



## Air terminal devices

### Ceiling diffusers Type VDL

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#### Product overview

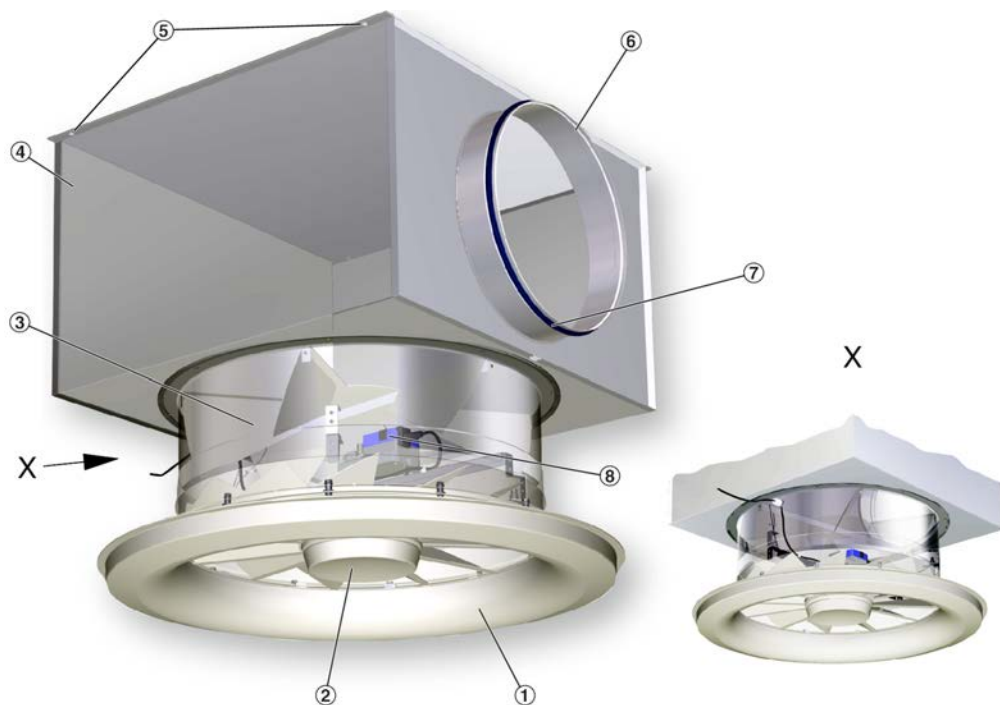


Fig. 1: Schematic illustration of VDL

- |   |  |   |                              |
|---|--|---|------------------------------|
| ① | Diffuser face  | ⑤ | Suspension hole              |
| ② | Decorative cap   | ⑥ | Spigot                       |
| ③ | Swirl unit with opposed blades (only with nominal sizes 630 and 800) | ⑦ | Lip seal (optional)          |
| ④ | Plenum box (for NW315 and 400 with perforated plate)                 | ⑧ | Electric actuator (optional) |

## Important notes

### Information on the installation manual

This manual enables operating or service personnel to correctly install the product described below and to use it safely and efficiently.

It is essential that these individuals read and fully understand this manual before starting any work. The basic prerequisite for safe working is to comply with the safety notes and all instructions in this manual.

The local regulations for health and safety at work and general safety regulations also apply.

### Qualified staff

#### Skilled qualified electrician

Skilled qualified electricians are individuals who have sufficient professional or technical training, knowledge and actual experience to enable them to work on electrical systems, understand any potential hazards related to the work under consideration, and recognise and avoid any risks involved.

#### Specialist personnel

Specialist personnel are individuals who have sufficient professional or technical training, knowledge and actual experience to enable them to carry out their assigned duties, understand any potential hazards related to the work under consideration, and recognise and avoid any risks involved.

### Limitation of liability

The information in this manual has been compiled with reference to the applicable standards and guidelines, the state of the art, and our expertise and experience of many years.

The manufacturer does not accept any liability for damages resulting from:

- Non-compliance with this manual
- Incorrect use
- Operation or handling by untrained individuals
- Unauthorised modifications

The actual scope of delivery may differ from the information in this manual for special constructions, additional order options or as a result of recent technical changes.

## Personal protective equipment

Personal protective equipment must be worn for any work in order to reduce health or safety hazards to the minimum.

The appropriate protective equipment for a job must be worn for as long as the job takes.

### Industrial safety helmet



Industrial safety helmets protect the head from falling objects, suspended loads, and the effects of striking the head against stationary objects.

### Protective gloves



Protective gloves protect hands from friction, abrasions, punctures, deep cuts, and direct contact with hot surfaces.

### Safety shoes



Safety shoes protect the feet against crushing, falling parts, and slipping on slippery ground.

### Correct use

Air terminal devices are used for the ventilation of rooms in industrial and comfort areas. The air terminal devices are connected to a supply air or extract air system (by others), which is typically connected to an air handling unit.

Air terminal devices supply cold or warm air to rooms (within the stated supply air to room air temperature differences).

Installation, operation and maintenance may have to meet increased hygiene requirements for certain areas of application.

The installation of air terminal devices in humid rooms, areas with potentially explosive atmospheres or rooms with dust-laden or aggressive air has to be assessed for each individual case.

## Transport and storage

### Delivery check

Upon delivery, carefully remove the packaging and check the unit for transport damage and completeness. In case of any damage or an incomplete shipment, contact the shipping company and your supplier immediately. Put the product back into its packaging after the delivery check to protect it from dust and contamination.



### **Fixing and installation material**

*Fixing and installation material is not part of the supply package (unless stated otherwise), but has to be provided by others; it has to be suitable for the installation situation.*

## Transport on site



### **CAUTION!**

**Danger of injury from sharp edges, sharp corners and thin sheet metal parts!**

Sharp edges, sharp corners and thin sheet metal parts may cause cuts or grazes.

- Be careful when carrying out any work.
- Wear protective gloves, safety shoes and a hard hat.

Please note:

- Be careful when unloading or moving the product, and pay attention to the symbols and information on the packaging.
- If possible, take the product in its transport packaging up to the installation location.
- Use only lifting and transport gear designed for the required load.
- Always secure the load against tipping and falling.
- Do not move bulky items just by yourself. Get help to prevent injuries and damage.

## Storage

Please note:

- Store the product only in its original packaging
- Protect the product from the effects of weather
- Protect the product from humidity, dust and contamination
- Storage temperature: -10 °C to 50 °C.
- Relative humidity: 95% max., no condensation

## Packaging

Properly dispose of packaging material.

## Installation

### General information

#### Personnel:

- Specialist personnel

#### Protective equipment:

- Industrial safety helmet
- Protective gloves
- Safety shoes

#### Installation notes:

- Fix the device only to load-bearing structural elements.
- Load suspension systems only with the weight of the device. Adjacent components and connecting ducts must be supported separately.
- Use only approved and adequately sized fixing material (fixing material is not included in the supply package).
- Refer to the technical leaflets for product weights and dimensions.
- The diffusers must remain accessible for cleaning even after installation.
- Installation and sealing material which the manufacturer provides is usually supplied in an extra bag.

Before you install the device, take suitable precautions to protect air distribution components from contamination during installation (VDI 6022). If this is not possible, at least cover the devices or take other precautions to protect them from contamination. In this case you have to ensure that the devices cannot be activated. Ensure that all components are clean before you install them. If necessary, clean them thoroughly. If you have to interrupt the installation procedure, protect all openings from the ingress of dust or moisture.

### Plenum box

If possible, install the device before fixing the ceiling tiles; if this is not possible, remove the adjacent ceiling tiles.

Use only approved and adequately sized suspension systems (fixing material is not included in the supply package). Dimensions and weights are given in the technical leaflets.

Only work in pairs; preferably use a lift.

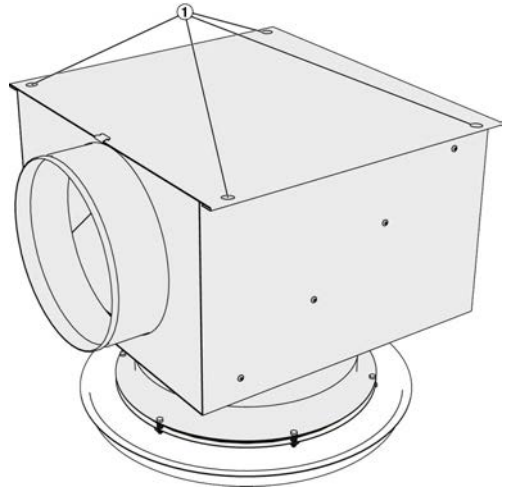


Fig. 2: Plenum box

1. ▶ Fix the suspension parts such as ropes, cables or metal hangers to the ceiling.
2. ▶ Use all of the available suspension points (Fig. 2/1) on the plenum box.

**Installation types**

- Preferably for rooms with a clear height from 3.8 m
- Flush ceiling installation
- Freely suspended installation
- Ceiling distance of at least 300 mm allows for continuous adjustment of the air pattern
- Horizontal or vertical duct connection
- Horizontal air discharge (variant X) or adjustable air discharge from horizontal to vertical

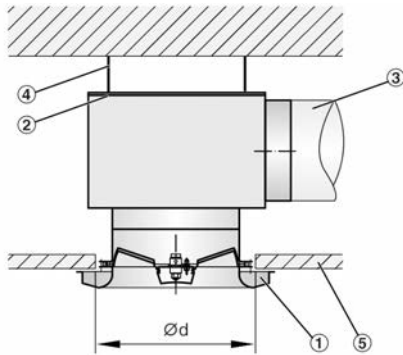


Fig. 3: Flush ceiling installation with square plenum box

- 1 Diffuser face
- 2 Suspension holes or lugs on the plenum box
- 3 Duct
- 4 Suspension parts such as ropes, cables or metal hangers. Use all of the available suspension points on the plenum box.
- 5 Suspended ceiling

**Installation openings**

Nominal size	Ød
315	400
400	500
630	750
800	950

**Installation without plenum box**

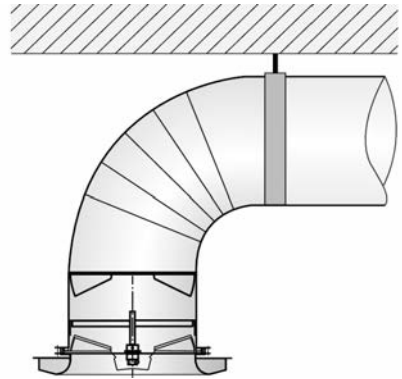


Fig. 4: Freely suspended installation

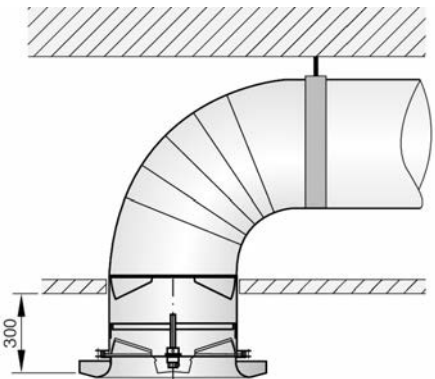


Fig. 5: Protruding installation (for adjustment)

To fix the diffuser to a vertical duct, you can use rivets or screws of Ø4 mm, set 25 mm below the connection opening at regular distances from each other. This requires that you suspend the duct such that it can take a sufficient load.

**No. of fasteners**

Nominal size	No. of rivets/screws
315	3
400	4
630	5
800	6

## Fixing the diffuser face – removable variant



*In order to protect the surface of the diffuser face, unpack and install it only after all other construction steps have been completed.*

*If there is a lengthy break between installation and commissioning, cover all openings of the casing (e.g. with plastic) to protect the interior and avoid cumbersome cleaning procedures at the time of commissioning.*

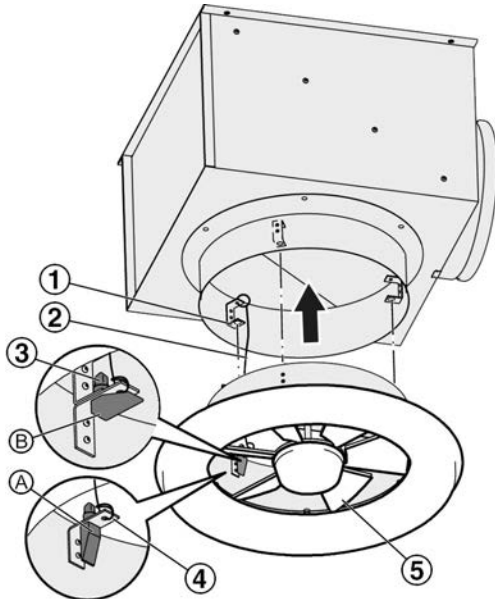


Fig. 6: Installing the diffuser face

- A 'Lever OPEN – Diffuser not fixed'
- B 'Lever CLOSED – Diffuser fixed'

1. ▶ Move the swirl unit (Fig. 6/5) such that it opens; in variants with an electric actuator you can press the gear release button to unlock the gears such that you can turn the swirl unit manually.
2. ▶ Attach the safety cable (Fig. 6/2) with a loop to the diffuser fixing bracket (Fig. 6/4), and with a key ring to the plenum box fixing bracket (Fig. 6/1).



### CAUTION!

#### Risk of injury from a falling diffuser face!

When you fix the diffuser face to the plenum box, be sure to also attach the safety cable.

3. ▶ Open the three 'levers' on the diffuser (position A); note the pointed parts protruding at the top (Fig. 6/3).
4. ▶ Insert the diffuser into the plenum box opening: Push the pointed parts of the levers through the holes in the plenum box fixing brackets (Fig. 6/1). Push the diffuser completely in and fix it by moving the levers into the 'CLOSED' position (position B).
5. ▶ Make sure that the diffuser sits tightly in the plenum box and cannot come loose.

### Duct connection

The plenum box has a spigot for duct connection. Variants with a double lip seal allow for a sufficiently tight connection; additional sealing is not required.

**Electrical connection****Personnel:**

- Skilled qualified electrician

**DANGER!**

Danger of electric shock! Do not touch any live components! Electrical equipment carries a dangerous electrical voltage.

- Only skilled qualified electricians are allowed to work on the electrical system.
- Switch off the power supply before working on any electrical equipment.

Order code	Type	Supply voltage	Max. power rating	Control input signal	Wiring diagram	Diffuser type
E1	NM230A	85 – 265 V AC, 50/60 Hz	6 VA 2.5 W	<ul style="list-style-type: none"> <li>■ OPEN/ CLOSE</li> <li>■ (3-point)</li> </ul>	Fig. 7, Fig. 8, Fig. 9, Fig. 10	VD, VDL, VDR, DUK
E2	NM24A	24 V AC $\pm 20\%$ , 50/60 Hz  24 V DC $\pm 20\%$	4 VA 1.5 W	<ul style="list-style-type: none"> <li>■ OPEN/ CLOSE</li> <li>■ (3-point)</li> </ul>	Fig. 7, Fig. 8, Fig. 9, Fig. 10	VD, VDL, VDR, DUK
E3	NM24A-SR	24 V AC $\pm 20\%$ , 50/60 Hz  24 V DC $\pm 20\%$	4 VA 2 W	2 – 10 V DC, Ra > 100 k $\Omega$	Fig. 11	VD, VDL, VDR, DUK

Electric open/close actuators

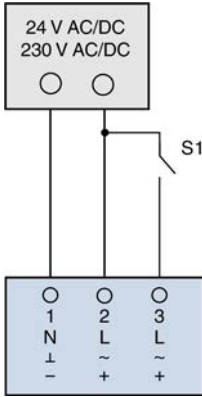


Fig. 7: Open/close control with NC or NO contact

S1	Direction of rotation
OPEN	1
CLOSED	2

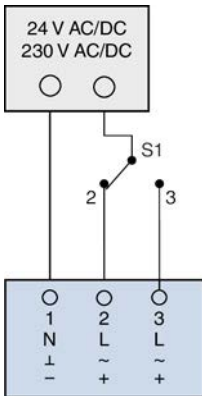


Fig. 8: Open/close control with changeover contact

S1	Direction of rotation
Pos. 2	1
Pos. 3	2

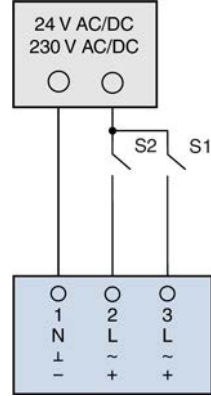


Fig. 9: 3-point control with NC or NO contact

S1	S2	Direction of rotation
OPEN	OPEN	Actuator has stopped (undefined position)
OPEN	CLOSED	1
CLOSED	OPEN	2
CLOSED	CLOSED	2

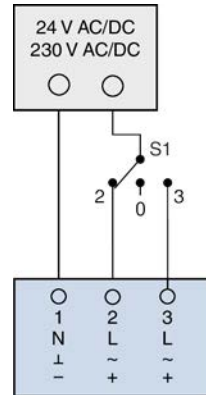


Fig. 10: 3-point control



S1	Direction of rotation
Pos. 0	Actuator has stopped (undefined position)
Pos. 2	1
Pos. 3	2

**Modulating actuators**

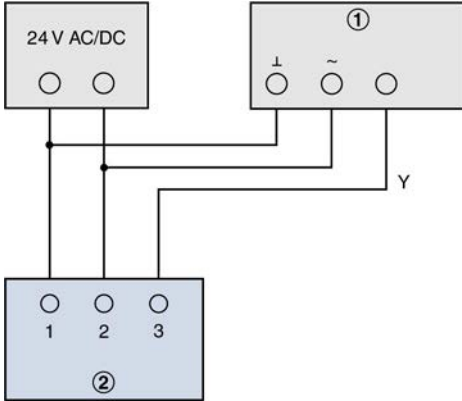


Fig. 11: Variable control

- ① Setpoint adjuster: Y = voltage signal 2-10 V DC
- ② Modulating actuator

**Initial commissioning, maintenance and cleaning**

**Initial commissioning**

Before you start commissioning:

- Check that the air terminal devices are correctly seated.
- Remove protective film, if any.
- Ensure that all air terminal devices are clean and free from residues and foreign matter.
- Check that electrical connections (if any) have been correctly made.
- Ensure that the device has been correctly fixed and connected to the ducting.
- For air terminal devices with an electric actuator you have to check the correct position of the adjustable swirl unit for each operating mode:

- 'Heating' mode = blades should be open
- 'Cooling' mode = blades should be closed

**Note:** If the position of the swirl unit (i.e. blades) is not as it should be, you can change the direction of rotation on the actuator.



Fig. 12: Switch for changing the direction of rotation on actuators E1, E2 and E3

For commissioning see also VDI 6022, part 1 – 'Hygiene requirements for ventilation and air-conditioning systems and units'.

**Maintenance and cleaning**

Please note:

- Before you start cleaning an air terminal device with an electric actuator, make sure that no voltage is present.
- The cleaning intervals given in the VDI 6022 standard apply.
- Clean surfaces with a damp cloth.
- Use only common household cleaners, do not use any aggressive cleaning agents.
- Do not use cleaning agents that contain chlorine.
- Do not use equipment for removing stubborn contamination, e.g. scrubbing sponges or scouring cream, as it may damage the surfaces.

