

Service instructions



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Translation from Dutch of the original instructions

Changes based on technical improvements reserved.

For information regarding warranty, installation, technical data, etc., see www.duco.eu.

Installation, connection, maintenance and repairs are to be carried out by an accredited installer. The electronic components of this product may be live. Avoid contact with water.



Always check that the product is correctly installed according to the installation manual before consulting the service manual.

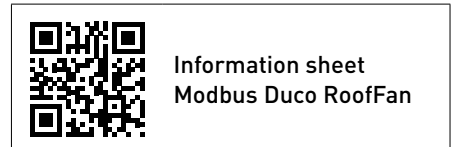
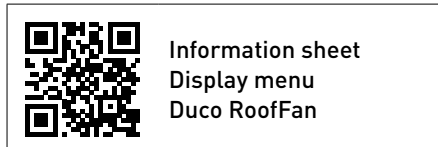
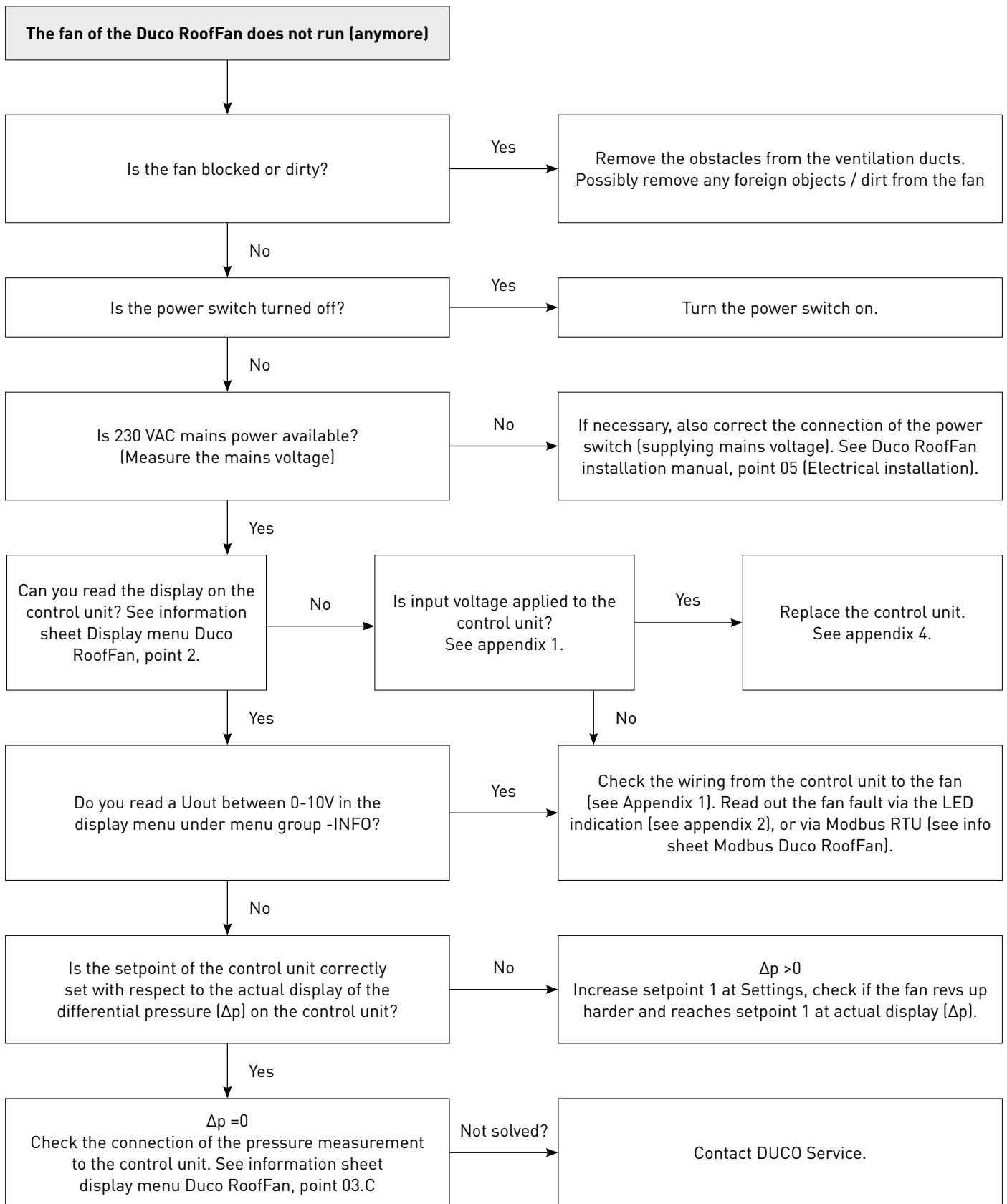
01 Overview of possible problems, causes and solutions

This manual describes a number of possible problems and uses handy flow charts to explain step by step how to solve them.

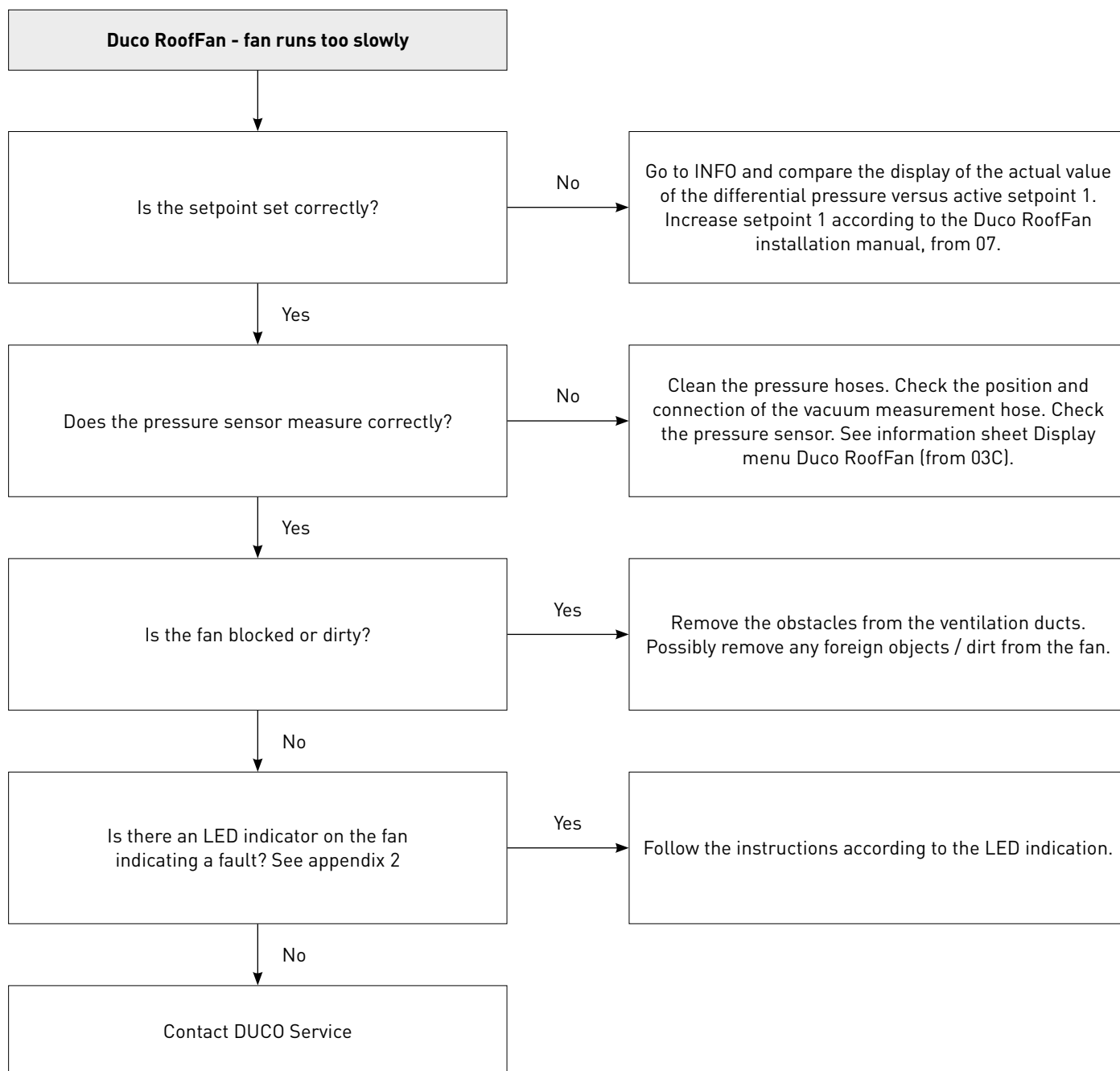
Where necessary, reference is made to an appendix to the current document.

ISSUE	POSSIBLE CAUSES	DIAGNOSIS
The (fan of the) Duco RoofFan does not run (anymore)	<ul style="list-style-type: none"> • The power switch is switched off. • The fan motor is blocked or has failed. • The pressure sensor is damaged. • The mains voltage to the Duco RoofFan is abnormal (too low or too high). • The control unit is damaged. • The ventilation ducts to and from the Duco RoofFan are blocked. • The fan or fan cable is physically damaged. • The thermal motor protection has been activated (the motor has overheated). 	Step-by-step instructions: what if the fan does NOT run? (see page 4)
The (fan of the) Duco RoofFan rotates too slowly - the desired flow rate is not achieved	<ul style="list-style-type: none"> • Active temperature management is in place (to prevent the engine or electronics from overheating). • Supply air temperature is too high. • The pressure sensor is damaged. • There is too little negative pressure. • The setpoint has been set incorrectly. • The control unit is damaged. • One or more ventilation ducts to and from the Duco RoofFan are blocked. • The fan or fan cable is physically damaged. 	Step-by-step instructions: what if the fan runs TOO SLOWLY? (see page 5)
The (fan of the) Duco RoofFan is always running at full speed (at high setting)	<ul style="list-style-type: none"> • There is too much negative pressure. • The pressure sensor is damaged. • The setpoint has been set incorrectly. 	Step-by-step instructions: what if the fan keeps running on high? (see page 6)
The (fan of the) Duco RoofFan makes too much noise	<ul style="list-style-type: none"> • Vibration due to unbalance the fan. • A fan bearing or wing is damaged and/or worn. • Pollution. • The setpoint has been set incorrectly. 	Step-by-step instructions: What if the fan is TOO NOISY? (see page 7)

01.A Step-by-step instructions: what if the fan does NOT run?



01.B Step-by-step instructions: what if the fan runs TOO SLOWLY?

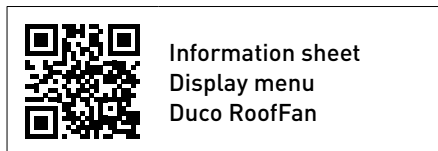
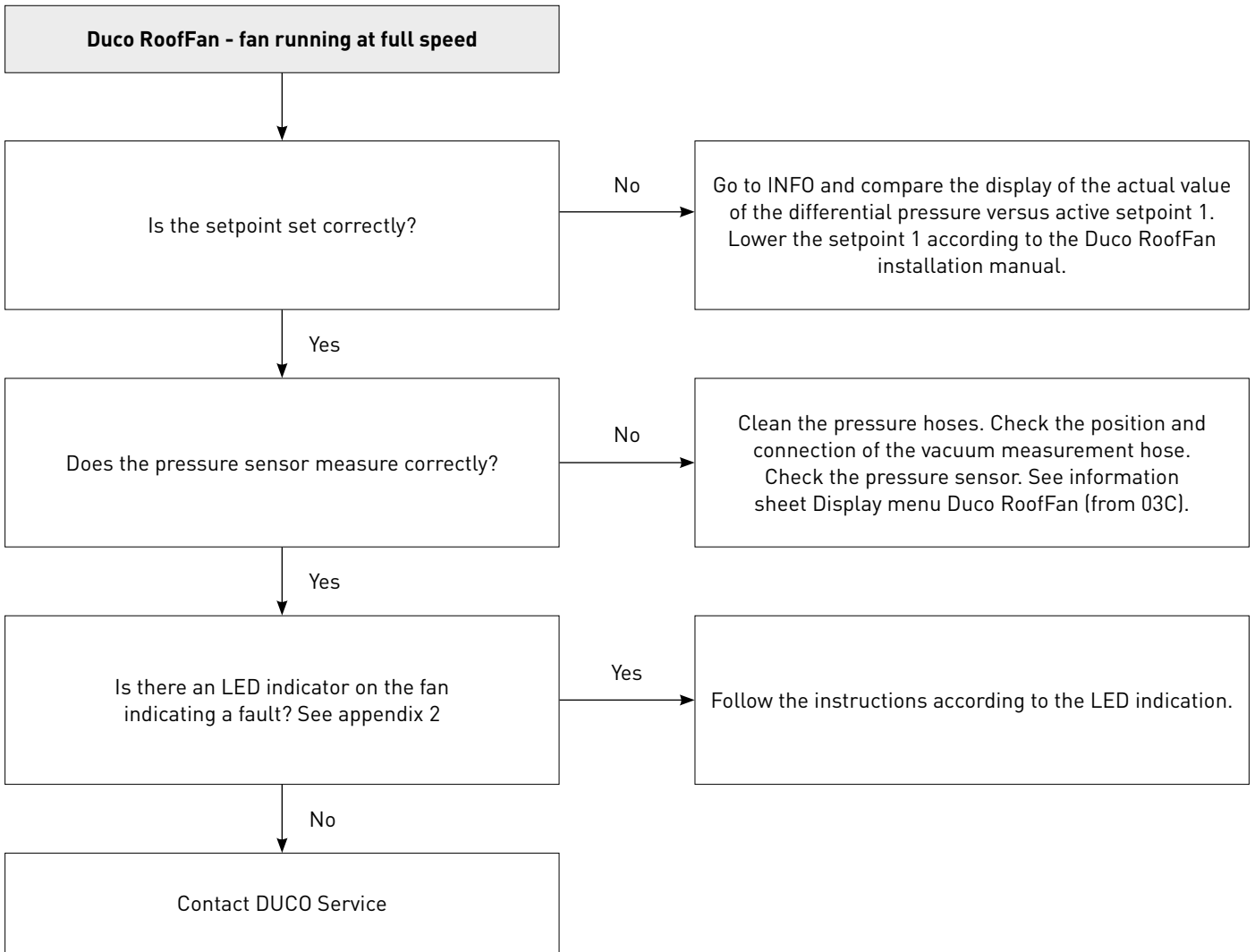


Installation manual
Duco RoofFan

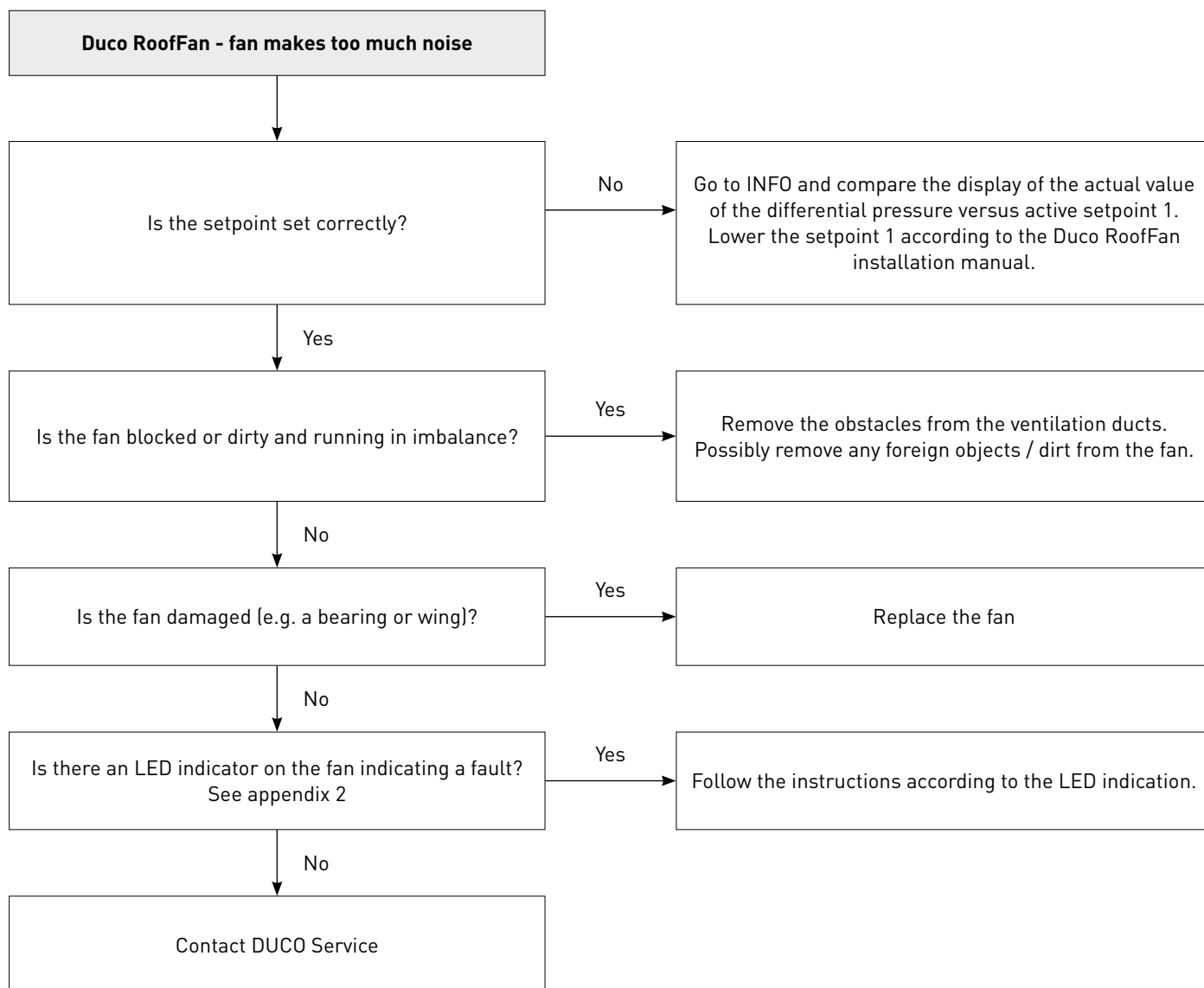


Information sheet
Display menu
Duco RoofFan

01.C Step-by-step instructions: what if the fan keeps running on high?



01.D Step-by-step instructions: What if the fan is TOO NOISY?



Installation manual
Duco RoofFan

02 Appendix 1: Duco RoofFan connection diagrams (control unit and fan)

Control unit:

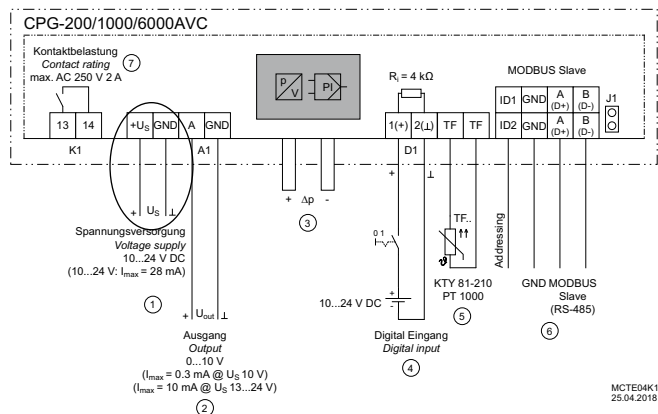


Structure of the device

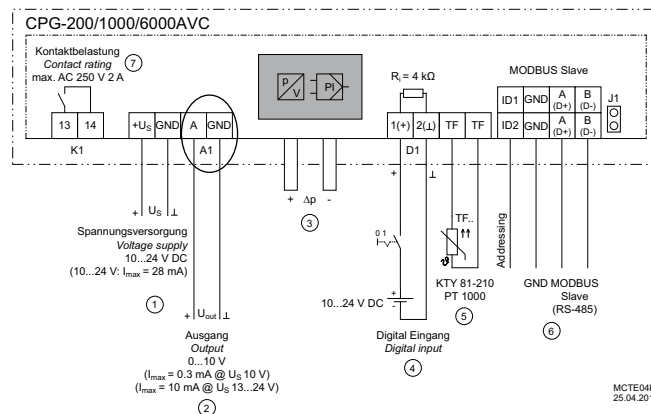


1. Signal relay (terminals: 13,14)
2. Supply voltage (terminals: U_s, GND)
3. Output signal 0... 10V (terminals: A, GND)
4. Cable gland M16 + sealing insert with two bores (5 mm)
5. "Minus" connection in lower pressure environment
6. "Plus" connection in higher pressure environment
7. Digital input D1 (terminals: 1, 2)
8. Outdoor temperature sensor input (terminals: TF, TF)
9. Modbus interface (terminals: GND, A, B, ID1, ID2 and plug J1)

Input voltage from fan to control unit



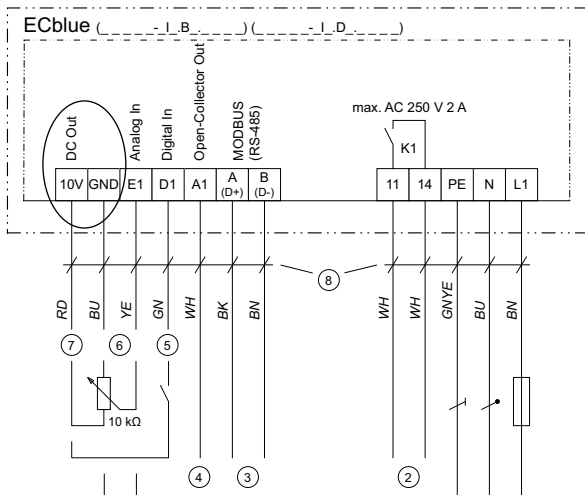
Output voltage from control unit to fan



Fan



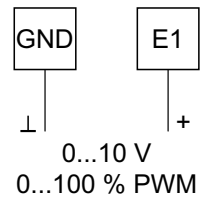
Output voltage from fan to control unit



Input voltage from control unit to fan

Options for the speed specification

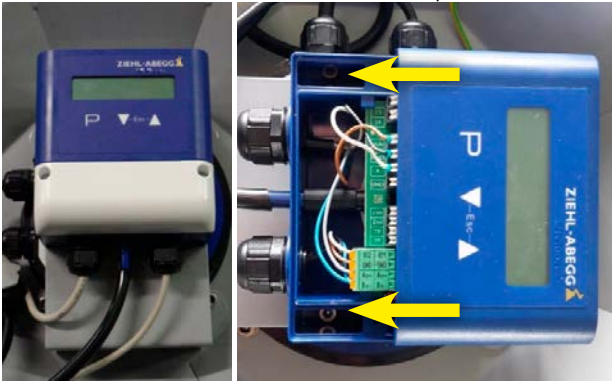
- Control via external input signal 0 ... 10V or 0 ... 100% PWM.
- By connecting externally with a resistor (499 Ω / 0.25 W) between terminals "E1" and "GND" in parallel with the input signal, control with a 0 ... 20 mA signal is possible.



03 Appendix 2: Duco RoofFan - fan LED display

Make LED indications visible

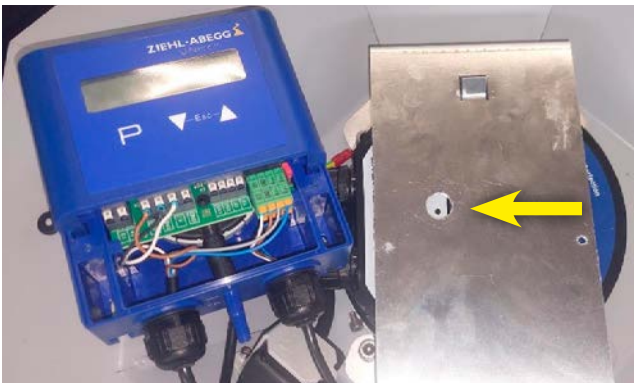
1. Unscrew the white cover of the control unit (2 screws).
2. Unscrew the control unit from the motor plate (2 Allen screws):



3. Unhook the control unit from the motor plate (slide the control unit slightly upwards):



4. Read the fan LED indicator:



LED status in fan cover

Possible signals (max 17x):

OFF	—————
ON	—————
1x	- - - - -
2x	- - - - -
3x	- - - - -
4x	- - - - -
5x	- - - - -

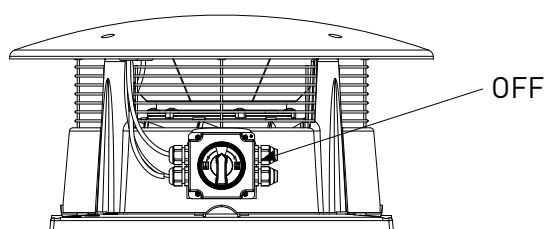
What do the various LED signals mean and what can you do to solve the problems?

LED INDICATION	POSSIBLE CAUSE	ADDITIONAL INFO + HOW TO FIX
OFF	Mains power failure	Is mains power present? The device switches OFF and automatically switches back ON when power returns.
ON	Normal operation without malfunction	
1 x	No release = OFF Terminals "D1" - "10 V" (Digital In 1) not bridged or switch-off via bus.	Disable digital input or bus.
2 x	Active temperature management To protect the unit from damage due to high indoor temperatures, it features active temperature management. If the temperature rises above the defined limits, the output is reduced linearly. In order to prevent an external shutdown of the entire system (in this operation authorised by the controller) in the event of reduced operation on the basis of excessively high indoor temperature, no fault signalling takes place via the relay.	As the temperature decreases, the output increases linearly again. Check assembly of the device and cooling of the controller.
3 x	Hall-IC failure Wrong signal from Hall-ICs. Commutation error. Internal plug connection incorrect.	Controller switches off the motor. Automatic restart when no more error is detected. Fan / motor replacement
4 x	Phase failure	Check the power connection
5 x	Motor blocks If during commutation in progress, during 8 sec. no speed > 0 is measured, the error "Motor blocks" is triggered.	EC controller switches off, renewed start attempt after approx. 2.5 sec. Definitive shutdown when the fourth attempt is unsuccessful. Reset by interrupting the voltage is necessary. Check whether the motor can rotate freely.
6 x	IGBT Fault Ground fault or short circuit of the motor winding.	EC controller switches off, renewed start attempt after approx. 2.5 sec. See also 9 x LED indication. Definitive shutdown when after second start attempt within 60 sec. an error is recognised again. Reset by interrupting the voltage is necessary.
7 x	Intermediate circuit voltage too low When the intermediate circuit voltage falls below the defined limit, a shutdown occurs.	When within 75 sec. the intermediate circuit voltage rises above the limit again, an automatic start attempt takes place. When the intermediate circuit voltage is longer than 75 sec. below the limit value, a shutdown with error message occurs.
8 x	DC Overvoltage When the intermediate circuit voltage rises above the defined limit, a shutdown of the motor takes place. Cause: too high input voltage or generator operation at the motor.	When within 75 sec. the intermediate circuit voltage falls below the limit value again, an automatic start attempt is made. When the intermediate circuit voltage is longer than 75 sec. above the limit value, a shutdown with error message occurs.

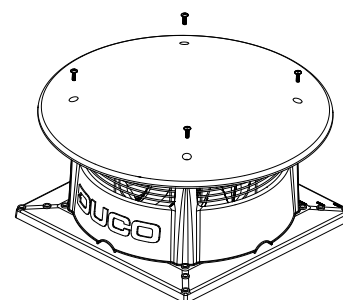
LED INDICATION	POSSIBLE CAUSE	ADDITIONAL INFO + HOW TO FIX
9 x	IGBT cooling phase IGBT cooling phase for approx. 60 sec. Final shutdown after 2 cooling pauses Code 6	IGBT cooling phase for approx. 60 sec. Final shutdown after 2 cooling pauses See also 6x LED indication.
11 x	Motor start error If a start command has been given (enable available and setpoint > 0) and the motor does not start rotating in the correct direction within 5 minutes, an error message will be displayed.	If it is possible to start the motor in the desired direction of rotation after the error message, the error message will disappear. After a temporary power interruption, the time measurement until shutdown starts again. Check whether the motor can rotate freely. Check whether the fan is driven backwards by the airflow. (Behaviour when rotating in the rearward direction due to airflow)
12 x	Mains voltage too low When the mains voltage falls below the defined limit, a switch-off takes place.	If the mains voltage rises above the limit again within 75 seconds, an automatic start-up attempt will follow. If the mains voltage remains below the limit for more than 75 seconds, shutdown follows with an error message
14 x	Peak current error If the motor current rises above a defined limit (even for a short time), shutdown follows.	After shutdown, the controller waits for 5 seconds and then makes another startup attempt. If 5 more shutdowns are made in a row within 60 seconds, a definitive shutdown with error message follows. When 60 seconds have elapsed without shutdown, the counter is reset.
17 x	Temperature alarm Exceeding the maximum permitted indoor temperature.	Controller switches off the motor. Automatic restart after cooling down. Check assembly of the device and cooling of the controller.

04 Appendix 3: Replacing the fan

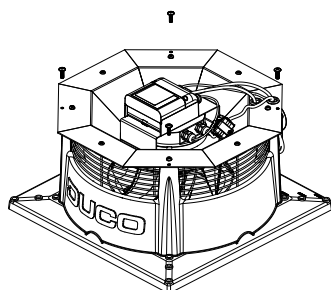
1. Set the operating switch of the Duco RoofFan to OFF
2. Open the cover.
3. Detach the motor plate
4. Unscrew the fan from the motor plate
5. Open the fan
6. Disconnect the wiring
7. Attach the wiring to the new fan
8. Screw the fan closed
9. Screw the fan to the motor plate
10. Fasten the motor plate



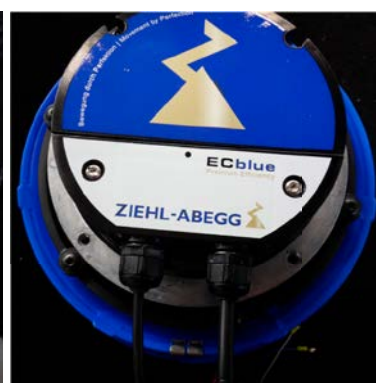
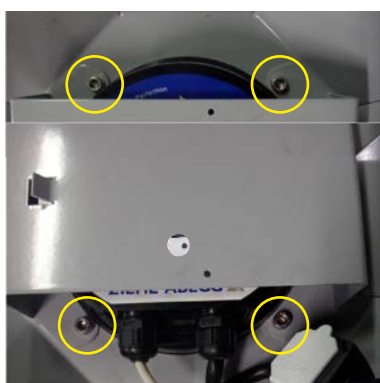
- 1** De-energise the roof exhaust fan by turning the emergency load switch from the ON to the OFF position. Ensure that the power cannot be switched back on by, for example, providing a mechanical lock on the emergency load switch.



- 2** Remove the lid of the roof exhaust fan by unscrewing the 4 Allen bolts.

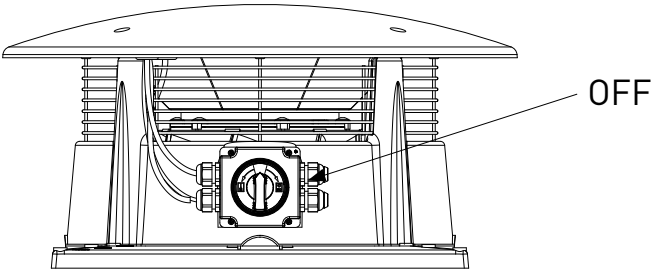


- 3** Remove the motor plate with rotor and control unit from the middle injection molding by unscrewing the 4 plastic screws.



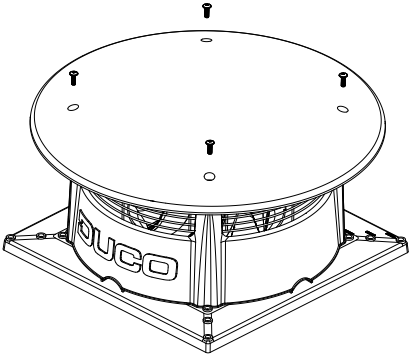
05 Appendix 4: Replacing the control unit

1. Set the operating switch of the Duco RoofFan to OFF.
2. Open the cover.
3. Disconnect the pressure hoses.
4. Open the control unit.
5. Disconnect the connection to the control unit.
6. Unscrew the control unit from the motor plate and unhook it.
7. Make the connections to the new control unit.
8. Screw the control unit shut.
9. Set the operating switch to ON and test operation.
10. Reset the control unit according to the installation manual.

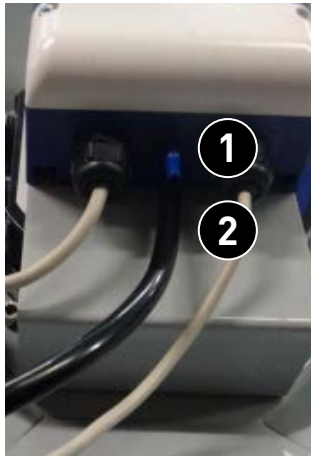


OFF

1 De-energise the roof exhaust fan by turning the emergency load switch from the ON to the OFF position. Ensure that the power cannot be switched back on by, for example, providing a mechanical lock on the emergency load switch.



2 Remove the lid of the roof exhaust fan by unscrewing the 4 Allen bolts.



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