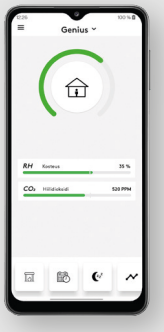
CASA R4-C Genius

Technical catalogue



Available on the App Store

Get it on Google play

QUICK FACTS

- CASA Genius control system
- Demand-controlled humidity function as standard
- Continuous control of the supply air temperature
- Anti-frost protection ensures continuous ventilation
- Automatic summer function and passive cooling
- External coils for heating and cooling as an option
- Can be connected to the automated building management system (I/O/Modbus)
- For ceiling installation, embedded in the suspended ceiling. Can also be installed on the wall.

UNIT TECHNICAL CONTENT	
Air flow range	HRV: 42-195 cfm | 20-92 l/s ERV: 85-195 cfm | 40-92 l/s
Outdoor temperature range	HRV: -4 - (+122) °F | -20 - (+50) °C ERV: +5 - (+122) °F | -15 - (+50) °C
Dimensions, w x l x h	41.3 x 11.6 x 27.6 inch, 141 lbs (1050 x 295 x 700 mm, 64 kg)
Duct outlets	4 x Ø 6 inch (152 mm)
Unit ambient temperature range	+50 - (+122) °F | +10 - (+50) °C
Energy calculations and acoustic data	procasa.swegon.com sds.swegon.com
Connection power	648 BTU/hr (190 W)
Power connection	220-240 V, MOP 10 A
Fans	170 W, EC
Filters	MERV13 filters for supply air and for extract air
Colour	Exterior White, RAL 9016 (corresponds to NCS S0502-G50Y)

Content

Technical description

Swegon CASA R4-C Genius

Residential air handling unit (41.3 x 27.6 x 11.6 inch, 6 Ø inch) with rotary heat exchanger for houses, small offices, etc.. Flat design and compact size enables various mounting options, also ideal for ceiling mounting as height under 30 cm. The market's most intelligent humidity control as standard. Developed, manufactured and tested for North American climate.

Indoor environmental quality

Ventilation control

The unit is controlled steplessly with automation functions to quarantee the best indoor environmental quality. The user can select five operating modes home, away, boost, travelling and home+ by using control panel, cooker hood or Swegon CASA app. Operation modes can be automated with unit's weekly programs.

Temperature control

The supply air temperature is controlled with heat exchanger and if needed also with standard or optional heating elements and optional cooling elements.

External pre-heater is demanded for outdoor temperature below **HRV:** +4 °F (-20 °C), **ERV:** +5 °F (-15 °C). External postheater is demanded for outdoor temperature below -5 °F (23 °C).

The unit has automatic summer time detection. The function sets lower supply air temperature setpoint and boost ventilation in order to bring more fresh outdoor air to the apartment during summer nights.

Available variants

Standard units are available in following variants:

- HRV **R** (supply air, right)
- ERV **R** (supply air, right)

Components

Fans

CASA R4-C is equipped with energy efficient EC fans.

Filter

The ventilation unit is equipped with MERV13 filters for supply air and for extract air. The need of filter replacement is indicated on the control panel.

Heat exchanger

The ventilation unit is equipped with a **speed controlled rotary heat exchanger**. Heath exchanger is controlled either to maintain constant supply air temperature or to achieve maximum energy efficiency (winter mode).

HRV (Heat Recovery Ventilation) systems recover heat from exhaust air and transfer it to incoming fresh air without mixing the airstreams.

ERV (Energy Recovery Ventilation) systems recover both heat and moisture from exhaust air, transferring it to incoming air.

External connections

All connections can be made without opening the electrical box. Plug-in modules are available for external connections. Wide variety of IO functions are available.

The ventilation unit is equipped with In-build Modbus. Modbus cabling can be made easily with external cable (SEC) or module (SEM). Unit can be fully controlled with Modbus and all external IO´s can be configured to Modbus usage.

Protective functions

The heat exchanger freeze protection (HRV)

The defrosting guarantees continuous ventilation and maintains units performance even in extreme conditions. During the defrost the heat exchanger efficiency is reduced so that warm extract air removes the frost. If supply air temperature can not be maintained, the air flows became unbalanced.

The heat exchanger freeze protection (ERV)

If outdoor temperature goes below minimum limit heat exchanger freezing danger alarm is generated. During the alarm supply fan is stopped and exhaust fan runs in fixed speed.

The fan overheating protection

The fan overheat protection stops the fan if the temperature rises too high and is reseted automatically. If protection stops the fans an alarm is generated.

Rotor guard

Rotor guard detects that the rotor is working. Malfunction generates an alarm.

Cold supply air

The ventilation unit has built-in condensation protection. If the supply air is too cold, the ventilation unit stops and an alarm is generated.

High humidity (ERV)

Indoor humidity is controlled by adjusting the unit humidity recovery rate. If the humidity reamains critical high, indoor humidity alarm is generated. During the alarm supply fan is stopped and exhaust fan runs in fixed speed.

High temperature

If supply air or units internal temperature is detected dangerously high the unit is stopped and an alarm is generated.

Temperature sensors

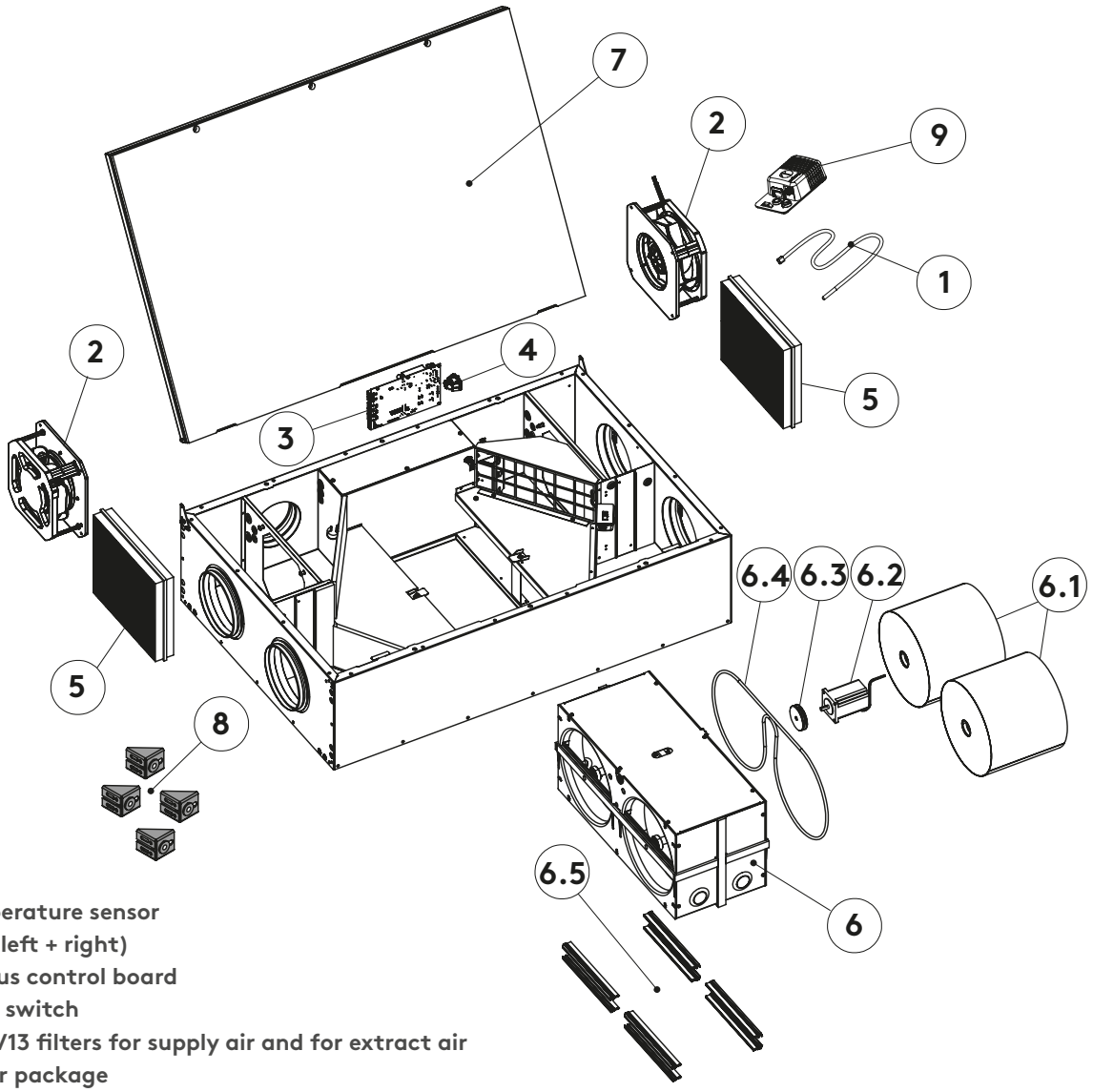
If a sensor fault is detected, an alarm is generated. If the faulted sensor is critical the ventilation unit is stopped. The ventilation unit returns to normal mode once the fault has been corrected.

The delivery includes

- Ventilation unit
- Mounting brackets, 4 pcs.
- Cover plugs, 3 pcs.
- Quick Guide
- Installation and commissioning instruction

Standard connections

- Power cord with earthed plug (6,6 ft | 2m)
- Cable for SEC/SEM connection module with RJ45 connector (6,6 ft | 2m)
- Modular cable with RJ9 connector (4,9 ft | 1.5 m)
- Freely configurable I/O contacts for connection of accessories (2 pcs.)



1. Temperature sensor
2. Fan (left + right)
3. Genius control board
4. Door switch
5. MERV13 filters for supply air and for extract air
6. Rotor package
   - 6.1 Rotor
   - 6.2 Rotor motor
   - 6.3 Drive wheel
   - 6.4 Drive belt
   - 6.5 Brush seals
7. Door
8. Mounting brackets
9. Sensor package RH

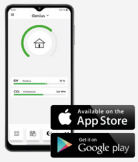
Swegon CASA Genius

Intelligent control of the ventilation

Using the Swegon CASA Genius control system, residents can monitor the quality of the indoor air (RH, CO2, VOC, °F, °C), control the ventilation according to need or allow the intelligent control to regulate the ventilation automatically.

Swegon CASA control panel

Wall-mounted touch screen for external or flush mounting. From the touch screen, it is possible to monitor ventilation, change the ventilation's operating mode, change the equipment's settings and commission the ventilation unit. The screen can be connected to the home's WLAN network, enabling the ventilation to be controlled remotely from a mobile app.



The Swegon CASA app

Using this app, the home owner can use all the functions in the control panel remotely from their own smartphone. With the aid of the app, the user has access to more information about their home's air quality as well as valuable instructions and advice about the ventilation (needs Swegon Genius control panel).

The CASA Service app

App for installation engineers/service engineers, which provides assistance when commissioning the ventilation unit. The app works locally together with the ventilation unit and does not require connection to a network. For example, the app defines the I/O connections, presets the percentage values for the fan speeds that correspond to specified air volumes, as well as automatically setting air volumes for home and boost mode. Finished settings can be saved in the app and copied to the next home (needs Swegon Genius control panel).

Home automation

Can be connected to the home automation for centralised monitoring and control, either directly via configurable I/O or with the aid of a separate Modbus connection module (SEM).

Basic modes

You can switch as required to an appropriate operating mode or let the pre-programmed weekly clock switch operating mode according to the diurnal rhythm you want.

Home
Normal air flow. Sufficient amount of fresh indoor air to ensure the wellbeing of the residents and the structural building elements when there are people in the home.

Home+
Higher air flow. Can be used when more ventilation is required. The home owner can change the efficiency of the operating mode from the settings.

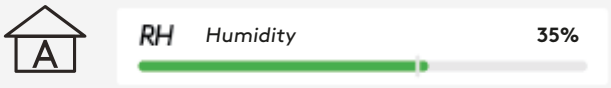
Boost
High air flow. Used if the ventilation requirement increases, for example, when cooking, taking a bath or drying laundry, or when an unusually large number of people are in the home.

Away
Low air flow. Reduces the energy consumption when nobody is present in the home.

Travelling
Very low air flow and lower supply air temperature. Used when nobody is present in the home.

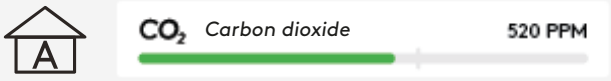
Automatic functions

The intelligent ventilation monitors the quality of the indoor air and adjusts the ventilation automatically.

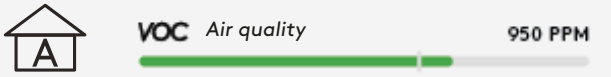


Automatic RH system included as standard
Humidity automation removes damaging moisture. The intelligent control analyses the indoor air continuously and boosts the ventilation steplessly so that excess moisture is removed, for example when you are washing.

Indoor humidity control (ERV)
The required indoor air humidity can be selected and the unit aims to maintain selected humidity level.

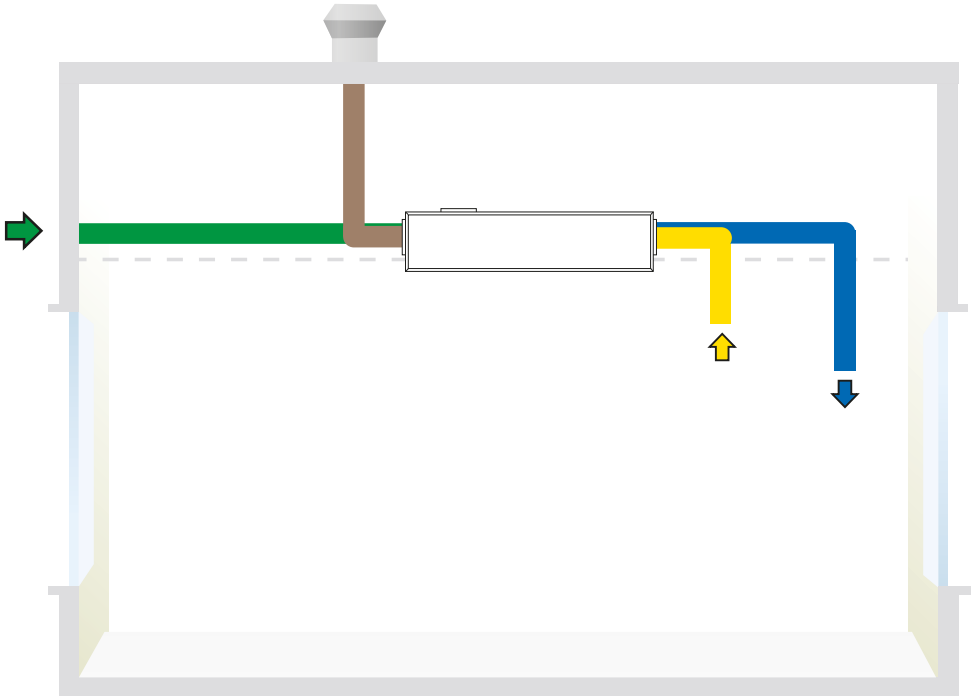


Automatic CO2 system as optional equipment
Automatically lowers the ventilation and saves energy when nobody is in the home. When the residents are at home, the ventilation is automatically boosted to bring exactly the right amount of fresh air into the home.



Automatic VOC system as optional equipment
The automatic air quality system boosts the ventilation if pollution, odours or vapours (evaporating organic compounds) are detected in the indoor air.

Design data



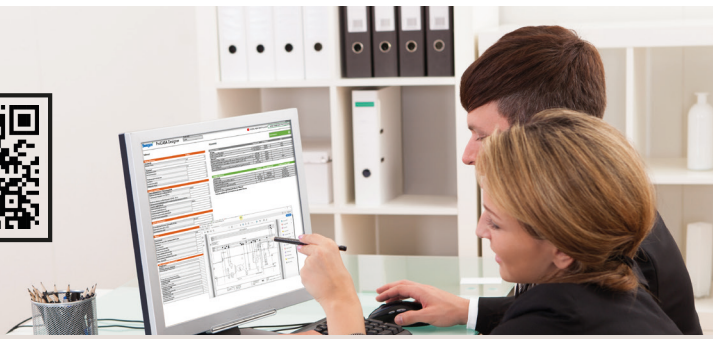
CASA R4-C -duct connections

Outdoor air Supply air Extract air Exhaust air

ProCASA®

Energy calculation, functional diagram and acoustic data on ProCASA.

procasa.swegon.com



Energy calculator

Select area

CAN - Ottawa

-27,4°F ... 82,4°F
Source: ASHRAE Fundamentals 2021

Intertek 5025428

cool, temperate climate
CERTIFIED COMPONENT
Passive House Institute

Enthalpy

Select and print pages
Energy calculation and dimensions

Project
Customer
Designed by
Location

Default values

Imperial
cfm

	Supply air	Extract air
Air flow	127 cfm	127 cfm
Duct pressure	0.32 in. w.g.	0.32 in. w.g.

Click here for dynamic fan curves

Cooker hood airflow 0 cfm
usage time per day 0 h/d

Indoor temperature 70°F
Minimum supply air temperature (+50°F...+70°F)

+50 +51 +52 +53 +54 +55 +56 +57 +58 +59 +60 +61 +62 +63 +64 +65 +66 +67 +68 +69 +70

Max airflow rate 398 cfm
Sound power level: 44 dB(A)

Fan power and energy use EN13141-7

Supply air	23 W	
Extract air	23 W	
SPI	0.36 W/cfm	
SFP	0.36 W/cfm	
Annual energy use of fans	1,375 kBTU	

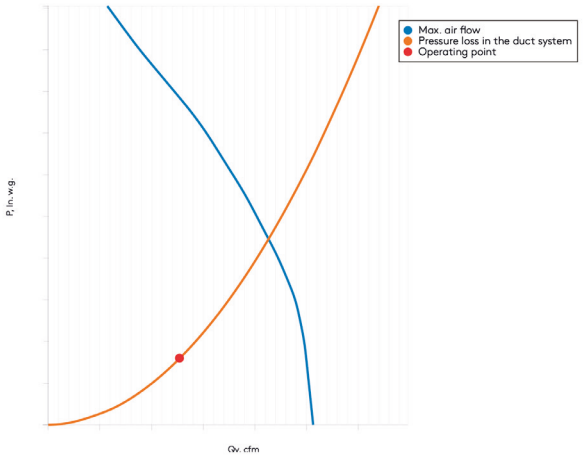
Energy used to heat the air EN13141-7

Reheating 63 °F	1,380 kBTU	422W peak load
Energy used without heat recovery	28,730 kBTU	
Annual energy efficiency for AHU (63 °F)	95 %	
Temperature efficiency of heat exchanger	85 %	
Temperature efficiency of air handling unit	80 %	

Acoustic data

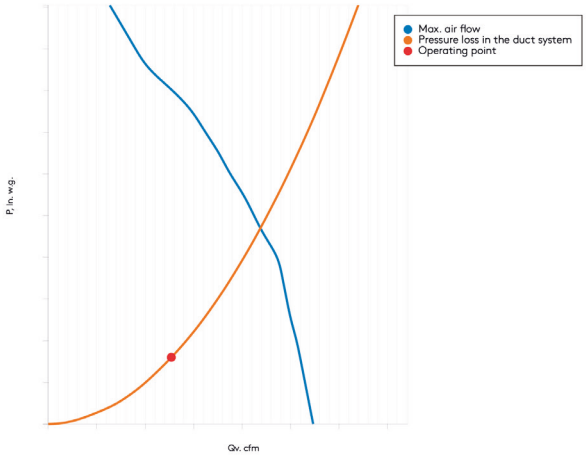
Octave band (Hz)	63, L_W	125, L_W	250, L_W	500, L_W	1k, L_W	2k, L_W	4k, L_W	8k, L_W	L_{WA}
Sound preassure emmited to:	dB	dB	dB	dB	dB	dB	dB	dB	dB(A)
supply air duct	70	71	57	52	46	41	24	16	57
extract air duct	64	68	60	42	36	27	18	14	55
outdoor air duct	65	69	61	44	40	33	23	15	56
exhaust air duct	69	71	61	55	49	47	32	23	59
surroundings	49	51	43	34	27	24	24	26	40
surroundings at -4dB sound attenuation								L_{pa}, dB(A)	36

Supply air:



At the selected working point the supply air flow is and the duct system's pressure loss is	cfm in. w.g.
The chosen ventilation unit's maximum air flow is then and the duct system's pressure loss is	cfm in. w.g.
The degree of boost is	%

Extract air

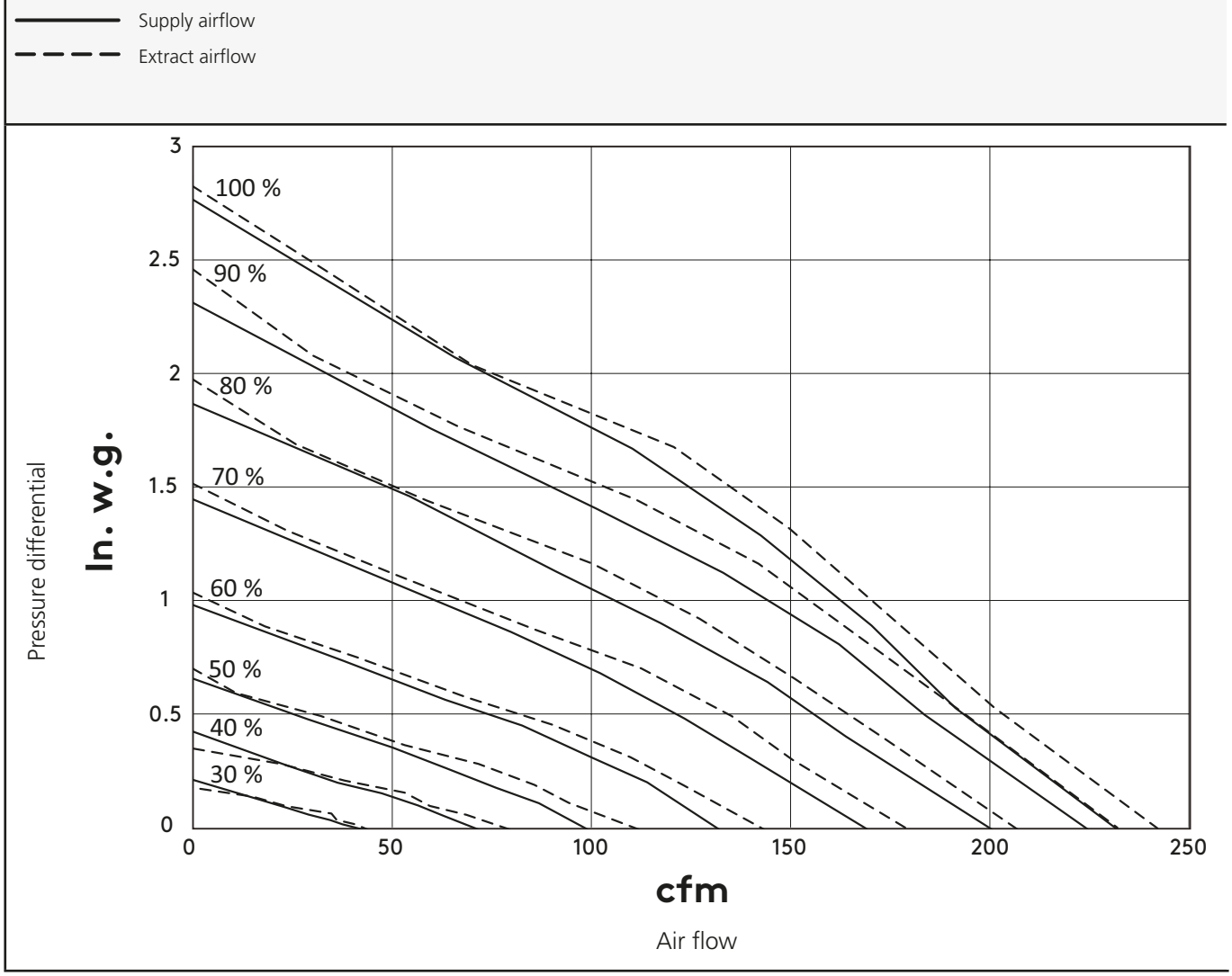


At the selected working point the extract air flow is and the duct system's pressure loss is	cfm in. w.g.
The chosen ventilation unit's maximum air flow is then and the duct system's pressure loss is	cfm in. w.g.
The degree of boost is	%

Air flows

Air flows EN 13141-4

R4-C

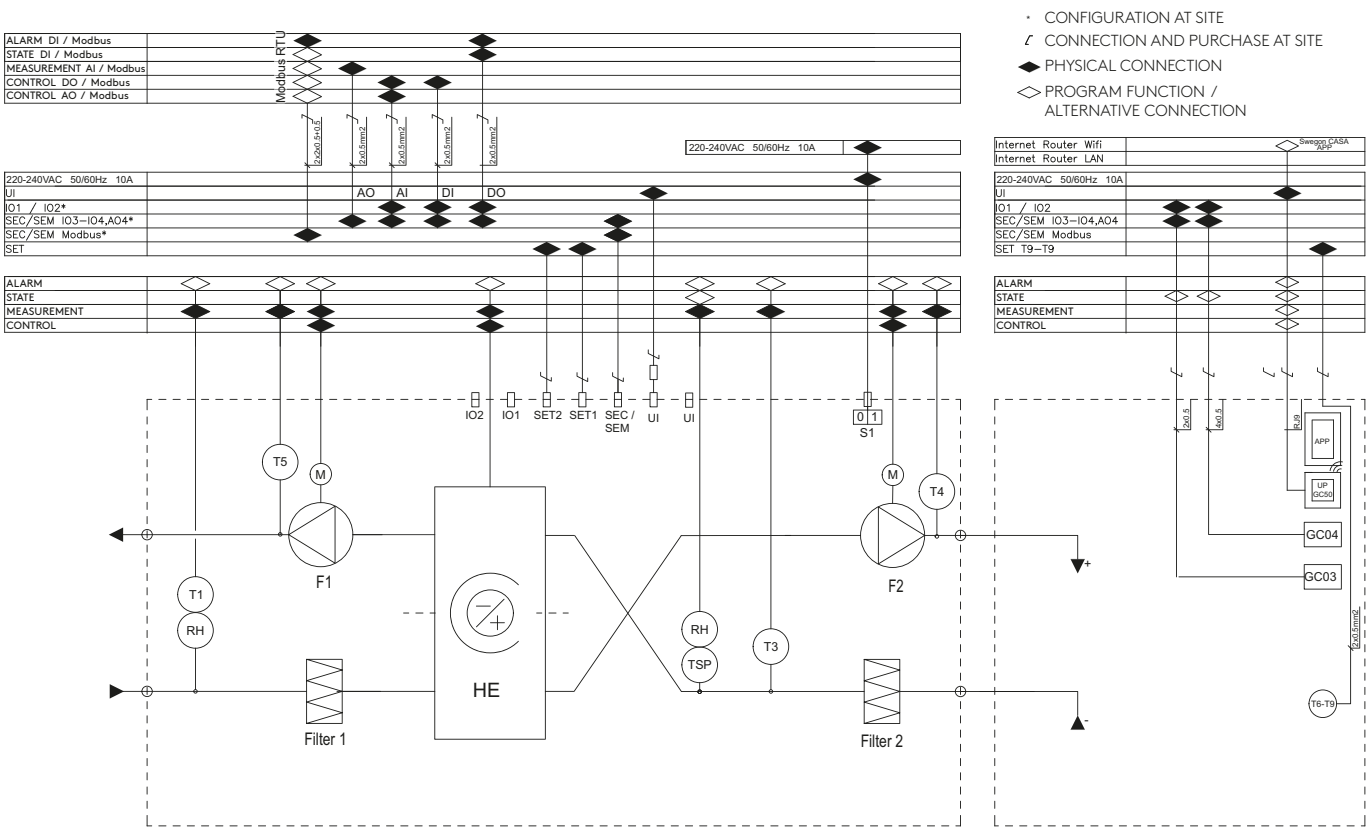


Considerable in dimensioning

The boost margin must be at least 30%

Functional diagram

Functional diagram
R4-C

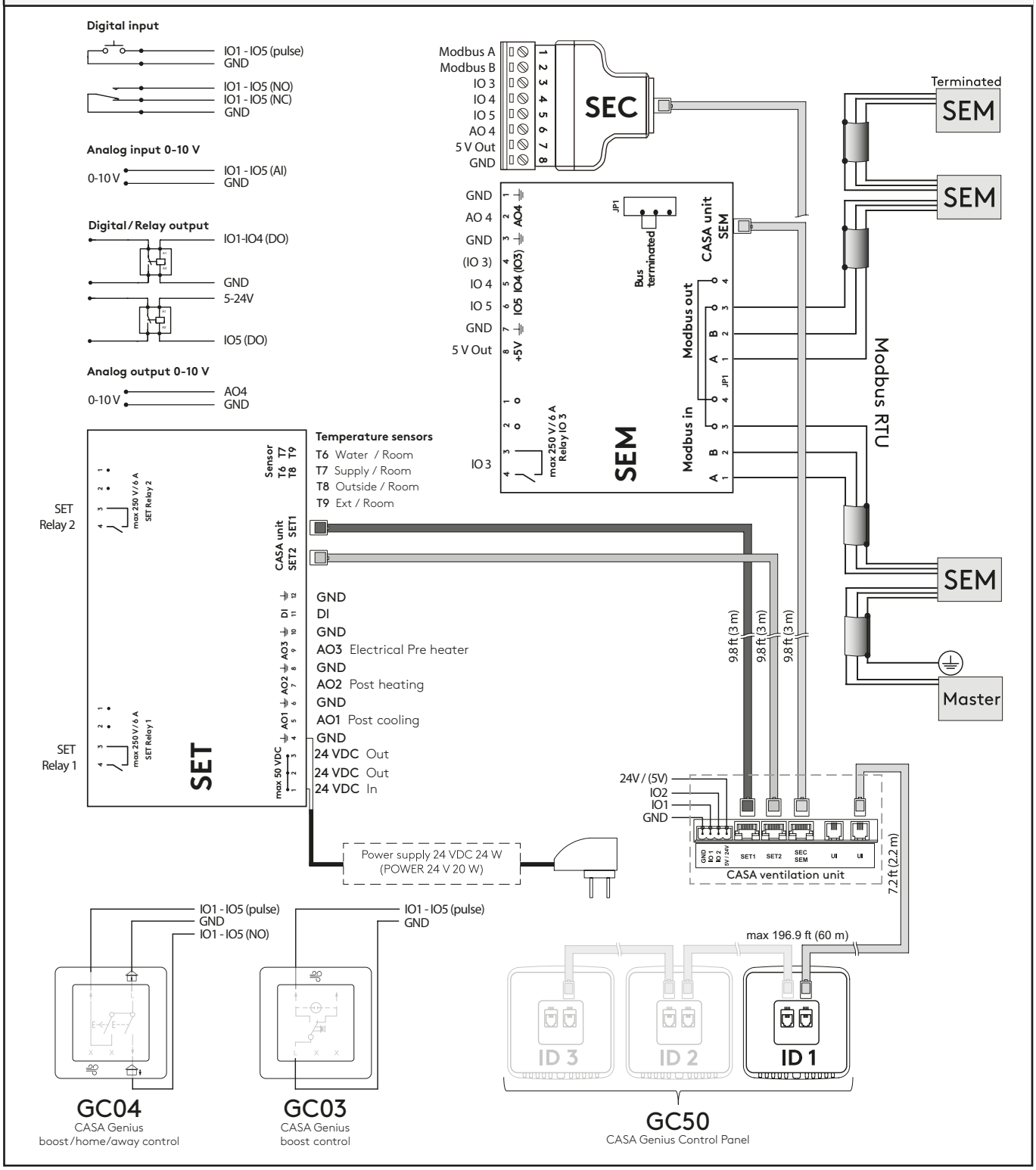


Device	Description	Modbus registers
T1	Temperature sensor, outdoor air	3x6201
T2	Temperature sensor, extract air	3x6204
T4	Temperature sensor, supply air	3x6203
T5	Temperature sensor, exhaust air	3x6205
Filter 1	Fresh air fine filter MERV13	Service reminder info 3x6129
Filter 2	Extract air fine filter MERV13	Service reminder info 3x6129
F1	Extract fan including internal overheat protection.	Control 3x6304(%), RPM 3x6306
F2	Supply fan including internal overheat protection.	Control 3x6303(%), RPM 3x6305
HE	Rotating heat exchanger (Rotor)	
HE M	A heat exchanger motor which speed is steplessly controlled based on the temperature and humidity of the supply air	Control 3x6332 (0.1xRPM)
S1	Use Switch. Note! power off the unit by removing the socket from the Mains when Service	
RH	Humidity sensor for RH automation	RH 3x6214
TSP	Extract air temperature sensor for humidity measurement	
UI	Connectors for the control panel. One connection point is wired outside the unit.	
SEC/SEM	Connector for connecting the SEC or SEM module.	
SET 1&2	Connectors for connecting the SET module.	
5V/24V	24V voltage output, which can be changed to 5V output with a jumper on the circuit board. (IO max 125 mA/3W)	
IO 1&2	Two general-purpose IO connectors. Connectors must be configured for the desired functions.	
GND	Ground for IO connections.	

Accessories	
CO2	CO2 sensor for CO2 automation
VOC	VOC sensor for VOC automation
SEM	Modbus module (Inc. 2m RJ-45 cable)
SEC	IO extension module
SET	Connection module for duct batteries and temperature sensors. (Inc. 2 x 3m RJ-45 cable)
APP	Swegon CASA mobile application for ventilation control and monitoring. Requires a Genius control panel (GC50) to operate.
UP GC50	Genius control panel that can be connected to Swegon CASA application via WiFi.
GC04	Control switch to select boost, home and away mode.
GC03	Control switch to select boost mode.

External connections

External connections
CASA Genius

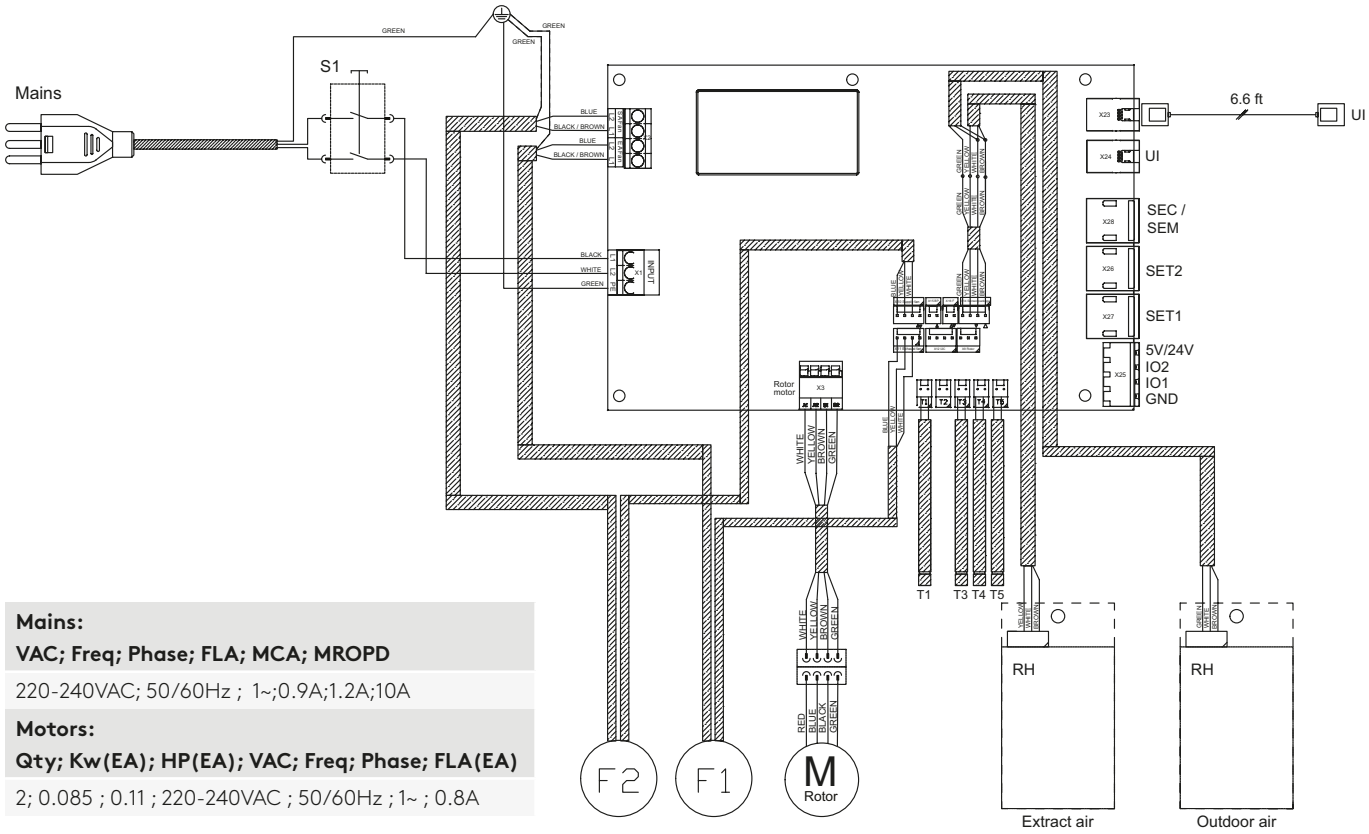


SEC IO extension cable with Modbus RTU
SEM IO extension module with relay and Modbus RTU (input and output connections)
SET IO extension module for control of external accessories

Electrical wiring diagram

Electrical wiring diagram

R4-C



Mains: **VAC; Freq; Phase; FLA; MCA; MROPD**
220-240VAC; 50/60Hz ; 1~;0.9A;1.2A;10A
Motors: **Qty; Kw(EA); HP(EA); VAC; Freq; Phase; FLA(EA)**
2; 0.085 ; 0.11 ; 220-240VAC ; 50/60Hz ; 1~ ; 0.8A

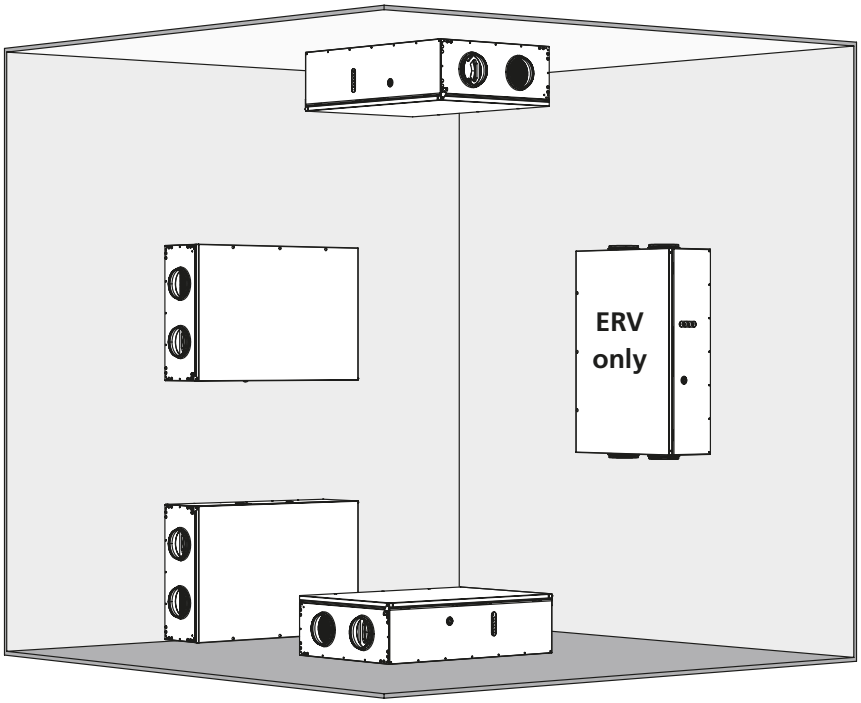
Device	Description
T1	Temperature sensor, outdoor air
T3	Temperature sensor, extract air
T4	Temperature sensor, supply air
T5	Temperature sensor, exhaust air
F1	Extract fan
F2	Supply fan
HE M	Rotor's motor
S1	Use Switch
RH	Sensor package RH
UI	Connectors for control panel / cooker hood
SEC/SEM	Connector for connecting the SEC or SEM module
SET 1&2	Connectors for connecting the SET module
5V/24V	24V voltage output (IO max 125 mA/3W)
IO 1&2	Two general-purpose IO connectors

Installation options

Allowed installation options

The unit can be installed in the positions shown in the drawing.

If the unit is installed vertically, the outdoor air and exhaust air ducts must be routed upwards.



Installation site

The ambient temperature where the ventilation unit will be installed must be between +50 - (+122) °F, +10 - (+50) °C.

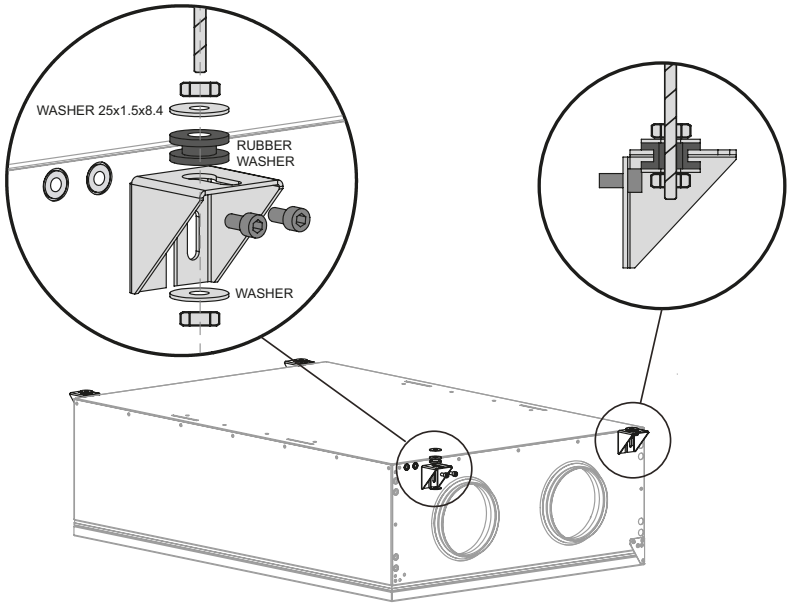
Due to the risk of disruptive noise, the ventilation unit should not be installed on the wall towards the living room or bedroom.

Ceiling mounting

The low installation height (296 mm) gives an opportunity for installation embedded in the lower ceiling.

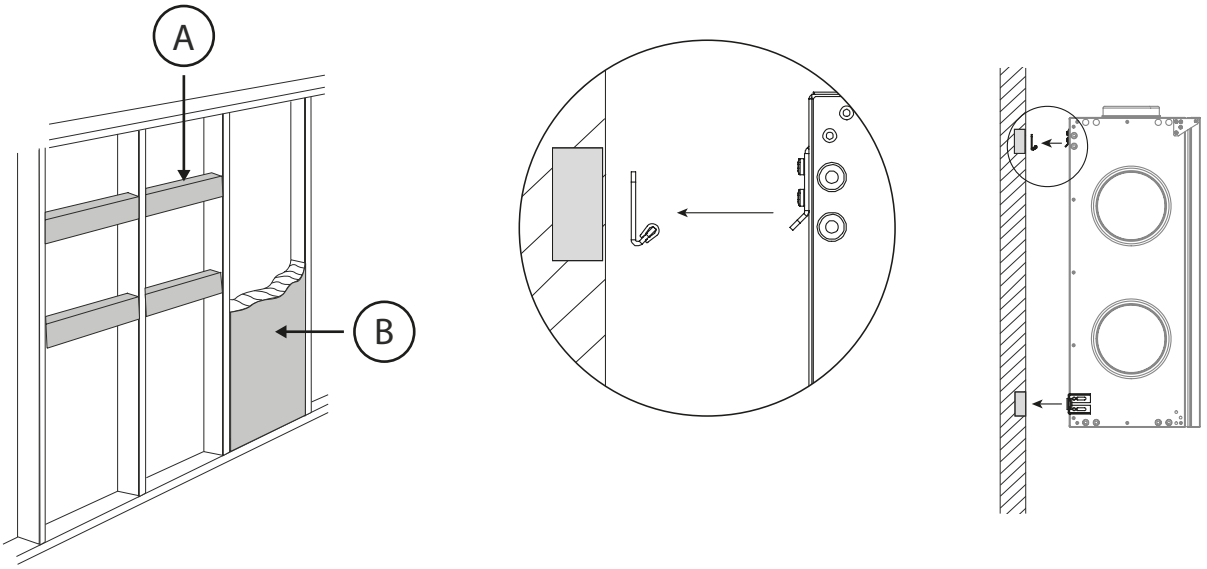
The unit can be mounted on the ceiling using the mounting brackets included in the delivery. The mounting angles should be attached to the unit with the bolts included in the delivery.

The unit is attached to the ceiling anchors with four M8 threaded rods. Use the washers and anti-vibration rubbers included in the delivery as shown in the drawing.



Wall mounting

Can also be mounted on a wall. The wall mounting bracket is accessory R04CWMB.

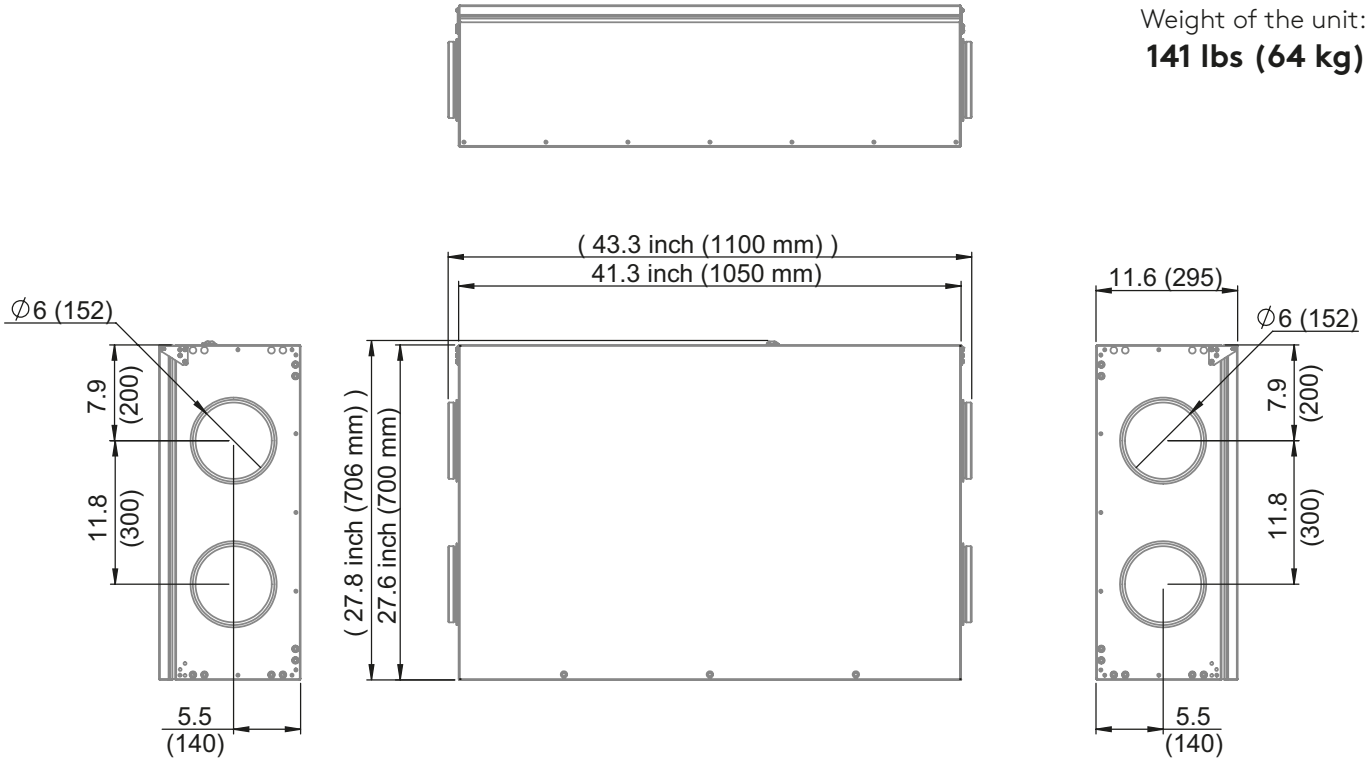


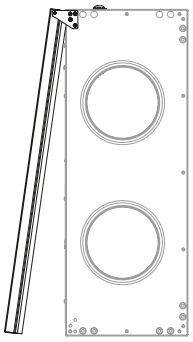
Dimensions and weight

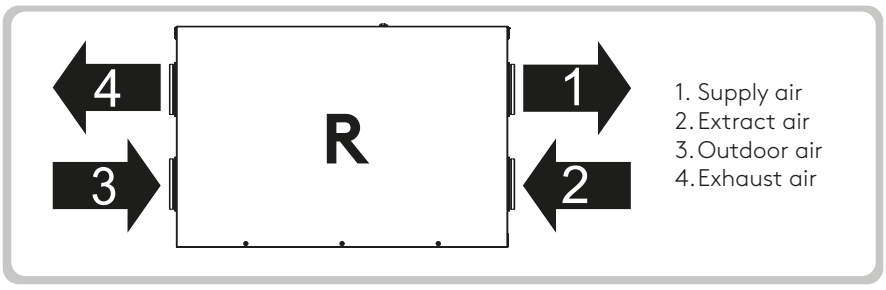
Dimensions

R4-C

Weight of the unit:
141 lbs (64 kg)







Product codes

R4-C

Product	Product code	GTIN
CASA R4-C Genius R ex.el RH NA (HRV)	R04CR00G0NH	6430080091324
CASA R4-C Genius R ex.el RH NA Sorption (ERV)	R04CR00G0NHAS	6430080091331

Accessories

Control accessories	Part no.
GC50 Control panel NA	GC50
Mounting frame control panel	102SAK
Modular cable 10m white	PMK10
Modular cable 20m black	PMK20

Building automation	Part no.
Building automation, Modbus	SEM
I/O connection	SEC
CASA ext. Module control NA	SETNA

Installation accessories	Part no.
Wall mounting bracket	R04CWMB

Electric air heater	Part no.
Electric heater 1200 W (Zon-5-1.2-240)	CA101558
Electric heater 1200 W (Zon-5-1.2-208)	CA101562

CASA R4C GENIUS - Performance Summary

Certified by the Home Ventilating Institute (HVI) in accordance with CSA C439 under Publication 920.

General Information

Item	Value
Testing Agency	Element
Manufacturer	Swegon North America Inc.
Model	CASA R4C
Options installed	Wall controller
Filter Type	MERV 13
Duct Size	6 in
Electrical Requirements	240 V

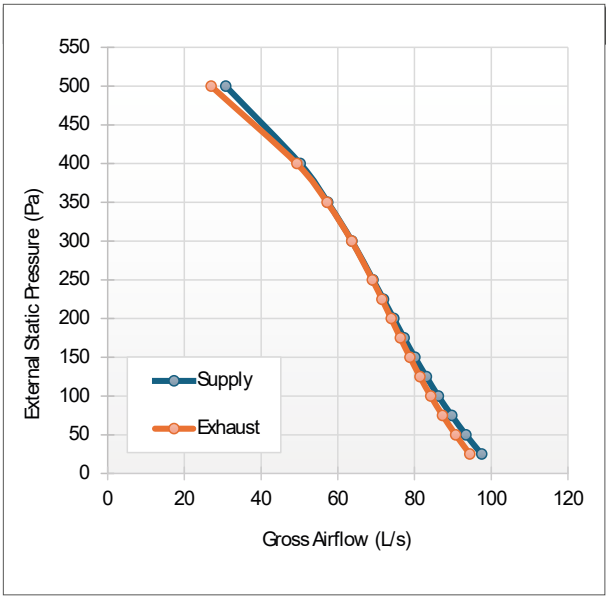
Certified Ventilation Ratings

Parameter	Value
Max Net Outdoor Airflow @ 0°C	97.2 L/s
Max Net Outdoor Airflow @ –25°C	68.8 L/s
LTIF	0.51
LTVR @ –25°C	0.0 %
Max Unbalanced Airflow @ –25°C	57.5 L/s
Standby Power	10.32 W
Exhaust Air Transfer Ratio	0.0070

Airflow Performance (High Speed)

External Static Pressure (Pa)	Net Supply (L/s)	Net Exhaust (L/s)	Power (W)
25	97.5	94.4	176.3
50	93.4	90.7	176.6
75	89.7	87.3	176.3
100	86.2	84.2	175.6
125	83.1	81.4	176.4
150	80.1	78.8	177.4
175	77.3	76.3	177.9
200	74.6	73.9	177.1
225	71.9	71.5	176.5
250	69.2	69	177.2
300	63.7	63.6	177.1
350	57.4	57.2	176.9
400	50.2	49.3	173.7
500	30.8	27	158.4

Fan Curve Data



Energy Performance – Heating

Supply Temp	Net OA Airflow	Avg Power	Sensible Recovery	Adjusted Sensible Recovery	Apparent Effectiveness	Net Moisture Transfer
0°C	35.5 L/s	38.0 W	79.4 %	83.0 %	86.5 %	0.86
0°C	50.1 L/s	58.0 W	77.3 %	81.1 %	84.1 %	0.77
0°C	70.1 L/s	119.6 W	72.6 %	78.1 %	81.2 %	0.69
–25°C	41.1 L/s	54.9 W	74.9 %	76.9 %	82.9 %	0.87

Energy Performance – Cooling

Supply Temp	Net OA Airflow	Avg Power	Sensible Recovery	Adjusted Sensible Recovery	Apparent Effectiveness	Net Moisture Transfer
35°C	40.8 L/s	48.0 W	64.3 %	71.5 %	77.7 %	0.65

Feel good **inside**

Swegon