ACDPH | CIRCULAR MOTORISED DAMPER WITH DIFFERENTIAL PRESSURE CONTROL

Mounting and operating instructions

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SAFETY AND PRECAUTIONS

Read all the information, the datasheet, Modbus map, mounting and operating instructions and study the wiring and connection diagram before working with the product. For personal and equipment safety, and for optimum product performance, make sure you entirely understand the content before installing, using or maintaining this product.

For safety and licensing (CE) reasons, unauthorised conversion and / or modifications of the product are inadmissible.

The product should not be exposed to abnormal conditions, such as extreme temperatures, direct sunlight or vibrations. Long-term exposure to chemical vapours in high concentration can affect the product performance. Make sure the work environment is as dry as possible and avoid condensation.

All installations shall comply with local health and safety regulations and local electrical standards and approved codes. This product can only be installed by an engineer or a technician who has expert knowledge of the product and the safety precautions.

Avoid contact with energised electrical parts. Always disconnect the power supply before connecting, servicing or repairing the product.

Always verify that you apply the appropriate power supply to the product and use the appropriate wire size and characteristics. Make sure that all the screws and nuts are well tightened and fuses (if any) are fitted well.

Recycling of equipment and packaging should be taken into consideration and these should be disposed of in accordance with local and national legislation / regulations.

In case there are any questions that are not answered, please contact your technical support or consult a professional.

PRODUCT DESCRIPTION

ACDPH series are circular motorised dampers with integrated differential pressure control that regulate the air flow in duct systems. They measure the static pressure at one point in the ductwork and when pressure, volume flow or air velocity changes this is compensated by adjusting the position of the damper blade in order to achieve the desired pressure. This is how comfort ventilation is provided. The supply voltage is 24 VDC. All parameters are accessible via Modbus RTU communication.

ARTICLE CODE

Article code	Duct diameter	Imax	Connection type
ACDPH-125	125 mm	100 mA	RJ45 or terminal block
ACDPH-160	160 mm		

INTENDED AREA OF USE

- Control of air flow in air ducts
- Control of fresh air supply for each room separately

TECHNICAL DATA

- 24 VDC supply voltage via RJ45 connector or terminal block
- Maximum input current: 100 mA
- Power consumption: max. 2,4 VA
- Modbus RTU communication via RJ45 connector or terminal block
- Casing airtightness according to EN1751, class D
- Built-in digital high resolution differential pressure sensor
- Compatible with SenteraWeb for remote control and online monitoring
- Fits circular air ducts with standard dimensions
- Enclosure material: ABS 10GF, grey
- Protection standard: IP54 (according to EN 60529)
- Operating air velocity range: 0—12 m/s
- Operating ambient conditions:
  - temperature: 5—65 ºC
  - rel. humidity: 5—95 % rH, (non-condensing)
- Storage temperature: -10—70 ºC

STANDARDS

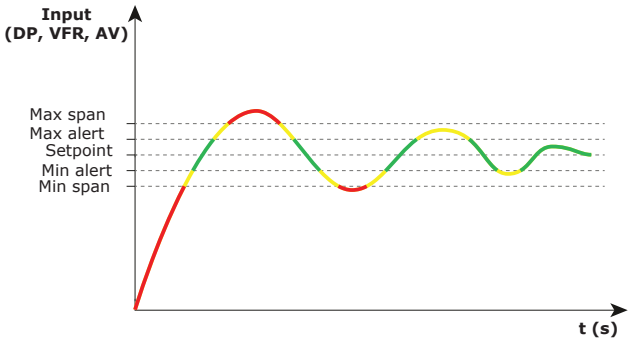
CE

- Machinery Directive 2006/42/EC:
  - EN 1751 Ventilation for buildings - Air terminal devices - Aerodynamic testing of damper and valves
  - EN 16798-3:2017 Energy performance of buildings - Ventilation for buildings - Part 3: For non-residential buildings - Performance requirements for ventilation and room-conditioning systems (Modules M5-1, M5-4)
- Low voltage (LVD) directive 2014/35/EU:
  - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
  - EN 60730-2-14:1997 Automatic electrical controls for household and similar use - Part 2-14: Particular requirements for electric actuators Amendments A1:2001, A11:2005 and A2:2008 to EN 60730-2-14

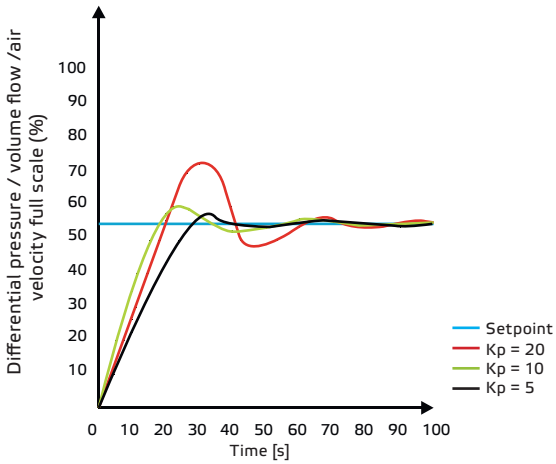
- Electromagnetic compatibility (EMC) directive 2014/30/EU:
  - EN 61000-6-2:2005 Electromagnetic compatibility (EMC) – Part 6-2: Generic standards - Immunity for industrial environments Amendment AC:2005 to EN 61000-6-2
  - EN 61000-6-3:2007 Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments Amendments A1:2011 and AC:2012 to EN 61000-6-3
- RoHS Directive (2011/65/EU incl. 2015/863/EU) REACH Regulation (1907/2006)
  - EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

OPERATIONAL DIAGRAMS

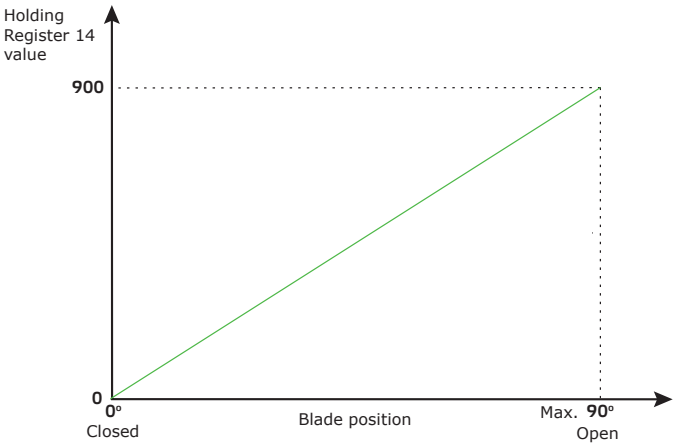
PI control (operating mode selected – differential pressure, volume flow rate or air velocity)



PI control example at different Kp



Blade position in overwrite mode



WIRING AND CONNECTIONS

		RJ45 socket (Power over Modbus)
Pin 1 Pin 2	24 VDC	Supply voltage, 24 VDC
Pin 3 Pin 4	A	Modbus RTU communication, signal A
Pin 5 Pin 6	/B	Modbus RTU communication, signal /B
Pin 7 Pin 8	GND	Supply voltage, ground

Terminal block	
VIN	Supply voltage, 24 VDC
GND	Supply voltage, ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B

NOTE

The damper needs to be supplied via the RJ45 connector or via the terminal block. Do not connect supply voltage via both simultaneously.

MOUNTING & OPERATING INSTRUCTIONS IN STEPS

Before you start mounting the unit, read carefully **"Safety and Precautions"**. Avoid obstruction of adjoining ducts. Make sure the blade can move freely.

Follow these steps:

1. Insert the duct into the flanged part of the damper and secure it with aluminium tape to guarantee the airtightness of the ventilation system.

ATTENTION

When installing the damper horizontally, make sure the actuator is located on the side or top of the damper, do not locate it at the bottom of the ACDPH damper. The damper can also be mounted in a vertical position.

2. Position the damper onto the duct according to the dimensions shown in **Fig. 2**. Mind the correct mounting position (see **Fig. 1**).
3. Unscrew the front cover of the actuator and remove it.

Fig. 1 Mounting position

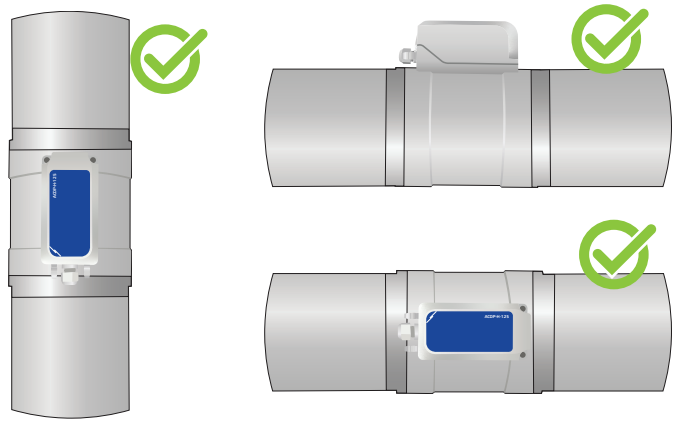
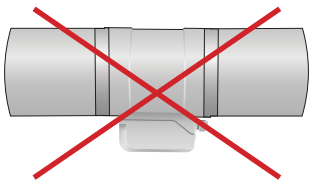
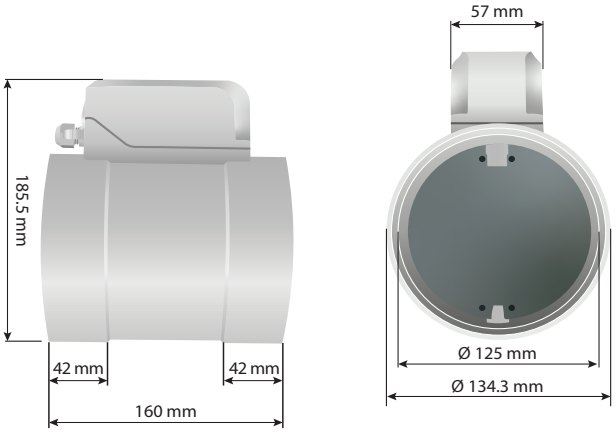
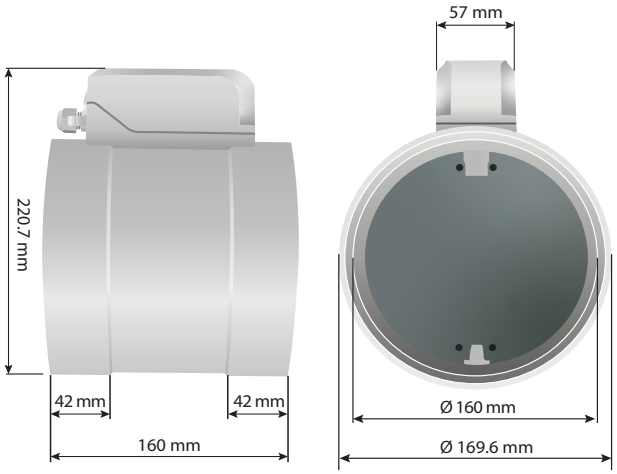
Correct	Incorrect
	

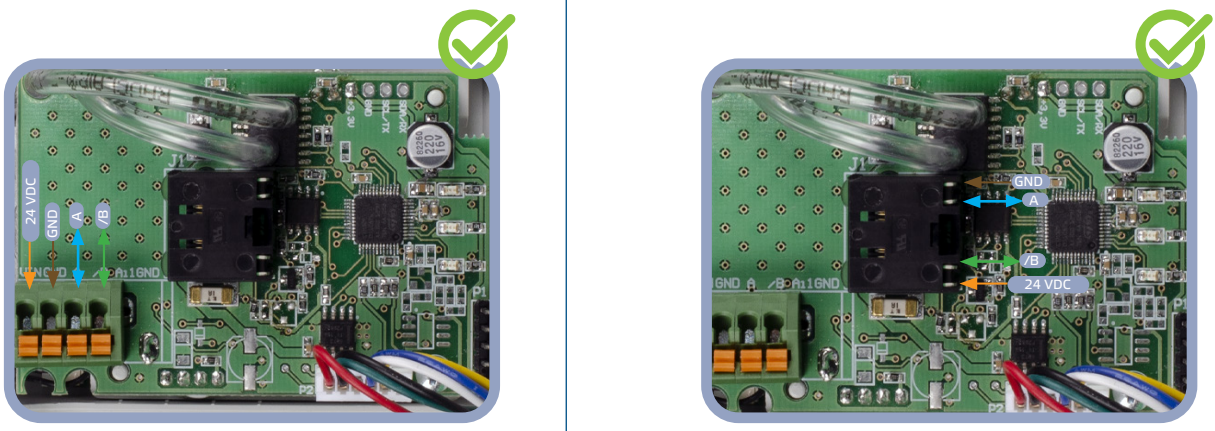
Fig. 2 Mounting dimensions

ACDPH-125	ACDPH-160
	

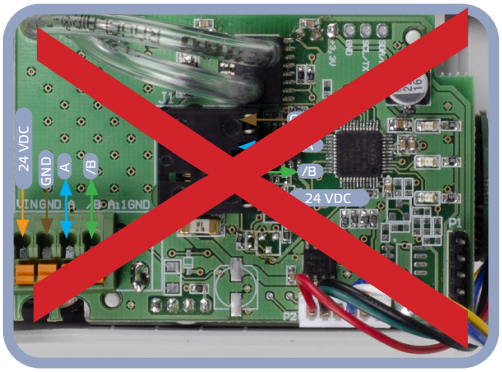
4. Insert the cable through the cable gland. Crimp the RJ45 connector and plug it into the socket as shown in **Fig. 3**.
5. Put back the cover and secure it with the screws.
6. Switch on the power supply.
7. Customise the factory settings to the desired ones via the 3SModbus software or via Sensistant. For the default factory settings see the *Modbus register map* of the product.

Fig. 3 Wiring and connections

Correct connections



Wrong input connection



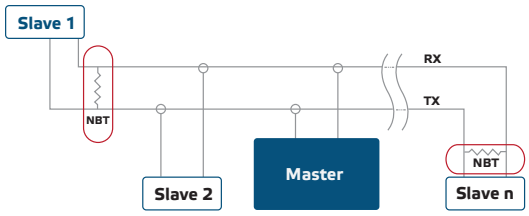
NOTE

For the complete Modbus register data, see the Modbus Register Map of the product. This is a separate document linked to the article code on the website containing the list of registers.

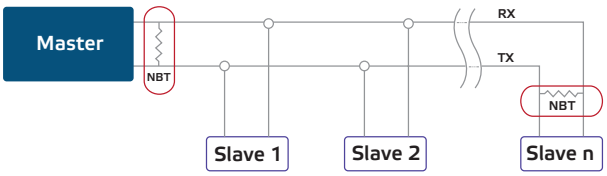
Network Bus Termination (NBT) Resistor

This resistor is controlled via Modbus RTU Holding register 9. By default, the NBT resistor is disconnected. Set the NBT resistor to be connected or not according to the following examples:

Example 1



Example 2



NOTE

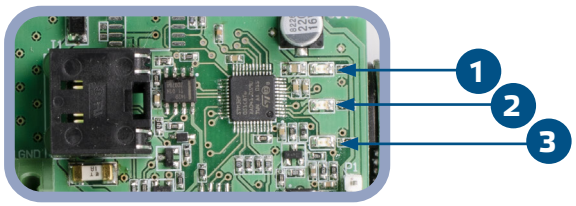
On a Modbus RTU network, two bus terminators (NBTs) need to be activated.

OPERATING INSTRUCTIONS

LED indications (visible only when the cover is removed):

1. When green LED1 is on, it indicates that the damper is fully closed (damper blade is at minimum position).
2. When green LED2 is constantly blinking, it indicates normal operation of the damper.
3. When green LED3 is on, it indicates that the damper is fully open (damper blade is at maximum position).

Fig. 4 LED indications



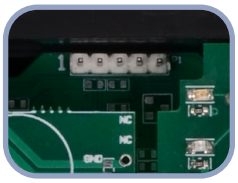
NOTE

When the actuator is in bootloader mode, LED3 is flashing. During the firmware upload, LED2 and LED3 are flashing simultaneously.

Bootloader

Firmware could be updated using the embedded bootloader via the Modbus RTU communication. The unit enters boot mode after resetting the supply voltage when a jumper is present between pins 3 and 4 on the P1 header or if a master device (Sensistant or 3SModbus software with PC) sends such command to the unit (see **Fig. 5**).

Fig. 5 P1 header

	 1 2 3 4 5	Put a jumper onto pins 3 and 4 and restart the supply to enter bootloader mode

VERIFICATION OF INSTALLATION

After switching on the power supply one of the LEDs lights up according to the status of the measured variable. If this is not the case, check the connections.

ATTENTION

For indoor use only. Avoid direct sunlight.

ATTENTION

After switching ON the power supply, the damper blade goes to zero position (fully closed) then returns to setpoint position.

TRANSPORT AND STORAGE

Avoid shocks and extreme conditions; stock in original packing.

WARRANTY AND RESTRICTIONS

Two years from the delivery date against defects in manufacturing. Any modifications or alterations to the product after the date of publication relieve the manufacturer of any responsibilities. The manufacturer bears no responsibility for any misprints or mistakes in this data.

MAINTENANCE

In normal conditions this product is maintenance-free. If soiled, clean with a dry or damp cloth. In case of heavy pollution, clean with a non-aggressive product. In these circumstances the unit should be disconnected from the supply. Pay attention that no fluids enter the unit. Only reconnect it to the supply when it is completely dry.