

Set Series

PIX STANDARD

Medium Voltage Distribution 12-17-24 kV
Forced Cooling Fan on Tunnel 4000 A

Installation, Operation, Maintenance, and Service Manual

BRU8628300-00

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Set Series

Featuring outstanding medium-voltage (MV) and low-voltage (LV) switchboards, motor control centres and power distribution solutions for high-performance power applications, Schneider Electric's Set Series is best-in-class solutions based on high levels of safety and an optimised footprint. Built on a modular architecture and incorporating smart connected devices for maximum safety, reliability, performance and energy efficiency, the Set Series is delivered to customers directly from our Schneider Electric plants or via a global network of licensed partner panel builders, who are trained and audited to provide quality equipment and support.

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Safety Information

Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety message indicates that an electrical hazard exists which will result in death or serious injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages with this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in death or serious injury.**

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in death or serious injury.**

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in minor or moderate injury.**

Failure to follow these instructions can result in injury or equipment damage.

NOTICE

NOTICE is used to address practices not related to physical injury.

Failure to follow these instructions can result in equipment damage.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and its installation and has received safety training to recognize and avoid the hazards involved.

Safety Precautions

Safety Rules

The safety hazards associated with the forced cooling fan must be assessed again following installation in the final product. The locally applicable industrial safety regulations are always to be observed when working on the forced cooling fan. Keep the workplace clean and tidy. Untidiness in the work area increases the risk of accidents.

NOTE: For performing any modifications, additions, or conversions on the forced cooling fan, contact Schneider Electric.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate Personal Protective Equipment (PPE) and follow safe electrical work practices. Refer to the standards or local equivalent.
- This Residual Current Circuit Breaker (RCCB) and the cooling fans must only be installed and serviced by qualified electrical personnel.
- Perform work only after reading and understanding all of the instructions contained in this guide.
- Respect the Lock Out Tag Out (LOTO) procedure according to OSHA requirements.
- Turn off all the power sources before working on or inside the equipment.
- Turn off or trip the RCCB, page 18 and discharge the mechanism.
- Always use a properly calibrated voltage sensing device to confirm power is off.
- Use only Schneider Electric specific tools (operating crank, extraction table, and so on).
- Check all devices, covers, and doors are in correct position before turning on the power.
- Beware of potential hazards and carefully inspect the work area for tools and objects that may have been left inside the equipment.
- Do not modify the mechanical or electrical parts.
- Do not bypass the interlocks before operation.
- Do not operate with protective barriers removed.
- When working on an electrically charged device, stand on a rubber mat.
- Turn off the low voltage supply while working on secondary connections.

Failure to follow these instructions will result in death or serious injury.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Ensure to wait at least five minutes after disconnecting the voltage at all poles before opening the device, as there can be electric discharge in the cubicle.
- Stay clear of the device's hazard area.
- When working on the device, switch OFF the line voltage and ensure it cannot be switched ON back. Wait until the device comes to a complete stop before proceeding.
- After working on the device, remove all the tools or other objects from the device.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

HAZARD OF ABNORMAL USE CONDITIONS

Make sure the forced cooling fan is operated according to its intended use. Refer to *About the Document*, page 8.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ CAUTION

HAZARD OF UNINTENDED EQUIPMENT OPERATION

- Ensure that the equipment is not faulty by ensuring the rotor and the impeller have basic insulation.
- Do not touch the rotor and impeller once installed.

Failure to follow these instructions can result in injury or equipment damage.

NOTICE

HAZARD OF INAPPROPRIATE MAINTENANCE

- Check the device's electrical equipment at regular intervals, Refer to *Safety Inspection*, page 43.
- Replace any loose connections and defective cables immediately.

Failure to follow these instructions can result in equipment damage.

NOTICE

HAZARD OF INAPPROPRIATE HANDLING AND STORAGE

- Comply with the handling rules and avoid causing any shocks to the device.
- If the equipment is stored before its final installation, observe the storage conditions, refer to *Storage*, page 14.

Failure to follow these instructions can result in equipment damage.

Cleaning Instructions

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Do not use solvents or alcohol for cleaning the equipment.
- Do not use high-pressure cleaner for cleaning the equipment.

Failure to follow these instructions will result in death or serious injury.

About the Document

Intended Use

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

Do not operate the forced cooling fan in the following ways:

- Operating the forced cooling fan in an unbalanced state, for example due to dirt deposits or ice formation
- Resonant operation, operation with severe vibration. This also includes vibration transmitted to the fan from the customer installation.
- Operation in medical equipment with a life-sustaining or life-support function.
- Conveying solids in the flow medium.
- Painting the forced cooling fan.
- Conveying highly corrosive air, for example salt spray. Exception: devices designed for salt spray and correspondingly corrosion protected.
- Conveying air with high dust content, for example suction off sawdust.
- Operating the forced cooling fan close to flammable materials or components.
- Operating the forced cooling fan in an explosive atmosphere.
- Using the forced cooling fan as a safety-device or to perform safety-related functions.
- Operation with completely or partially disassembled or manipulated protective devices.
- In addition, all applications not listed among the intended uses.

Failure to follow these instructions will result in death or serious injury.

WARNING

HAZARD OF INAPPROPRIATE USE CONDITIONS

Any other usage above and beyond this, does not comply with the intended purpose and constitutes misuse of the forced cooling fan.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The forced cooling fan is exclusively designed as a built-in forced cooling fan for conveying air according to its technical data.

Customer equipment must be capable of withstanding the mechanical and thermal stresses that may arise from this product.

This applies for the entire service life of the equipment in which this product is installed.

All dimensions not specified in detail are in millimeters.

Intended use also includes:

- Use of the forced cooling fan in stationary systems only.
- Performance of all maintenance work.
- Conveying air is always at an ambient air pressure.
- Using the forced cooling fan within the permitted ambient temperature range, refer to [Transport](#), page 14 and [Electromagnetic Compatibility \(EMC\)](#), page 15.
- Operate the forced cooling fan with all protective devices.

- Following the operating instructions.

Related Documents

Title of Document	Reference Number
Pressure Relief Channel 1000 mm	AGSC73700
Gas channel 1000 mm Anti Air Ventilating System (AAVS) Rear Exhaust	PKR92704
Pressure Relief Channel 1000 mm AAVS Vent	BQT10948

Safety Provisions

Read the following instructions carefully before working on the fan, and perform the work detailed in them as described. Do not perform any work which is not described in this guide.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Respect the LOTO procedure according to OSHA requirements.
- Ensure that the system is isolated from high voltage, supply voltage, and properly grounded.
- Ensure that the VCB is in test condition, the E/S is closed, and access is locked.
- Do not operate the device without a guard, as a person's hands could accidentally get trapped in the machine while it is running.
- Additionally, loose parts (like small tools) or loose clothing could be pulled into the device, leading to serious injury.
- The device is a built-in component. As the owner is responsible for ensuring that the device is adequately safeguarded. Operate the device only with a fixed protective device and guard grill.
- Stop the device immediately if a protective device is found missing or ineffective.

Failure to follow these instructions will result in death or serious injury.

WARNING

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Comply with the applicable country specific national standards where the equipment will be installed.
- Other standards or regulations have to be checked and accessed locally.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Applicable Standards and Regulations

The applicable standards and regulations are as follows:

- Adjustable speed electrical power drive systems (Safety requirements - Electrical, thermal and energy): EN 61800-5-1.
- Adjustable speed electrical power drive systems (Generic interface for power drive systems - Communication and control): EN 61000-6-2.
- Electromagnetic compatibility (EMC).
(Generic standards - Emission standard for residential, commercial, and light-industrial environments): EN 61000-6-3.

Electromagnetic Compatibility (EMC)

The applicable EMC standards are as follows:

- EMC immunity to interference: EN 61000-6-2.
- EMC circuit feedback: EN 61000-3-2/3.

Design and Description

Product Drawing

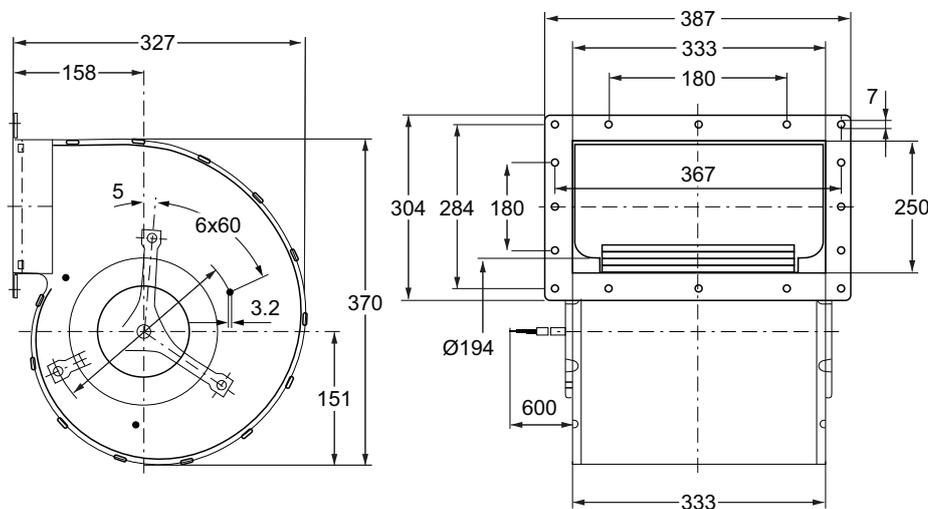


Figure 1
Sectional View of the Forced Cooling Fan

Nominal Data

Description	Specification	
Type	D6E225-FB07-02	
Motor	M6E068-LA	
Phase	1-230	
Nominal voltage (V)	1-230	
Frequency (Hz)	50	60
Type of data definition (ml)		
Valid for approval/standard (CE)		
Speed (min ⁻¹)	800	900
Power input (W)	365	410
Current draw (A)	1.60	1.80
Motor capacitor (µF)	10	
Capacitor voltage (VDB)	450	
Minimum back pressure (Pa)	20	80
Maximum ambient temperature (°C)	30	
Air flow (m ³ /h)	2680	2480
Back pressure (Pa)	20	80
Sound pressure level [Db(A)]	59	59

Nameplate

The type designation on the nameplates on the front of the panels (Figure 2) informs about essential technical data. When submitting enquiries to the manufacturer or ordering spare parts, the following information is required:

- Type designation
- Serial number
- Year of construction

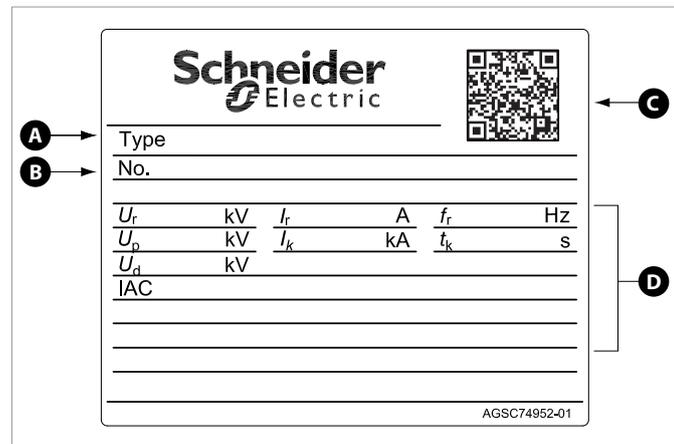


Figure 2
Nameplate on Panel Front

- | | | | |
|---|------------------|---|----------------------|
| A | Type designation | C | Year of construction |
| B | Serial number | D | Technical data |

Technical Description

Description	Value
Size	225 mm
Leakage current	< 0.75 mA
Operation mode	Continuous operation (S1)
Direction of rotation	Counter-clockwise, seen on rotor
Insulation class	B
Bearing motor	Ball bearing
Mass	12.5 kg
Housing material	Sendzimir galvanized sheet steel
Material of impeller	Sendzimir galvanized sheet steel
Motor protection	Thermal Overload Protector (TOP) wired internally
Type of Protection	IP54
Protection class	I

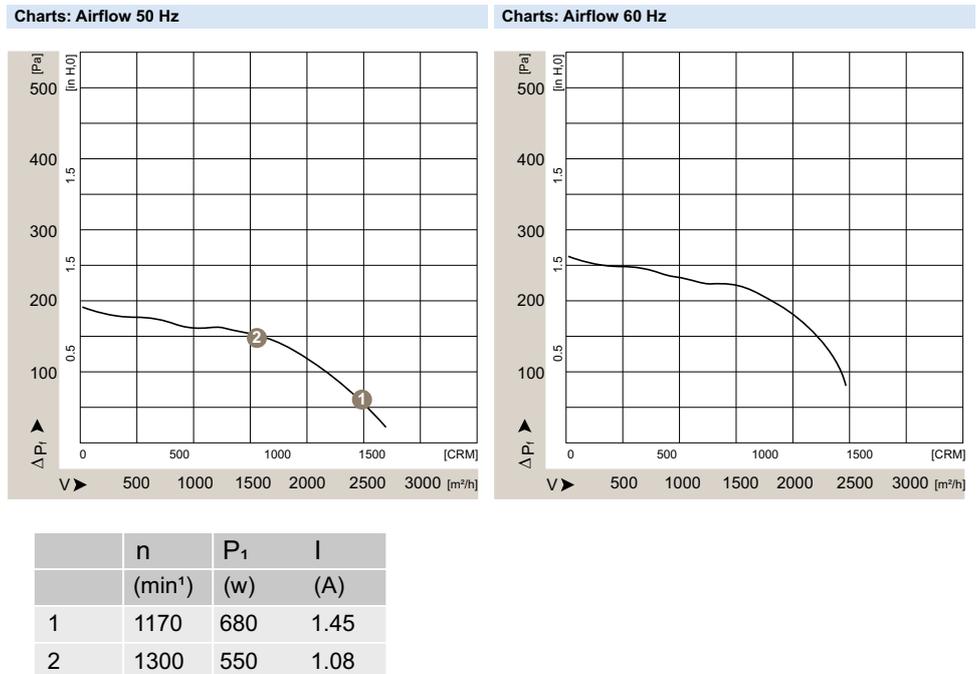


Figure 3
Airflow Charts

Screw Fastenings

⚠ CAUTION

HAZARD OF INAPPROPRIATE ASSEMBLY

During the assembly, always use the tightening torque values mentioned in the table below.

Failure to follow these instructions can result in injury or equipment damage.

The following elements should be used for all screw fastenings:

- Screws and bolts: Grade ≥ 8.8
- Nuts: Grade 8

NOTE: Do not grease screws or nuts.

Hex, bolts, socket-head cap screws (except slotted screws), and nuts (except self-locking nuts and rivet nuts/insert nuts)		
Thread size	Tightening torque (N•m)	
	Min.	Max.
M5	3.8	4.7
M6	7	9
M8	16	24
M10	36	44
M12	63	77

Screw fastening with casting nuts in cast resin parts (transformer and post insulator)		
Thread size	Tightening torque (N•m)	
	Min.	Max.
M6	5	7.5
M8	12	18
M10	24	38
M12	63	54

Screw fastening for current transmission conductor material is copper		
Thread size	Tightening torque (N•m)	
	Min.	Max.
M6	5.5	7.5
M8	12	19
M10	30	40
M12	60	76

Transport

⚠ WARNING

HAZARD OF INAPPROPRIATE HANDLING

When transporting the fan, ensure that the units do not slip or tip.

Ensure that the specified transport temperature conditions are met.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTICE

HAZARD OF TRANSPORT UNDER INADEQUATE CONDITIONS

Ensure that the specified transport temperature conditions are met.

Failure to follow these instructions can result in equipment damage.

Transport temperature conditions:

- Maximum permitted ambient temperature for motor: + 80 °C
- Minimum permitted ambient temperature for motor: - 40 °C

Storage

⚠ WARNING

HAZARD OF STORING UNDER INADEQUATE CONDITIONS

Ensure that the storage area is even and supporting area provides sufficient stability.

Ensure that the specified storage conditions are met.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTICE

HAZARD OF STORING UNDER INADEQUATE CONDITIONS

Comply with the storing time before installation is compliant with the warranty period in the terms and conditions.

Storage only in packed condition. Performance will not be guaranteed if stored in open condition.

Failure to follow these instructions can result in equipment damage.

If the panels are not installed immediately after delivery, they can be stored under the following conditions:

- Indoor storage only is admissible.
- Fans and accessories can be stored sealed with desiccants in aluminum foil and packed in a wooden box.
- Pallet is not removed before/until installation.
- The storage room environment must be healthy, no rodents, humidity control $\leq 95\%/\leq 90\%$ for 24 hours and 1 month respectively, and no water on the floor.

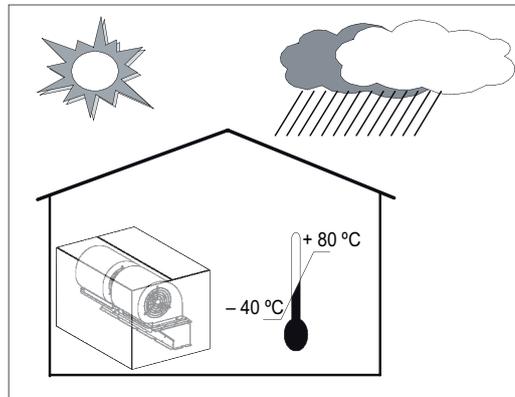


Figure 4
Indoor Storage of the Forced Cooling Fan

Electromagnetic Compatibility (EMC)

The applicable EMC standards are as follows:

- EMC immunity to interference: EN 61000-6-2.
- EMC circuit feedback: EN 61000-3-2/3.

Connection and Startup

Mechanical Connection

⚠ WARNING

HAZARD OF INAPPROPRIATE HANDLING

Two personnel are required to remove the device from its packaging.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ CAUTION

CRUSH HAZARD

- To avoid any shocks, carefully remove the blowers from its packaging only by touching the housing.
- Comply with the electrical safety precautions. Refer to *Safety Precautions*, page 6.
- Apply appropriate PPE and follow safe electrical work practices.

Failure to follow these instructions can result in injury or equipment damage.

⚠ CAUTION

HAZARD OF INAPPROPRIATE ASSEMBLY

Ensure that the device is securely positioned at its place of installation until all fastening screws have been tightened.

Failure to follow these instructions can result in injury or equipment damage.

NOTICE

HAZARD OF ABNORMAL USE CONDITIONS

Bearing damage can cause shorter service life:

- Ensure there is no damage to the device from vibration.
- Do not subject the fan to force or excessive vibration from sections of the installation.
- Isolate the connection from vibration, if the fan is connected to air ducts, for example using compensators or similar elements.
- Ensure that the fan is attached to the substructure without causing any stress or strain.
- Check the device for transport damage. Do not install the damaged devices.
- Install the undamaged device in accordance with your application.
- The fan must not be strained on fastening.

Failure to follow these instructions can result in equipment damage.

Electrical Connection

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Comply with the safety precautions. Refer to Safety Precautions, page 6.
- Apply appropriate PPE and follow safe electrical work practices. See standards or local equivalent.
- Before working on the electrical hookup, short the supply and earthing connections.
- Ensure all the earthing connections that are essential for electrical current to safely ground in the event of a system fault or overload.
- Check for the correct earthing.

Failure to follow these instructions will result in death or serious injury.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Only use the cables that meet the specified installation regulations for voltage, current, insulation material, capacity, and so on.
- Ensure that the cables are routed so they do not come into contact with any rotating parts.

Failure to follow these instructions will result in death or serious injury.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Ensure the device is a built-in component and has no disconnecting switch.
- Only connect the device to circuits that can be switched OFF with an all-pole disconnection switch.
- When working on the device, secure the system/machine in which the device is installed to help prevent it from being switched ON back.

Failure to follow these instructions will result in death or serious injury.

CAUTION

HAZARD OF INAPPROPRIATE USE CONDITIONS

Ensure that there is no water ingress into wires or cables, as water entry from customer's connection points can damage the device.

Ensure that the end of the cable is connected in a dry environment.

Failure to follow these instructions can result in injury or equipment damage.

Electrical charge (>50 μC) between phase conductor and earthing connection after switching OFF supply with multiple devices connected in parallel.

Requirements

⚠ WARNING

HAZARD DUE TO OVERHEATING

- The earthing must have a cross-section equal to or greater than that of the phase conductor.
- Ensure that only 105 °C cables are used to avoid overheating.
- Make sure that the minimum cable cross-section is at least AWG 26/0.13 mm².

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Check the following before connecting the device:

- Nameplate matches the connection data.
- Power supply matches the device voltage.
- Cables used are designed for the current level indicated on the nameplate.

For determining the cross-section:

- Make sure the sizing criteria is according to EN 61800-5-1:
 - The resistance requirements for both the earthing connection circuit and the customer earthing connection points should comply with the indicated standard.
 - Depending on the installation condition, it may be necessary to connect an additional earthing conductor through the extra earthing terminal provided on the device.
 - The earthing terminal is located on the housing and provided with an earthing symbol and a hole.

Reactive Currents

As the EMC filter complies with EMC limits (interference emission and immunity to interference), reactive currents can be measured in the supply line even when the motor is at a standstill and the line voltage is switched ON.

The reactive current values are typically in the range < 250 mA.

At the same time, the effective power in this operating state (operational readiness) is typically < 4 W.

RCCB

NOTE: Only pulse-current sensitive and/or AC/DC sensitive residual current devices (type F or B) are permissible, if the Residual Current Device (RCD) is required in your installation.

The residual current devices are being operated with the variable frequency drives, it helps make sure of self-protection.

When the device power supply is switched ON, pulsed charging currents from the capacitors in the integrated EMC filter can lead to the residual current devices tripping instantly.

It is recommended to use residual current circuit breakers with a trip threshold of 300 mA and delayed tripping (super-resistant, characteristic K).

Basic Insulation of the Alarm Relay

NOTE: Take the corresponding precautions for industrial applications (EN 61800-5-1), as the alarm relay has only basic insulation (for TN/TT systems) or functional insulation (for phase-conductor-grounded networks) with respect to the supply voltage, and does not have double insulation like the rest of the interface.

The voltage switched by the alarm relay (for example 230 Vac) must then have no electrical connection to the control input and GND (electrically isolated interface).

Locked-Rotor Protection

NOTE: Due to the locked-rotor protection, the starting current that is Locked Rotor Amperage (LRA) is equal to or less than the nominal current that is Full Load Amperage (FLA).

Cables Connection

The device has external leads:

- Connect the earthing.
- Connect the cables according to the application. For more details, refer to Connection Diagram, page 20.

Factory Settings

Factory settings made for the device by Schneider Electric:

Description	Value
Mode	PWM control
Group address	01
Fan/device address	01
Maximum PWM/%	100
Minimum PWM/%	0
Save set value to EEPROM	No
Set value requirement	Analog
Direction of action	Positive (heating)

Checking Connections

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Make sure that there is isolation from supply (all phases).
- Make sure that the restart is impossible.
- Check for all the cables for proper fit.

Failure to follow these instructions will result in death or serious injury.

Switching ON the Forced Cooling Fan

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Ensure that there are no combustible or flammable materials located near the blower.
- Before switching ON, check the forced cooling fan for visible external damage and make sure the protective devices are functional.
- Check the fan's air flow paths for foreign matter and remove any foreign matter found.
- Apply the nominal supply voltage.
- Start the forced cooling fan by changing the input signal.
- Ensure no part is falling into the cubicle during service.

Failure to follow these instructions will result in death or serious injury.

WARNING

HAZARD OF INAPPROPRIATE OPERATION

The forced cooling fan should only be switched ON if it has been installed correctly and in line with its intended use, including necessary protective mechanisms, and professional electrical connections.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTICE

HAZARD OF ABNORMAL USE CONDITIONS

- Ensure there is no bearing damage, it can cause shorter service life.
- Ensure the fan operates with low-vibration across the entire speed control range.
- Operation with excessively high vibration levels can lead to premature failure.
- Avoid severe vibration which can occur due to inexpert handling, transportation damage, and resultant imbalance or by component or structural resonance.
- Avoid high vibration levels during fan commissioning.
- Identify speed ranges with excessively high vibration levels and potential resonant frequencies.
- Either run through the resonant range as quickly as possible with speed control or find another remedy.

Failure to follow these instructions can result in equipment damage.

This requirement also applies to devices that the customer installed with plugs, terminals, or similar connectors.

For more details on connections, refer to [Connection Diagram](#), page 20.

Switching OFF the Forced Cooling Fan

Switching OFF the forced cooling fan during operation:

- Switch OFF the forced cooling fan via the control input.
- Do not switch ON and switch OFF the motor (for example in cyclic operation) through power supply.

Switching OFF the forced cooling fan for maintenance:

- Switch OFF the forced cooling fan via the control input.
- Do not switch ON and switch OFF the motor (for example in cyclic operation) through power supply.
- Disconnect the forced cooling fan from the power supply.
- When disconnecting, also disconnect the ground earthing.

Assembly

Positions of the Extra Cooling Fan in the Switchboard

NOTE: In principle, extra cooling is necessary for the following:

- The CB-HVX (Circuit Breaker) and DS-UTX (Disconnecter) units when uprated from 3150–4000 A.
- If the incomer is far from the coupler, additional cooling to be installed to cool the middle busbar or maximum at every four outgoing cubicles.

The activation of the middle fans shall follow the nearest 4000 A incomer.

Fans Over CB			Fans Over CB			Fans Over CB		Fans Over CB		Fans Over CB			Fans Over CB
LV	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV
CB	CB	CB	CB	CB	CB	CB	With UTX	CB	CB	CB	CB	CB	CB
Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables
Incoming 4000 A						Coupler 4000 A		Riser 4000 A		Incoming 4000 A			

Fans Over CB				Fans Over CB				Fans Over CB				Fans Over CB	
LV	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV
CB	CB	CB	CB	CB	CB	CB	CB	CB	CB	Without UTX	CB	CB	CB
Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables
Incoming 4000 A									Coupler 4000 A		Riser 4000 A		Incoming 4000 A

					Fans Over CB		Fans Over CB							Fans Over CB
LV	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV
CB	CB	CB	CB	CB	CB	CB	Without UTX	CB	CB	CB	CB	CB	CB	CB
Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables	Cables
					Incoming 4000 A		Coupler 4000 A	Riser		Incoming 4000 A				

Number of Forced Cooling Fans

To provide extra cooling, only one fan is required. An additional fan is installed alongside the first one as a standby, in case of any potential fan malfunction.

An automatic or manual change-over switch is provided in the control circuit to easily switch between the operational fan and the standby fan.

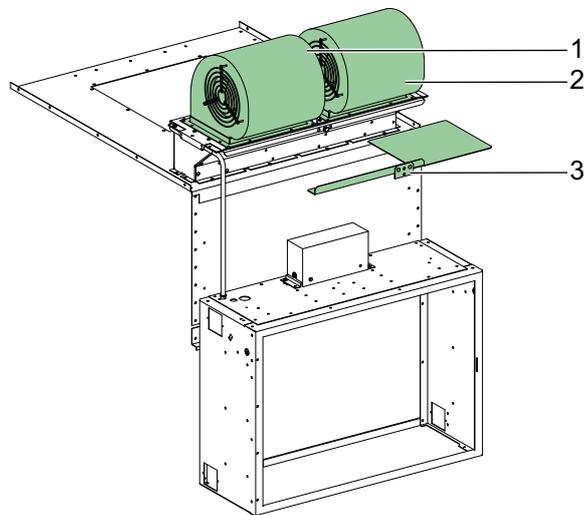


Figure 6
Number of Forced Cooling Fans

- 1 Standby status (in operation)
- 2 Reserved status
- 3 Invertible / Removable plate airflow block

Assembly of Forced Cooling Fan

▲ CAUTION

HAZARD OF INCORRECT ASSEMBLY

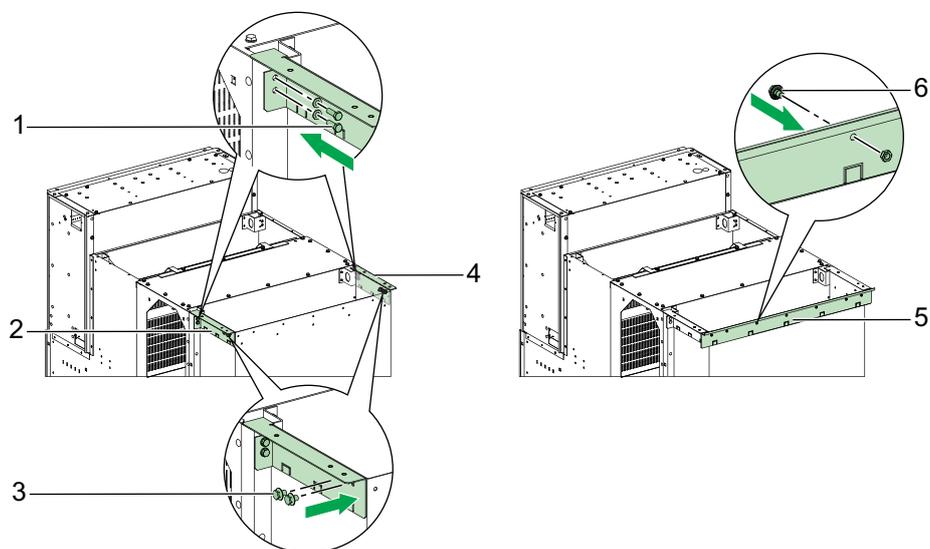
- Comply with the safety precautions, refer to the Safety Precautions, page 6
- Assembly of the product must be performed or supervised by qualified personnel only.

Failure to follow these instructions can result in injury or equipment damage.

Follow the below procedure for tunnel and forced cooling fan assembly:

Assembly of the Frame (Support plates, Frame, and Rear sheets):

1. Assemble the rear frame support plate A (2) with the two M8 x 25 bolts (1) and two M6 x 8 bolts (3).
2. Assemble the rear frame support plate B (4) with the two M8 x 25 bolts (1) and two M6 x 8 bolts (3).
3. Assemble the rear frame support plate C (5) with the seven M6 x 8 bolts (6).

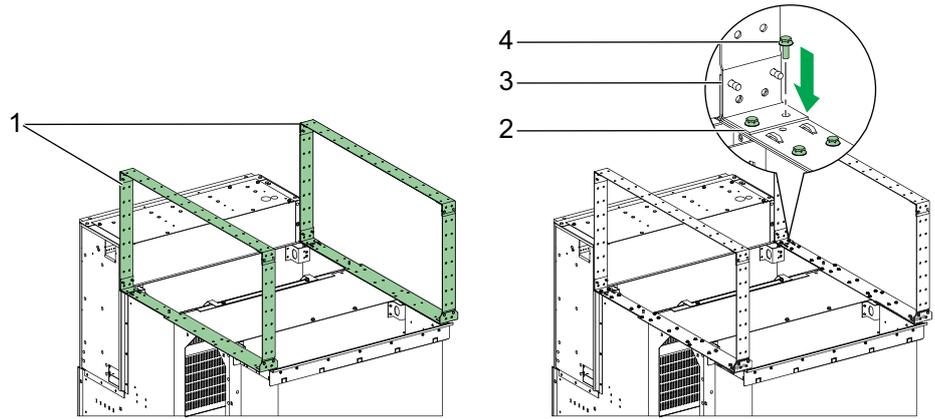


- 1 M8 x 25 bolts
2 Support plate A
3 M6 x 8 bolts

- 4 Support plate B
5 Support plate C
6 M6 x 8 bolts

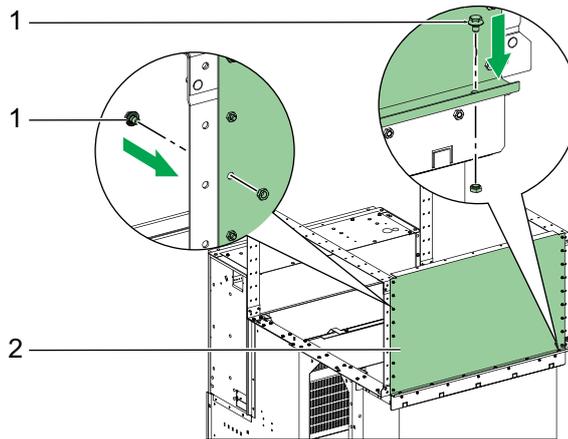
4. Assemble both the frames (1) with the 44 M6 bolts (4).

NOTE: Use M6 x 12 bolts for two sheet metal plates joint (3) and M6 x 16 bolts for three sheet metal plates joint (2).



- | | | | |
|---|--------------------------------|---|------------------------------|
| 1 | Frames | 3 | Two sheet metal plates joint |
| 2 | Three sheet metal plates joint | 4 | M6 bolts |

5. Assemble the rear sheet (2) with the 24 M6 x 12 bolts (1).



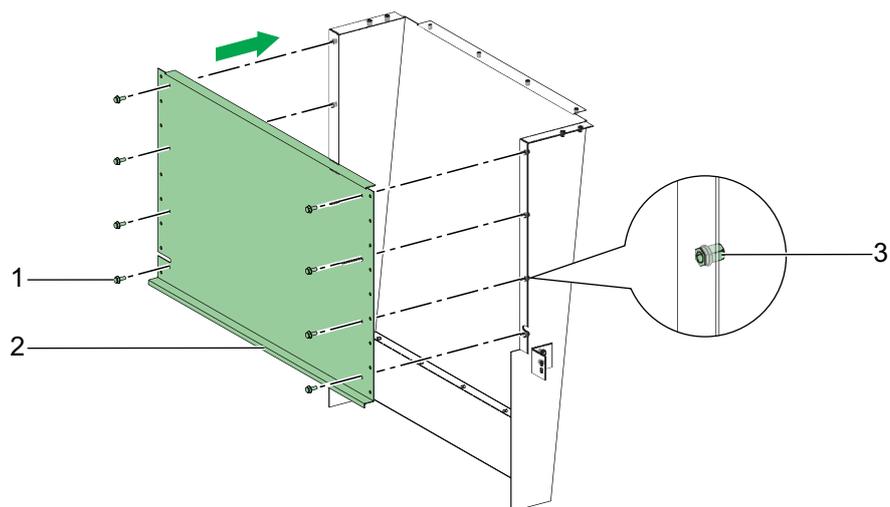
- | | |
|---|---------------|
| 1 | M6 x 12 bolts |
| 2 | Rear sheet |

Assembly of the ventilation channel:

1. Insert the 16 M6 rivet nuts (3) on the air ventilation channel using a rivet gun.

NOTE: Follow the above step only if the rivet/insert nuts are not installed to the panel.

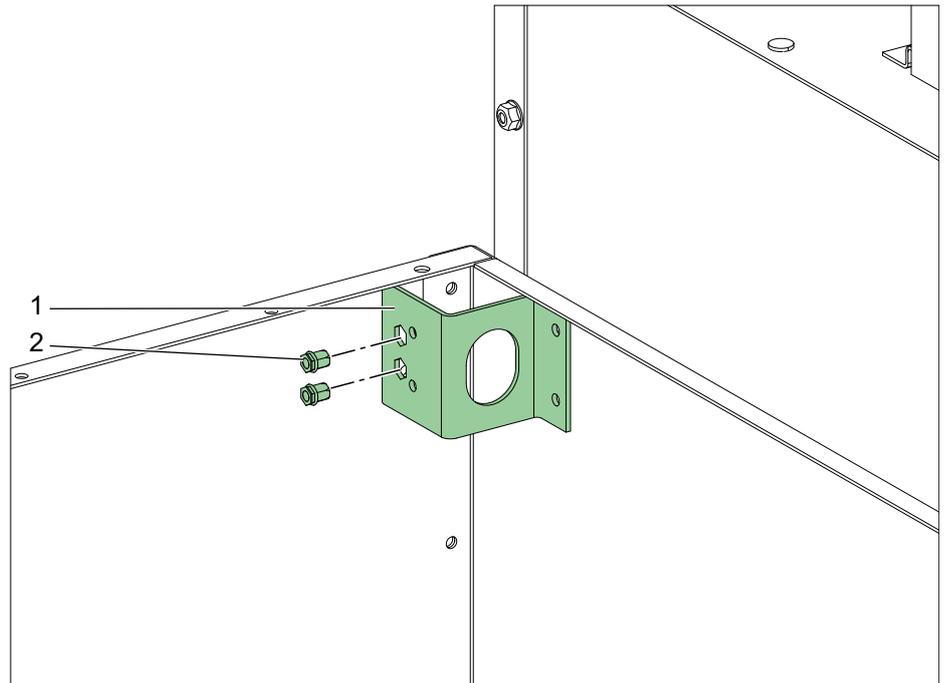
2. Pre-assemble the air ventilation channel to the front plate (2) of the gas tunnel using eight M6 x 12 bolts (1).



- 1 M6 x 12 bolts
2 Front plate
3 M6 rivet nuts

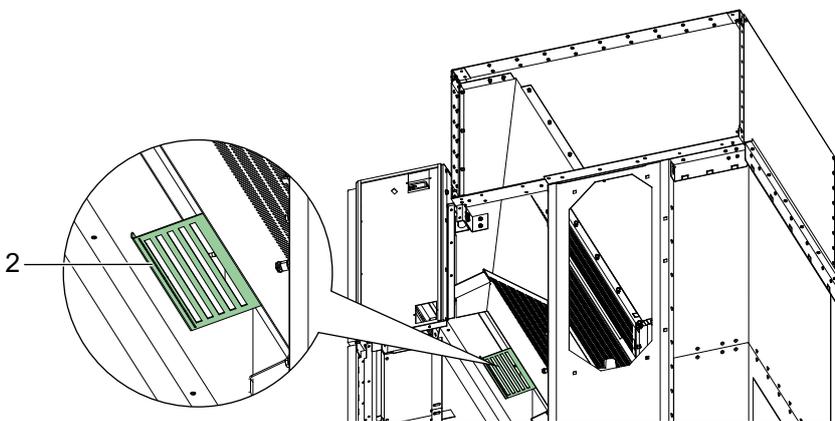
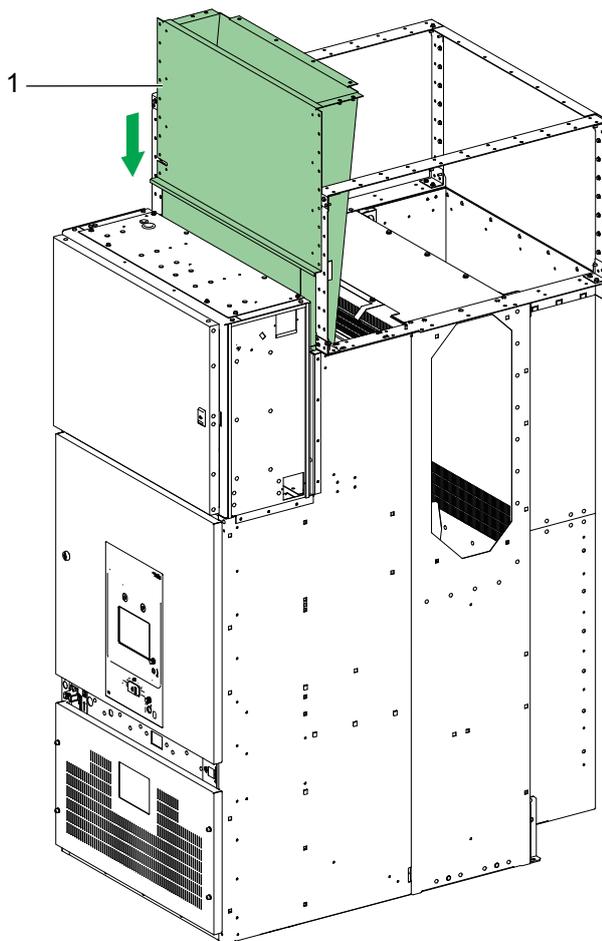
3. Before starting the assembly, insert the two M6 rivet nuts (2) on the front lifting brackets (1) using a rivet gun.

NOTE: Follow the above step only if the rivet/insert nuts are not installed to the panel.



- 1 Front lifting brackets
- 2 M6 rivet nuts

4. To install the ventilation channel:
 - a. Insert the ventilation channel (1) from the top of the cubicle into the circuit breaker compartment.



- 1 Ventilation channel
- 2 Pressure relief flap

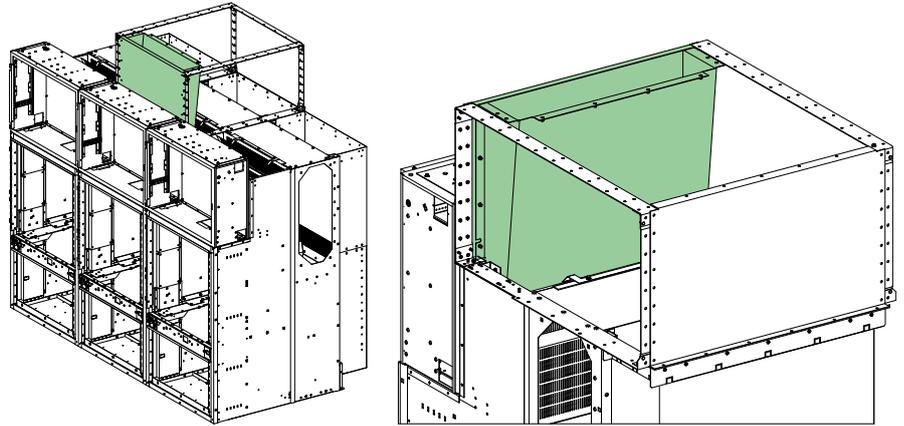
NOTICE

HAZARD OF INAPPROPRIATE ASSEMBLY

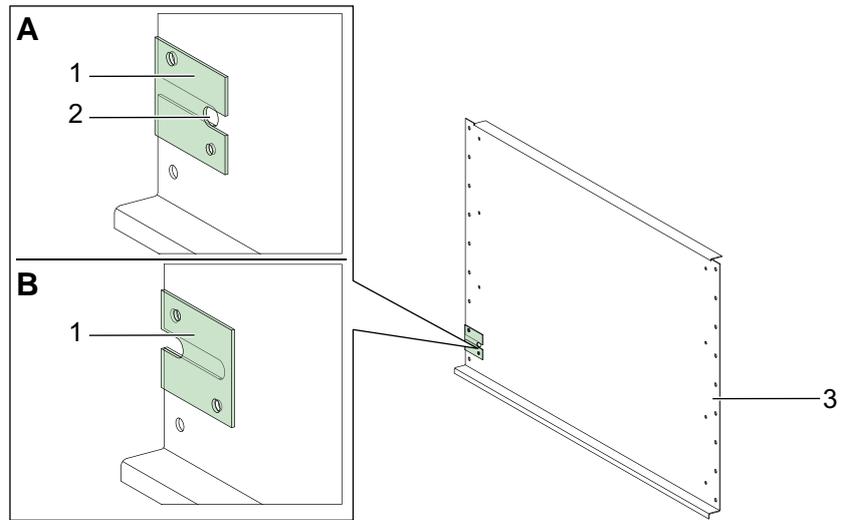
During the insertion of the ventilation channel, coordinate the pressure relief flap to their functional positions.

Ensure the ventilation channel should not collide with the pressure relief flap during its insertion.

Failure to follow these instructions can result in equipment damage.

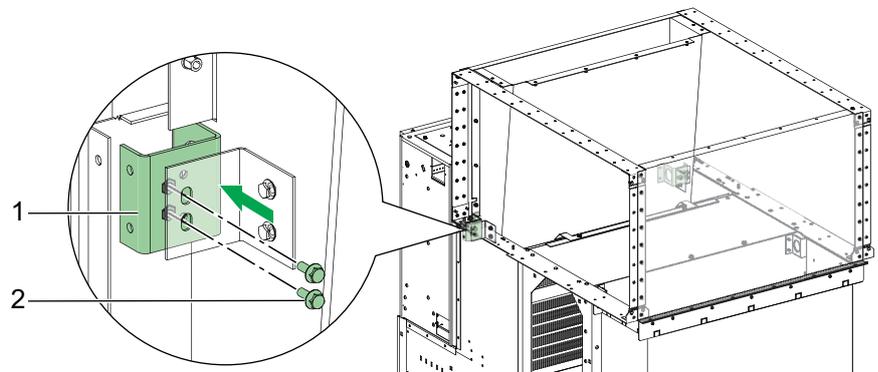


NOTE: In case an arc sensor (1) is present, the sensor cable can be routed through the hole (2) in the front plate (3), refer to below figure view A. Without the sensor, the cover should be flipped, which closes the hole (2) completely, refer to below figure view B.



- 1 Arc sensor
- 2 Hole for sensor cable
- 3 Front plate

b. Fix the ventilation channel to the front lifting brackets (1) of the cubicle with four M6 x 16 bolts (2) two each on either side.

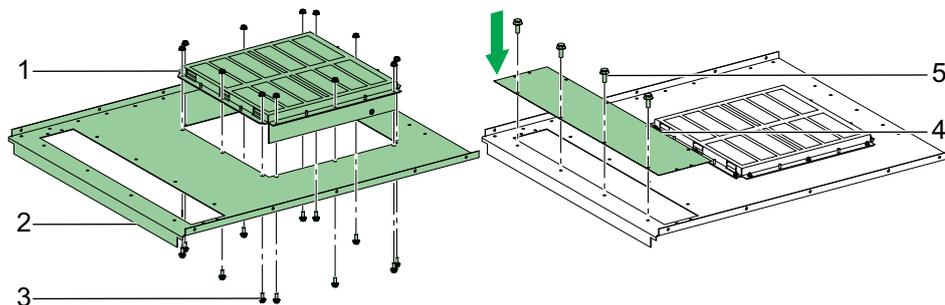


- 1 Front lifting brackets
- 2 M6 x 16 bolts

Assembly of the tunnel:

Pre-assemble the AAVS (1) with the twelve M6 x 16 bolts (3) and the fan's IP grid (4) with the four M6 x 16 bolts (5) to the top plate (2) of the gas tunnel.

NOTE: Install only the first row of bolts for the assembly of the AAVS and IP grid.



1 AAVS

2 Top plate

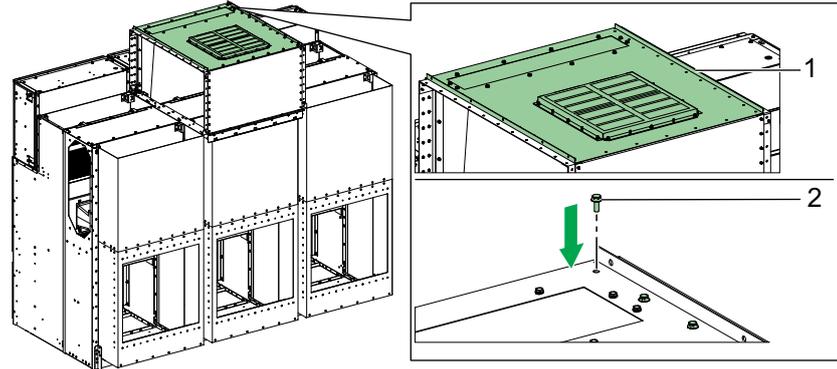
3 M6 x 16 bolts

4 IP grid

5 M6 x 16 bolts

Assembly of the top plate:

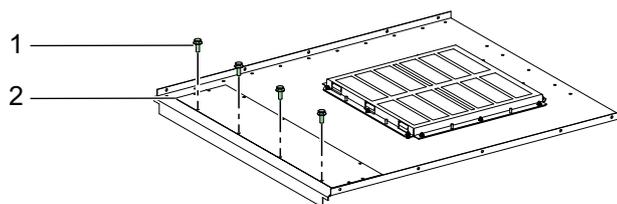
Assemble the top plate (1) with the 27 M6 x 12 bolts (2).



- 1 Top plate
- 2 M6 x 12 bolts

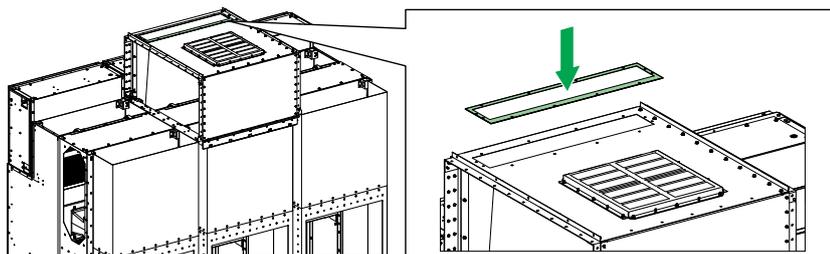
Assembly of the fan assembly:

1. Remove the four M6 x 16 bolts (1) from the IP grid (2) to mount the fan on top equipped plate on the IP grid.

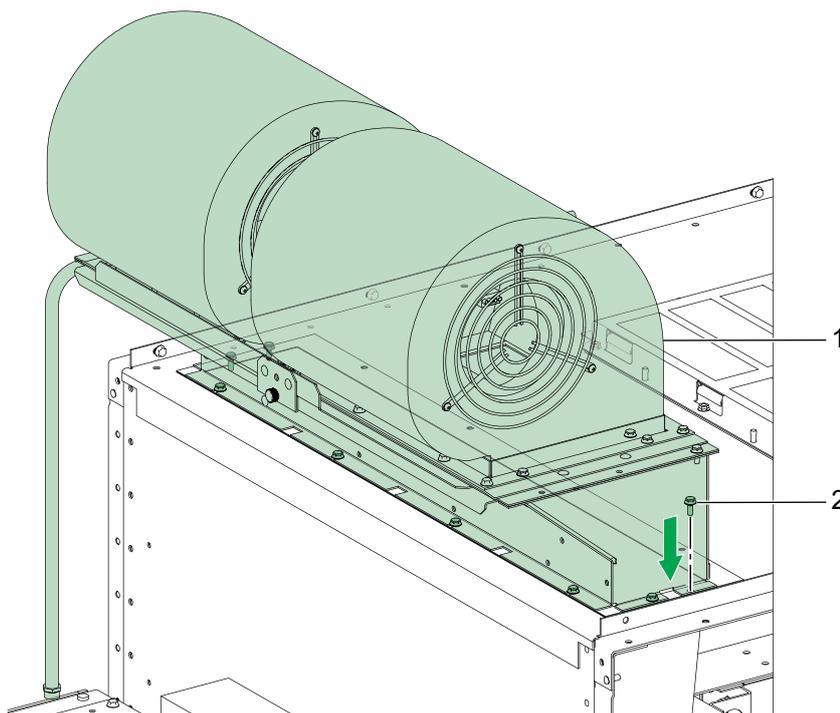


- 1 M6 x 16 bolts
- 2 IP grid

2. Place the rectangular frame on top of IP grid.



3. Mount the fan assembly (1) on the gas duct from the front of the cubicle.
4. Install the fan assembly (1) with a total of eight M6 x 16 bolts (2), four on the front and two each on either side.



- 1 Fan assembly
- 2 M6 x 16 bolts

NOTICE

HAZARD OF INAPPROPRIATE ASSEMBLY

Ensure that the direction of the fan placement is correct during this process fan assembly.

Failure to follow these instructions can result in equipment damage.

Wiring

Condensator Wiring

NOTE: The starter condensators have to be fixed on top of the low voltage cabinet.

Follow the below steps to connect the condensator:

1. Remove the four M6 x 10 bolts (4) and remove the plastic cover (1).
2. Connect the two capacitor plugs (2) from the fans with the two condensator plugs.
3. Reassemble the plastic cover (1) and install the four M6 x 10 bolts (4).
4. Position the condensator assembly (3) on top of the LV box.
5. Install the four M6 x 12 bolts (4) along with plain washers and lock nuts with spring washer on each side.

NOTE:

- The below shown pictures are for representation only, and they may differ from the actual products.
- In case of open delta resistor system in combination with condenser, contact Schneider Electric for assembly details.

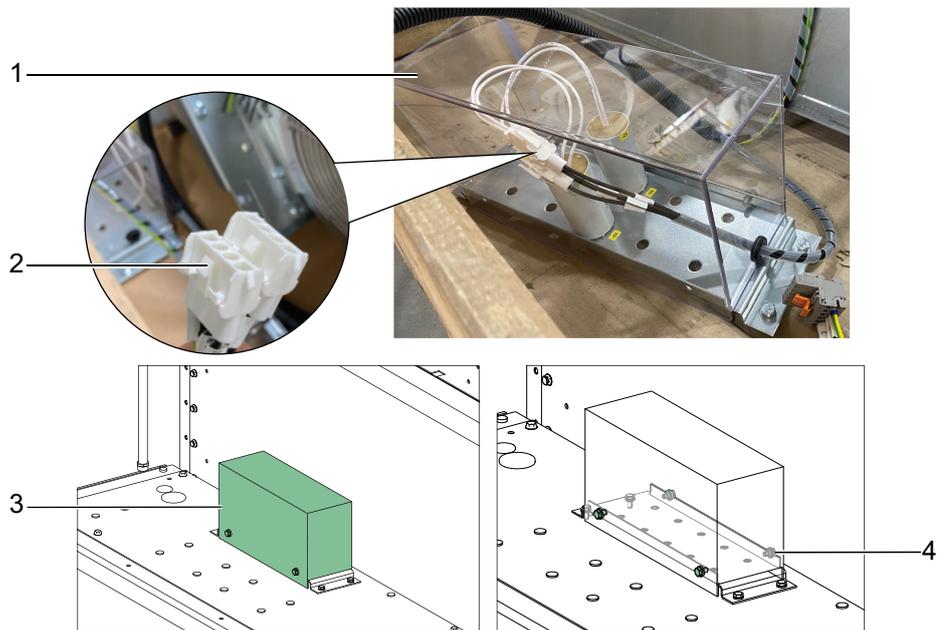


Figure 7
Condensator Assembly

- | | | | |
|---|-----------------|---|---------------|
| 1 | Plastic cover | 3 | Condensator |
| 2 | Capacitor plugs | 4 | M6 x 10 bolts |

Fan Control Wiring

NOTE: The fan control has a plug with five sockets for the five cables. It has a connection in the low voltage cabinet.

Follow the below steps to connect the fan control wiring:

1. Remove the five cables from the plug.
2. Pass all the five cables through the rubber band on top of the low-voltage compartment.
3. Reconnect the five cables to the plug.
4. Connect the plug to its counterpart inside the low-voltage compartment.

NOTE: The plugs are named on the current line drawings, naming can differ based on the project.

Wiring table

LV Compartment:		- X51	- X52	- X53	- X54	- X55
FAN-1	FAN-1:L	:22	-	-	-	-
	FAN-1:N	-	:12	-	-	-
FAN-2	FAN-2:L	-	-	:22	-	-
	FAN-1:N	-	-	-	:12	-
Earthing	FAN-1, 2:E	-	-	-	-	:12



NOTE: The above shown pictures are for representation only, and they may differ from the actual products.

Integrated Protective Features

The integrated protective features are designed to automatically switch off the motor in case of any detected faults.

For details, refer to the table below.

Detected fault	Safety feature description/function
Rotor position detection error	An automatic restart follows.
Blocked rotor	After the blockage is removed, the motor restarts automatically.
Line under voltage (line voltage outside of permitted nominal voltage range)	If the line voltage returns to permitted values, the motor restarts automatically.

Maintenance, Malfunctions, Possible Causes, and Remedies

Maintenance

The switchboard is expected to reach high load (> 70% of planned capacity) after several months or years post-commissioning. The fan may not be activated automatically during this period due to lower loads.

For the fan to remain functional, it should be activated weekly by a timer relay for 10 minutes at mid-day.

NOTE: This practice gives confidence that the fan will operate effectively when needed.

Monitor the lifetime of fan with a life monitoring device (running hour metering). Regular monitoring can help prevent unexpected failures detected and optimize performance.

Forced Cooling Fan Malfunction

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Ensure to wait at least five minutes after disconnecting the voltage at all poles before opening the device, as there can be electric discharge in the cubicle.

Failure to follow these instructions will result in death or serious injury.

WARNING

HAZARD OF INAPPROPRIATE OPERATION

- Keep out of the device's danger zone.
- When working on the device, switch off the line voltage and ensure that it cannot be switched back on.
- Wait until the device comes to a stop.
- After working on the device, remove any tools or other objects from the device.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

CAUTION

HAZARD OF INCORRECT MAINTENANCE

- Ensure no repairs are performed on the forced cooling fans.
- For repair or replacement of the forced cooling fans, contact Schneider Electric.

Failure to follow these instructions can result in injury or equipment damage.

NOTICE**HAZARD OF INADEQUATE MAINTENANCE**

- If the forced cooling fan is not operated for a long period in installed condition in a dry environment, start and operate at full speed for at least one hour every four months.
- If the forced cooling fan is not operated for a long period in installed condition in a damp environment (for example outdoors), start and operate at full speed for at least two hours once a month.
- Doing the above will move the bearings and allow any condensate that may have ingresses to evaporate.

Failure to follow these instructions can result in equipment damage.

Malfunction/Fault	Possible cause	Possible remedy
Impeller not running smoothly	Imbalance in rotating part	Clean the device and replace it if imbalance persists after cleaning. Make sure not to remove weight clips during cleaning.
Motor not turning	Mechanical blockage	Switch off, isolate from supply, and remove mechanical blockage.
	Line voltage faulty	Check line voltage, restore power supply, and apply control signal.
	Faulty connection	Isolate from supply, correct connection. Refer to Connection Diagram, page 20.
Motor/electronics over temperature	Deficient cooling	Improve cooling. Let the device cool down. To reset the error message, switch off the line voltage for at least 25 s and then switch it on again.
	Thermal overload protector activated	Allow motor to cool off, locate and rectify the cause of the error, and release restart lockout if necessary
	Ambient temperature too high	Reduce the ambient temperature. Reset by reducing control input to 0.
	Impermissible point of operation	Correct the operating point. Let the device cool down.

NOTE: For any other malfunctions, contact Schneider Electric.

Troubleshooting - Single Fan Malfunction

In case of fan malfunction during the service of operation as described in Integrated Protective Features, page 38, replace the fan, refer to Replacement, page 44 immediately within the period as described in the Graph A, refer to Figure 9

Or

Decide on the load shedding to decrease the operating current in the incomer or coupler down to the current defined as I_{pu} , refer to Design and Description, page 11 respecting the actual ambient temperature.

The replacement of the fan is possible in condition the CB/UTX is disconnected with respect to the local protective measures.

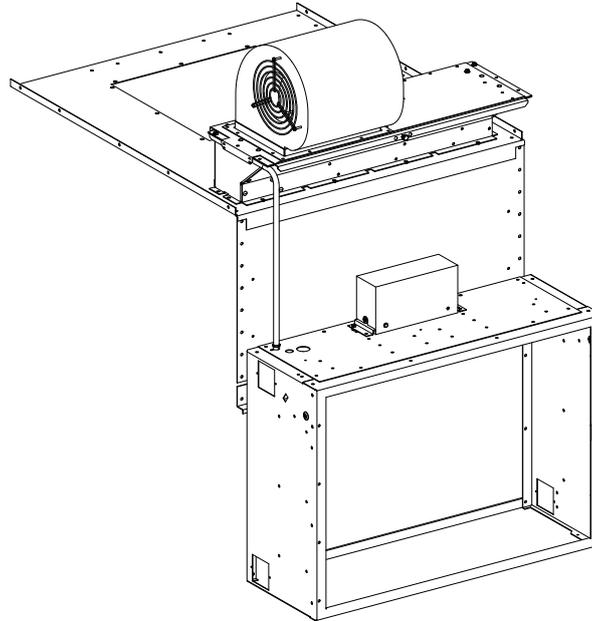


Figure 8
Single Fan replacement

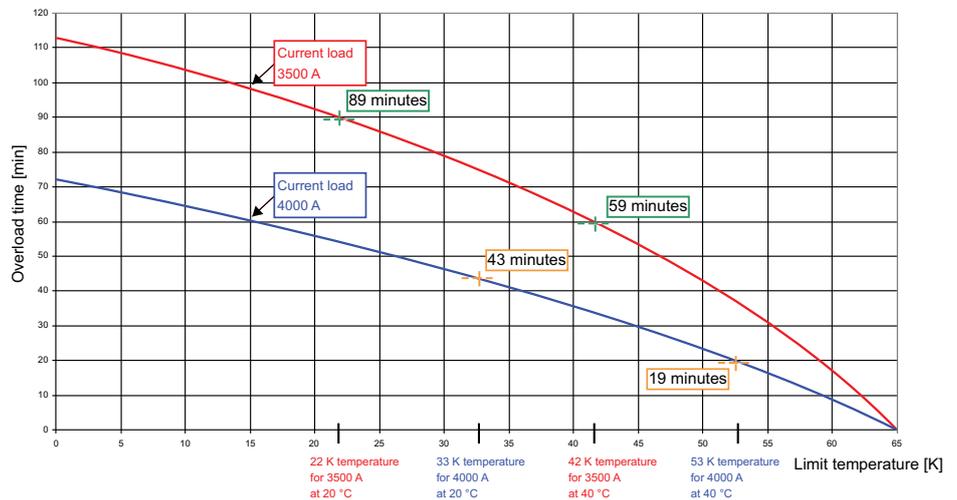


Figure 9
Graph A - Time to Temperature Rise Saturation

Troubleshooting - Double Fan Malfunction

For the extra cooling details, refer to Number of Forced Cooling Fans, page 25.

Invert a removable selective tray to enable the airflow from the stand-by fan and block the other one. For detailed instructions, refer to Switching the Active Cooling Fan (in case of Double Fan), page 44.

This system suggests fast fan-stand-by recovery, and replacing the malfunction fan can be made while the other fan is in stand-by status without shutting down the panel with respect to the local protective measures.

Cleaning

⚠ DANGER

HAZARD OF MOVING PARTS AND SHARP-EDGES

- Clean the fan only when it is not in motion.
- Do not disconnect the fan from the power supply, just switch OFF through the control input. This will prevent start-up of the fan.
- Do not allow dirt deposits on the motor housing can cause overheating of the motor.
- Do not allow soiling of the impeller can cause vibration that will shorten the service life of the fan.
- Severe vibration can destroy the fan. In such cases, switch OFF the fan immediately and clean it.
- Ensure the cleaning method used is dry cleaning (for example using compressed air).
- Do not use aggressive cleaning agents.

Failure to follow these instructions will result in death or serious injury.

⚠ CAUTION

HAZARD OF INADEQUATE MAINTENANCE

- Do not clean the device using a water jet or high-pressure cleaner.
- Do not use any acid, alkali or solvent-based cleaning agents.
- Do not use any pointed or sharp-edged objects for cleaning.
- Completely remove any cleaning agents used.
- If severe corrosion is visible on load-bearing or rotating parts, switch OFF the device immediately and replace it.
- Repair of load-bearing or rotating parts is not permitted.
- Operate the fan for two hours at maximum speed so that any water that has ingresses can evaporate.
- If cleaning does not stop vibrations, the fan may need to be rebalanced. For more information, contact Schneider Electric.
- The fan is equipped with maintenance-free ball bearings.
- The lifetime lubrication of the ball bearings is designed for a service life of 40,000 hours.
- For bearing replacement after service life, contact Schneider Electric.
- Adapt the maintenance intervals to the actual level of dust exposure.

Failure to follow these instructions can result in injury or equipment damage.

Make sure the fans are not soiled and are in proper operating condition, this helps for a long service life. The frequency of these checks should be adjusted depending on the degree of soiling.

NOTE: Make sure there is no damage to the device during cleaning.

Safety Inspection

⚠️⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION AND ARC FLASH

Do a high voltage test to detect any equipment degradation.

Failure to follow these instructions will result in death or serious injury.

The integrated EMC filter has Y capacitors.

The tripping current is exceeded when AC testing voltage is applied.

- Test the forced cooling fan with DC voltage while performing the legally required high-voltage test. The voltage to be used corresponds to the peak value of the AC voltage required by the standard.

What to check	How to check	How often	What action
Contact protection cover for intactness or damage	Visual inspection	At least every 6 months	Repair or replace the forced cooling fan.
Forced cooling fan for damage to blades and housing	Visual inspection	At least every 6 months	Replace the forced cooling fan.
Fastening the cables	Visual inspection	At least every 6 months	Tighten the cables.
Fastening the earthing terminal	Visual inspection	At least every 6 months	Tighten the earthing terminal.
Insulation of cables for damage	Visual inspection	At least every 6 months	Replace the cables.
Impeller for wear/deposits/corrosion and damage	Visual inspection	At least every 6 months	Clean the impeller or replace the forced cooling fan.
Abnormal bearing noise	Acoustic	At least every 6 months	Replace the forced cooling fan.

Replacement

⚠ WARNING

HAZARD OF INAPPROPRIATE HANDLING

- Some of the product components are heavy. Make sure that the components do not drop off during disassembly, this can result in fatal or serious injury and material damage.
- Secure components before unfastening to stop them falling.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Replacement of the product must be performed or supervised by qualified personnel with the appropriate technical knowledge.

Switching the Active Cooling Fan (in case of Double Fan)

⚠ WARNING

HAZARD OF INAPPROPRIATE OPERATION

Before starting the process, make sure to follow the safety instructions given in Safety Precautions, page 6

Failure to follow these instructions can result in death, serious injury, or equipment damage.

If there is an active cooling fan malfunction, it is allowed to switch the cooling fan with the separator sheet to the other one while the cubicle is in powered condition.

For the replacement of the old cooling fan to a new cooling fan, shutdown the system and follow the below given instructions:

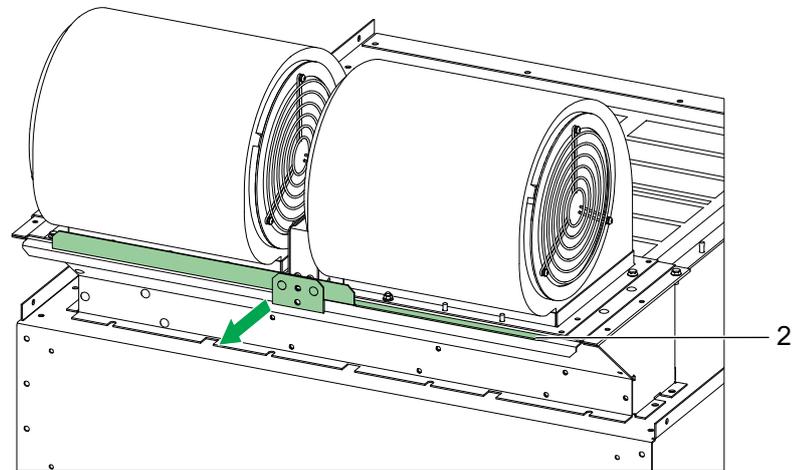
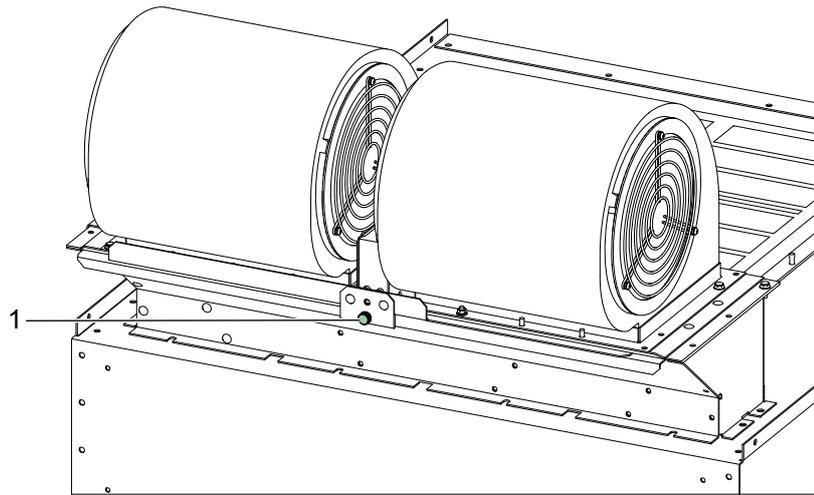
- The cubicle can be operated on maximum performance without cooling fan maximum 30 minutes. Otherwise, the power must be reduced to 3150 A.
- The cooling fan switching process is approximately 10 minutes.

Step 1:

1. Power off the cooling fans before starting the operation.
2. Remove the M6 x 18 bolt (1) accessible from one side of the cooling fan support.
3. Loosen the plate (2) underneath the cooling fans.

4. Pull the plate (2) out carefully.

NOTE: The images shown below are only for reference, the cooling fan direction might vary depending on the requirement.



1 M6 x 18 bolt

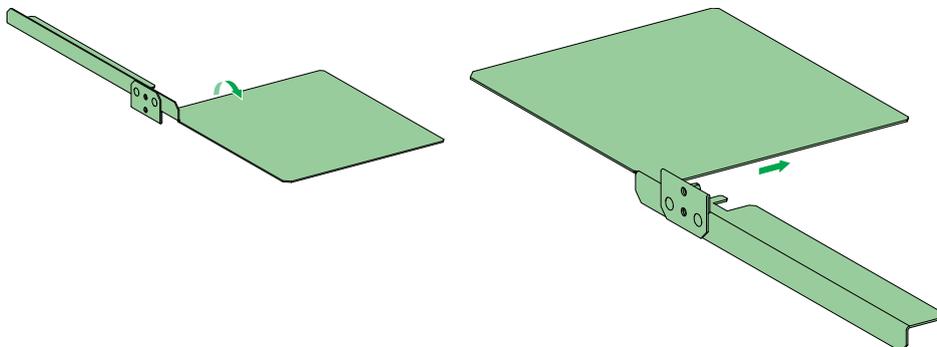
2 Plate

Step 2:

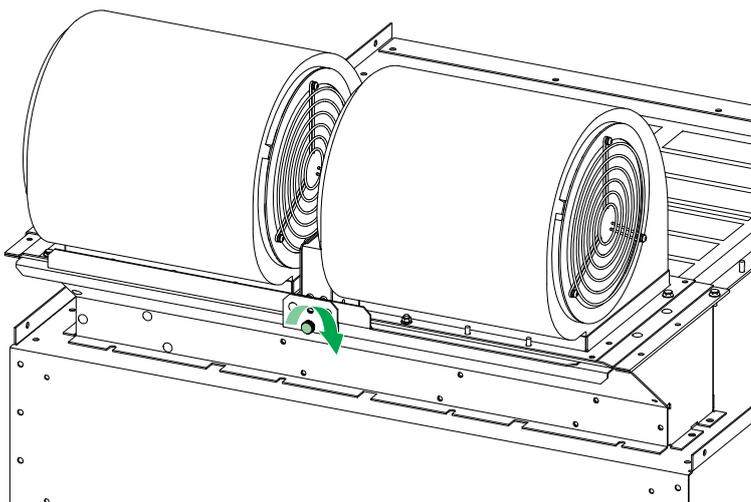
The plate should be installed in reverse position that is upside down.

NOTE: When the plate is removed, both cooling fans will not work because this plate is not present to press the microswitch of the cooling fans.

NOTE: Maximum time without cooling is 30 minutes on maximum cubicle performance.

**Step 3:**

On proper mounting of the plate, fasten the M6 X 18 bolt. Refer to Screw Fastenings, page 13.

**NOTICE****HAZARD OF OVERHEATING**

In case of customer notice any malfunction on a cooling fan:

- The active cooling fan must be switched following the above steps.
- Customer is requested to immediately order a new cooling fan to replace the broken one.
- It is suggested to mark with "X" on the broken cooling fan.

Failure to follow these instructions can result in equipment damage.

Replacing the Forced Cooling Fan Malfunction

⚠ WARNING

HAZARD OF OVERHEATING

The cubicle can be operated on maximum performance without cooling fan maximum 30 minutes. Otherwise, the power must be reduced to 3150 A.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ CAUTION

HAZARD OF INAPPROPRIATE OPERATION

Before starting the process, make sure to follow the safety instructions given in Safety Precautions, page 6

Failure to follow these instructions can result in injury or equipment damage.

If there is an active cooling fan malfunction, it is allowed to switch the cooling fan with the separator sheet to the other one while the cubicle is in powered condition.

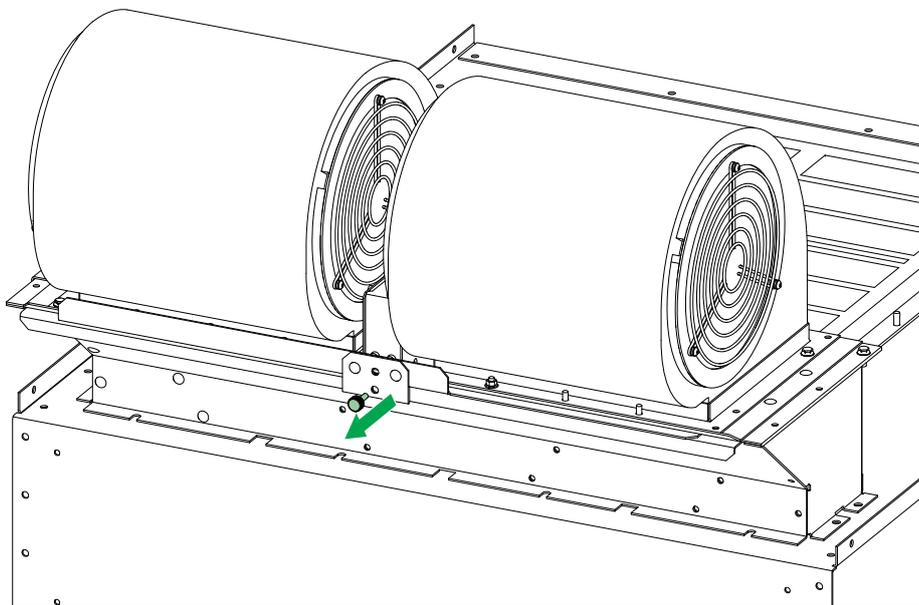
For the replacement of the old cooling fan to a new cooling fan, shutdown the system and follow the below given instructions:

- The cooling fan switching process is approximately 10 minutes.

Step 1:

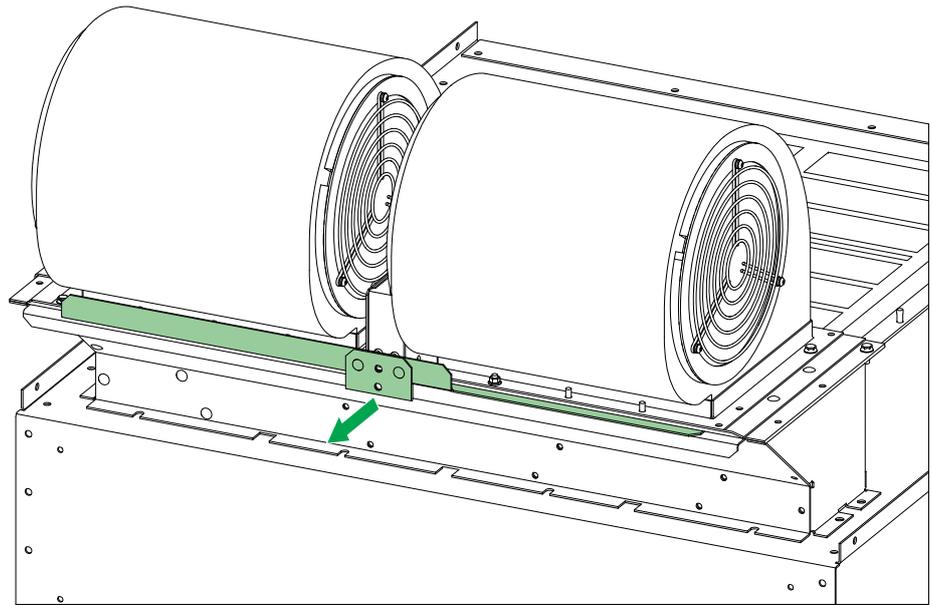
1. Remove the M6 x 18 bolt accessible from one side of the fan support to switch the operating fan.

NOTE: The images shown below are only for reference, the cooling fan direction might vary depending on the requirement.



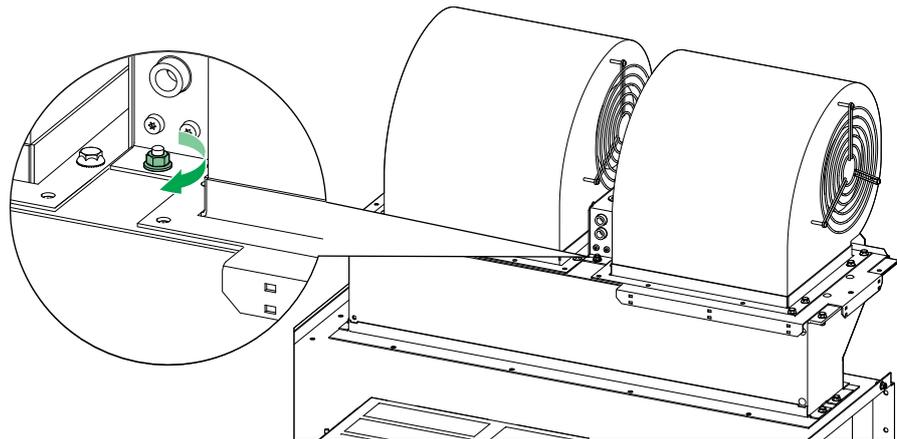
2. Loosen the plate underneath the fans after removing the bolt.

3. Pull out the plate underneath the fans.

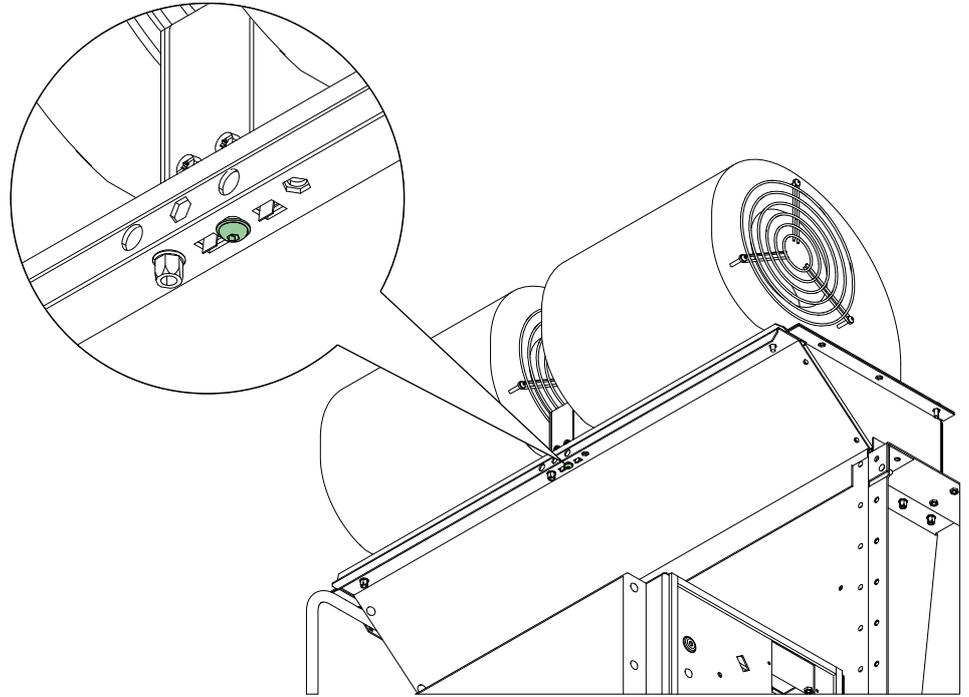


Step 2:

1. Remove the two-lock nut with spring washer of the secondary box of the cooling fans using ratchet wrench 10.

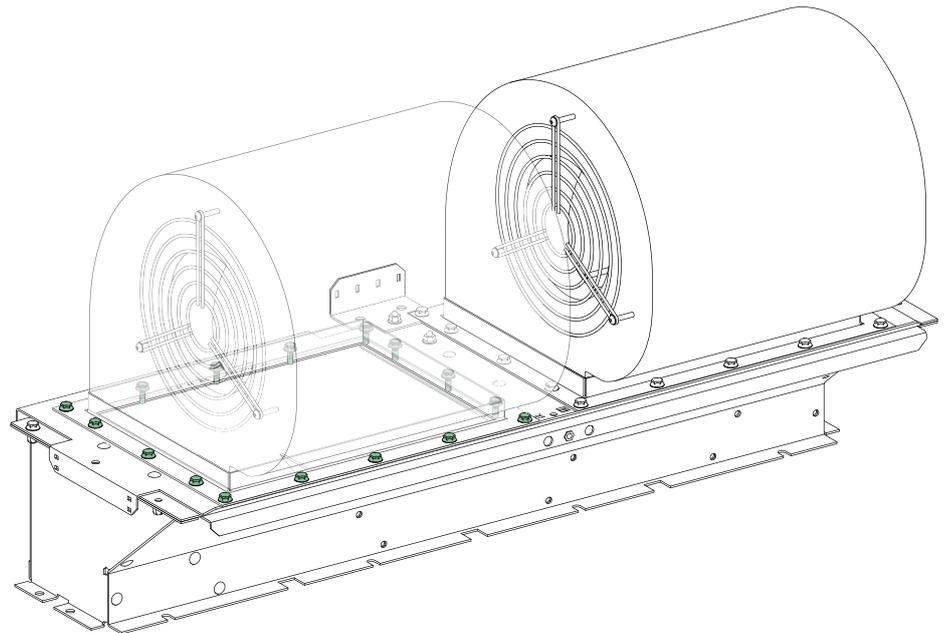


2. Remove the M6 x 20 bolt and washer from the bottom side of the fan support using an allen key of 4 mm.
3. Remove the secondary box of the cooling fans.
4. Disconnect the wiring plugs between the secondary box and the cooling fan.



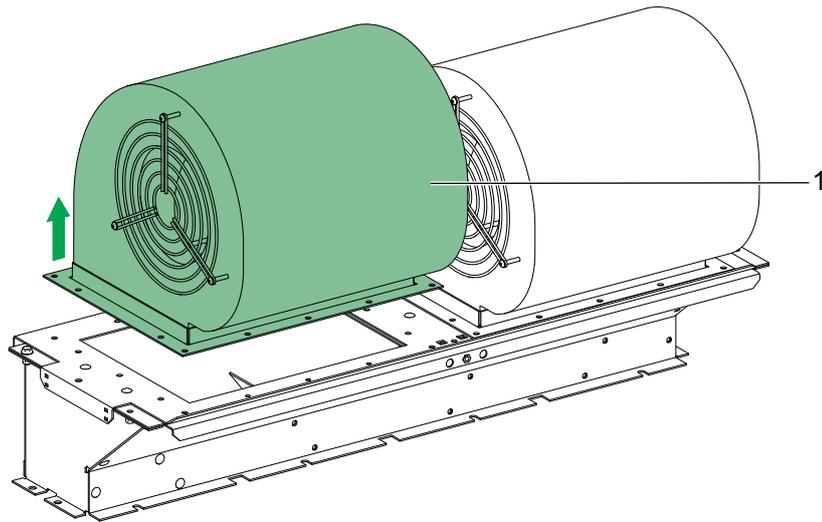
Step 3:

1. Remove the 12 M6 x 16 bolts from the broken fan using a ratchet wrench size 10 and hand wrench size 10.



2. Disconnect the wiring plugs, and remove the cooling fan device from its support.

3. Remove the side cover grid (1) from both sides and assemble them onto the new fan with a help of screwdriver, before installing the new fan.



1 Side cover grid

4. Check for the presence of cables and the plug with the help of allen key 3 mm on the new fan before installing.

Follow the above Steps in reverse order to install the new forced cooling fan.

Removal Process

Disassembly of Forced Cooling Fan

⚠ WARNING

HAZARD OF INAPPROPRIATE HANDLING

- Some of the product components are heavy. Make sure that the components do not drop off during disassembly, this can result in fatal or serious injury and material damage.
- Secure components before unfastening to stop them falling.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ CAUTION

HAZARD OF INAPPROPRIATE DISASSEMBLY

- Disassembly of the product must be performed or supervised by qualified personnel with the appropriate technical knowledge.
- The product is to be disassembled into suitable components for disposal employing standard procedures for motors.

Failure to follow these instructions can result in injury or equipment damage.

NOTE: The product should be disassembled into appropriate components for disposal, following standard procedures for motors.

Follow the below steps to disassemble the entire fan assembly and the tunnel:

1. Disconnect all the wires if the fan with alarms, condensator and all other components to which the fan is connected.
2. Follow the steps in reverse order of forced cooling fan assembly procedure for the disassembly, refer to *Assembly of Forced Cooling Fan*, page 26.

Disposal

For Schneider Electric, environmental protection and resource preservation are part of our core corporate goals. Schneider Electric operates an environmental management system which is certified in accordance with ISO 14001 and rigorously implemented around the world based on German standards.

Right from the development stage, ecological design, technical safety, and health protection are fixed criteria.

The following section contains recommendations for ecological disposal of the product and its components.

Country-Specific Legal Requirements

NOTICE

HAZARD OF INAPPROPRIATE DISPOSAL OF PRODUCTS

Always observe the applicable country-specific legal regulations regarding the disposal of products or waste occurring in the various phases of the life cycle. The corresponding disposal standards are also to be heeded.

Failure to follow these instructions can result in equipment damage.

Component Disposal

The products are mostly made of steel, copper, aluminium and plastic. Metallic materials are generally considered to be fully recyclable. Separate the components for recycling into the following categories:

- Steel and iron
- Aluminium
- Non-ferrous metal, for example motor windings
- Plastics, particularly with brominated flame retardants, in accordance with marking
- Insulating materials
- Cables and wires
- Electronic scrap, for example circuit boards

Only ferrite magnets and not rare earth magnets are used in external rotor motors from Schneider Electric. Ferrite magnets can be disposed in the same way as normal iron and steel. Electrical insulating materials on the product, in cables and wires are made of similar materials and are therefore to be treated in the same manner.

The materials concerned are as follows:

- Miscellaneous insulators used in the terminal box
- Power cables
- Cables for internal wiring
- Electrolytic capacitors

NOTE:

- Dispose of electronic components employing the proper procedures for electronic scrap.
- For more information on disposal, contact Schneider Electric.

Glossary

A

AAVS: Anti Air Ventilating System

E

EMC: Electromagnetic Compatibility

F

FLA: Full Load Amperage

L

LRA: Locked Rotor Amperage

LV: Low Voltage

M

MV: Medium Voltage

R

RCCB: Residual Current Circuit Breaker

T

TOP: Thermal overload protector

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As standards, specifications, and design change from time to time, please ask for confirmation of the information given in this publication.

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