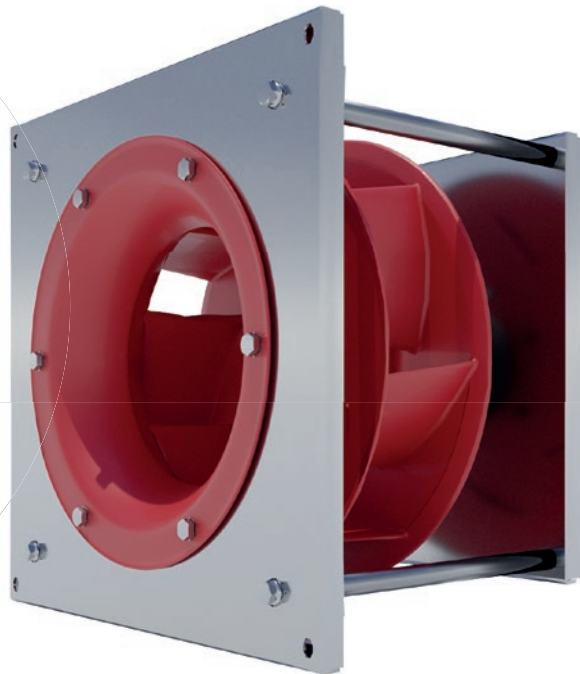


**SWISS
ROTORS**

FanSet

OPERATION AND
MAINTENANCE





Please read the following documentation carefully before installation of our product. In case of doubts contact Swiss Rotors official support.

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1. INTRODUCTION

1.1 Preface

To ensure trouble-free usage of our products we would like to provide the following technical and commissioning documentation. This manual is to help at every stage of use. Mandatory maintenance service tasks that are responsibility of the user, from appropriate transportation methods to periodic inspections. All the crucial information and warnings will be preceded by various caution symbols as shown below:



Electrical Voltage



Important Information



Useful Hint

Please read carefully the entire user manual and all other accompanying documents before first start-up. Improper use of the product may void the warranty.

Keep it as a reference for future maintenance and service procedures.

1.2 Disclaimer

The following instruction, unless otherwise stated, applies to all Swiss Rotors FanSet units. In exceptional circumstances, differences will be noted. This document is a property of Swiss Rotors, licensors or affiliates, protected by international trademark and copyright laws. Swiss Rotors constantly develops its products and this document is subject to change without notice.



2 PRODUCT DESCRIPTION

2.1 Construction

Swiss Rotors FanSet is designed specially to replace an old fan systems solutions used in air handling units. FanSet consist of two steel plate's integrated by spacing sleeves. Properly selected EC electric engine mounted on the first plate is driving a radial fan located at the center of the FanSet unit. Impeller has 7 backward-curved blades in frame. Ventilating cone of dedicated diameter is mounted on the opposite side. Each of fans Series 225, 250 and 315 have two pressure tabs. The exception is Fan 190 Series which have one pressure tab.

All parts are made of high quality materials:

- Support bracket and plate: Sheet steel, galvanized
- Impeller: plastic
- Electronics housing: Die-cast aluminum.

All parts create perfectly optimized air supply/exhaust device. Depending on customer needs, FanSet's comes in few configurations (Tab.1). All FanSet's are statically and dynamically balanced before shipment. For balancing are used special balancing weight. In first step the FanSet is mounted into balancing machine. At the next step, balancing of the fan needs to be performed by glued of the balancing weight (Fig 2). Mounting location of the weights will be displayed on the screen. FanSet is balanced and ready to operate after successful placing of the balancing weight.

FanSet models listed below:

FanSet Model	Rated voltage	Rated Output Power	Rated Current	Rated Speed	L	A
	[V]	[W]	[A]	[rpm]	[mm]	[mm]
SR190	230	128	1,2A	4490	120	220
SR225-03	230	349	2,3A	3600	250	300
SR225-03_UL	110/240	349	2,6A	3600	250	300
SR250-03	230	349	2,3A	3000	260	330
SR250-03_UL	110/240	349	2,6A	3000	260	330
SR315-03	230	374	1,5A	2060	310	400
SR315-03_UL	110/240	374	1,5A	2060	310	400
SR225-07	230	725	5,4A	4500	275	300
SR225-07_UL	110/240	725	3,2A/230VAC	4500	275	300
SR250-07	230	700	5,1A	3800	290	330
SR250-07_UL	110/240	700	3,7A/230VAC	3800	290	330
SR315-07	230	715	3,8A	2600	340	400
SR315-07_UL	110/240	715	3,3A/230VAC	2600	340	400

Table 1. Swiss Rotors FanSet models and dimensions

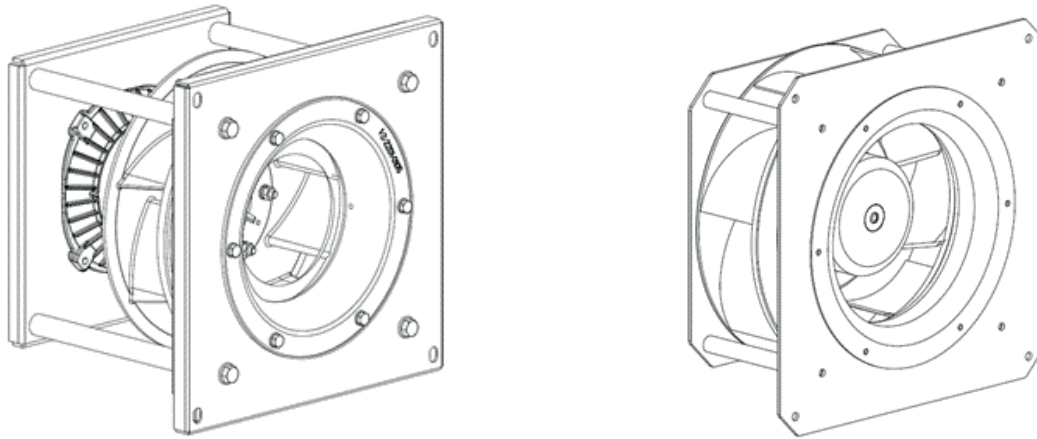


Figure 1. FanSet SR190 Series (left) and FanSet SR225, 250, 315 Series (right)

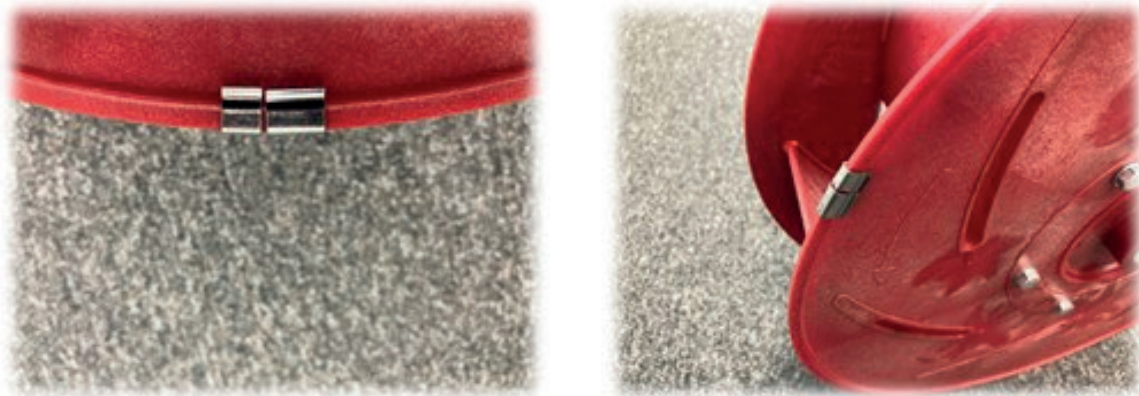


Figure 2. Balancing weight

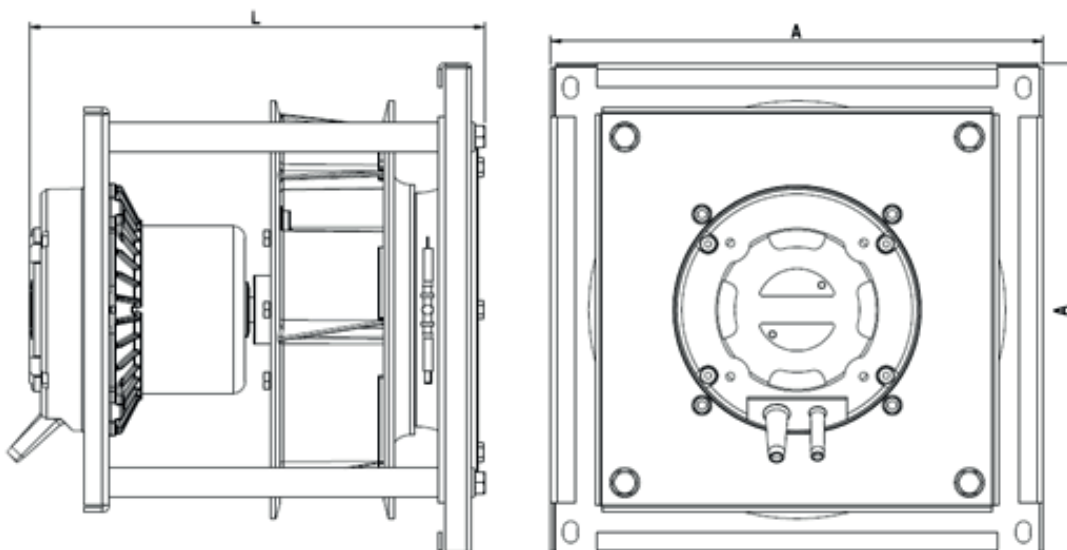


Figure 3. Swiss Rotors FanSet overall dimensions



Detailed dimensions are included within the company technical documentation:

- SR225-03 ASM
- SR225-07 ASM
- SR250-03 ASM
- SR250-07 ASM
- SR315-03 ASM
- SR315-07 ASM
- SR190 ASM

2.2 Principle of operation

FanSet is a device used to supply and exhaust air. The engine, mounted in the housing, drives the impeller located inside. The fan, after accelerating to the dedicated rotational speed, is able to force the flow through the exchanger in the air handling unit. Special designed 7 backward-curved blades in frame redirect exhaust of air at 90 degrees so that the centrifugal effect increases the pressure and power of the fan. Ventilating cone of dedicated diameter is mounted on the opposite side. All parts are made of high quality materials:

Fig. 4 presents the principle operation of the FanSet inside the Air Handling Unit. It is crucial to note that exhausting airstreams are directed perpendicularly to the fan axis (Fig. 5)

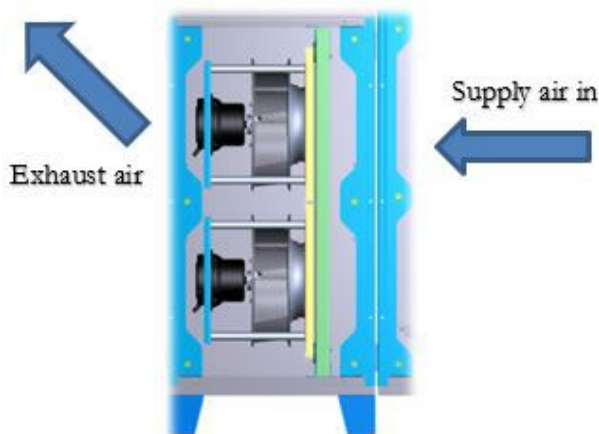


Figure 4. FanSet's inside AHU

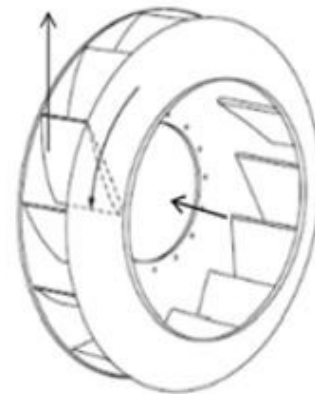


Figure 5. Direction of supply and exhaust air flow

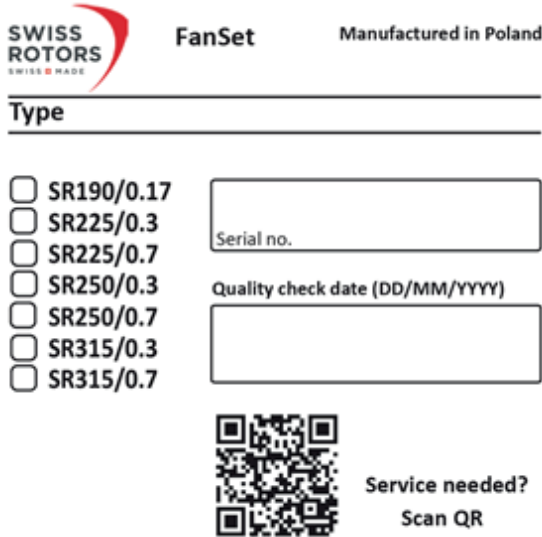
2.3 Operational limits

Impeller units inside the FanSet are prepared to work within temperature conditions oscillating between -25oC and +60oC. Air flow rates up to 2600m³/h for single fan. All FanSet's are tested for flammability according to UL-94. Each device is adapted to work vertically and horizontally.



2.4 Serial number identification

Each product leaving our factory is equipped with a plate containing product identification data. Labels are attached directly on the casing and provide essential information about the product.



The label consists of the following information:

- Type
- Power
- Size
- Serial number
- Quality check date
- QR Code

By serial number and model name it is possible to identify your product and answer your question effectively and immediately.

Figure 6. FanSet's label sticker



While contacting our company make sure to have your serial number in sight.

Nameplate field	Explanation
Fan Type	The manufacturer's product name to indicate the particular type which has been acquired.
Power	Nominal power of engine which is used to drive fan.
Size	Nominal size of fan impeller.
Serial number	A set of characters that uniquely identifies a single unit and can be used for traceability and warranty purposes.
Quality check date	Date of checking and approval of correct operation of the device.
QR Code	Unique code to call a service.

Table 2. Identification label explanation

2.5 Air volume measuring

FanSet units are equipped with the inlet cone. Air volume measuring device with circular lead is placed on the inlet side of the cone. Measuring device is positioned perpendicularly to the air flow direction. With the assistance of the measuring device it is possible to control the air volume depending on the difference in pressure between the static pressure at the inlet cone and the static pressure on the inlet area. This sensor cannot measure the dynamic pressure in the inlet area. While Fan Set is tested it is possible to regulate air volume.

The air volume is calculated according to the following formula.



$$\dot{V} = k_{10} * \sqrt{\frac{2}{\rho}} * \Delta p$$

\dot{V} – air flow $\left[\frac{m^3}{h}\right]$

k_{10} – calibration factor $[m^2s/h]$

ρ – density of air $[kg/m^3]$

Δp – differential pressure $[Pa]$

Calibration factor k for each type of fan is deviation of the airflow smaller than 10%. This factor is determined by comparative measurement on a standard test rig. For Swiss Rotors FanSet's the calculated K factor's have the following values:

- FanSet SR190 : $k_{10}=36$
- FanSet SR225 : $k_{10}=49$
- FanSet SR250 : $k_{10}=56$
- FanSet SR315 : $k_{10}=105$

$$k' = k_{10} * \frac{1}{\sqrt{\frac{\rho}{2}}}$$

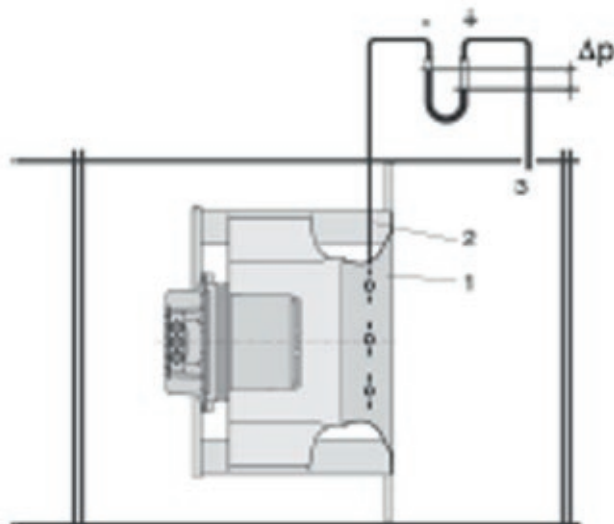


Figure 7. Air Volume measurement method



3 TRANSPORTATION

3.1 Packing



To avoid dents or scratches on the surface please make sure to properly secure the package for the transportation.

3.2 Quality control



Figure 8. Packing model

3.2.1 Examine the package:

1. Before accepting the delivered parcel, carefully check the condition of the package in the presence of a shipping company representative. Look for any signs of transportation damage. Our FanSet's are precisely and tightly secured for the shipment. Any signs of tearing, punctures, damage exposing the goods being delivered or traces of opening are not acceptable.
2. Pay attention to the way in which the goods were delivered. – Fig.8.
3. Swiss Rotors prepares shipments using professional labels and transport descriptions. If you see that the shipping company did not follow the instructions given on the labels - refuse to accept the parcel.

4. Check if the received parcel matches with your order. Inspect the product identification label plates for confirmation.

5. In case of noticing any damage please contact our support immediately – phone numbers are listed at the Support chapter of this guidebook or at our official website: www.swissrotors.com

3.2.2 Examine the unit:

1. Remove packing materials from the product.
2. Dispose all packing materials in accordance with local regulations.
3. To determine whether any parts have been damaged or are missing, examine the product carefully.
4. If there is any issue, please contact our support.

3.3 Storage



If the FanSet is not installed immediately, leave the product in its original packaging and follow the rules of proper storage.

Prolonged exposure of the product to the improper conditions may damage and shorten the lifetime of the device.

- Avoid exposure to moisture, excessive sunlight and other weather conditions.
- Secure the fans against mechanical damages.
- Keep the storage temperature between -40°C and 75°C and humidity 5-90 %.



4 INSTALLATION – MOTOR CONNECTION

4.1 General safety

The following section contains valuable notes and list of mandatory procedures which are responsibility of the user. Neglecting advices collected in this chapter may result in product damage or void of warranty. Take time to study carefully whole chapter and make sure everything is understandable. If you have any questions, please contact support.



FanSet needs to be installed in a way enabling seamless execution of future maintenance tasks.



CAUTION! Electric Voltage: All motors described in the following manual can be operated, connected, installed, repaired and modified by qualified personnel only. Failure in performing in any of this operations may result in risk of fatal injury, electric shock, incorrect mounting or product damage. Installation should be carried out with usage of power lines, without short circuits and with proper grounding. Follow the connection diagrams dedicated to given motors.

WARNING: Do not open or disassemble the motor while power supply is connected to the device. It may result in fatal injury caused by electric shock. If it is necessary to open the motor, wait at least 5 minutes after disconnecting from the power supply.

NOTE: It is the user and the installer responsibility to provide the system with the proper grounding and protection in accordance with national and local standards. Swiss Rotors is not responsible for any damages or injuries caused by incorrect installation, bad circuits or other failures.

Before installation and operating the motor please read entire instruction carefully! Follow the connection diagrams to perform successful installation.

4.2 Product description

Swiss Rotors Fans are equipped with various motor configurations tailored to the needs and electrical requirements of our customers. To get the right parameters and to ensure proper operation characteristics of the fans, range of motors includes a few basic configurations available. Table 2.1 shows the motors used in the fans and operating parameters – mechanical and electrical.

Note: Given setups are explanatory. Swiss Rotors reserves the right to change those configurations without informing. Any modification or configuration changes other than proposed should be reported and consulted in details with Swiss Rotors technical department first.



FAN TYPE	MOTOR TYPE	RATED VOLTAGE	FREQUENCY	RATED CURRENT	RATED TORQUE	RATED OUTPUT POWER	RATED SPEED	SPEED CONTROL	OPERATING TEMP [C°]	IP
SR190	EC169W-B190/44P1-05	230V AC	50/60Hz	1,2A	-	128W	4490 rpm	0~10VDC, Modbus RTU	-25° to 60°	44
SR225-03	EC092/25E3G01-03	230V AC	50/60Hz	2,3A	0,93 Nm	349W	3600 rpm	0~10VDC, Modbus RTU	-25° to 60°	54
SR225-03 UL	EC092/25EF3G-03-02,UL	110/240V AC	50/60Hz	2,6A	0,93 Nm	349W	3600 rpm	0~10VDC, Modbus RTU	-25° to 60°	54
SR250-03	EC092/25E3G01-04	230V AC	50/60Hz	2,3A	1,11 Nm	349W	3000 rpm	0~10VDC, Modbus RTU	-25° to 60°	54
SR250-03 UL	EC092/25EF3G-03-03,UL	110/240V AC	50/60Hz	2,6A	1,11 Nm	349W	3000 rpm	0~10VDC, Modbus RTU	-25° to 60°	54
SR315-03	EC092/35E3G01-03	230V AC	50/60Hz	1,5A	1,72 Nm	374W	2060 rpm	0~10VDC, Modbus RTU	-25° to 60°	54
SR315-03 UL	EC092/35EF3G-01-02,UL	110/240V AC	50/60Hz	1,5A	1,72 Nm	374W	2060 rpm	0~10VDC, Modbus RTU	-25° to 60°	54
SR225-07	EC102/35E3G03-03	230V AC	50/60Hz	5,4A	1,56 Nm	725W	4500 rpm	0~10VDC, Modbus RTU	-25° to 60°	54
SR225-07 UL	EC102/35E3G-01-02,UL	110/240V AC	50/60Hz	3,2A /230VAC	1,56 Nm	725W	4500 rpm	0~10VDC, Modbus RTU	-25° to 60°	54
SR250-07	EC102/35E3G03-04	230V AC	50/60Hz	5,1A	1,76 Nm	700W	3800 rpm	0~10VDC, Modbus RTU	-25° to 60°	54
SR250-07 UL	EC102/35E3G-01-03,UL	110/240V AC	50/60Hz	3,7A /230VAC	1,76 Nm	700W	3800 rpm	0~10VDC, Modbus RTU	-25° to 60°	54
SR315-07	EC102/50E3G03-02	230V AC	50/60Hz	3,8A	2,67 Nm	715W	2600 rpm	0~10VDC, Modbus RTU	-25° to 60°	54
SR315-07 UL	EC102/50E3G-01-02,UL	110/240V AC	50/60Hz	3,3A /230VAC	2,67 Nm	715W	2600 rpm	0~10VDC, Modbus RTU	-25° to 60°	54

Table 3. Technical specification of available motors



Do not change the motor configurations. Follow the correctly selected configurations given in the table above. Changing the settings is associated with poor fan performance and risk of motor damage as well as electric shock due to incorrect connection. Motor setup modifications carried out on your own is associated with the loss of warranty.

4.3 Technical specifications

Drawings below presents the overall dimensions of the motors used in FanSet units. Figure 9 shows EC092 motor and figure 10 shows EC102 series.

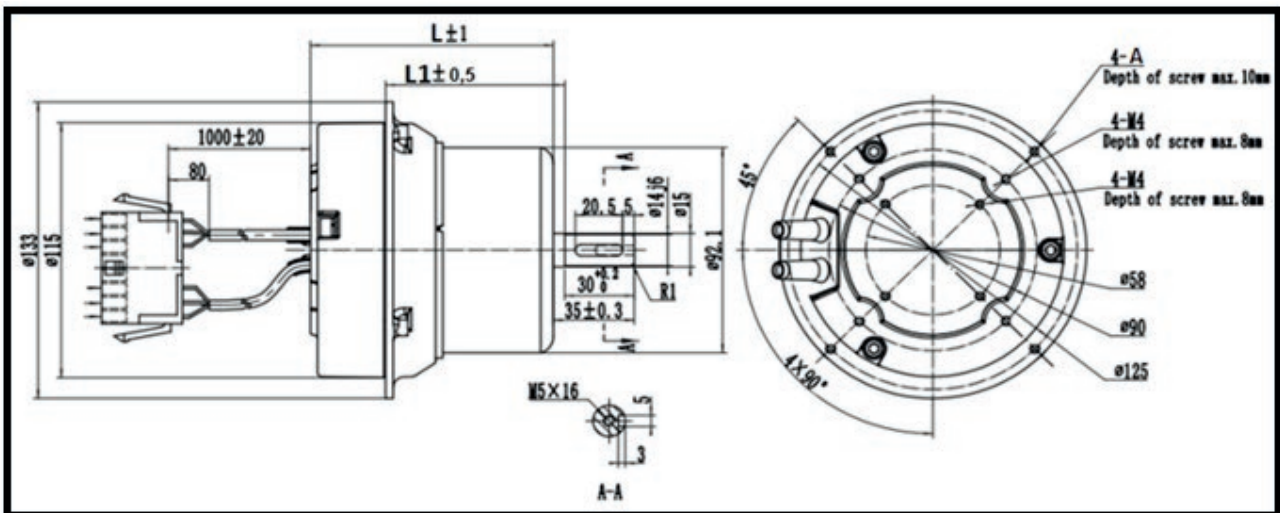


Figure 9. EC092 motor series DIMENSIONS (all dimensions are given in mm units)

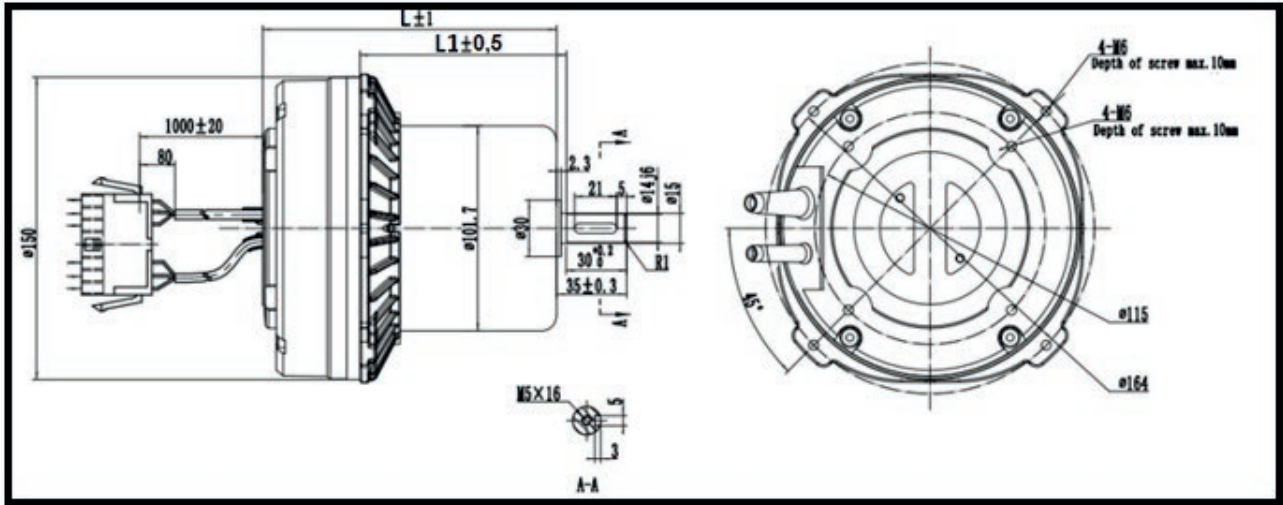


Figure 10. EC102 motor series DIMENSIONS (all dimensions are given in mm units)

Table 3.1 below represent the available motors with the correct dimensions and identification numbers. The index number is a unique code identifying the right motor for the product.

FAN TYPE	MOTOR TYPE	INDEX	L [mm]	L1 [mm]
SR225-03	EC092/25E3G01-03	1-2-2214-0182	105	78
SR225-03UL	EC092/25EF3G-03-02,UL	1-2-2214-0188	105	78
SR250-03	EC092/25E3G01-04	1-2-2214-0184	105	78
SR250-03UL	EC092/25EF3G-03-03,UL	1-2-2214-0190	105	78
SR315-03	EC092/35E3G01-03	1-2-2214-0186	116	88
SR315-03UL	EC092/35EF3G-01-02,UL	1-2-2214-0192	116	88
SR225-07	EC102/35E3G03-03	1-2-2214-0183	131,5	88
SR225-07UL	EC102/35E3G-01-02,UL	1-2-2214-0189	131,5	88
SR250-07	EC102/35E3G03-04	1-2-2214-0185	131,5	88
SR250-07UL	EC102/35E3G-01-03,UL	1-2-2214-0191	131,5	88
SR315-07	EC102/50E3G03-02	1-2-2214-0187	146,5	103

Table 4. All motors specifications



4.4 Connection & Diagrams



To perform the correct setup, please refer to the following diagrams representing possible ways of motor connection. Installation and connection can be done by qualified personnel only. Failure in performing in any of this operations may result in risk of fatal injury, electric shock, incorrect mounting or product damage.

WARNING: Do not open or disassemble the motor while power supply is connected to the device. It may result in fatal injury caused by electric shock. If it is necessary to open the motor, wait at least 5 minutes after disconnecting from the power supply.

Notes on proper installation:

- Use fuses at power line
- Check the wires condition before operating. Make sure that there are no short circuits.
- Use cables fulfilling the voltage, current, load and insulation installation requirements.
- Use only high quality hard wire or fiber copper wire with ferrule.
- Use shield cable.
- Make sure that motor label plate specification matches the operating supply voltage. Use cables that are adapted to work with the desired current.

Connection instructions:

1. Remove the Top cover of the terminal strips.
2. Fasten the control and main power wires by screwing them to the connector.
3. Check all connections again and carefully replace the Top cover.
4. Connect the Power supply voltage.

Motor EC169W-B190/44P1-05

		Cable color	Description
Control	A	Green	Bus connection RS485 - A; MODBUS RTU
	B	Yellow	Bus connection RS485 - B; MODBUS RTU
Main Supply	PE	Yellow/Green	PE connection
	L	Brown	Supply voltage 220 - 240V AC
	N	Blue	

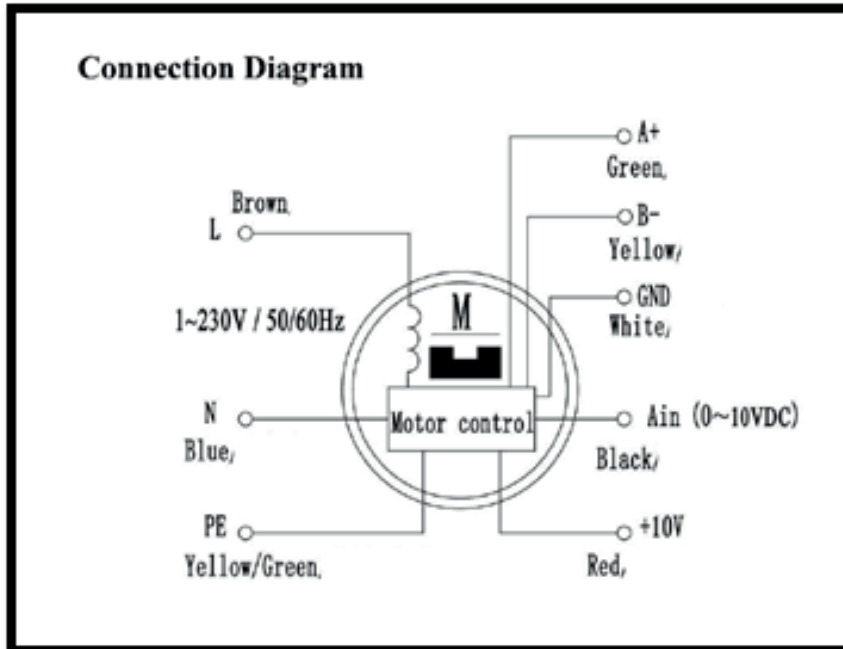


Figure 11. EC169W-B190/44P1-05 CONNECTION DIAGRAM

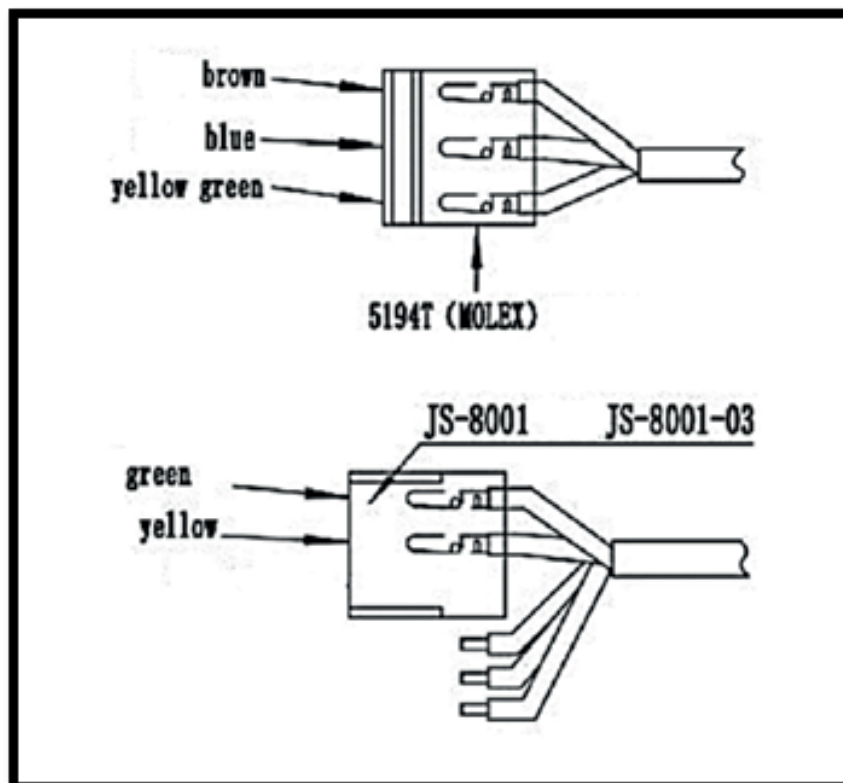


Figure 12. Wires and factory connectors EC169W-B190/44P1-05



Motor EC092 series and EC102 series

		Terminal Number / color	Description
Main Supply	L	1 Brown	Supply voltage 220 - 240V AC
	N	2 Blue	
	PE	3 Yellow/Green	PE connection
Control	A	4 Green	Bus connection RS485 - A; MODBUS RTU
	B	5 Yellow	Bus connection RS485 - B; MODBUS RTU
	10V	6 Red	Output 10V DC
	AIN	7 Black	Analog Input; Set value 0-10 V DC; $R \geq 1 \text{ k}\Omega$
	GND	8 White	I/O ground

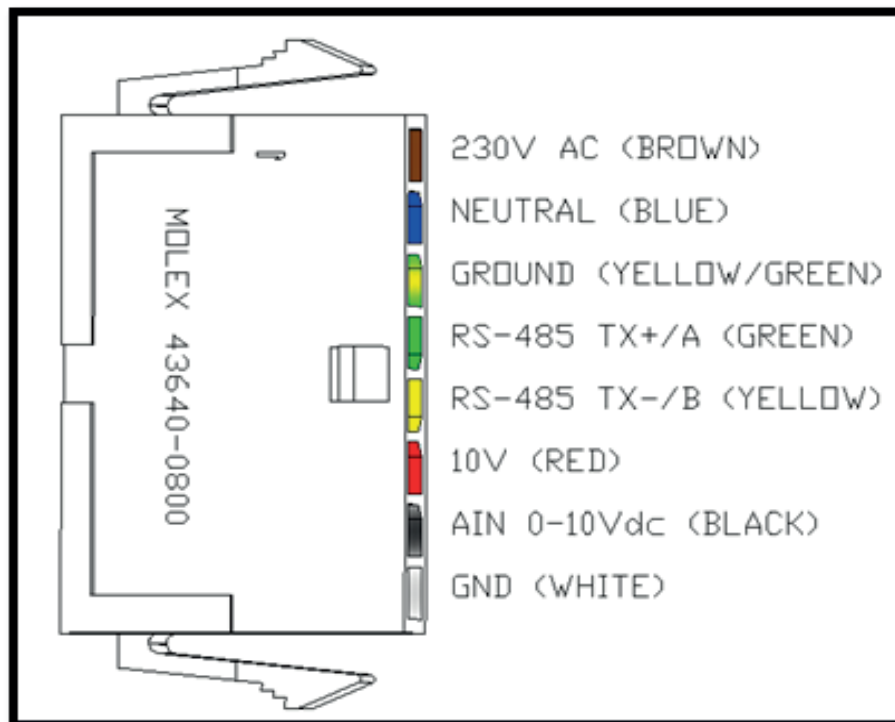


Figure 13. EC092 series and EC102 series CONNECTION DIAGRAM



4.5 Communication

The motors can be controlled via an analog connection and using the Modbus protocol. The EC169W-B190 / 44P1-05 engine can only be controlled using the Modbus protocol. The 092 and 102 series motors can be controlled in both ways. The parameters and control methods are presented below.

5.5.1 Analog input

AN1: Analogue input 1 – Electronics can be controlled by external analogue input voltage 10-0 VDC. Electronics controls speed linear from RPM min to RPM max. Maximal or minimal speed is defined as input voltage $9,5V \pm 3\%$.

AN1Min parameter can be set to the desired minimum setpoint. AN1Max parameter can be set to the desired maximum setpoint. AN1Min and AN1Max can be set from 0V to 10V.

By AN1Stop, stop threshold voltage can be set. If AN1Stop is 0 threshold voltage is disabled and motor will run with minimal settable RPM. By setting AN1Stop higher than 0 motor will not run up to settable value.

For example if AN1min is set to 1V, AN1max is set to 9V and AN1stop is set to 0V controller works from 200 rpm to 1500 rpm and motor will run with minimal rpm. AN1 operates from 1V to 9V (AN1max > AN1min). If AN1stop is set to 1V then motor will not run below 1V. These examples show the charts below. (Figure 4.1)

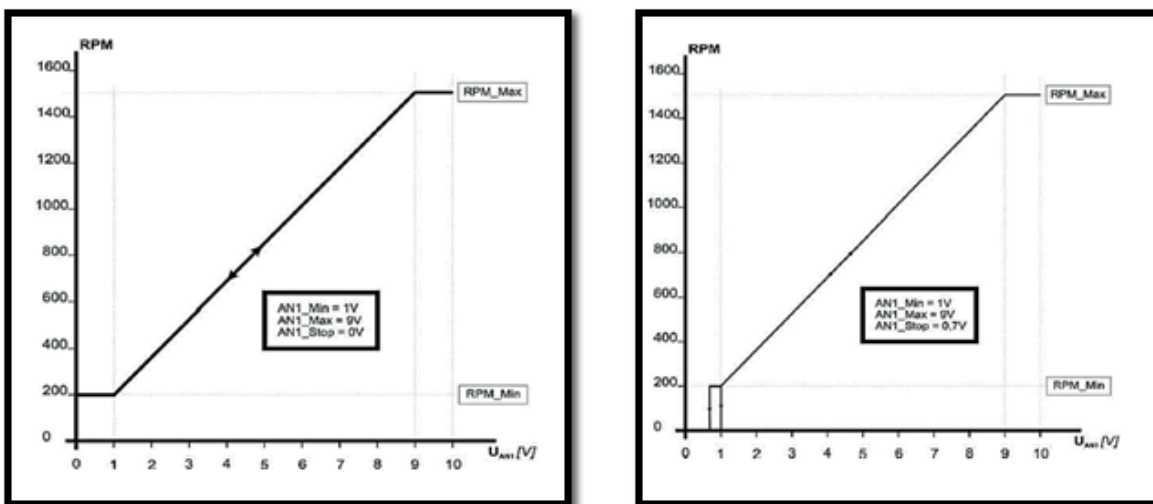


Figure 14. RPM/voltage charts with analogue connection.



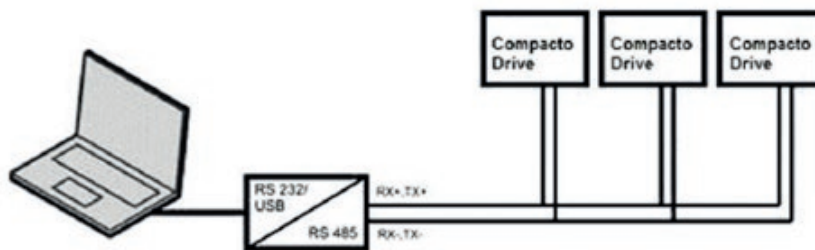
Incorrect polarity at input AN1 can cause serious damage of the controller.

4.5.2 Modbus RTU

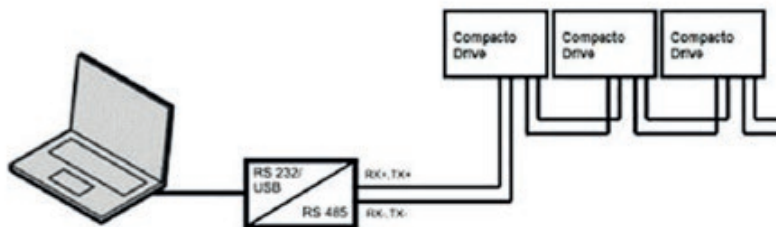
Electronics are equipped with Modbus RTU 485 communication. To connect controllers into chain use only shielded cables. Shielded wires for grounding connection between controllers is necessary. The MODBUS RTU protocol is based on the built-in RS-485 (EIA-485) interface. RS-485 is a two-wire bus-interface that allows multi-drop network topology i.e. nodes can be connected as a bus (daisy chain), or via drop cables from a common trunk line.



Drives uses the two-wire system where the communication between master and slave is half duplex, i.e. it cannot transmit and receive at the same time. Each signal uses one twisted pair line – two wires twisted around themselves. The signal on one wire is ideally the exact opposite of the signal on the second wire. Since RS-485 is a multipoint communication system, all devices are connected to the single twisted-pair cable. The Modbus RTU uses master/slave architecture, where each slave device has its unique address and responds only to packets addressed to this device. The packets are generated by the master (Controller), which periodically polls all connected slave devices. Data travels over the single line in both directions. Multiple EC drives can be connected to a control (or master) using the RS-485 standardized interface. Maximal number of Compacto EC Drives connected to the network is 32. Use parallel connections method to connect multiple frequency converters.



Parallel connections



"Daisy chain" connection

Figure 14. Parallel and "Daisy chain" connections via modbus



To connect PC and drive over serial line (MODBUS) RS-23/USB to RS-485, use of converter is needed.

4.5.3 Modbus parameters

MODBUS is addressing of the drives (up to 32 pcs.) via software, adjustable: 9600, 19200 and 38400.

Coils				
Address	Function	Range	Description	Level
0	Motor ON/OFF	0-1	Indication, 1=ON, 0=OFF	0
1	Reset Controller	0-1	1=Reset controller	0



Discrete status bits				
Address	Function	Range	Description	Level
0	Under Voltage	0-1	1=Voltage too low to run	0
1	Over Voltage	0-1	1=Voltage too high to run	0
2	IGBT Overcurrent	0-1	1=Overcurrent protection tripped	0
3	Hot	0-1	1=Temperature protection active, power reduced	0
4	Phase Loss	0-1	1=Phase or motor sync loss	0
5	RESERVED			0
6	Parameters CRC	0-1	1=Parameter checksum failed (TBD)	0
7	Circuit Fault	0-1	1=There was an error detected during circuit internal check	0
8	Motor Fault	0-1	1=Motor does not behave as expected	0
9	Too Hot	0-1	1=Converter too hot to operate	0
10	I2R IGBT Fault	0-1	1=Software IGBT protection triggered	0
13.lis	RESERVED			0
14	Restart Fault	0-1	1=Fault condition repeated several times in a short time. Converter power should be power cycled or reset.	0
15	RESERVED			0
16 - 17	RESERVED			0
18	Waiting To Stop	0-1	1=Motor should be stopped, but is still spinning	0
19 – 23	RESERVED			0
24	RpmReg	0-1	Speed regulator active	0
25	PowerReg	0-1	Power limit regulator active	0
26	RESERVED			0
27	OvermodReg	0-1	Over modulation reached. Converter can no longer supply the voltage required by motor.	0
28	RegenReg	0-1	Motor is in regeneration. Speed increased to prevent DC link over voltage	0
29	IphaseReg	0-1	RMS motor phase current limit reached	0
30	SyncReg	0-1	Motor is still in Synchronous mode	0



Holding Registers					
Address	Function	Range	Description	LEVEL	Resolution
0	Set point	0..10000	Performance set point for speed depends on operation mode.	0, 1	0,01%
1	Direction	0..65535	Motor direction: 0: clockwise rotation. >0: anti-clockwise rotation	1	1
2	Maximum Speed	MinRPM.. MaxRPM[level+1]	Max rpm allowed in normal operation. External control will use this as set point maximum.	0, 1	1
3	RESERVED				
4	MinRPM[level+1]... MaxRPM	10% RPM to Max RPM	Minimal allowed speed	0, 1	1
5	Password	0..32767	0: level 0 9788: master password 24681: password for level 1 24681 can be changed 10000: store values to EEPROM at current level (will override lower levels) When level is changed, stored values for the level will be loaded	0	
6	Operation Mode		0: AN1 Speed (default) 2: MODBUS Speed	0	
7	Modbus Address	1..247	Set Modbus address: Write 10000 to Password to save. Restore by writing to broadcast address (0) (in case you forgot address)	1	
8	MODBUS connection detection	0/1	Detection MODBUS connection loos (1 MODBUS disconnection ignored, 0 – MODBUS disconnection used for motor stop)	0	
9	MODBUS connection detection timeout	0..65536 s	timeout to stop motor after loose connection	1	
10	RESERVED				
11	AN1Max	0..1000	Voltage for maximum setpoint. Transfer function is inverted if AN1Max < AN1Min.	1	0.01V
12	AN1Min	0..1000	Voltage for minimum setpoint	1	0.01V
13	AN1Stop	0..1000	0: disable stop AN1Stop >0: Stop threshold voltage.	1	0.01V
18	Modbus speed	1-3	Modbus speed can be changed: 1 - baud rate 9600 (default), 2 - baud rate 19200, 3 - baud rate 38400. Notice: after baud rate change Modbus communication will not work, also change baud rate on converter to get proper working.		
19	RESERVED				
20	RESERVED				
21	Password change	0..32767	new password for level 1		



Input Registers					
Address	Function	Range	Description	LEVEL	Resolution
0	HW Version		Hardware version	0	1
1	FW Version		Firmware version	0	1
2..3	RESERVED			0	
4	Speed	0..32767	RPM	0	1
5	Controller temperature	-50..150	°C	0	0.01
6	UDC		DC Bus voltage in V	0	0.1
7	Stator IRMS		RMS Stator current in A	0	0.001
8	Power		W	0	0.1
9	Analogue1	-300..2000	Analogue input 1 voltage	0	0.01V
19	Error Code	0..7	7 = motor failed to start repeatedly 6 = under or overvoltage 5 = motor misconnected/faulty 4 = internal frequency converter fault 3 = temperature protection active 2 = active overcurrent protection 1 = slow blink = standby 0 = always on (operating normally)	0	
20 - 21	RESERVED			0	
23	Op Minutes		Minutes of operation	0	
24	Op Days		Days of operation (RPM>0, no error)	0	



5 MAINTENANCE

5.1 Maintenance

Swiss Rotors strongly recommends checking the condition of fans systematically. Technical control is obliged to the user. Properly frequent checks allow early detection of irregularities in the system and may help avoiding serious damages resulting from various random factors. Please refer to our general proposed inspection checklist presented below.

Verify	OK
Unit is free of mechanical damage. There are no traces of rust.	
There are no unwanted objects inside the casing which are not internal fan parts.	
The impeller rotates without rubbing against other elements	
The impeller has no undesirable vibrations during operation.	
There are no unwanted objects inside the casing which are not internal fan parts.	
Fixing bolts are firmly tightened	
The fan blades are not damaged, there are no cracks.	
Engine wires are not damaged – no signs of mechanical damage.	

Table 5. General maintenance checklist

5. SUPPORT



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