ADAPT™ Free

Active communicative, supply air diffuser for the WISE system, ADAPT F

Quick facts

▶ Supply air diffuser with an active damper

▶ Pressure-dependent and cleanable

▶ Integrated sensor module

▶ Simple wiring, Plug & Play

▶ Communication via Modbus RTU

▶ Supplied complete with connection box, CONNECT Adapt

▶ Complemented with the WISE templates, containing detailed descriptions for planning

▶ Allows for control of:
  – Heat alternatively, cooling valve (max. 3 actuators per master)
  – Slaves (supply or extract air, 3 pcs)
  – Lighting (via relay)

Quick Selection

AIR FLOW – SOUND LEVEL – COOLING EFFECT				
Size	min q[*] (l/s)	max q (l/s)		max p[**] (W)
		50 Pa / 30 dB(A)	50 Pa / 35 dB(A)	
160	0/5	50	85	480
200	0/10	65	100	625

[*] The first value indicates closed damper, the second value indicates lowest adjustable air flow.

[**] Max. cooling effect is calculated at Δt=8K and for an air flow at 50 Pa and 30 dB(A).

Swegon

Technical Description

Design

ADAPT is a series of flow-controlled supply air diffusers for the Swegon WISE system:

- The air diffuser controls the airflow with an active slot behind the frontplate.
- An ADAPT diffuser is always supplied with a commissioning box.
- Inside the air diffuser, is a controller providing all the required set points and control functions as well as a multi-functional sensor module, see figure 1.

Functions in the Master diffuser

- Cools/heats and ventilates with air.
- Two stage cooling with water in the second stage, cannot be combined with heating.
- Controls airflow with regard to temperature and presence.
- Ventilation boost after longer periods of unoccupancy.
- Provision for wiring to a CO_2 controller.
- Provision for manually setting set points.
- Has provision for connection to a main control system (Modbus).
- Emergency functions for closing / opening of the damper.
- Control of the heating in sequence unless 2-stage cooling has been selected.
- Indication via LED. Indicates current operating mode and warns of malfunctions in the diffuser.
- Comfort control indicated by the LED if the room temperature or CO_2 value deviates too much from the set point, not activated by default.

Sensor module

A sensor module is integrated in all ADAPT supply air diffusers, containing the following functions:

- A temperature sensor controls the airflow to maintain required temperature in the room.
- A presence detector makes it possible to save additional energy by lowering the airflow when there are no occupants in the room.
- The presence signal from the air diffuser can be fetched for controlling the lighting, for instance, and in this way save more energy.

Connectivity

In each delivery of a master diffuser, a CONNECT Adapt connection box is included:

- The connection box replaces the coupling box which otherwise is mounted on a wall/ceiling for wiring a 24 V supply voltage to the air diffuser and Modbus networks.
- Both air diffuser and connection box are equipped with RJ45 quick-fit connectors for quick and fault-free wiring.
- The device has provision for connection to a main control system (BMS/SCADA) via ModBus.
- Accessory cable, LINK Modbus (RJ12) can be connected between air diffuser and connection box. The air diffuser will then be ready for the main control system.
- From the connection box, control functions for heating in sequence, CO_2 sensor and set point adjuster, can also be connected.

Planning – WISE Templates

See separate documentation, "WISE Project manual", available for download from www.swegon.se.

In addition, Swegon sales personnel can supply WISE templates containing descriptions with detailed information regarding functionality, flowcharts, wiring diagrams and demarcation list for various constructions.
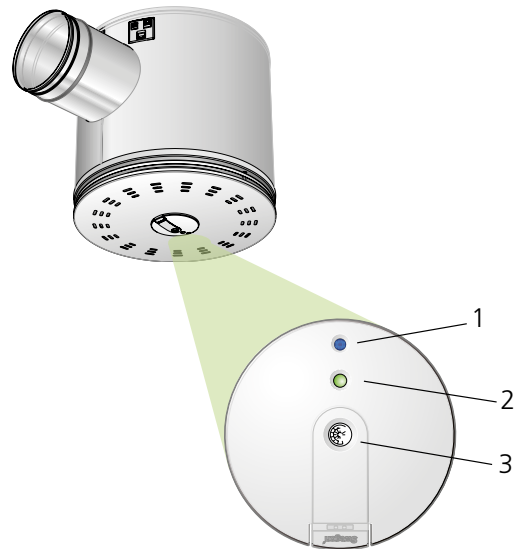

Figure 1. The sensor module of ADAPT Free with connection for TUNE Adapt.
1. Temperature detector
2. In-operation indicator, green, red and orange LED.
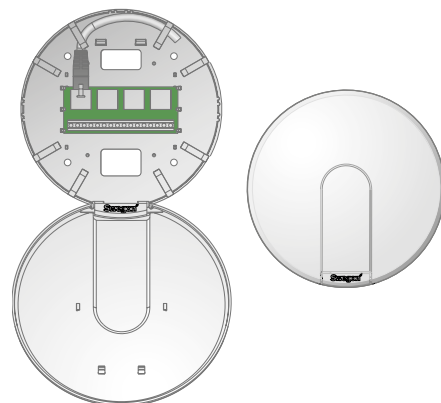*3. Presence detector*

Figure 2. Connection box, CONNECT Adapt.

Installation

A detailed installation instruction is enclosed with each delivery and can also be downloaded from www.swegon.

1. Adapt Free is suspended from the ceiling. Female-threaded grommets are available on the top of the air diffuser.

2. Secure the connecting duct by means of pop rivets.

3. The bottom plate can be dismantled by pressing the fixing pins of the bottom plate outward, which will loosen it from the upper cone. Secure the bottom plate to the upper cone with the safety cord, press together the S-hook to prevent it from coming loose.

N.B.! Disconnect the electric cable (C) from the motor.

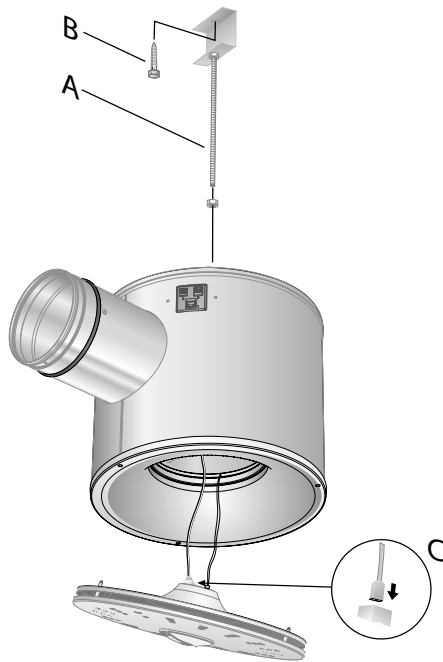

Figure 3. Adapt Free, installation.

A[*)] M8 threaded rod and lock nuts.
B[*)] Securing to the ceiling or load-carrying structure.
[*)] N.B.! Parts A and B are not included at delivery.

Commissioning

- Normally, the ADAPT air terminals are preset from the factory based on design values.
- The TUNE Adapt hand-held terminal is used for manually checking the current air flow through the air diffuser, and for changing set points, if required.
- For more information, see the installation - Commissioning - Maintenance instruction as well as the TUNE Adapt user manual.

Materials and finish

- ADAPT air terminals are made of galvanized sheet steel, with parts made of plastic, rubber and also contain electronic components.
- The ADAPT air terminals are powder coated in Swegon's white interior standard colour RAL 9010, both on the inside and on the outside.
- The sensor module and connection box are made of ABS plastic.

- The commissioning box is made of galvanized sheet steel with internal insulation.

Maintenance

- The ADAPT air terminals can be cleaned on the outside, if necessary, using lukewarm water with dishwashing detergent added.
- The duct system is accessible without need for tools. (See the separate installation instruction)

Declaration

Declaration of Construction Materials is available for download from www.swegon.com.

Electrical data

ADAPT is supplied with power via the connection box.

For more information about various wiring and room solutions, see the Technical Section.

Supply voltage	24 V AC ±10 %
Max. power consumption	3 VA
Cable rating	0,6 A
Ambient temperature	0 °C - +50 °C

Forms of delivery

- Some of the ADAPT-products are available from stock with standard settings.
- At delivery, a master air diffuser contains a complete air diffuser with commissioning box, connection box CONNECT Adapt and 5 metre long RJ45 cable LINK Adapt.
- Delivery of a slave air diffuser contains a complete air diffuser with commissioning box and 5 metre long RJ45

Standard settings

Temperatures (°C)

Presence	22	± 1 K
Absence	22	+3 / -2 K
Night-time cooling	18	
Morning heat	25	

Airflows (l/s)	Absence	Min. airflow	Max. airflow
The smallest size	0/5	10	60
The largest size	0/10	15	90

Air quality (ppm)	Min.	Max.
CO_2	800	1000

Presence

Switch on delay	0 sec.
Switch out delay	20 min.

Communication Modbus RTU by RS-485

Modbus ID	1
Speed	38,400 bps
Bit length	8 bits
Stop bits	1 bit
Parity	None

Sizing

- The specified sound levels dB(A) are applicable to rooms with an equivalent sound absorption area of 10 m² (4 dB room attenuation).

- The throw $L_{0.2}$ is measured under isothermal discharge conditions.

- Recommended max. permitted temperature below room temperature is 12 K.

- All technical data applies to 360° distribution pattern.

- For calculating the air stream propagation, air velocities in the occupancy zone, or sound levels in rooms with other dimensions, we refer to our ProAir Web calculation program. ProAir Web is available at www.swegon.com.

Sound data

Sound power level, L_w(dB)
Table, K_{ok}

| Size	Mid-frequency (Octave band) Hz							
	63	125	250	500	1000	2000	4000	8000
160	7	2	-3	1	-1	-6	-14	-17
200	8	2	-1	2	-1	-7	-18	-21
Tol. ±	2	2	2	2	2	2	2	2

Sound attenuation ∆L
Table ∆L

| Size	Mid-frequency (Octave band) Hz							
	63	125	250	500	1000	2000	4000	8000
160	21	16	24	21	19	10	11	11
200	18	13	23	21	14	10	10	12
Tol. ±	2	2	2	2	2	2	2	2

Engineering graphs

Air flow – Pressure drop – Sound level – Throw

- The diagrams should not be used for commissioning.

- The dB(C) value is normally 6-9 dB higher than the dB(A) value.

- The throw can be read at the design max. air flow and pressure drop.

- The slot opening of the diffuser is shown at 0, 1, 3, 6 and 15 mm.

- Sizing example – size 200:
  - Given airflow 10-50 l/s at P_t 50 Pa.
  - Max. sound level 30 dB(A)
  - Max. throw at line 06 = 3.2 meters.

ADAPT F 160
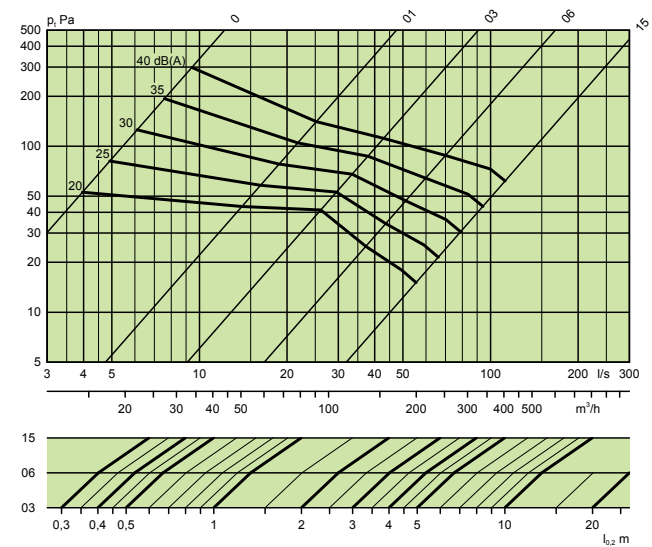
ADAPT F 200
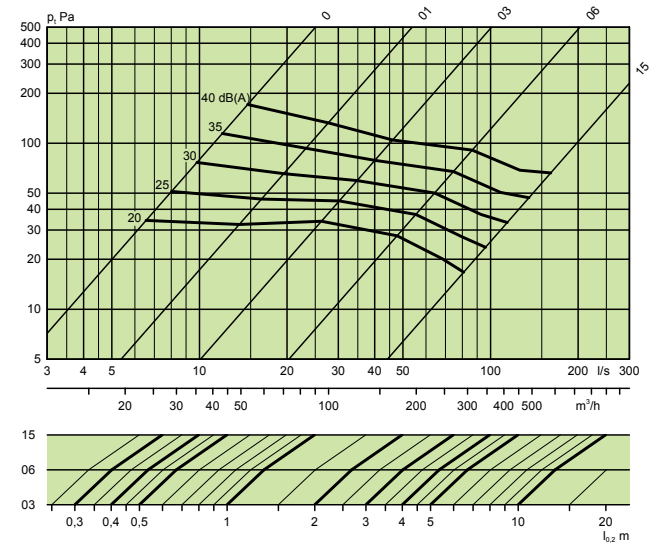
Dimensions and weights

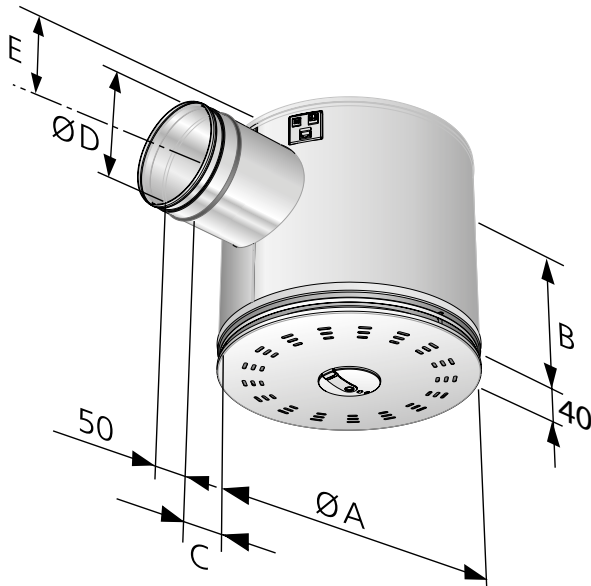| Size	ØA	ØD	B	C	E	Weight, kg
160	380	159	320	123	130	6,8
200	456	199	390	159	150	10,2

Figure 4. ADAPT Free, dimension figure.

Ordering key

Product

Circular active air diffuser for ceilings	ADAPT F	d	-bbb	-c
Version:				
Connection dimensions:				
M: Master				
S: Slave				

N.B.! Specify absence, min./max. airflows in your specification!

Standard range: Size: 160, 200

Accessories

DETECT Quality	Temperature and CO_2 sensor with set point selector knob
TUNE Adapt	Hand-held terminal for reading/changing settings
TUNE Temp	Temperature adjuster
LINK Modbus	RJ12-cable for connecting up Modbus RTU
LINK Adapt	RJ45 cable for connecting up in other lengths
SPLIT Link	Split connector
FIX Link	For securing cords to ducts, etc.
POWER Adapt	Transformer
ACTUATOR	Valve actuator, on/off
VALVE	Radiator valve
ADAPT Relay	Relay for light or heat control
ADAPT TR	Semi-conductor relay for lighting or heat control
CABLE Ext	Extension cable between box and air diffuser
LINK Wa	Network cable for Modbus, complies with the EIA-485 standard

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