



Air terminal devices

Jet nozzle Type TJN

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Product overview

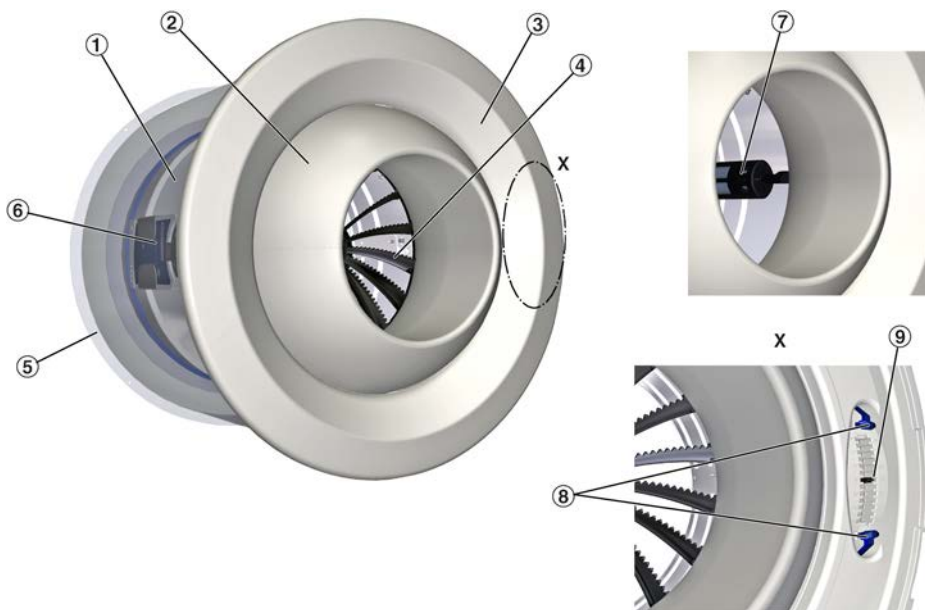


Fig. 1: Schematic illustration of TJN

- | | | | |
|---|--|---|------------------------------|
| ① | Spherical nozzle casing | ⑥ | Electric actuator (optional) |
| ② | Nozzle | ⑦ | Thermal actuator T1 (option) |
| ③ | Trim ring | ⑧ | Travel stops (adjustable) |
| ④ | Swirl unit and cap (an option in case of throw distance reduction) | ⑨ | Position indicator |
| ⑤ | Outer casing (optional) | | |

Note: If TJN is ordered with a swirl unit (optional), the swirl unit ④ is factory fitted with a thermal actuator (T1). For all other TJN variants you have to insert the swirl unit before you install the discharge nozzle, see Chapter 7.5 'Throw distance reduction' on page 16

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.

Technische Daten

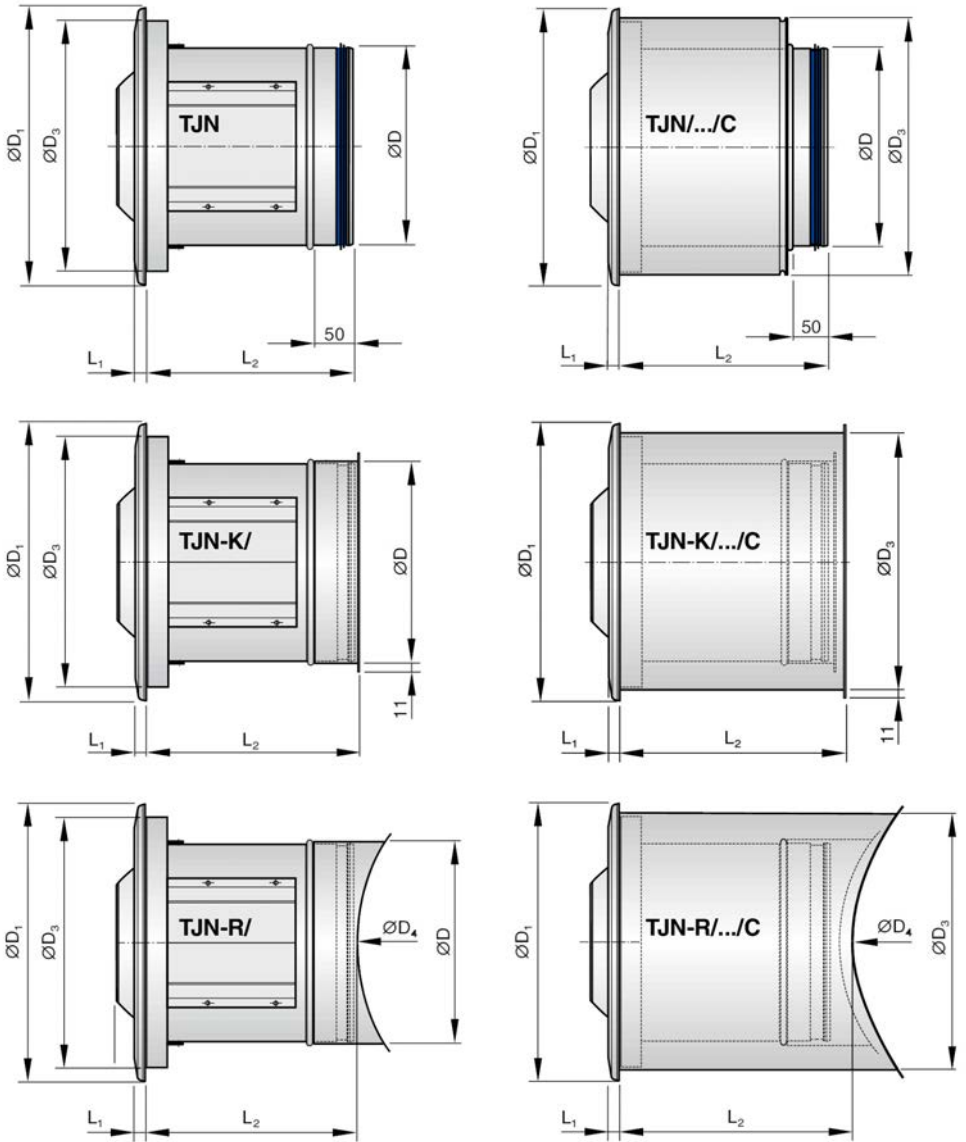


Fig. 2: Dimensions

Dimensions [mm]

NG	ØD	ØD ₁	ØD ₃	L ₁	L ₂							
					TJN TJN/.../C	TJN-K TJN-R	TJN-K /.../C	TJN-R /.../C	TJN-T1	TJN-R-T1 TJN-K-T1	TJN-K- T1/.../C	TJN-R- T1/.../C
160	158	258	227	15	242	248	258	261	302	308	318	321
200	198	298	263	14	250	257	267	270	310	317	327	330
250	248	348	315	14	260	265	276	279	320	325	336	339
315	313	413	379	15	275	281	291	294	335	341	351	354
400	398	501	468	16	285	292	302	305	345	352	362	365

ØD4: Diameter of the circular duct, according to order details

Weights [kg] – TJN, manual adjustment / actuator E7, E8, E9

Nominal size	TJN	TJN-K TJN-R	TJN/.../C	TJN-K/.../C TJN-R/.../C	Actuator (E7, E8, E9)	Swirl unit
160	1.9	2.1	2.7	3.5	0.2	0.2
200	2.3	3.2	3.4	4.3		
250	3.1	3.4	4.4	5.5		0.3
315	4.0	4.6	5.8	7.2		
400	4.6	6.5	8.0	9.9		

Weights [kg] – TJN with actuator T1

Nominal size	TJN	TJN-K TJN-R	TJN/.../C	TJN-K/.../C TJN-R/.../C	Actuator (T1)	Swirl unit
160	2.1	2.3	3.2	4.0	0.15	0.2
200	2.6	3.5	4.0	4.9		
250	3.5	3.8	5.1	6.2		0.3
315	4.5	5.1	6.7	8.1	0.4	
400	5.2	7.1	9.2	11.1		

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 air terminal devices 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.

Installation orientation

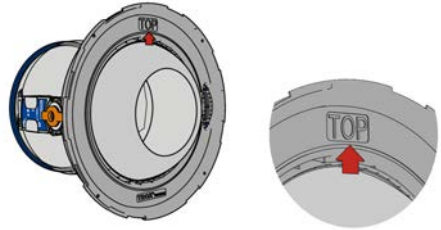


Fig. 3: Ensure the correct installation orientation



The thermal actuator (T1) applies only a low mechanical force to move the jet nozzle.

This is why you should take particular care when you install a jet nozzle with a thermal actuator. Contamination, e.g. dust, or exercising any tension can adversely affect its function.

Removing and fitting the trim ring

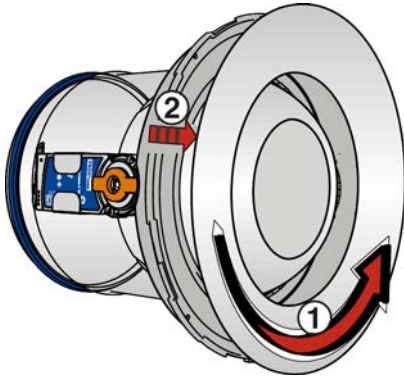


Fig. 4: Removing the trim ring

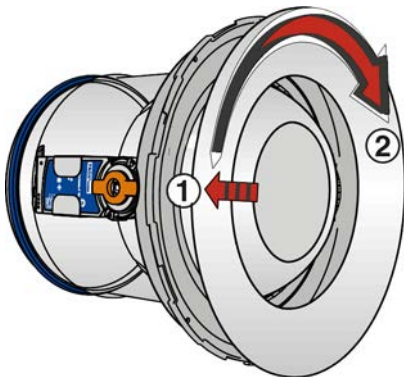


Fig. 5: Fitting the trim ring

Wall installation

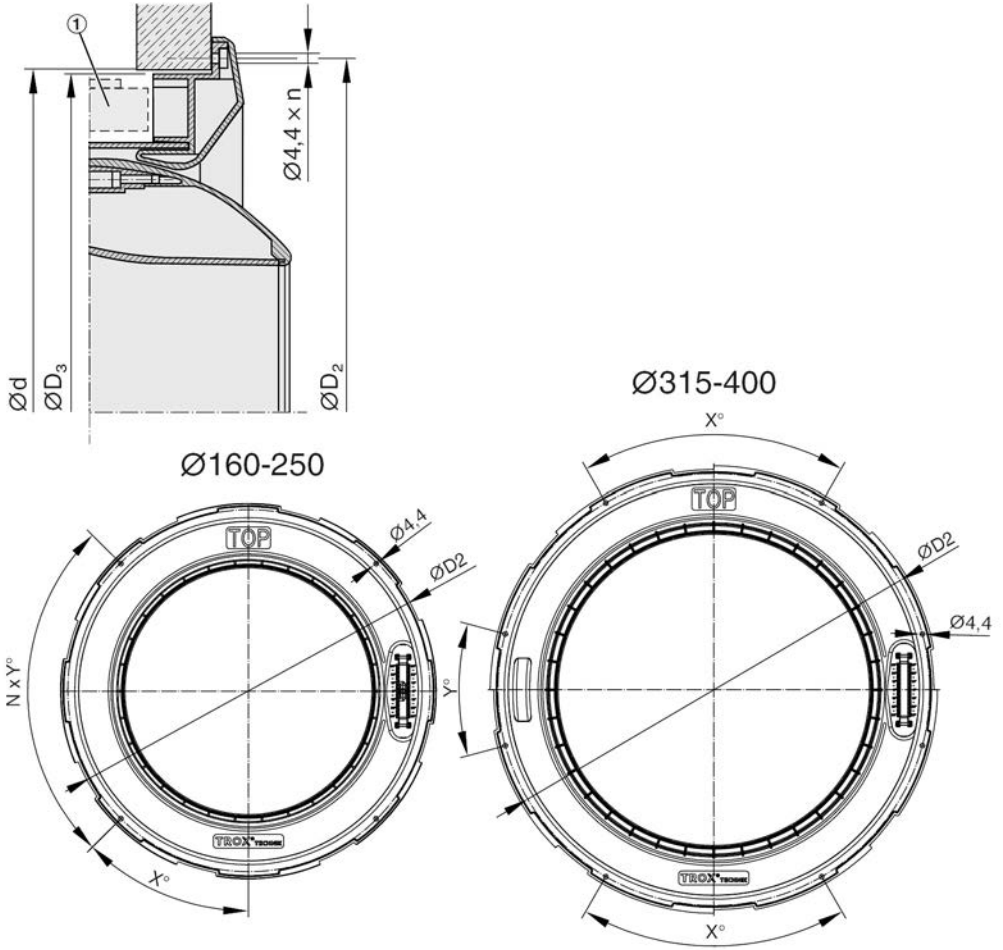


Fig. 6: ① Electric actuator (optional)

NG	$\varnothing D_2$	$\varnothing D_3$	$\varnothing d$	X	Y	n
160	238.5	227	229	0	72	5
200	278.5	263	266	30	60	4
250	330	315	318	45	90	4
315	393	379	382	60	30	8
400	481	468	470	60	30	8

Duct installation – circular duct

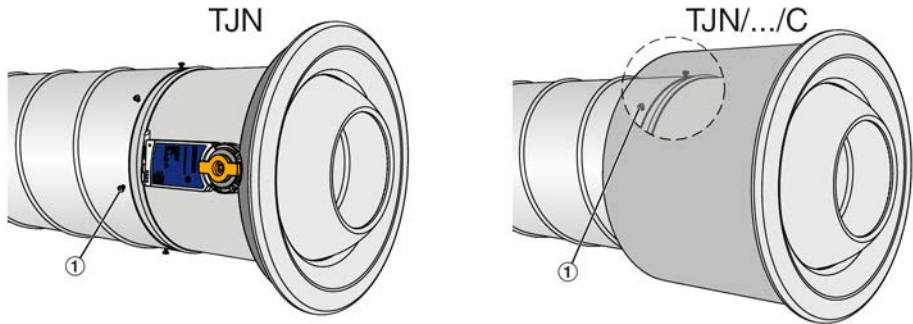


Fig. 7: Installation onto the end of a duct

Push TJN into the duct and fix it, e.g. with self-drilling screws (1).

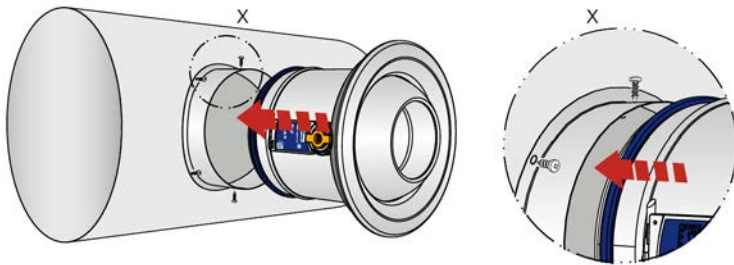


Fig. 8: TJN-R/... with saddle connector

Provide a hole for the saddle connector in the circular duct. Fix the saddle connector, then push TJN in and fix it, e.g. with self-drilling screws.

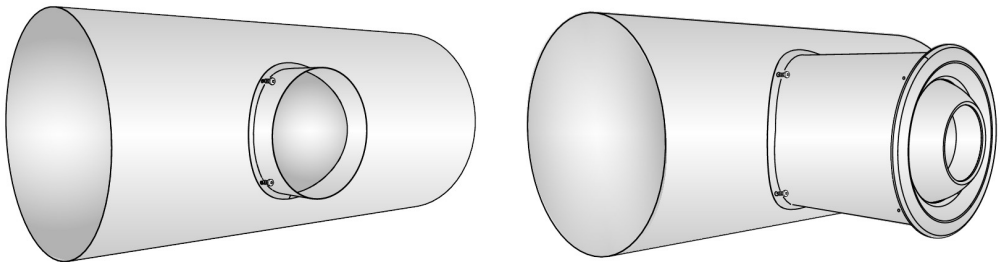


Fig. 9: TJN-R/.../C with saddle connector and outer casing

Variant with outer casing: Fix the outer casing to the duct.

Rectangular duct

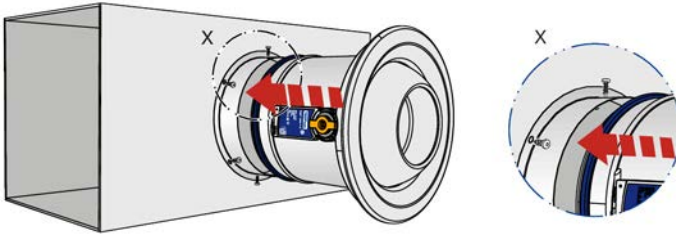


Fig. 10: TJN-K (with spigot that fits onto rectangular ducts)

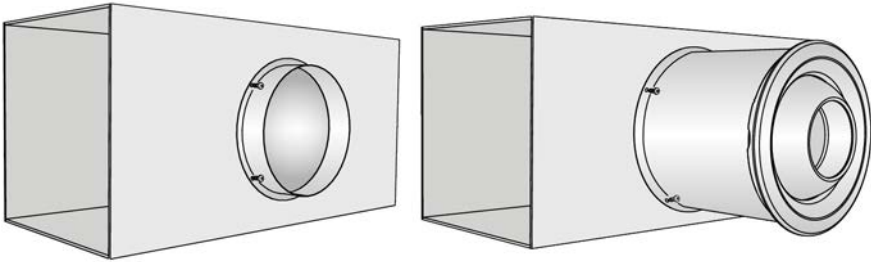


Fig. 11: TJN-K/.../C (with outer casing and spigot that fits onto rectangular ducts)

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.

Designation	-E7	-E8	-E9
Type	CM230-F TR	CM24-F TR	CM24-SX-F TR
Nominal voltage	100 ... 240 V AC 50/60 Hz	24 V AC 50/60 Hz 24 VDC	24 V AC 50/60 Hz 24 V DC
Work areas	–	–	DC 2...10 V
Functional range	AC 85...265 V	AC / DC 19.2...28.8 V	–
Position feedback	–	–	DC 2...10 V
Control input signal	–	–	DC (0)2...10 V
Power consumption	1.5 W with nominal torque	0.5 W with nominal torque	1 W with nominal torque
Operation			
Idle position	1 W	0.2 W	0.5 W
Rating	3 VA	1.0 VA	1.5 VA
Torque (nominal torque)	2 Nm min. with nominal voltage		
Manual adjustment	Gear release with magnet		
Rotation angle	–	–	Restricted by two mechanical travel stops
Rotation angle without restriction	Unrestricted		
Rotation angle with restriction	315° (fixed) or 0 ... 287.5°, restricted by travel stops, adjustable in increments of 2.5°		
Running time	75 s / 90°		
Damper movement	Positive lock connection, 10 mm		
IEC protection class	II (protective insulation)	III (protective extra-low voltage)	
Protection level	IP 54 for any installation orientation		
Weight	150 g		185 g
Position indicator	Mechanical attachment (including magnet for gear release)		Mechanical attachment
Connecting cable	1 m cable, 3 x 0.75 mm ²		1 m cable, 4 x 0.75 mm ²
Wiring diagram	Fig. 12, Fig. 13, Fig. 14, Fig. 15		Fig. 16

Electric open/close actuators

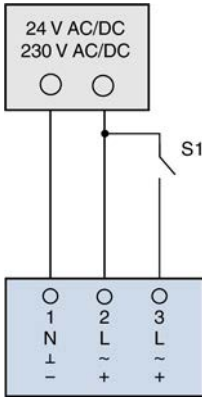


Fig. 12: Open/close control with NC or NO contact

S1	Direction of rotation
OPEN	Cooling
CLOSED	Heating

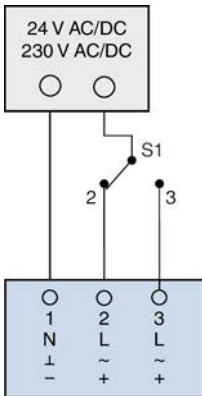


Fig. 13: Open/close control with changeover contact

S1	Direction of rotation
Pos. 2	Cooling
Pos. 3	Heating

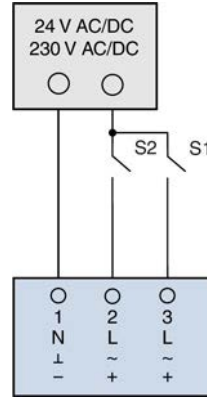


Fig. 14: 3-point control with NC or NO contact

S1	S2	Direction of rotation
OPEN	OPEN	Actuator has stopped (undefined position)
OPEN	CLOSED	Cooling
CLOSED	OPEN	Heating
CLOSED	CLOSED	Heating

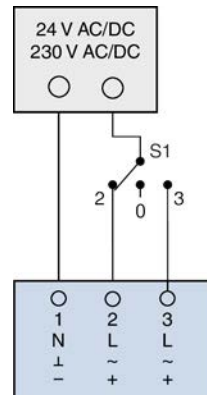


Fig. 15: 3-point control

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

Modulating actuators

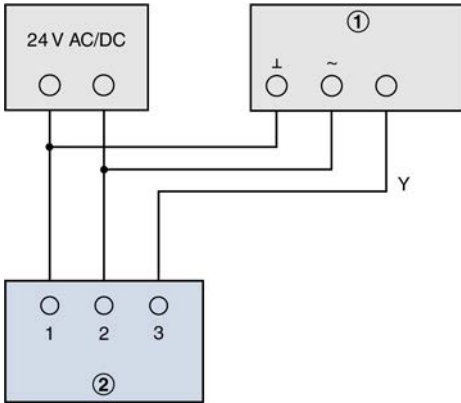


Fig. 16: Variable control

- ① Setpoint adjuster: Y = voltage signal 2-10 V DC
 - ② Modulating actuator
- (0) 2 V - Travel stop – cooling
 10 V - Travel stop – heating

Commissioning

Initial commissioning

Before you start commissioning:

- Check that the jet nozzles are correctly seated.
- Remove protective film, if any.
- Ensure that all jet nozzles are clean and free from residues and foreign matter.
- Check that electrical connections (if any) have been correctly made.
- Ensure that the devices have been correctly fixed and connected to the ducting.
- For jet nozzles with electric actuator: Check that the position of each discharge nozzle matches the operating mode, *Chapter 7.3 'Operating modes' on page 14*

Note: If the position of the discharge nozzle is not as it should be, you can change the direction of rotation on the actuator by swapping the terminal connections.

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

Thermal actuator T1

The smallest and largest swivel angles are reached with supply air temperatures of ≤ 18 °C and ≥ 30 °C.

Be sure to position the jet nozzle correctly for installation, *5.1 'Installation orientation' on page 6*. An incorrect position may impair its function.

A 'standard' jet nozzle cannot be retrofitted with a thermal actuator unit at a later stage since a thermal actuator requires a casing that is 60 mm longer.

Jet nozzles with thermal actuator may be factory fitted with a swirl unit (option) but it is not possible to retrofit a swirl unit at a later stage.

Removing the factory mounted swirl unit may impair the function of the jet nozzle.

Operating modes

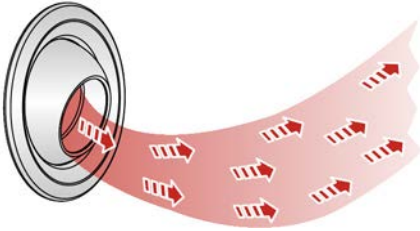


Fig. 17: Horizontal air discharge, heating mode

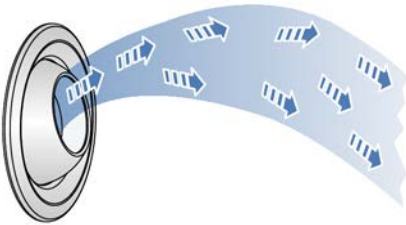


Fig. 18: Horizontal air discharge, cooling mode

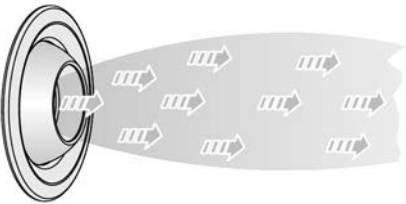


Fig. 19: Horizontal air discharge, isothermal

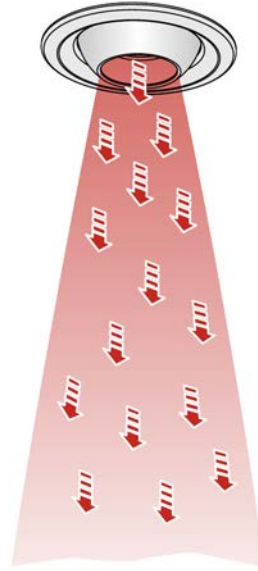


Fig. 20: Vertical air discharge, heating mode

Setting the travel stops (swivel angle)

TJN and TJN/.../T1

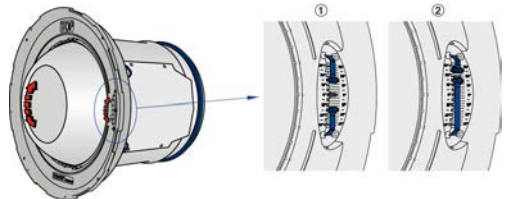
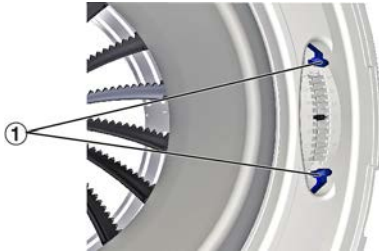


Fig. 21: TJN and TJN/.../T1

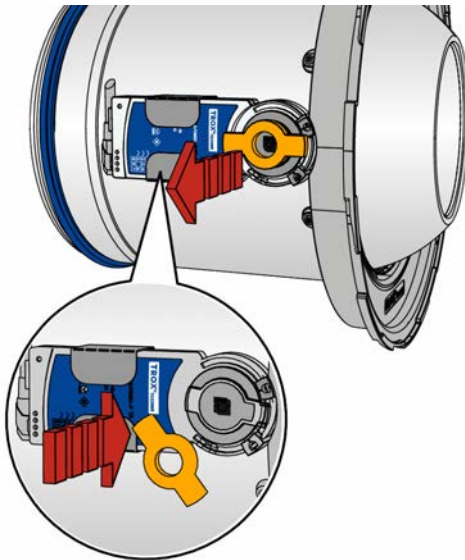
- 1 Nozzles with thermal actuator T1: Set the travel stops for heating mode and cooling mode.
- 2 Nozzles without an actuator: Set the nozzle position using the travel stops.

TJN/.../E*/...

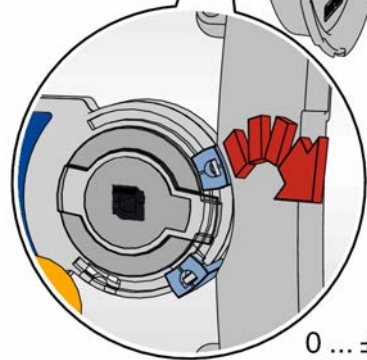
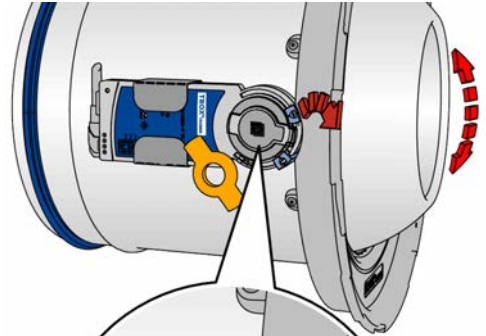
1. ▶ Remove the trim ring, ☞ 7.
TJN/.../C: Also remove the outer casing.



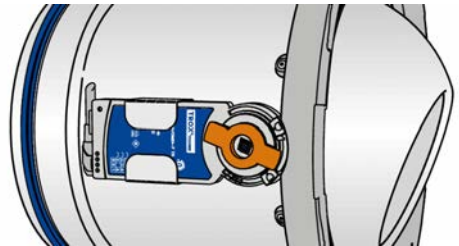
2. ▶ Set the travel stops ① as shown.



3. ▶ Remove the magnet from the shaft recess and place it on the actuator, see sticker on the actuator [magnetic gear release].



4. ▶ Set the nozzle to the correct position; remove the travel stops.



5. ▶ Put the travel stops back on to the correct position; put the magnet back to its earlier position.

For jet nozzles with modulating actuator CM24-SX-FTR a self adjustment is required. To start the self adjustment procedure, hold the magnet to the point on the actuator that is marked accordingly [magnetic adaption].

Throw distance reduction

TJN-.../.../D/... (with swirl unit)

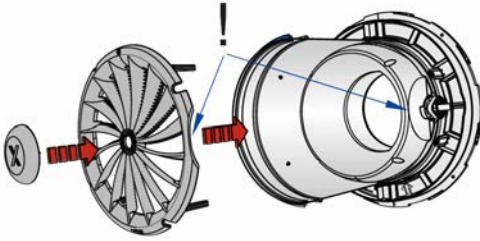


Fig. 22: Swirl unit for throw distance reduction

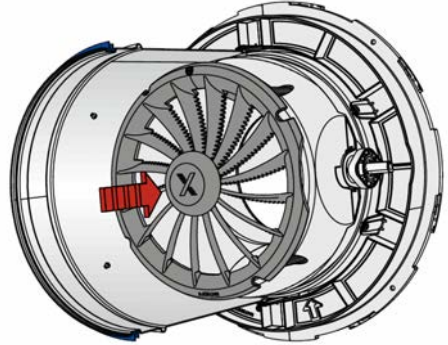


Fig. 25: Throw distance 65%

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.

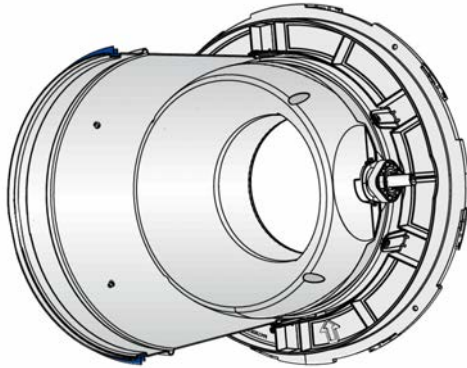


Fig. 23: Throw distance 100%

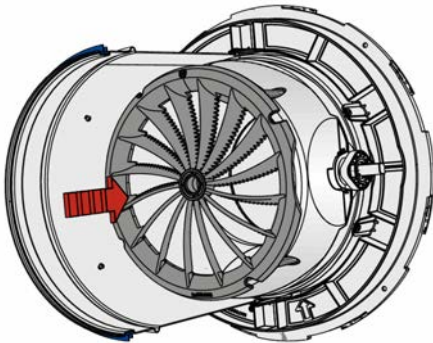


Fig. 24: Throw distance 75%