# ACDPH
## Circular motorised damper with pressure control

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 of 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.

## Key features

- 24 VDC supply voltage via RJ45 connector or terminal block
- Modbus RTU communication via RJ45 connector or terminal block
- Built-in digital high resolution differential pressure sensor
- Compatible with SenteraWeb for remote control and online monitoring
- Fits circular air ducts with standard dimensions
- Holding registers to activate manually zero-point calibration and Modbus registers reset
- Damper blade can be placed in any position in accordance with the airflow direction with the overwrite function

## Area of use

- Control air volume flow and temperature in order to provide comfort ventilation
- Regulate fresh air supply for each room separately

## Technical specifications

| | | |
|---|---|---|
| Supply voltage | | 24 VDC (RJ45 (PoM) or terminal block |
| Operating range of the differential pressure sensor | | 0—1.000 Pa |
| Max. actuator torque | | 5 Nm |
| Operating air velocity range | | 0—12 m/s |
| Power consumption | | max. 2,4 VA |
| Accuracy | | ±2 % of the operating range |
| Damper blade airtightness | | Class 4 (according to EN1751) |
| Protection standard | | IP54 (according to EN 60529) |
| Enclosure | | ABS 10GF, grey |
| Ambient conditions | Temperature | -5—65 °C |
| | Rel. humidity | < 95 % rH (non-condensing) |

## Article codes

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

## Modbus registers

The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:

https://www.sentera.eu/en/3SMCenter

For more information about the Modbus registers, we refer to the Modbus Register Map of the product.

## Settings and indications
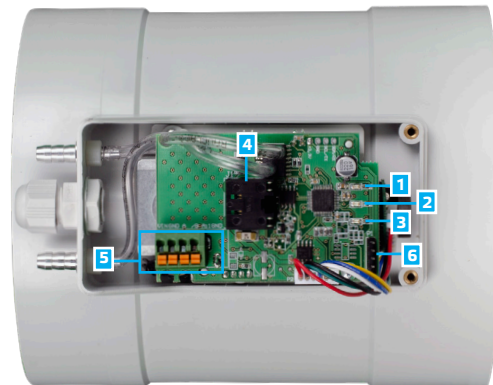


| | | | |
|---|---|---|---|
| 1 - Green LED 1 | On | | Damper blade is fully closed (zero position) |
| 2 - Green LED 2 | Blinking | | Indicates normal operation of the damper |
| 3 - Green LED 3 | On | | Damper blade is fully open (90 º) |
| 4 - RJ45 socket | | | Modbus RTU communication and 24 VDC power supply can be connected via the RJ45 socket |
| 5 - Terminal block | | | Modbus RTU communication, 24 VDC power supply and the control input can be connected via the terminal block |
| 6 - PROG header, P1 | | 1 2 3 4 5 | Put a jumper onto pins 1 and 2 and wait for at least 15 seconds to reset the Modbus communication parameters |
| | | 1 2 3 4 5 | Put a jumper onto pins 3 and 4 and restart the supply to enter bootloader mode |

***Note:*** *When the actuator is in bootloader mode, LED 3 is flashing. During the firmware download, LED 2 and LED 3 are flashing simultaneously.*
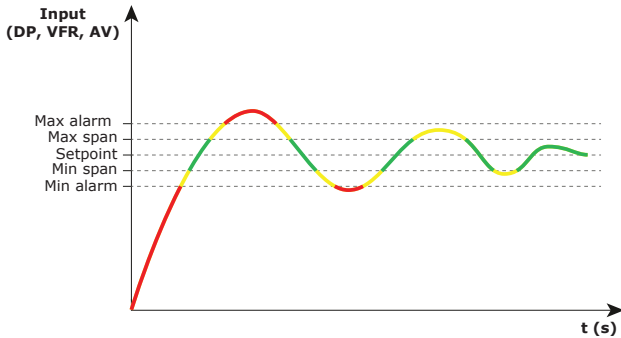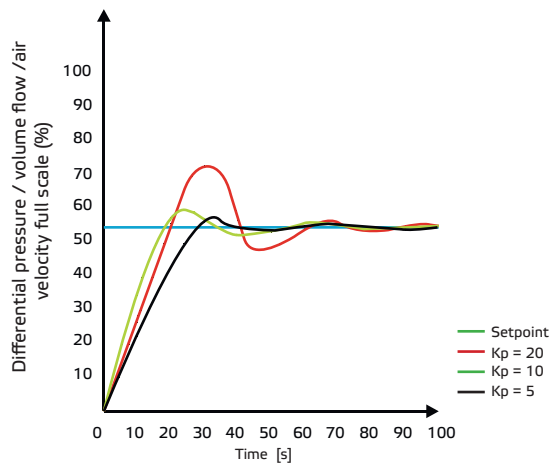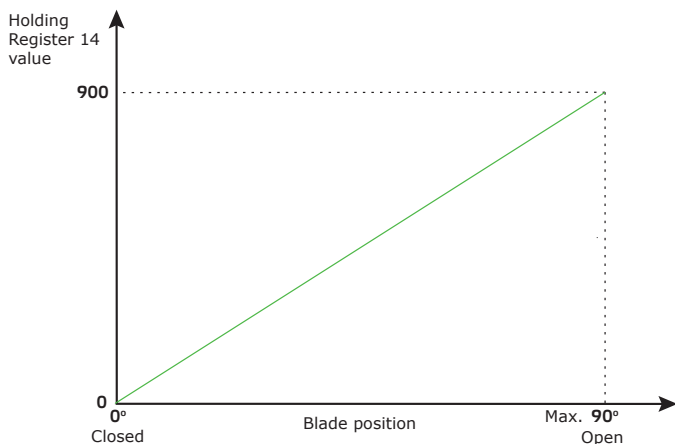
## Operational diagram

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



### PI control example at different Kp



### Blade position in overwrite mode



## Air flow characteristics

| Article Code | | | ACDPH-125 | | | | ACDPH-160 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Average velocity $V_k$(m/s) | | | 3 | 6 | 9 | 12 | 3 | 6 | 9 | 12 |
| Air Volume Q(m³/h) | | | 130 | 263 | 396 | 530 | 216 | 434 | 652 | 871 |
| $p_s$=125 Pa | Lw (dB/Oct) | 63 Hz | 38 | 46 | 50 | 57 | 41 | 49 | 53 | 59 |
| | | 125 Hz | 40 | 54 | 55 | 57 | 42 | 56 | 57 | 58 |
| | | 250 Hz | 36 | 50 | 52 | 55 | 39 | 51 | 52 | 57 |
| | | 500 Hz | 35 | 46 | 44 | 51 | 37 | 50 | 47 | 53 |
| | | 1 kHz | 33 | 40 | 40 | 45 | 36 | 42 | 42 | 47 |
| | | 2 kHz | 33 | 37 | 38 | 40 | 35 | 39 | 40 | 42 |
| | | 4 kHz | 33 | 36 | 36 | 38 | 35 | 38 | 38 | 39 |
| | | 8 kHz | 33 | 36 | 36 | 37 | 36 | 37 | 38 | 37 |
| | Lw (A) (dB(A)) | | 39 | 46 | 50 | 54 | 43 | 46 | 50 | 53 |
| $p_s$=125 Pa | Lw (dB/Oct) | 63 Hz | 43 | 49 | 52 | 61 | 46 | 51 | 56 | 66 |
| | | 125 Hz | 44 | 56 | 60 | 64 | 45 | 59 | 64 | 69 |
| | | 250 Hz | 44 | 55 | 58 | 62 | 44 | 55 | 59 | 64 |
| | | 500 Hz | 42 | 51 | 56 | 59 | 42 | 51 | 57 | 59 |
| | | 1 kHz | 39 | 47 | 50 | 42 | 41 | 48 | 53 | 53 |
| | | 2 kHz | 38 | 45 | 48 | 49 | 38 | 45 | 48 | 49 |
| | | 4 kHz | 37 | 43 | 48 | 48 | 38 | 44 | 47 | 48 |
| | | 8 kHz | 37 | 42 | 45 | 52 | 36 | 40 | 41 | 46 |
| | Lw (A) (dB(A)) | | 45 | 52 | 56 | 58 | 49 | 54 | 57 | 59 |
| $p_s$=125 Pa | Lw (dB/Oct) | 63 Hz | 48 | 52 | 60 | 62 | 53 | 58 | 66 | 69 |
| | | 125 Hz | 48 | 60 | 70 | 72 | 50 | 63 | 70 | 73 |
| | | 250 Hz | 48 | 59 | 67 | 68 | 47 | 60 | 68 | 69 |
| | | 500 Hz | 46 | 57 | 62 | 63 | 46 | 57 | 62 | 64 |
| | | 1 kHz | 44 | 55 | 57 | 58 | 46 | 54 | 56 | 58 |
| | | 2 kHz | 44 | 52 | 54 | 56 | 44 | 53 | 56 | 58 |
| | | 4 kHz | 42 | 48 | 50 | 54 | 43 | 48 | 51 | 55 |
| | | 8 kHz | 41 | 46 | 49 | 51 | 43 | 48 | 51 | 53 |
| | Lw (A) (dB(A)) | | 50 | 58 | 60 | 62 | 52 | 58 | 61 | 64 |
| $p_s$=125 Pa | Lw (dB/Oct) | 63 Hz | 60 | 64 | 70 | 74 | 60 | 64 | 70 | 74 |
| | | 125 Hz | 58 | 61 | 70 | 73 | 58 | 63 | 70 | 73 |
| | | 250 Hz | 53 | 60 | 69 | 73 | 55 | 62 | 70 | 73 |
| | | 500 Hz | 52 | 60 | 67 | 72 | 54 | 60 | 67 | 72 |
| | | 1 kHz | 53 | 58 | 66 | 70 | 56 | 59 | 66 | 70 |
| | | 2 kHz | 51 | 57 | 65 | 68 | 55 | 59 | 65 | 69 |
| | | 4 kHz | 50 | 56 | 61 | 65 | 50 | 57 | 61 | 65 |
| | | 8 kHz | 49 | 55 | 60 | 63 | 49 | 57 | 60 | 65 |
| | Lw (A) (dB(A)) | | 55 | 64 | 71 | 77 | 60 | 67 | 72 | 79 |

**Legend:**

*Q = Air volume in m³/h.*

*Vk = Average velocity in the damper in m/s.*

*Ps = Pressure drop over the damper according to the position of the blade in Pa.*

*Lw (dB/Oct) = Sound power given at a specific pressure drop (Ps) for the frequencies from 63 Hz up to 8 kHz in dB.*

# ACDPH
## Circular motorised damper with pressure control

## Wiring diagram

### RJ45 socket (Power over Modbus)

| Pin 1 | 24 VDC | Supply voltage, 24 VDC |
|---|---|---|
| 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 | Power over Modbus supply, 24 VDC |
| Pin 8 | | |



### Terminal block

| VIN | Supply voltage, 24 VDC |
|---|---|
| GND | Supply voltage, ground |
| A | Modbus RTU communication, signal A |
| /B | Modbus RTU communication, signal /B |

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

## Standards

- Machinery Directive 2006/42/EU:
  - 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)
  - EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
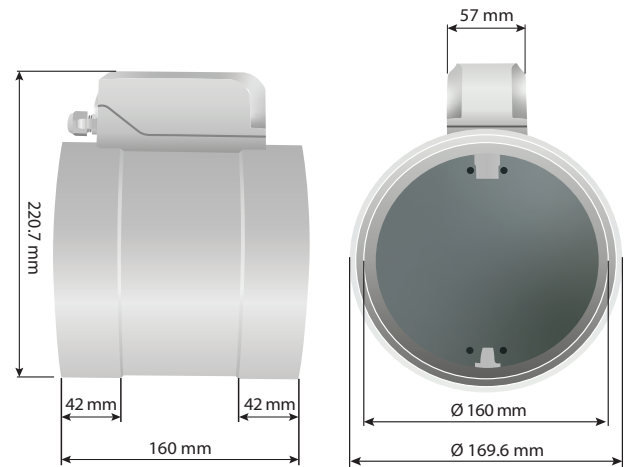
## Global trade item numbers (GTIN)

| Packaging | |
|---|---|
| **ACDPH-125 (unit)** | 05401003018637 |
| **ACDPH-160 (unit)** | 05401003018781 |

## Fixing and dimensions

### ACDPH-125
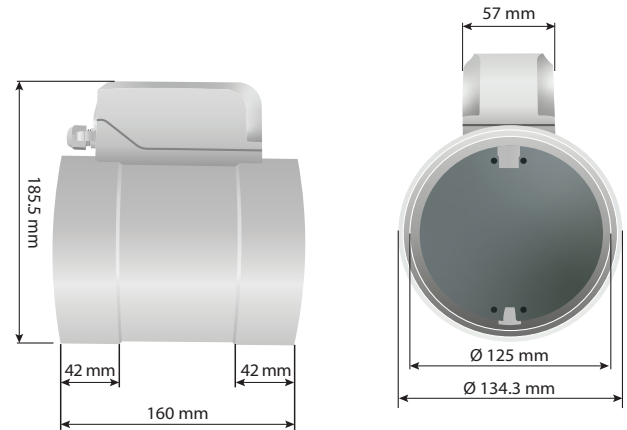


### ACDPH-160



## Packaging
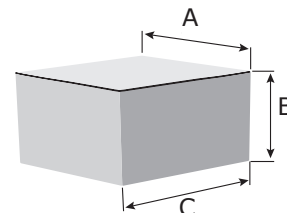


| Article | Packaging | A [mm] | B [mm] | C [mm] | Net weight | Gross weight |
|---|---|---|---|---|---|---|
| **ACDPH-125** | Unit (1 pc.) | 230 | 185 | 175 | 0,62 kg | 0,90 kg |
| **ACDPH-160** | Unit (1 pc.) | 230 | 185 | 175 | 0, 64 kg | 0,92 kg |