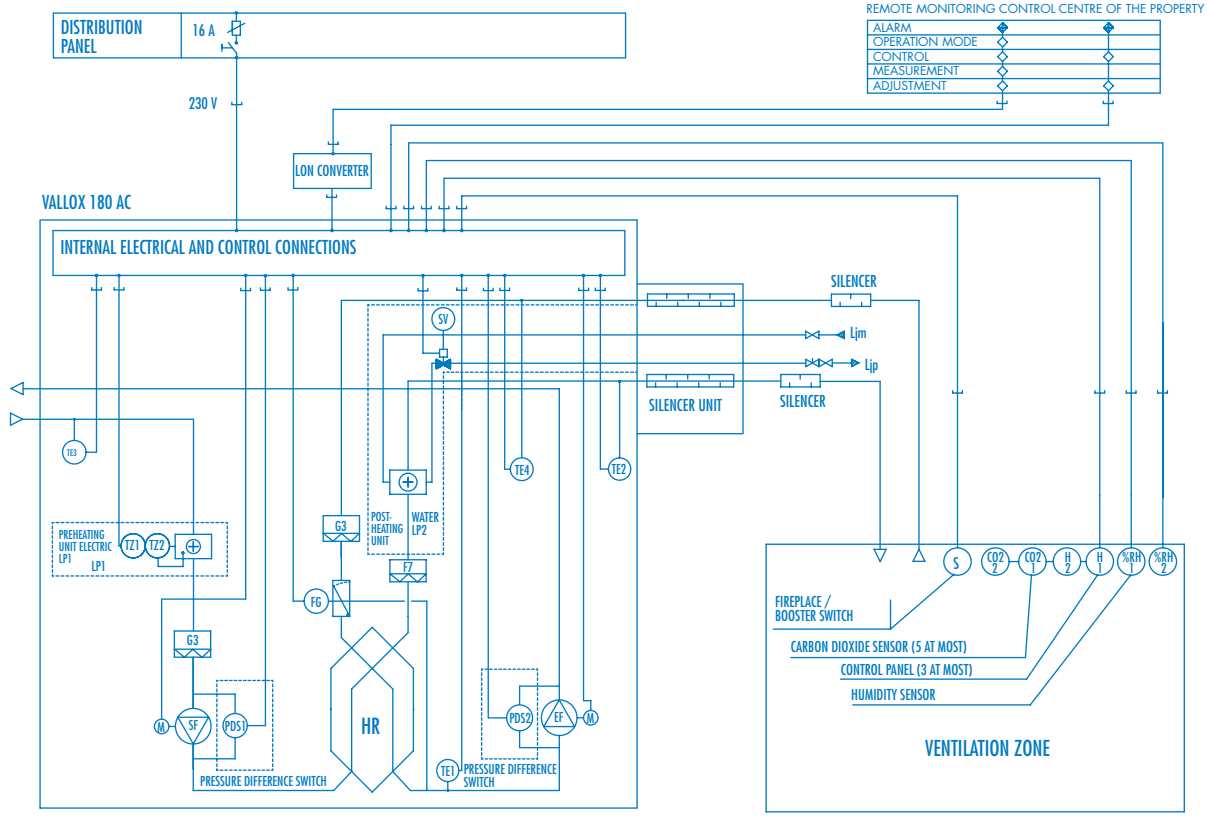
Parts list for VALLOX 180 (AC / DC)

Code	Name	Technical data (factory settings in parentheses)	Standard / option
CO_2	Carbon dioxide sensor Carbon dioxide control	Adjustment range 500...2000 ppm (900) Adjustment range 1...15 min (10)	Option
G3	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)	Interface	Standard
LP1	Preheating unit	Electric radiator 2 kW	Option
LP2	Post-heating unit	Electric radiator 1 kW	Standard
HR	Heat recovery cell	Counter-current, efficiency = 80%	Option
PDS1	Pressure difference switch Pressure guard on the supply air side	Adjustment range 0...500 Pa (320)	Option
PDS2	Pressure difference switch Pressure guard on the extract air side	Adjustment range 0...500 Pa (320)	Standard
EF	Extract air fan AC	qv =205 dm^3/s (100 Pa)	Standard
	Extract air fan DC	qv =180 dm^3/s (100 Pa)	Standard
%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 bypass defrosting, 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
SF	Supply air fan AC	qv =185 dm^3/s (100 Pa)	Option
	Supply air fan DC	qv =165 dm^3/s (100 Pa)	Option
TZ1	Overheating protection of heating unit	Automatic + 60 °C, self-resetting	Incl. in LP1 / LP2
TZ2	Overheating protection of heating unit	Manually reset, +95 °C	Incl. in LP1 / LP2
S	Fireplace / booster switch	Functions as either a fireplace or booster switch (fireplace switch)	Option
LON	LON converter	Remote monitoring control	Option

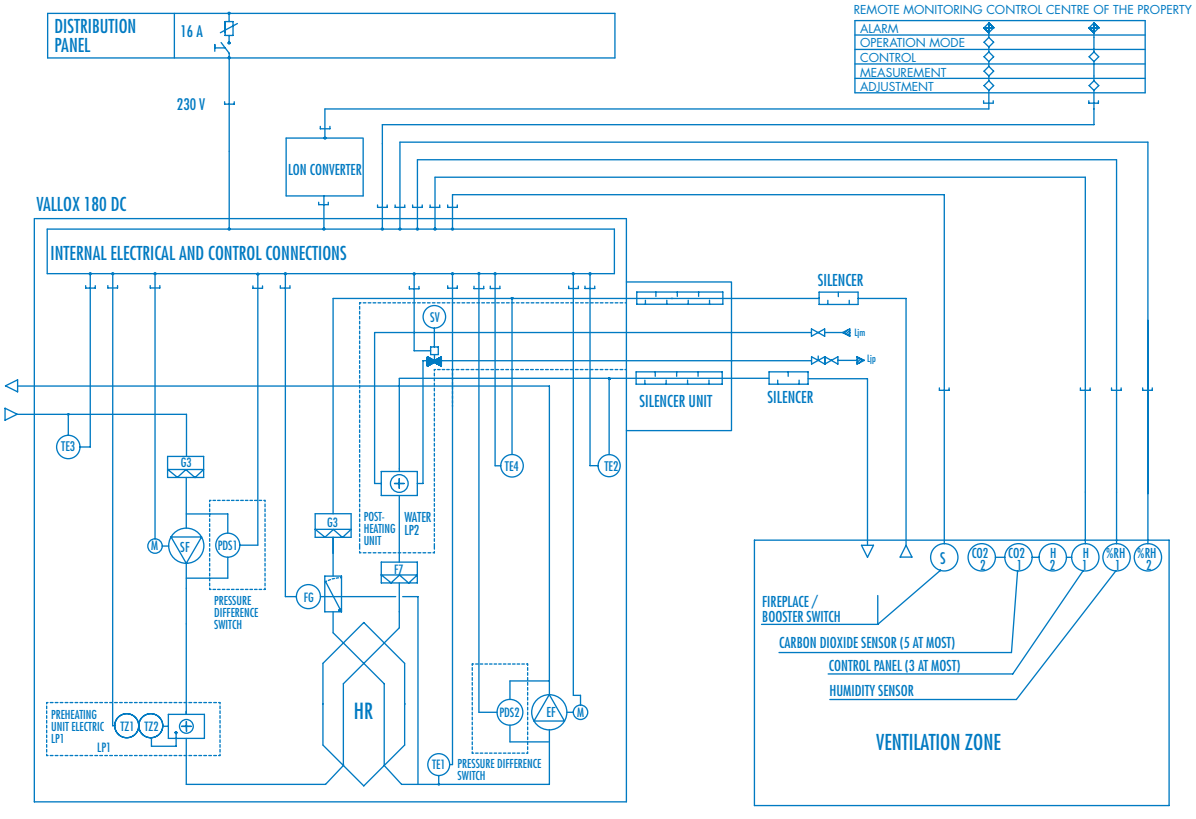
VALLOX 180 SE

CONTROL DIAGRAM for VALLOX 180 / Water-circulating post-heating unit

CONTROL DIAGRAM, AC FANS



CONTROL DIAGRAM, DC FANS



VALLOX 180 SE

DESCRIPTION OF OPERATION / Water-circulating post-heating unit

Control of operation

If needed, power supply to the unit can be controlled via a contactor in the distribution panel with a timer program, for instance. After starting, the unit first operates at minimum capacity. After that, capacity is adjusted on the basis of the measurement data given by the air quality sensors, and/or through manual control on the control panel.

Fan speed adjustment

Manual control

Fan speed of the ventilation unit is controlled in 8 steps at the 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 for 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 (CO_2 and %RH sensors) located in the ventilation zone. The aim is to keep carbon dioxide and/or humidity content below the threshold set at the control panel H. One or more modes of control may be used simultaneously. The dominant mode is the one demanding boosting. Fan speed varies depending on load status 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 capacity 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 capacity 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, CO_2 and %RH controls.

Voltage and current signals (selection at 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 the control valve SV on the basis of the measurement data given by the temperature sensor TE2, aiming at keeping supply air temperature at the temperature value set at 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 measurement data given by the extract air sensor TE2, aiming at keeping extract air temperature at the temperature value set at the 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 the damper motor FG on the basis of measurement results given by the outdoor temperature sensor TE3 and the 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.

Heat recovery defrosting

The control centre of the unit controls the operation of the preheating unit LP1 on the basis of the measurement data of the temperature sensor TE1, preventing freezing alerts and the stopping of the supply air fan TF. If the capacity of the preheating unit LP1 is not sufficient, the control centre keeps stopping the supply air fan SF on the basis of the measurement data on the 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 defrosting can be set at the control panel H.

Water radiator freezing protection

The control centre of the unit stops the fans SF and EF on the basis of the measurement data in the outdoor temperature sensor TE3 (outdoor air < 0°C) and the supply air temperature sensor TE2 (supply air < 7°C), thus preventing the water heating unit LP2 from freezing. 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). Preheating unit overheat protection The overheating protection thermostats TZ1 and TZ2 monitor the surface temperature of the heating unit LP1. If surface temperature exceeds the threshold, overheat protection is triggered and power supply to the heating unit is stopped. The overheat protector TZ1 is reset automatically and TZ2 manually.

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 active all the time. The fault signal relay in the unit gives potential-free alarm indications on the following fault conditions.

- When the defrost function of the water-circulating 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 sensor faults, the points of the relay close.

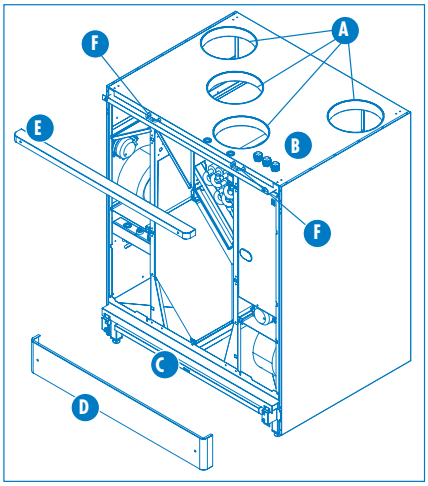
Booster or fireplace switch function

An extra switch S may be connected to the connection box of the ventilation unit to work as a booster or fireplace switch. The operation mode of the switch is selected at the control panel H. The booster switch function raises fan speed to maximum 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.

Parts list for VALLOX 180 AC / DC, water radiator

Code	Name	Technical data (factory settings in parentheses)	Standard / option
CO_2	Carbon dioxide sensor Carbon dioxide control	Adjustment range 500...2000 ppm (900) Adjustment range 1...15 min (10)	Option
G3	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)	Interface	Standard
LP1	Preheating unit	Electric radiator 2 kW	Standard
LP2	Post-heating unit	Water radiator 3 kW 70/55°C	Option
HR	Heat recovery cell	Counter-current, 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 on the extract air side	Adjustment range 0...500 Pa (320)	Option
EF1	Extract air fan AC	qv =205 dm^3/s (100 Pa)	Standard
	Extract air fan DC	qv =180 dm^3/s (100 Pa)	Standard
%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 bypass defrosting, preheating control	Exhaust air temperature Adjustment range –6...+15°C (HR bypass) Adjustment range –6…'C9+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
SF	Supply air fan AC	qv =185 dm^3/s (100 Pa)	Option
	Supply air fan DC	qv =165 dm^3/s (100 Pa)	Option
TZ1	Overheating protection of heating unit	Automatic + 60 °C, self-resetting	Included in LP1
TZ2	Overheating protection of heating unit	Manually reset, +95 °C	Included in LP1
S	Fireplace / booster switch	Functions as either a fireplace or booster switch (fireplace switch)	Option
LON	LON converter	Remote monitoring control	Option

INSTALLATION INSTRUCTIONS



A Duct outlets
B Cable clamps with bushing seals (PK16)
C Condensing water tank
D Socle
E Cover strip
F Measurement outlets

Location of the ventilation unit

- The unit is mounted indoors, in a place where temperature does not fall below +10°C.
- The unit is to be 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 (146 kg) and to vibration isolation.
- The unit is splash protected (IP34), and can thus also be mounted in a damp room.

Electrical connections

- The unit is permanently connected to the mains supply. The electrical connection box of the unit is located inside the unit adjacent to the connection outlet of the supply air ductwork.
- The cables connected to the unit are wired through the bushing seals and cable inserts equipped with cable clamps and located next to the connection outlet of the supply air ductwork.

Installation

- Remove the upper door of the unit (4 door screws).
- Remove the cover of the electrical connection box (2 screws 3.5 x 9.5)
- Mount and connect the needed cables to the screwed terminal block as specified in the connection instructions.
- The external connection diagram is shown in these instructions and inside the cover of the electrical connection box.
- The internal connection diagram is shown in these instructions and inside the cover of the electrical connection box.

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.

NOTE! LENGTH OF THE CONNECTING HEAD OF THE CONNECTING PIECE NO MORE THAN 35 MM.
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 air flow measurement outlets are located behind the cover strip. To remove the cover strip, open its straight-slot fixing screws.
- 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 air volume tables (pp. 3 and 4) show volume flow rates at various adjustment positions.
- The red measurement hose is on the pressure side and the black hose on the suction side of the fan.

Pipe connections

- If the unit is equipped with a water-circulating post-heating unit, it is connected to the warm water circuit with 15/13 copper tubes.

NOTE! Water-circulating heating unit includes a control valve.

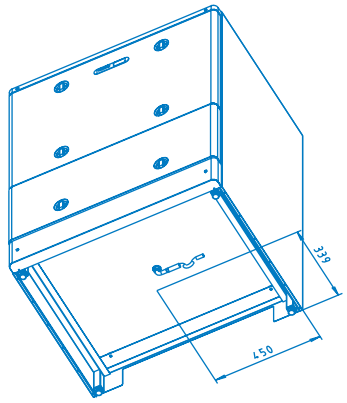
Pressure difference switches

If the unit is equipped with pressure difference switches monitoring the pressure difference between the supply and extract air ducts, they have to be set at their correct values after the installation and adjustment of the ductwork and the related terminal units (valves, outdoor grilles etc.). For more detailed information on adjustments, see the instructions for using the unit.

Condensing water connections

- Water condensing from extract air going through the unit can be removed from the bottom tank in two ways.
- When the humidity content of extract air is high, as for example in washing rooms, the condensing water is led from the screw-type coupling in the bottom tank to the floor drain via the condensing water outlet (water seal) delivered with the unit. Any pipe connected to the condensing water outlet must not rise.
- When the humidity content of extract air is low, as in office rooms, the condensing water can be led from the screw-type coupling in the bottom tank to the condensing water tank delivered with the unit. It is pushed below the bottom tank to the guide posts in the base. In this case, no separate condensing water outlet is used.

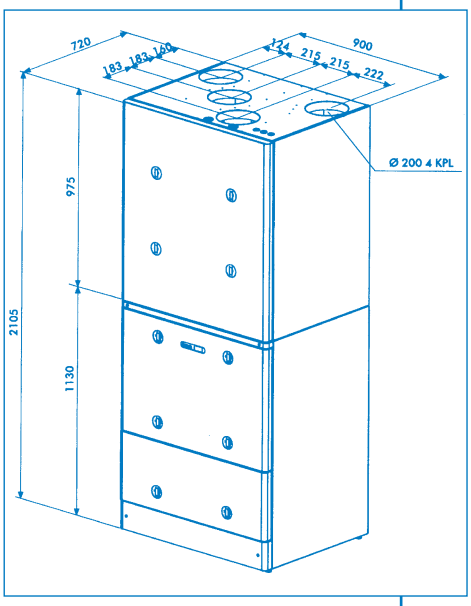
  NOTE! When a condensing water tank is used, it has to be inspected sufficiently often.
- The screw-type coupling is located almost in the middle of the unit. This is why the unit has to be mounted level with the horizontal.



Location of condensing water connection

VALLOX 180 SE

INSTALLATION INSTRUCTIONS FOR SILENCER



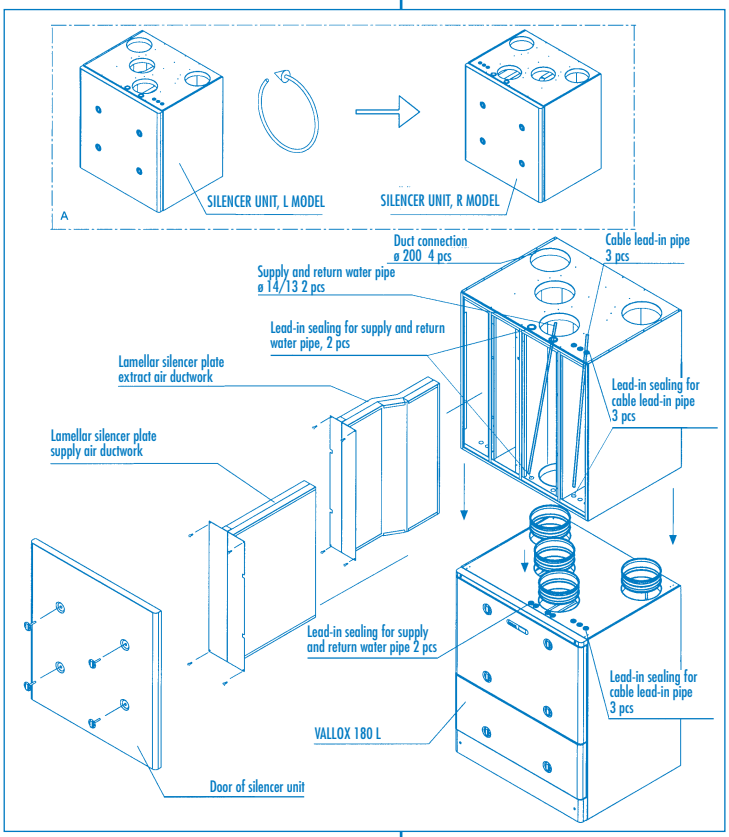
General

- The silencing unit is meant as a duct silencer mounted upon the VALLOX 180 unit. The unit has an opening cover, thanks to which the unit can be cleaned without detaching the ducts.
- The unit also incorporates detachable lamellar silencer plates in supply and extract air ducts.
- 4 x 200-mm external joints are used as duct joints, allowing the leading of ductwork directly from the unit with curved sections, for instance.
- The top and bottom of the unit have lead-in sealings for the lead-in pipes of cables and also for the supply and return water pipes of a water-circulating heater if such a heater is used.
- The weight of the silencer unit is 97 kg with door, and 60 kg without door and silencers.

Installation

NOTE! BEFORE INSTALLATION CHECK WHETHER THE VALLOX 180 IS AN L OR R MODEL. TURN THE SILENCER UNIT TO THE CORRECT POSITION. (See item A in the figure on the following page.)

- Detach the door of the silencer unit. If you want to make the unit lighter so that it will easier to lift it in place, you can also detach the lamellar silencer plates of the supply and extract air ducts. (See the adjoining figure.)
- If VALLOX 180 is equipped with a water-circulating heater, you should always detach the lamellar silencer plate of the supply air duct. (See the adjoining figure.)



- Mount the internal joints (4 200 mm) included in the delivery to the duct outlets, which are situated either at the top of the VALLOX 180 unit or at the bottom of the silencer unit.
- Lift the unit on top of VALLOX 180. (See the adjoining figure.)
- Mount the lead-in pipes (included in the delivery) for cables in place by pushing them first through the lead-in sealings located at the top of the silencer unit and then through the lead-in sealings located at the bottom of the silencer unit and at the top of the VALLOX 180 unit. (See the adjoining figure.)
- Thread necessary cables through lead-in pipes to the connection box located within VALLOX 180.
- If you use a water-circulating heater, mount the supply and return water pipes for it (not included in the delivery) through the lead-in sealings located at the top and bottom of the silencer unit and at the top of VALLOX 180, and connect them to the heater. (See the adjoining figure.)
- Mount the lamellar silencer plates in place.
- Carefully fix the door of the silencer unit in place.
- Fix the ducts steadily and tightly to the relevant outlets. Implement duct insulation if needed as defined in the ventilation plan.

VALLOX

Vallox Oy FIN- 32200 LOIMAA FINLAND Telephone +358 2 7636 300 Fax +358 2 7631 539
Internet: www.vallox.com

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