

ACT-H | CIRCULAR MOTORISED DAMPER

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 contents 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 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

ACT-H series are circular motorised dampers that regulate the air flow in duct systems. The damper blade position can be regulated via an analogue / modulating input or via Modbus RTU communication. The supply voltage is 24 VDC. All parameters are accessible via Modbus RTU communication.

ARTICLE CODE

Article code	Compatible duct diameter	I _{max}	Connection type
ACT-H-125	125 mm	100 mA	RJ45 or terminal block
ACT-H-160	160 mm	100 mA	RJ45 or terminal block

INTENDED AREA OF USE

- Control air volume flow in air ducts
- Control fresh air supply for each room separately
- Control ventilation in buildings

TECHNICAL DATA

- Spring contact terminal blocks or RJ45 connection
- Analogue / modulating input to control the damper blade position in standalone mode
- Bootloader for updating the firmware via Modbus RTU communication
- Dedicated holding register for setting blade position in Modbus mode
- Minimum and maximum damper blade position, settable via Modbus Holding registers 17 and 18
- Casing airtightness according to EN1751, class D
- Damper blade airtightness according to EN1751, class 4
- Zero position calibration function via Modbus Register
- Suitable air velocity: 0–10 m/s
- Selectable temperature range: 5–65 °C
- Selectable relative humidity range: 5–85 %
- 3 LEDs for status indication
- Accuracy: ±0,4 °C (0–50 °C); ±3 % rH (0–100 % rH);
- Enclosure material and colour: grey, ABS 10 GF
- Protection standard: IP54 (according to EN 60529)
- Operating ambient conditions:
 - ▶ temperature: 5–65 °C
 - ▶ rel. humidity: 5–85 % rH, (non-condensing)
- Storage temperature: -10–70 °C

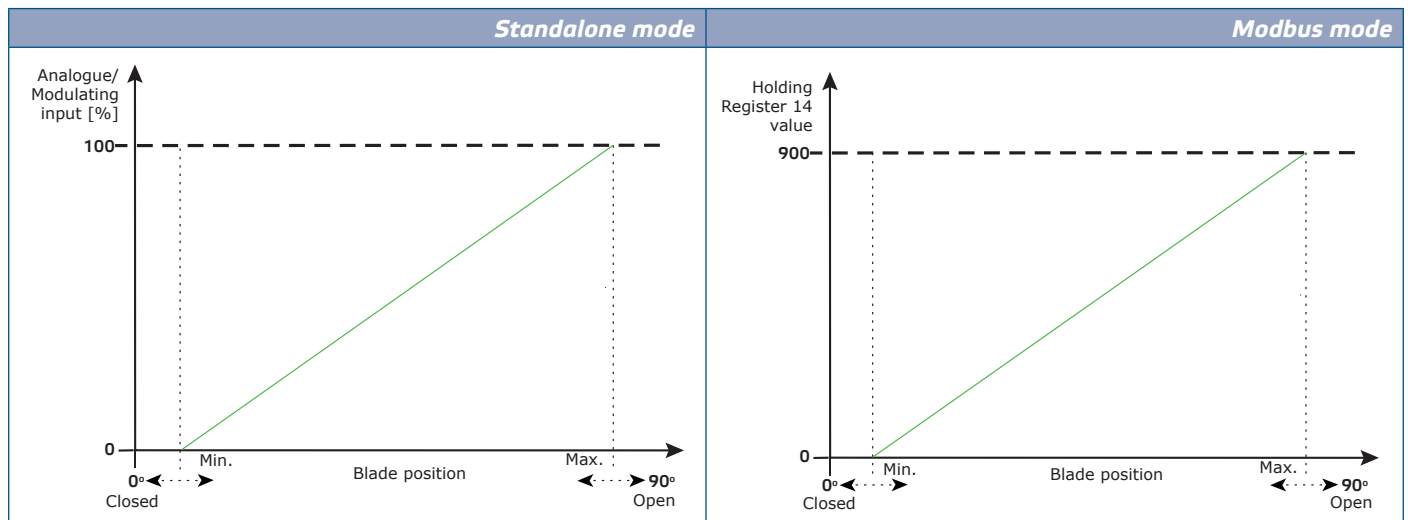
STANDARDS

- Machinery Directive 2006/42/EU:
 - ▶ EN 13141-2:2010 Ventilation for buildings — Performance testing of components/products for residential ventilation — Part 2: Exhaust and supply air terminal devices
 - ▶ EN ISO 12100:2010 Safety of machinery — General principles for design — Risk assessment and risk reduction
 - ▶ EN 1751:2014 Ventilation for buildings. Air terminal devices. Aerodynamic testing of damper and valves
- Low voltage (LVD) directive 2014/35/EU:
 - ▶ EN 60204-1:2018 Safety of machinery — Electrical equipment of machines — Part 1: General requirements
- 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)

OPERATIONAL DIAGRAMS



ATTENTION

The minimum and maximum positions of the damper blade can be adjusted via Modbus Holding registers 17 and 18.

WIRING AND CONNECTIONS

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

Terminal block		
VIN	GND	Supply voltage 24 VDC
		Supply voltage, ground
A		Modbus RTU communication, signal A
/B		Modbus RTU communication, signal /B
Ai1		Analogue / modulating input (0–10 VDC / 0–20 mA / PWM)
GND		Ground, Ai1

NOTE

Apply the 24 VDC supply voltage via the terminal block or via the RJ45 socket. Do not apply the supply voltage via the terminal block and the RJ45 socket 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. The damper will not reduce the effective duct diameter, since the duct is inserted in the damper and not the other way around. This increases the efficiency of the ventilation system.

ATTENTION

Make sure the actuator is located on the side or on the top of the damper. Install the unit in an area that is easily accessible for control and service.

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

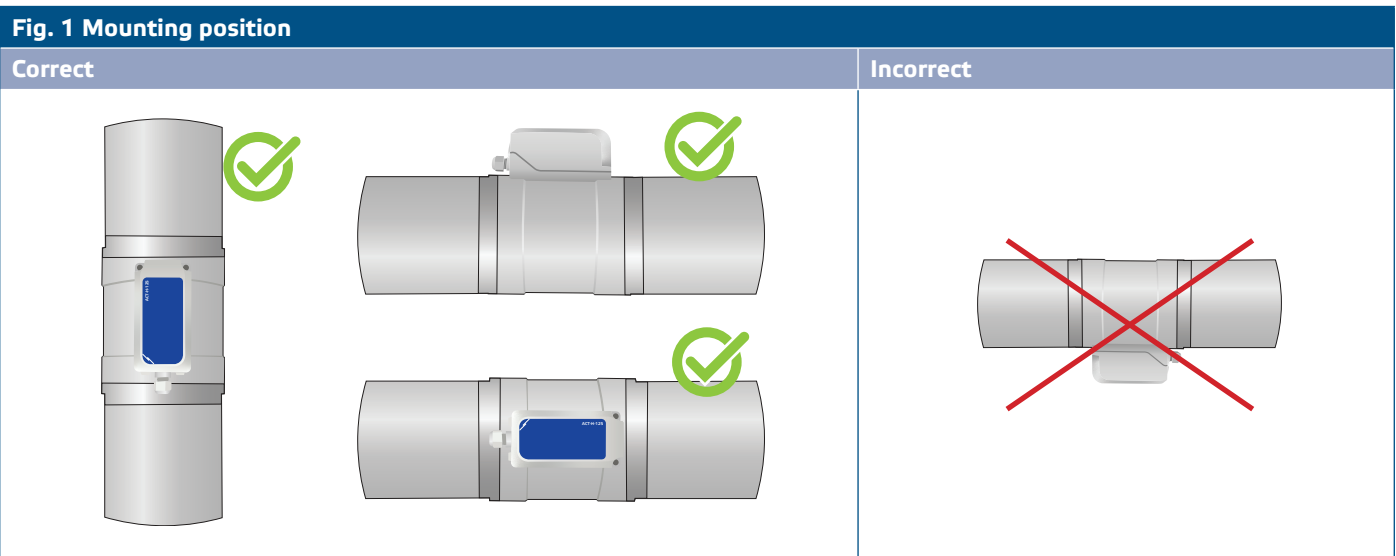


Fig. 2 Mounting dimensions ACT-H-125

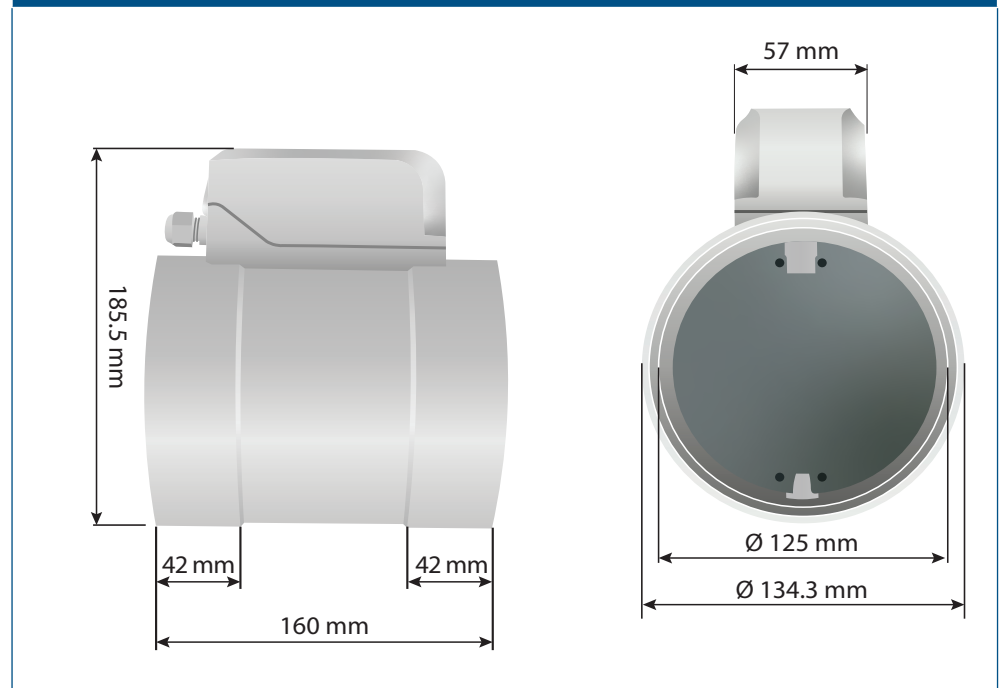
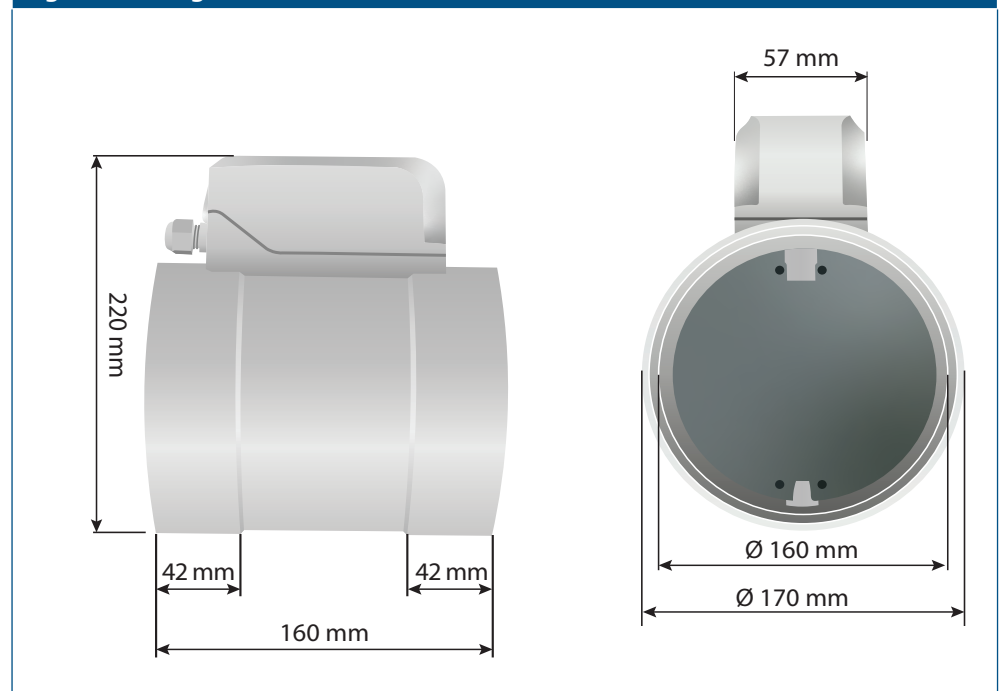


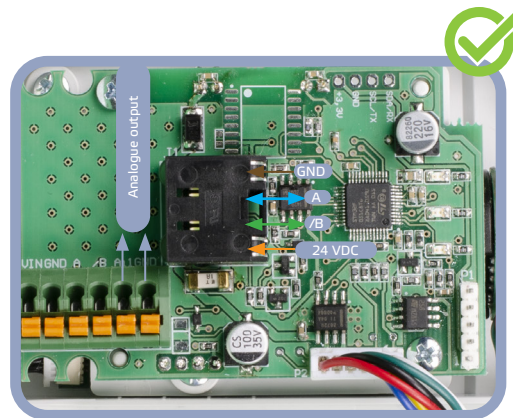
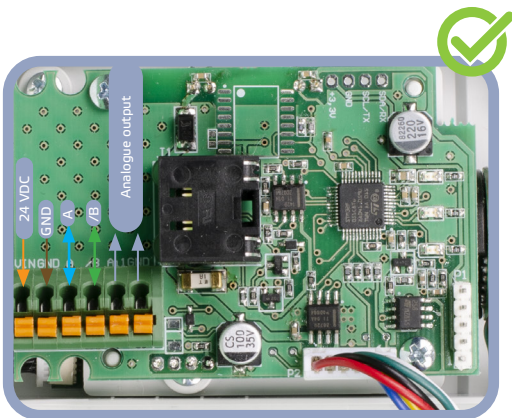
Fig. 2 Mounting dimensions ACT-H-160



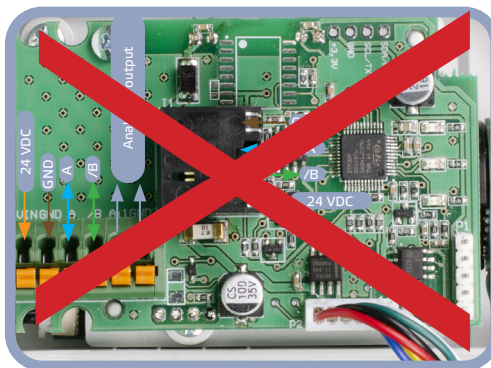
4. Insert the cable through the cable gland. Crimp the RJ45 connector and plug it into the socket or connect the device via the terminal block (see **Fig.4**).

Fig. 4 Wiring and connections

Correct connections



Wrong input connection



5. Put back the front cover and switch on the mains supply.
6. 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.

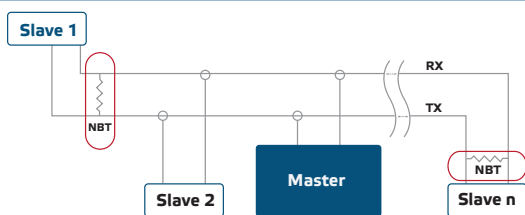
NOTE

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. Products with earlier firmware versions may not be compatible with this list.

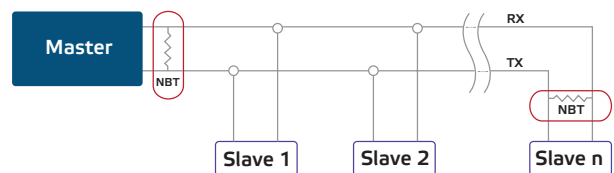
Optional settings

To assure correct communication, the NBT needs to be activated in only two devices on the Modbus RTU network. If necessary, enable the NBT resistor via 3SModbus or Sensistant (*Holding register 9*).

Example 1



Example 2



NOTE

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

OPERATING INSTRUCTIONS

Firmware update

New functionalities and bug fixes are made available via a firmware update. In case your device does not have the latest firmware installed, it can be updated. SenteraWeb is the easiest way to update the firmware of the unit. In case you do not have an internet gateway available, the firmware can be updated via the 3SM boot application (part of the Sentera 3SMcenter software suite).



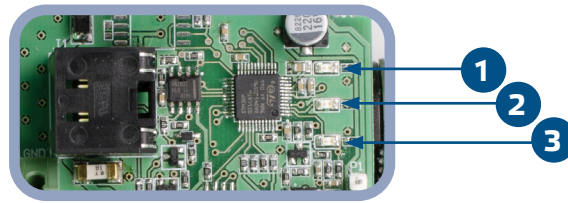
NOTE

Make sure the power supply does not get interrupted during "bootload" procedure.

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. 5 LED indications



NOTE

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

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.

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.