DucoBox Silent Connect

Product version **17xxxx** and above

Installation guide

Video instructions
www.duco.tv

DUCO

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DUCO

01 Introduction

Congratulations on your DucoBox Silent Connect, the quietest box in Europe! The DucoBox Silent Connect performs two functions in a DUCO Demand-Controlled Natural Ventilation System:

On the one hand it is the **extractor fan** that exhausts stale air with excessive CO_2 content or humidity.

On the other it is the system '**master**' or brain of the system. It receives and interprets signals from slave components (measurements from sensors or manual input), on the basis of which it controls the ventilation system.

It is inadvisable to connect the DucoBox (via a duct or directly) to an extractor hood, regardless of type. This usually causes excessive fouling in the DucoBox, which affects its operation or has a more direct effect on the flow rate.
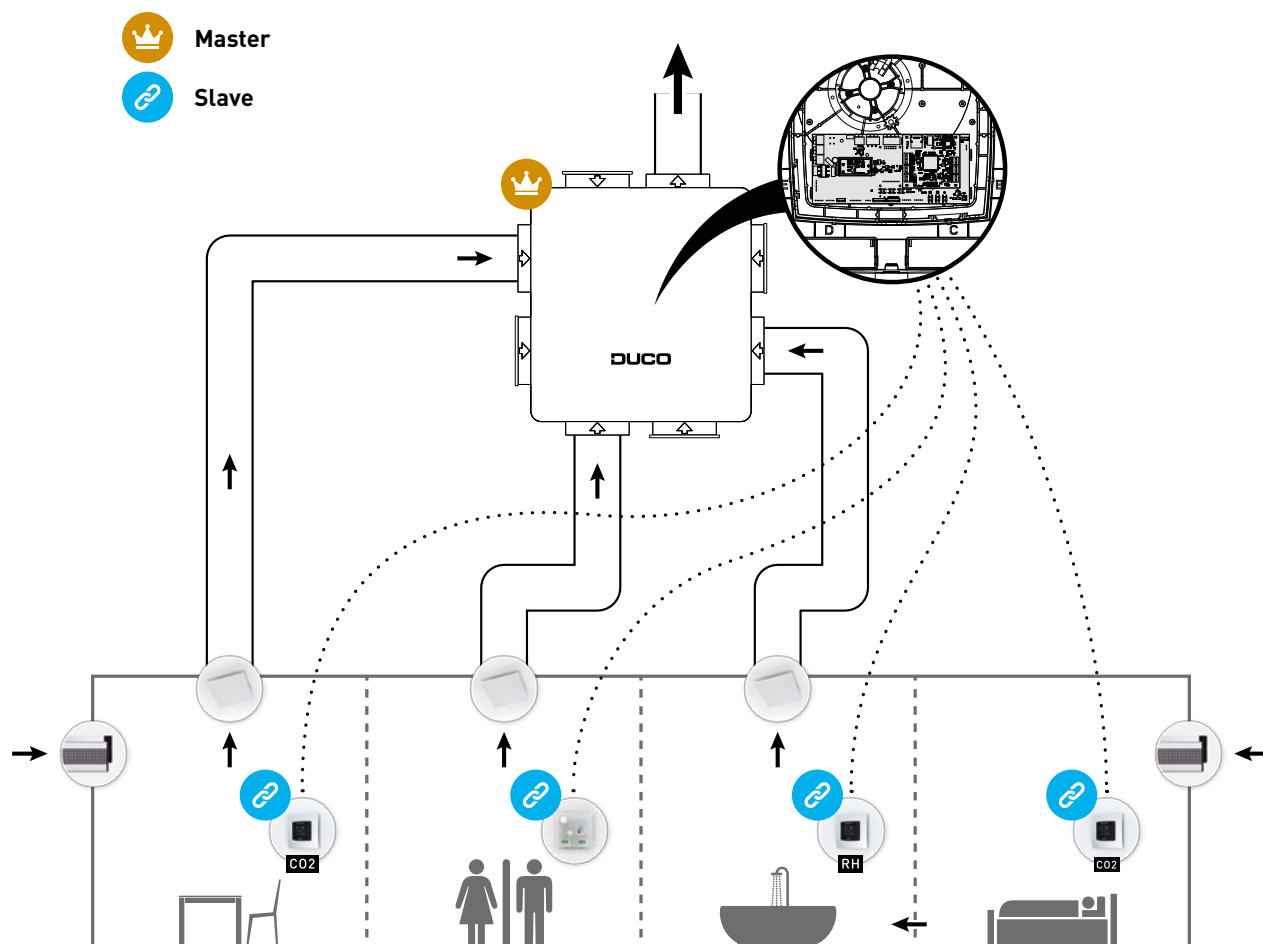
02 Product sheet

PRODUCT FICHE - Ref Delegated regulation (EU) n° 1253/2014

DucoBox Silent Connect

(English)

Trade mark	**Duco**	
Model reference	**DucoBox Silent Connect**	
	0000-4250 / 0000-4455	

		Manual control (no DCV)	Clock control (no DCV)	Central demand control (+ 1 sensor)	Local demand control (+ min 2 sensors)
Specific energy consumption (SEC) in (kWh/(m².an))	cold	-30,5	-	-40,7	-54,1
	average	**-14,1**	-	**-19,8**	**-27,0**
	warm	-4,8	-	-7,7	-11,5
SEC class	cold	B	-	A	A+
	average	**E**	-	**E**	**B**
	warm	F	-	F	E
Typology		Unidirectional	-	Unidirectional	Unidirectional
Type of motor		Variable speed	-	Variable speed	Variable speed
Type of heat recovery		None	-	None	None
Thermal efficiency of heat recovery in (%)		Not applicable	-	Not applicable	Not applicable
Maximum flow rate in (m³/h)		400	-	400	400
Electric fanpower input at maximum flow rate in (W)		72,42	-	72,42	72,42
Sound power level Lwa at reference flow rate in dB(A))		45	-	45	45
Reference flow rate in (m³/s)		0,08	-	0,08	0,08
Reference pressure difference in (Pa)		50	-	50	50
SPI en (W/m³/h)		0,10	-	0,10	0,10
Control factor and control typology		1	-	0,85	0,65
		Manual control	-	Central demand control	Local demand control
Declared maximum internal leakage rates in (%)		Not applicable	-	Not applicable	Not applicable
Declared maximum external leakage rates in (%)		2,23%	-	2,23%	2,23%
Mixing rate in (%)		Not applicable	-	Not applicable	Not applicable
Position and description of visual filter warning		Not applicable	-	Not applicable	Not applicable
Instructions to install regulated supply/exhaust grilles		Instructions according to legislative regulations area of application			
Pre-/dis-assembly instructions		www.duco.eu			
Airflow sensitivity to pressure variations at + 20 Pa / -20Pa		Not applicable	-	Not applicable	Not applicable
Indoor/outdoor air tightness in (m³/h)		Not applicable	-	Not applicable	Not applicable
Annual electricity consumption (AEC) in (kWh electricity/a)		120,2	-	86,8	50,8
Annual heating saved (AHS) in (kWh primary energy/a)	cold	3355	-	4290	5536
	average	**1715**	-	**2193**	**2830**
	warm	776	-	992	1280

PRODUCT FICHE - Ref Delegated regulation (EU) n° 1253/2014

DucoBox Silent Connect 325

(English)

	Trade mark	**Duco**		
	Model reference	**DucoBox Silent Connect 325**		
		0000-5133		

		Manual control (no DCV)	Clock control (no DCV)	**Central demand control (+ 1 sensor)**	**Local demand control (+ min 2 sensors)**
Specific energy consumption (SEC) in (kWh/(m².an))	cold	-31,0	-	-41,1	-54,3
	average	**-14,6**	-	**-20,1**	**-27,2**
	warm	-5,2	-	-8,1	-11,7
SEC class	cold	B	-	A	A+
	average	**E**	-	**D**	**B**
	warm	F	-	F	E
	Typology	Unidirectional	-	Unidirectional	Unidirectional
	Type of motor	Variable speed	-	Variable speed	Variable speed
	Type of heat recovery	None	-	None	None
	Thermal efficiency of heat recovery in (%)	Not applicable	-	Not applicable	Not applicable
	Maximum flow rate in (m³/h)	325	-	325	325
	Electric fanpower input at maximum flow rate in (W)	45,73	-	45,73	45,73
	Sound power level Lwa at reference flow rate in dB(A))	41	-	41	41
	Reference flow rate in (m³/s)	0,06	-	0,06	0,06
	Reference pressure difference in (Pa)	50	-	50	50
	SPI en (W/m³/h)	0,08	-	0,08	0,08
	Control factor and control typology	1 Manual control	-	0,85 Central demand control	0,65 Local demand control
	Declared maximum internal leakage rates in (%)	Not applicable	-	Not applicable	Not applicable
	Declared maximum external leakage rates in (%)	2,74%	-	2,74%	2,74%
	Mixing rate in (%)	Not applicable	-	Not applicable	Not applicable
	Position and description of visual filter warning	Not applicable	-	Not applicable	Not applicable
	Instructions to install regulated supply/exhaust grilles	Instructions according to legislative regulations area of application			
	Pre-/dis-assembly instructions	www.duco.eu			
	Airflow sensitivity to pressure variations at + 20 Pa / -20Pa	Not applicable	-	Not applicable	Not applicable
	Indoor/outdoor air tightness in (m³/h)	Not applicable	-	Not applicable	Not applicable
	Annual electricity consumption (AEC) in (kWh electricity/a)	100,9	-	72,9	42,6
Annual heating saved (AHS) in (kWh primary energy/a)	cold	3355	-	4290	5536
	average	**1715**	-	**2193**	**2830**
	warm	776	-	992	1280

PRODUCT FICHE - Ref Delegated regulation (EU) n° 1253/2014

DucoBox Silent Connect 225

(English)

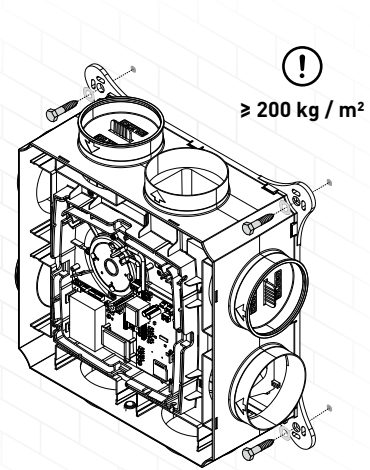| Trade mark	Duco		
Model reference	**DucoBox Silent Connect 225**		
	0000-5132		

		Manual control (no DCV)	Clock control (no DCV)	Central demand control (+ 1 sensor)	Local demand control (+ min 2 sensors)
Specific energy consumption (SEC) in (kWh/(m².an))	cold	-31,3	-	-41,3	-54,4
	average	**-14,9**	-	**-20,3**	**-27,4**
	warm	-5,5	-	-8,3	-11,9
SEC class	cold	B	-	A	A+
	average	**E**	-	**D**	**B**
	warm	F	-	F	E
Typology		Unidirectional	-	Unidirectional	Unidirectional
Type of motor		Variable speed	-	Variable speed	Variable speed
Type of heat recovery		None	-	None	None
Thermal efficiency of heat recovery in (%)		Not applicable	-	Not applicable	Not applicable
Maximum flow rate in (m³/h)		225	-	225	225
Electric fanpower input at maximum flow rate in (W)		24,43	-	24,43	24,43
Sound power level Lwa at reference flow rate in dB(A))		37	-	37	37
Reference flow rate in (m³/s)		0,04	-	0,04	0,04
Reference pressure difference in (Pa)		50	-	50	50
SPI en (W/m³/h)		0,07	-	0,07	0,07
Control factor and control typology		1 Manual control	-	0,85 Central demand control	0,65 Local demand control
Declared maximum internal leakage rates in (%)		Not applicable	-	Not applicable	Not applicable
Declared maximum external leakage rates in (%)		3,96%	-	3,96%	3,96%
Mixing rate in (%)		Not applicable	-	Not applicable	Not applicable
Position and description of visual filter warning		Not applicable	-	Not applicable	Not applicable
Instructions to install regulated supply/exhaust grilles		Instructions according to legislative regulations area of application			
Pre-/dis-assembly instructions		www.duco.eu			
Airflow sensitivity to pressure variations at + 20 Pa / -20Pa		Not applicable	-	Not applicable	Not applicable
Indoor/outdoor air tightness in (m³/h)		Not applicable	-	Not applicable	Not applicable
Annual electricity consumption (AEC) in (kWh electricity/a)		89,6	-	64,7	37,8
Annual heating saved (AHS) in (kWh primary energy/a)	cold	3355	-	4290	5536
	average	**1715**	-	**2193**	**2830**
	warm	776	-	992	1280

Ecodesign Delegated regulation (EU) n° 1253/2014 (Duco V20200701)

DUCO
Ventilation & Sun Control

03 Mounting

03.A **Position**

03.B **Fitting**

≥ 200 kg / m²
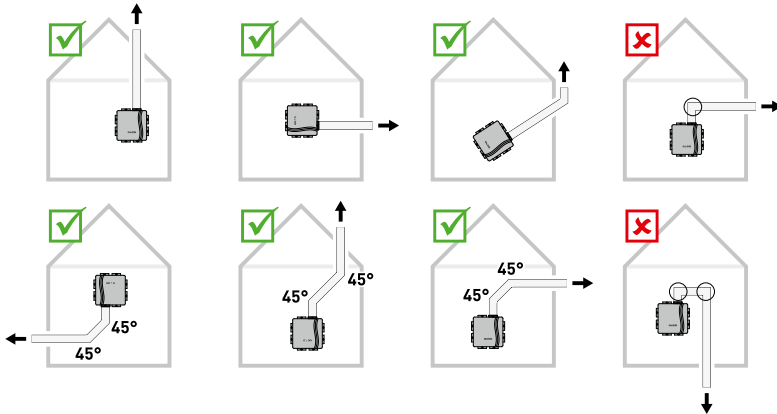
03.C **Air duct connections**

Keep down restriction. A non-return flap valve is required when discharging into a manifold.
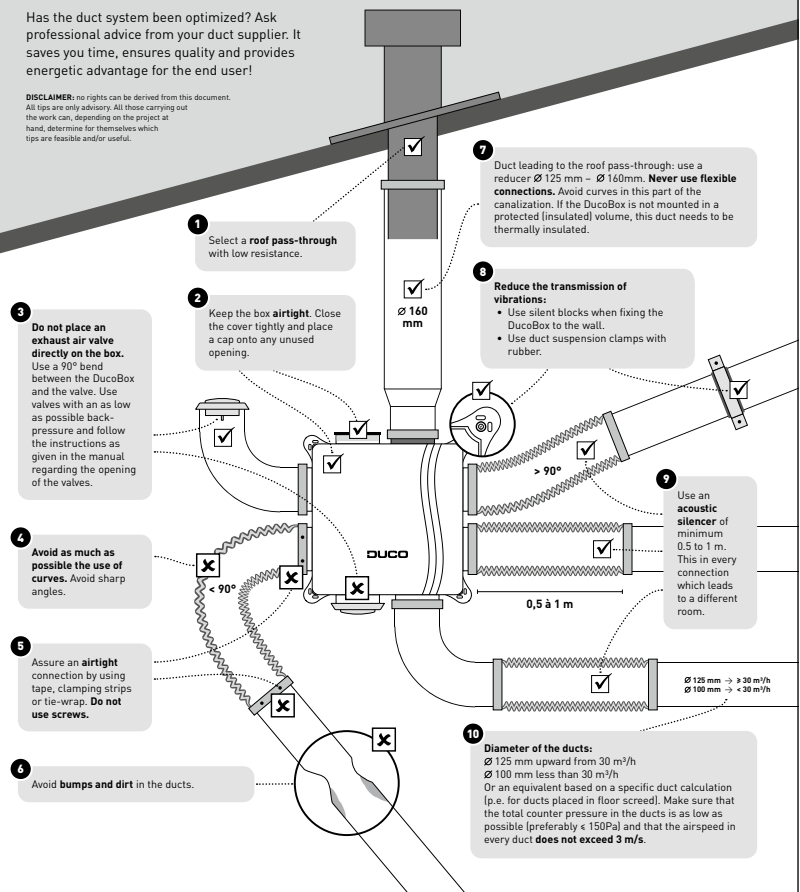
Be sure to take note of the **'10 unmissable tips'** as well when mounting the DucoBox. Avoiding excessive use of bends, especially angles greater than 90° and adhering to the diameter guidelines for the ductwork will ensure that the ventilation box is able to do its job satisfactorily. Failure to take account of this recommendation may result in a highly energy and maintenance-intensive system that gives rise to frequent excessive noise levels.

(!) **10 UNMISSABLE TIPS** (!)

The smooth running of your Duco ventilation system is totally dependent on the choice and the quality of implementation of the duct system!

Has the duct system been optimized? Ask professional advice from your duct supplier. It saves you time, ensures quality and provides energetic advantage for the end user!

DISCLAIMER: no rights can be derived from this document. All tips are only advisory. All those carrying out the work can, depending on the project at hand, determine for themselves which tips are feasible and/or useful.

1 Select a **roof pass-through** with low resistance.

2 Keep the box **airtight**. Close the cover tightly and place a cap onto any unused opening.

3 **Do not place an exhaust air valve directly on the box.** Use a 90° bend between the DucoBox and the valve. Use valves with an as low as possible back-pressure and follow the instructions as given in the manual regarding the opening of the valves.

4 **Avoid as much as possible the use of curves.** Avoid sharp angles.

5 Assure an **airtight** connection by using tape, clamping strips or tie-wrap. **Do not use screws.**

6 Avoid **bumps and dirt** in the ducts.

7 Duct leading to the roof pass-through: use a reducer Ø 125 mm – Ø 160mm. **Never use flexible connections.** Avoid curves in this part of the canalization. If the DucoBox is not mounted in a protected (insulated) volume, this duct needs to be thermally insulated.

8 **Reduce the transmission of vibrations:**
• Use silent blocks when fixing the DucoBox to the wall.
• Use duct suspension clamps with rubber.

9 Use an **acoustic silencer** of minimum 0.5 to 1 m. This in every connection which leads to a different room.

10 **Diameter of the ducts:**
Ø 125 mm upward from 30 m³/h
Ø 100 mm less than 30 m³/h
Or an equivalent based on a specific duct calculation (p.e. for ducts placed in floor screed). Make sure that the total counter pressure in the ducts is as low as possible (preferably ≤ 150Pa) and that the airspeed in every duct **does not exceed 3 m/s.**

Ø **160 mm**

> 90°

< 90°

0,5 à 1 m

Ø 125 mm → > 30 m³/h
Ø 100 mm → < 30 m³/h

04 Wiring

04.A Connector & buttons

Strain relief

It is mandatory to place the power supply cable in the slot provided, as shown in the drawing, before powering up the DucoBox.
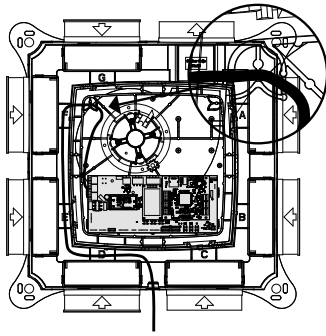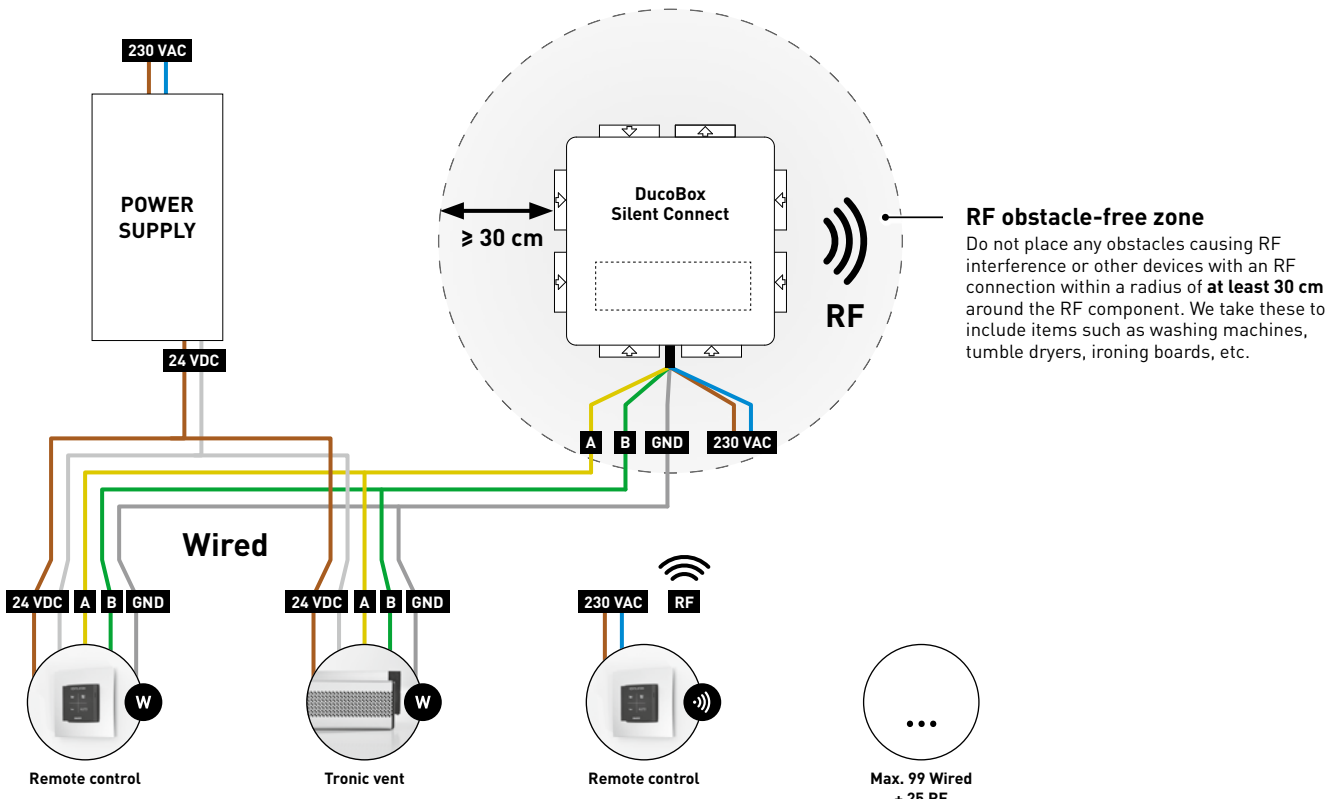

Illustrations and connections may vary depending on product configuration. Incorrect connection or failure to follow the instructions may result in damage to the connected devices.
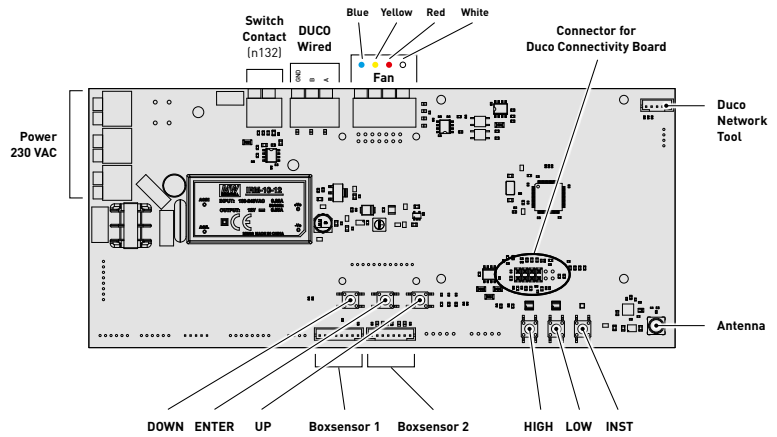
04.B Wiring diagram

The DucoBox Silent Connect is able to communicate with DUCO slave components via a wireless (RF) or wired link. Both types of communication can be combined in one system.
Communication with non-DUCO components is possible via the switch sensor.

RF obstacle-free zone
Do not place any obstacles causing RF interference or other devices with an RF connection within a radius of **at least 30 cm** around the RF component. We take these to include items such as washing machines, tumble dryers, ironing boards, etc.

RF (wireless communication)

RF components have a maximum free-field range of 350 metres. This distance will be much less in a building because of obstacles. Therefore, you will need to take objects such as walls, concrete and metal into account. All slave components (except those which are battery powered) also act as repeaters. Signals from components that are unable to make a (strong) connection with the master component are forwarded automatically via no more than one other non-battery-powered component (= hop). Please refer to information sheet RF communication (L8000018) at www.duco.eu for further information.

Wired (cabled communication)

Wired components can be daisy-chained (= recommended). This means that a separate cable will not be required for each component. A single central power supply can be used.

The cable required is a 5 x 0.75 mm² data cable. We strongly advise using a shielded cable. This is to prevent any interference that may affect the data communication. Any Tronic vents will be supplied with a 5 x 0.25 mm² cable which can be connected via a splicing terminal block.

DUCO RF	
Power supply	230 VAC
Wiring	1,5 mm²
Frequency	868 Mhz
Maximum distance	350 m, free field (less through obstacles)
Maximum number of components	Up to 25 wireless components in a single system

DUCO WIRED	
Power supply	24 VDC
Wiring	5 x 0,75 mm² (5 x 0.25 mm² from Tronic vents)
Maximum distance	up to 300 m
Maximum number of components	Up to 99 wired components in a single system

05 Additional control options

05.A Box sensors

Box sensors can be built into a DucoBox Silent Connect and provide CO_2 and/or humidity measurement in an air duct. A DucoBox Silent Connect can contain a **maximum of one CO_2 and one Humidity Box Sensor**. If the living room (CO_2 measurement) and bathroom (humidity measurement) are connected to the same duct/zone, the two Box Sensors can be clipped together.

Fitting + connecting Box Sensor	
1	Twist the Box Sensor(s) into the desired duct in the box until the Box Sensor clicks into place.
2	Connect the Box Sensors to one of the two connectors provided on the DucoBox Silent Connect PCB.
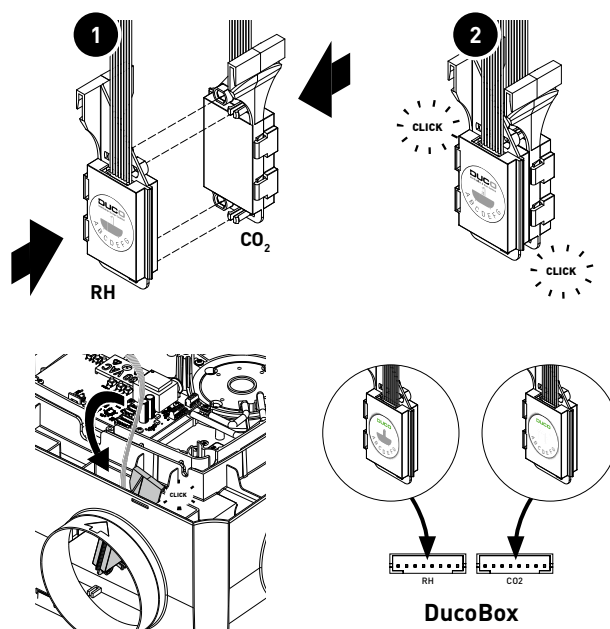
Settings

The CO_2 and RH setpoint can be changed via the Duco Network Tool. See www.duco.eu for more information.

DucoBox

05.B Duco Connectivity Board

The optional circuit board allows linking towards home automation and building management systems via REST API (locally or via the cloud) or Modbus TCP (locally). Both are possible via Ethernet or Wi-Fi.

The Duco Connectivity Board also enables the Duco Installation App to be used. This application supports - and relieves - installers to control and maintain a ventilation system in a user-friendly way.

Ethernet

Wifi

Connector for DucoBox
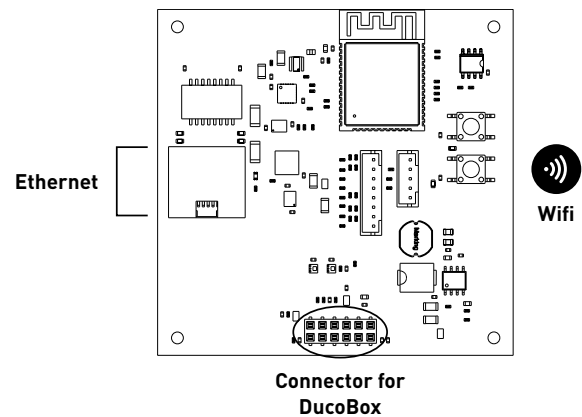
06 Electronical installation

06.A Change settings

Most of the factory settings for the network and components will be satisfactory as they are, however, depending on the situation, it may be desirable to change some parameters, such as the CO_2 setpoint. This can be done via the **Duco Installation App** or **Duco Network Tool***. For more information, consult our website, scan the QR code or contact your DUCO distributor.

* Only in Belgium and the Netherlands
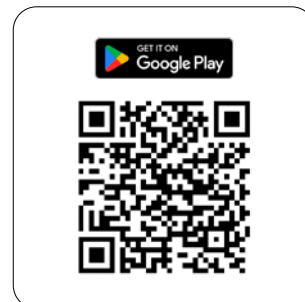
06.B Installer / User mode

To add, remove or replace components to the network, the system should be put in 'Installer mode'. The LED on each component indicates the active mode of the component (see table in next section).

'Installer mode' can be activated by pressing the DucoBox Silent Connect 'INST' button (see drawing in section "04.A Connections & buttons" on page 8.) Once the LED on the master unit starts flashing, it means that 'Installer mode' is active. Press 'INST' again to return to 'User mode' (LED fully on or off). The system reverts automatically to 'User mode' after 15 minutes of inactivity.

06.C   **LED indications**

🔴	**RED (blinking slowly)** Not in network	**RED (blinking rapidly)** Logging in	
🟢	**GREEN (blinking slowly)** In network	**GREEN (blinking rapidly)** In network, waiting for associated components	
🟡	**YELLOW (clignotement rapide)** Transitional phase (please wait)	**YELLOW (on) Initialising (system calibration in progress)**	
⚪	**WHITE or OFF** Normal		
🔵	**BLUE** Component is displayed if changes are being put through via the master.		
🟠	**ORANGE** The system is not working correctly because the DucoBox has not been calibrated. Restart the DucoBox. Follow the guidelines in '10 essential tips' if the problem recurs continually.		

06.D   **Setting type of home**

Setting the type of home and number of occupants correctly will provide the ventilation system with a better basis to adjust the mid-position. There are two types of home: low-rise (e.g. a house) and high-rise (e.g. a flat). **Configuration of this component is obligatory in the Netherlands.** The standard setting for a DucoBox is as a low-rise home for 4 (or more) occupants.

Setting type of home	
1	Ensure that 'Installer Mode' has been activated (via the **'INST'** button).
2	Press **'LOW'** for a low-rise or **'HIGH'** for a high-rise home.
3	The yellow LED (see illustration) will flash in a pattern that indicates the **number of occupants**: Once, twice (applies for 3 occupants as well) or 4 times (applies for 4 occupants or more). Press 'LOW' or 'HIGH' respectively again until the LED pattern matches the correct number of occupants.
4	Press the **'INST'** button to exit 'Installer mode'.
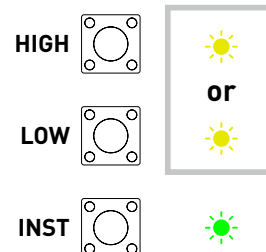
06.E **Pairing components**

> ⚠ Never pair more than one system with RF components at the same time. If you do so, a component in the wrong network could be paired, e.g. in the neighbours' DucoBox.

Pairing components on the DucoBox Silent Connect	
1	Activate 'Installer mode' by tapping **'INST'** on the DucoBox. The LED will flash green rapidly.
2	Add control components by tapping once on the component to be paired. The LED will flash red briefly and then start to flash green rapidly. Repeat this step until all remaining components in the current zone have been paired. With RF components: start with the component closest to the master. If the first pairing fails, another component can be tried first, which can then act as a hop for components that cannot make a direct RF connection to the DucoBox.
3	Once all components have been paired, 'Installer mode' can be deactivated by tapping **'INST'** on the DucoBox Silent Connect. LEDs on all components will stop flashing.

Please refer to the manual with the components for more detailed information.

Example of a pairing sequence
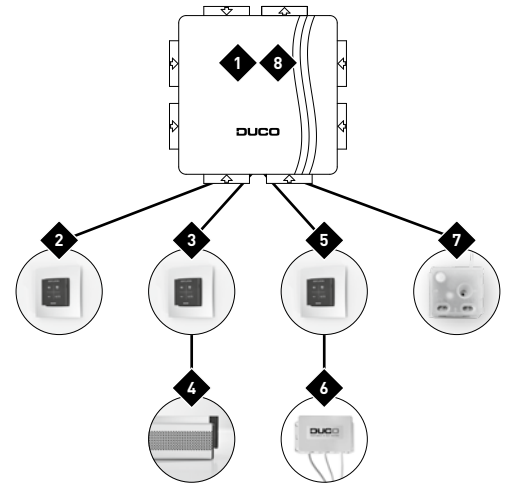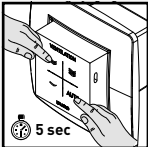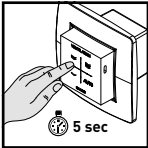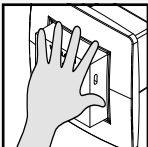
X indicates the order to press a button on the component
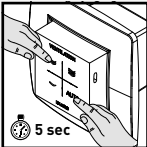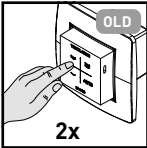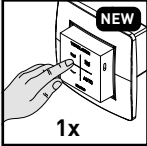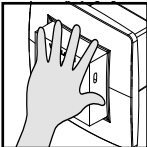
06.F **Removing / replacing components**

Removing paired components from the network or replacing is **only possible within 30 minutes after the component is paired in or is restarted**. Restarting can be done by disconnecting the power for a moment. After a time-span of 30 minutes, remove and replace operations are ignored. This is valid for **all components from date of manufacture 170323**.

Removing a component		
1	Activate 'Installer mode' by **long-pressing 2 diagonal buttons on a paired control**. The LED will flash green rapidly.	⏱ 5 sec
2	Press **once and hold** a button on the component to be removed in order to remove it from the network.	⏱ 5 sec
3	Deactivate 'Installer mode' by pressing the 4 buttons on a **paired control** simultaneously (or using the palm of your hand on a control featuring touch buttons). The LED will turn white.	

Replacing a component		
1	Activate 'Installer mode' by **long-pressing 2 diagonal buttons on a paired control**. The LED will flash green rapidly.	⏱ 5 sec
2	Press the button of the component to be replaced **twice briefly**.	OLD 2x
3	Briefly press the button of the new component **once (short)**. The latter will take on all settings / connections in the network.	NEW 1x
3	Deactivate 'Installer mode' by pressing the 4 buttons on a **paired control** simultaneously (or using the palm of your hand on a control featuring touch buttons). The LED will turn white.	

06.G Tips

- **Removing all components from the network (e.g. in the event of problems):** Activate 'Installer mode' and **long-press 'INST'** until the LED starts flashing red. The DucoBox will reboot (around 15 seconds) and the LED will stop flashing.

- **Restoring factory settings of the DucoBox and all registered components (AS FROM DucoBox version 18xxxx)**: Long press 'INST' and 'ENTER' when not in 'Installer mode'. The network will be preserved.

- Use the **Duco Installation App** or the **Duco Network Tool** to read out information from components.

07 Air calibration

The system needs to be configured for it to work correctly. This will ensure its operation is as quiet as possible and energy-efficient. See under the Tools heading at www.duco.eu for information about determining ventilation flow rates.

07.A Air calibration procedure for DucoBox Silent Connect

> (!) **The air calibration procedure must be carried out on a calm day** (no more than wind force 2: leaves rustling, feeling the wind in one's face).

Air calibrating the DucoBox Silent Connect

1 Set all exhaust vents so they match the desired flow rate in accordance with the table below. Proper pre-setting makes for rapid and correct calibration.

Flow rate	DucoVent Design	DucoVent Basic and other vents
75m³/h	◯	**100%** open
50m³/h	◎	**50%** open
25m³/h	◉	**25%** open

When using DucoVent Design exhaust vents always leave the outer ring in place for acoustic effect.

Example

25 m³/h	75 m³/h	50 m³/h	50 m³/h
Toilet	**Kitchen**	**Bathroom**	**Storeroom**

2 Before activating air calibration mode:
- Close **all** windows and doors.
- Ensure that **all duct openings in the DucoBox are fully closed and that the DucoBox lid is closed!**
- Avoid air leaks in the ventilation ducts.
- Set all window ventilators to the open position
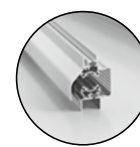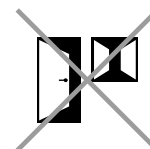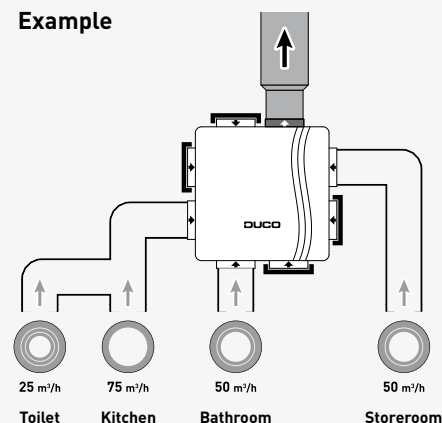
open

③ Press **'HIGH' or 'LOW'** to activate the configuration mode for 30 minutes.
Then close the lid firmly.

Which configuration mode should I choose?

Button	Air calibration using 'HIGH' This method is standard and has the lowest consumption. Recommended in the majority of homes.	Air calibration using 'LOW' This method offers a boost mode but may give rise to more noise and higher consumption.
☷	Low mode (10%)	Low mode (14-33%)*
☶	Medium mode (50%)	**High mode (100%)**
☴	**High mode (100%)**	Boost mode (143-333%)*

HIGH

LOW
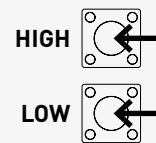
The percentages in the table indicate what percentage of the flow rate configured will be extracted.
The configuration mode chosen does not affect the operation of the AUTO mode.
* In the 'LOW' configuration, the percentage in low mode and boost mode depends on the type of home
  (see section "06.D Setting type of home" on page 11) and limited to the maximum achievable
  ventilation system flow rate.

④ Close the lid of the DucoBox.
Make sure it seals the DucoBox **airtight** .
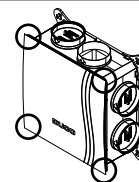
⑤ Choose the duct with the highest flow rate and resistance.

25 m³/h   **75 m³/h**   50 m³/h   50 m³/h
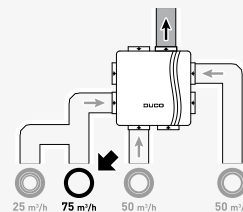
⑥ Measure at the vent and adjust the DucoBox's rpm until the desired flow rate is obtained. This can be done in two ways:
• Using the ☷ (lower) and ☶ (higher) buttons on a paired Remote control or Room Sensor*.
• Using the **'DOWN'** and **'UP'** buttons on the DucoBox. This requires the lid to be removed temporarily. **Always close the lid after every measurement.**

▲ / ☶
▼ / ☷
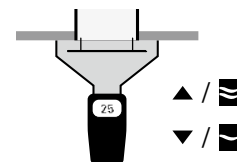
Pressing the buttons once is equal to 1% (= **approximately 2 to 3 m³/h per button press** depending on the resistance in the ducts).

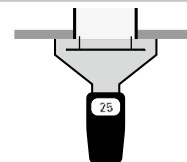**⑦** Now measure the other vents. **The flow rate from these other vents must only be adjusted at the vents themselves.**
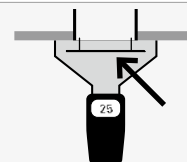
**⑧** Repeat steps **⑥** and **⑦** until the desired flow rate has been obtained at each vent.

⑨ Exit adjustment mode. This can be done in two ways:
• Long-press **'AUTO'** on a paired Remote control or room sensor* until the 4 LEDs light up white briefly and then turn yellow again.
• Press **'ENTER'** in the DucoBox and **then immediately close the lid on the Duco-Box**. If the lid was not closed, you can pull the plug out of the power socket for a few seconds after closing the lid in order to reboot the DucoBox.

The DucoBox will now perform a calibration by speeding up high. This may take up to 1.5 min. Calibration will be complete once the DucoBox slows down, the 'AUTO' button LEDs on the Remote controls / room sensors* will turn white, as will the LED on the DucoBox.
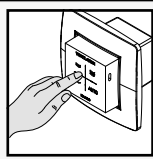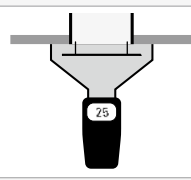
ENTER
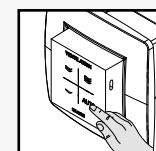
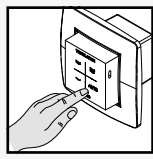* Depending on the software version of the Remote control.

07.B Checking

The steps set out below can be used to check whether flow rates have been set correctly.

	Checking configured flow rate	
1	The configured flow rate depends on whether the 'HIGH' or 'LOW' configuration mode has been chosen. Press ⬇ **for 'HIGH'** configuration (= standard) or ⬇ **for 'LOW'** configuration on a random control to have the system run for 15 minutes at 100% of the requested flow rate.	
2	Measure the flow rate at the exhaust vents.	
3	After the check, the system can be reset to the desired ventilation mode. If you do not do so, the system will automatically revert to the AUTO mode after 15 minutes.	

08 Maintenance & service

Please refer to the maintenance instructions at **www.duco.eu** and view the videos on **duco.tv** for more information.
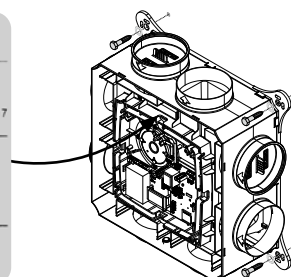
For service problems as a user:

Please contact your installer. Keep the serial number of your product to hand.

For service problems as an installer:

Please contact your retailer of DUCO products. Keep the serial number of your product to hand.

Sticker inside the DucoBox

09 Warranty

All warranty conditions concerning the DucoBox and DUCO's ventilation systems can be found on the DUCO website.
All complaints are to be reported to DUCO by the DUCO distributor with a clear description and the order/invoice number under which the products were delivered. To do so, please fill out the complaint registration form, found on the DUCO website, mentioning the serial number and send it to service@duco.eu.

Installed by:

DUCO