

## **VENTS V16EN Centrifugal Fan In Scroll Casing User Manual**

Home » VENTS » VENTS V16EN Centrifugal Fan In Scroll Casing User Manual



#### **Contents**

- 1 VENTS V16EN Centrifugal Fan In Scroll Casing
- 2 PURPOSE
- **3 DELIVERY SET**
- **4 DESIGNATION KEY**
- **5 TECHNICAL DATA**
- 6 OVERALL DIMENSIONS AND VARIANTS OF THE VCUN FAN CASING **POSITIONS**
- 7 OVERALL DIMENSIONS AND VARIANTS OF THE VCU(z) FAN CASING **POSITIONS**
- **8 DESIGN AND OPERATING PRINCIPLE**
- 9 INSTALLATION AND SET-UP
- 10 MOUNTING STEPS FOR THE VCUN FAN
- 11 MOUNTING STEPS FOR THE VCU(z) FAN
- 12 CONNECTION TO POWER MAINS
- 13 WIRING STEPS FOR THE VCU(z) FAN
- **14 WIRING DIAGRAMS**
- 15 TECHNICAL MAINTENANCE
- **16 MAINTENANCE INSTRUCTIONS**
- 17 TROUBLES AND TROUBLESHOOTING
- 18 STORAGE AND TRANSPORTATION REGULATIONS
- 19 MANUFACTURER'S WARRANTY
- **20 CERTIFICATE OF ACCEPTANCE**
- 21 SELLER INFORMATION
- 22 INSTALLATION CERTIFICATE
- 23 WARRANTY CARD
- 24 Documents / Resources
  - 24.1 References
- 25 Related Posts



### **VENTS V16EN Centrifugal Fan In Scroll Casing**



### **PURPOSE**

Centrifugal fans in scroll casing are designed for supply and extract ventilation of residential, public and industrial premises. The fan is designed for floor mounting.

THE UNIT SHOULD NOT BE OPERATED BY CHILDREN OR PERSONS WITH REDUCED PHYSICAL, MENTAL, OR SENSORY CAPACITIES, OR THOSE WITHOUT THE APPROPRIATE TRAINING. THE UNIT MUST BE INSTALLED AND CONNECTED ONLY BY PROPERLY QUALIFIED PERSONNEL AFTER THE APPROPRIATE BRIEFING. THE CHOICE OF UNIT INSTALLATION LOCATION MUST PREVENT UNAUTHORISED ACCESS BY UNATTENDED CHILDREN.

The unit is rated for continuous operation. Transported air must not contain any flammable or explosive mixtures, evaporation of chemicals, sticky substances, fibrous materials, coarse dust, soot and oil particles or environments favourable for the formation of hazardous substances (toxic substances, dust, pathogenic germs).

### **DELIVERY SET**

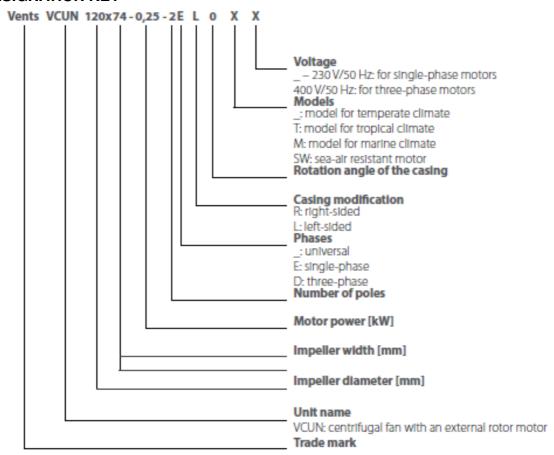
### Name Quantity

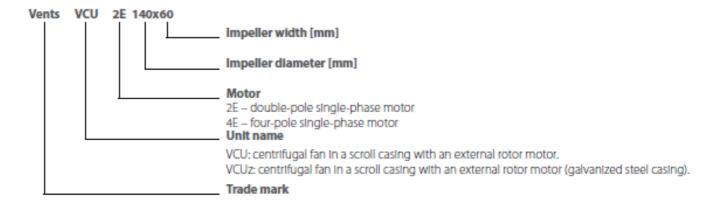
Fan 1 pc.

User's manual 1 pc.

Mounting bracket (for the VCU models) Packing box 1 pc.

### **DESIGNATION KEY**





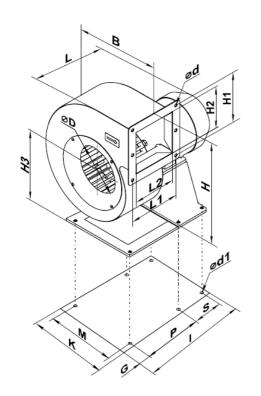
### **TECHNICAL DATA**

The unit is designed for indoor application at ambient temperature from -20 °C up to +40 °C and relative humidity of 80 %. The unit design is constantly being improved, so some models can slightly differ from those ones described in this manual. The unit is rated as a Class I electrical appliance. Ingress protection rating against access to hazardous parts and water ingress:

- IPX4 for VCU models
- IP54 for VCUN models.

NEVER TEST RUN OR OPERATE THE FAN, WHICH IS NOT CONNECTED TO THE VENTILATION SYSTEM, IF THE AIR FLOW RATE AND THE CURRENT CONSUMPTION EXCEED THE MAXIMUM VALUE FOR THE GIVEN STANDARD SIZE (SEE TECHNICAL PARAMETERS ON THE LABEL), AND IN THE ABSENCE OF THERMAL PROTECTION OF THE MOTOR

### OVERALL DIMENSIONS AND VARIANTS OF THE VCUN FAN CASING POSITIONS



# POSSIBLE VARIANTS OF THE VCUN FAN CASING POSITIONS (View on the supply side)

Impeller rightv	rotation wards	Impeller rotation leftwards						
R 0°	R 180°	0°	L 180°					
R 45°	R 225°	L 45°	L 225°					
R 90°	R 270°	90°	L 270°					
R 135°	R 315°	L 135°	115°					

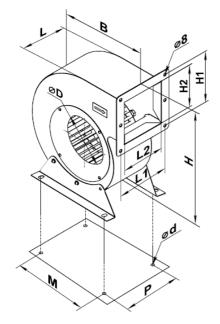
	Din	nens	ions	[mn	n]													Weig
Model	Ø D	Ø d	Ø d1	В	Н	H 1	H 2	H 3	L	L1	L2	Р	М	I	G	K	S	ht [k g]
VCUN 140×74-0,25-4	14 0	8	10	24 2	32 3	12 5	92	14 4	30 9	12 5	95	12 4	22 0	23 4	18	25 3	8	9.3
VCUN 140×74-0,37-2	14 0	8	10	24 2	32 3	12 5	92	14 4	30 9	12 5	95	12 4	22 0	23 4	18	25 3	8	9.3
VCUN 160×74-0,55-4	16 0	8	10	27 7	37 3	13 4	10 6	17 3	35 6	13 4	10 4	14 1	22 0	26 0	17	25 2	9	12.7
VCUN 160×74-0,75-2	16 0	8	10	27 7	37 3	13 4	10 6	17 3	35 6	13 4	10 4	14 1	22 0	26 0	17	25 2	9	13.0
VCUN 180×74-0,55-4	18 0	10	10	31 1	41 4	14 3	12 0	19 3	36 5	14 3	11 4	14 6	27 0	27 0	22	31 4	9	13.5
VCUN 180×74-1,1-2	18 0	10	10	31 1	41 4	14 3	12 0	19 3	36 5	14 3	11 4	14 6	27 0	27 0	22	31 4	9	14.5
VCUN 200×93-0,55-4	20 0	10	10	34 5	43 6	16 0	13 4	19 3	38 0	16 0	12 9	15 8	27 0	28 4	24	31 5	9	15.2
VCUN 200×93-1,1-2	20 0	10	10	34 5	43 6	16 0	13 4	19 3	38 0	16 0	12 9	15 8	27 0	28 4	24	31 5	9	16.2
VCUN 225×103-1,1-4	22 5	10	12	38 8	50 7	17 8	15 1	23 2	43 2	17 2	14 1	17 4	27 5	31 6	27	33 0	1 0 0	21.2

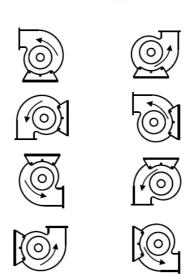
VCUN 225×103-2,2-2	22 5	10	12	38 8	50 7	17 8	15 1	23 2	43 2	17 2	14	17 4	27 5	31 6	27	33 0	1 0 0	24.2
VCUN 240×114-2,2-4	24 0	10	12	41 4	56 8	18 6	16 1	28 2	46 1	18 6	15 6	19 5	27 5	36 2	27	33 0	1 2 5	30.5
VCUN 240×114-3,0-2	24 0	10	12	41 4	56 8	18 6	16 1	28 2	46 1	18 6	15 6	19 5	27 5	36 2	27	33 0	1 2 5	31.4
VCUN 250×127-1,5-6	25 0	10	12	43 1	59 4	20 2	16 8	29 2	47 3	20 2	16 6	20 6	30 0	37 3	27	35 5	1 2 5	33.0
VCUN 250×127-2,2-4	25 0	10	12	43 1	59 4	20 2	16 8	29 2	47 3	20 2	16 6	20 6	30 0	37 3	27	35 5	1 2 5	32.2
VCUN 250×127-5,5-2	25 0	10	12	43 1	61 4	20 2	16 8	31 2	51 7	20 2	16 6	21 3	30 0	39 7	27	35 5	1 4 0	40.0
VCUN 280×127-1,5-6	28 0	10	12	48 3	62 6	22 5	18 9	29 2	50 3	23 1	19 6	24 3	30 0	41 0	27	35 5	1 2 5	35.1
VCUN 280×127-2,2-4	28 0	10	12	48 3	62 6	22 5	18 9	29 2	50 3	23 1	19 6	24 3	30 0	41 0	27	35 5	1 2 5	34.2
VCUN 280×127-5,5-2	28 0	10	12	48 3	64 6	22 5	18 9	31 2	54 5	23 1	19 6	24 3	30 0	42 7	27	35 5	1 4 0	42.4

VCUN 315×143-2,2-6	31 5	10	15	54 3	73 1	25 0	21 3	35 3	56 8	25 5	21 6	26 8	35 0	45 2	27	40 5	14 0	46. 8
VCUN 315×143-4,0-4	31 5	10	15	54 3	73 1	25 0	21 3	35 3	56 8	25 5	21 6	26 8	35 0	45 2	27	40 5	14 0	49. 8
VCUN 355×143-2,2-6	35 5	10	15	61 1	81 7	27 5	24 1	40 3	56 6	25 5	21 4	25 3	35 0	44 2	32	40 5	14 0	49. 0
VCUN 355×143-4,0-4	35 5	10	15	61 1	81 7	27 5	24 1	40 3	56 6	25 5	21 4	25 3	35 0	44 2	32	40 5	14 0	51. 0
VCUN 400×183-1,5-8	40 0	10	15	68 9	87 0	31 0	27 2	40 3	61 9	31 0	26 8	31 3	40 0	49 7	27	45 5	14 0	57. 1
VCUN 400×183-2,2-6	40 0	10	15	68 9	87 0	31 0	27 2	40 3	61 9	31 0	26 8	31 3	40 0	49 7	27	45 5	14 0	54. 1
VCUN 400×183-5,5-4	40 0	10	15	68 9	88 2	31 0	27 2	41 4	66 2	33 0	28 9	34 1	40 0	52 5	27	45 5	14 0	69. 5
VCUN 450×203-3,0-8	45 0	10	15	77 4	98 5	34 5	30 6	46 4	69 0	35 2	31 5	35 1	45 0	55 0	42	53 0	14 0	77. 8
VCUN 450×203-4,0-6	45 0	10	15	77 4	98 5	34 5	30 6	46 4	69 0	35 2	31 5	35 1	45 0	55 0	42	53 0	14 0	76. 5
VCUN 450×203-11,0-4	45 0	10	15	77 4	10 05	34 5	30 6	48 4	72 2	35 2	31 5	37 1	45 0	60 8	42	53 0	17 8	105 .0
VCUN 500×229-5,5-8	50 0	11	15	86 0	11 15	39 0	34 1	53 4	76 1	40 1	35 3	40 8	50 0	64 5	42	58 0	17 8	85. 0
VCUN 500×229-7,5-6	50 0	11	15	86 0	11 15	39 0	34 1	53 4	76 1	40 1	35 3	40 8	50 0	64 5	42	58 0	17 8	86. 0
VCUN 500×229-11,0-4	50 0	11	15	86 0	11 15	39 0	34 1	53 4	76 1	40 1	35 3	40 8	50 0	64 5	42	58 0	17 8	107 .0

OVERALL DIMENSIONS AND VARIANTS OF THE VCU(z) FAN CASING POSITIONS

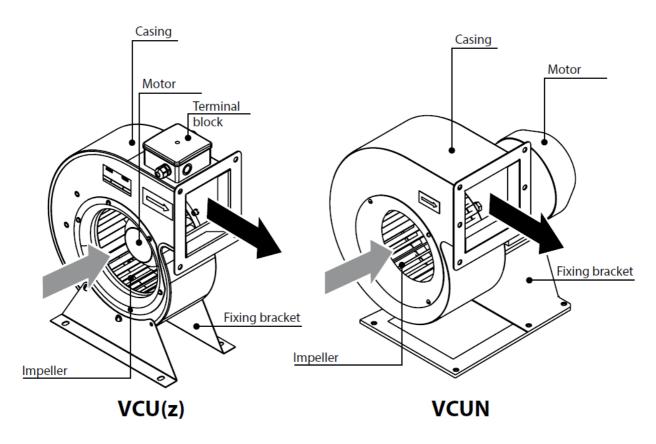
# POSSIBLE VARIANTS OF THE VCU(z) FAN CASING POSITIONS (View on the supply side)





Model	Dime	Dimensions [mm]											
Model	ØD	Ød	В	Н	H1	H2	L	L1	L2	Р	М	ht [kg ]	
VCU(z) 2E 140×60	140	9	243	287	125	93	85	107	75	116	150	3.5	
VCU(z) 2E 160×62	160	9	277	324	136	106	89	112	82	122	200	4.6	
VCU(z) 2E 160×90	160	9	277	324	136	106	136	158	127	168	200	5.5	
VCU(z) 4E 180×92	180	9	311	360	150	120	145	166	137	181	230	7.1	
VCU(z) 4E 200×80	200	9	345	398	165	134	116	140	108	150	240	7.5	
VCU(z) 4E 200×102	200	9	345	398	165	134	152	175	143	185	240	8.0	
VCU(z) 4E 225×102	225	11	365	441	210	171	145	170	137	178	250	11.9	
VCU(z) 4E 250×102	250	11	410	485	230	191	165	190	157	198	270	16.3	
VCU(z) 4E 250×140	250	11	410	485	230	191	205	230	197	238	270	16.3	

### **DESIGN AND OPERATING PRINCIPLE**



The **VCUN** fan is enclosed in a metal casing. The electric motor and the air intake ring are fixed to the casing through the flange. The impeller is fastened to the drive shaft. The fixing bracket for the fan mounting is attached to the motor bottom. The VCUN fans are available in the right- and left-hand modifications. In the first case the impeller has clockwise rotation and in the second case the impeller has counter-clockwise rotation, view on the supply side. The **VCU(z)** fan is enclosed in a metal casing. The impeller and the electric motor are bolted to the flange. The terminal box for connection to power mains is located on the top of the casing. The capacitor is enclosed in the terminal box. The fan fixation is performed with fixing brackets.

### **INSTALLATION AND SET-UP**

After the fan unpacking, prior to the mounting:

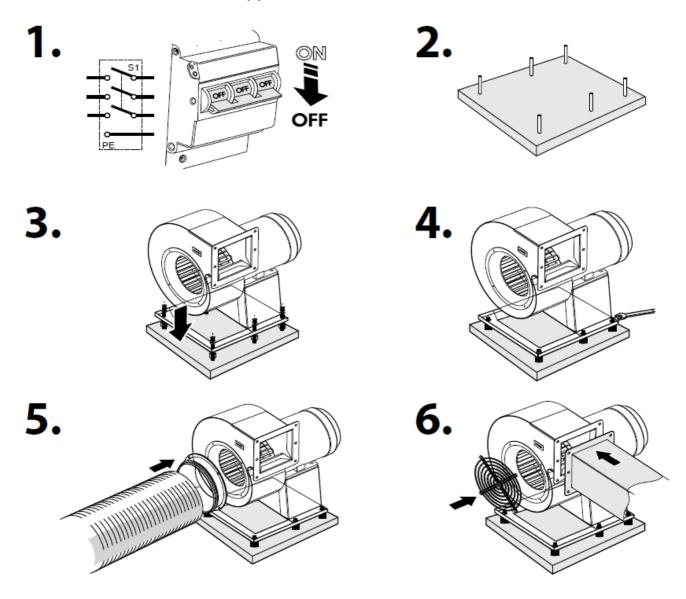
- Read carefully the user's manual and the mounting, start-up, operating and servicing guidelines.
- Make sure that the fan impeller rotates freely.
- · Make sure there is no condensate on the motor.
- Check the electrical resistance of insulation between the motor windings and between each winding and the motor casing. Follow the safety regulations during the make-ready procedures and fan operation.

### MOUNTING STEPS FOR THE VCUN FAN

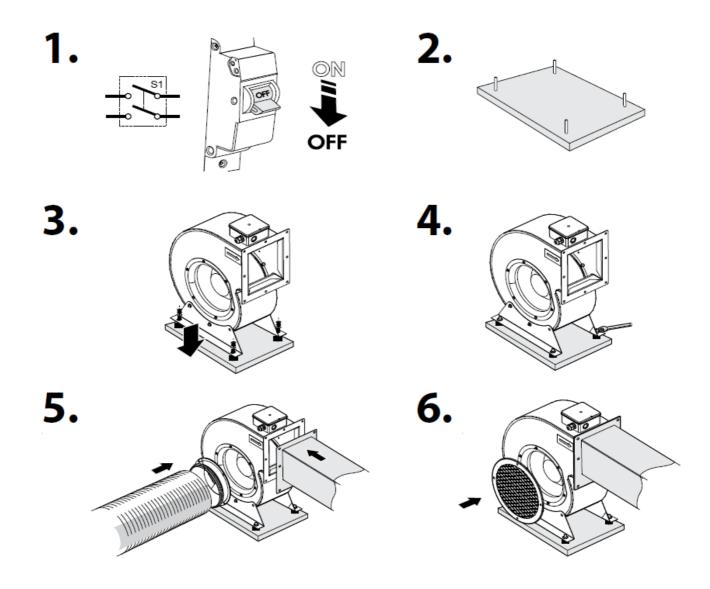
- Make sure that the motor is disconnected from power supply (Fig. 1).
- Bore holes and fasten the fixing bracket using the appropriate fasteners (i.e. expansion anchors). In case of need, use the vibration dampers VVCr or VVCp (specially ordered accessories), (Fig. 3).
- Provide reliable grounding of the fan (Fig. 4).

• Connect the air ducts to the fan. On the air intake side install the flange FVC-VCU, FVC-VCUN (specially ordered accessories) (Fig. 5) or the protecting grille RVC-VCU, RVC-VCUN (Fig. 6).

### MOUNTING STEPS FOR THE VCU(z) FAN



- Make sure that the motor is disconnected from power supply (Fig. 1).
- Mark holes on the mounting surface for mounting of the fixing bracket (Fig. 2).
- Bore holes and fasten the fixing bracket using the appropriate fasteners (i.e. expansion anchors). In case of need, use the vibration dampers VVCr or VVCp (specially ordered accessories) (Fig. 3).
- Provide reliable grounding of the fan (Fig. 4).
- Connect the air ducts to the fan. On the air intake side install the flange FVC-VCU, FVC-VCUN (specially ordered accessories) (Fig. 5) or the protecting grille RVC-VCU, RVC-VCUN (Fig. 6).



After installing the unit, you need to make sure that the fan impeller rotates freely.

### **CONNECTION TO POWER MAINS**

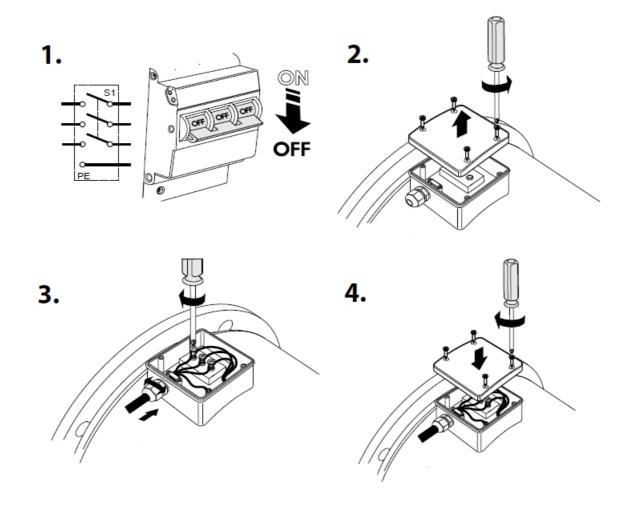
POWER OFF THE POWER SUPPLY PRIOR TO ANY OPERATIONS WITH THE UNIT. THE UNIT MUST BE CONNECTED TO POWER SUPPLY BY A QUALIFIED ELECTRICIAN. THE RATED ELECTRICAL PARAMETERS OF THE UNIT ARE GIVEN ON THE MANUFACTURER'S LABEL. ANY TAMPERING WITH THE INTERNAL CONNECTIONS IS PROHIBITED AND WILL VOID THE WARRANTY.

The VCU(z) fan is rated for connection to single-phase alternating current 230 V/50 (60) Hz power supply. The VCUN fan is rated for connection to three-phase alternating current 400 V/50 (60) Hz power supply. The fan must be connected to power mains using durable, insulated and heat-resistant electric conductors (cables, wires). Connect the unit to power mains through the external automatic circuit breaker with a magnetic trip integrated into the fixed wiring system. The installation place of the circuit breaker must provide unhampered access to the unit for its emergency shutdown. For selection of the rated trip current of the automatic circuit breaker refer to the fan technical data table.

The wire cross section is stated in the table. The actual conductor cross section selection must be based on the maximum permissible wire temperature depending in the wire type, insulation, length and installation method.

Fan model	Minimum wire cross section [mm2]
All VCU(z) models	1.5
VCUN 140 VCUN 180	1.5
VCUN 200 VCUN 400	2.5
VCUN 450 VCUN 500	4

- Make sure the power cable is disconnected from power supply (Fig. 1).
- Take off the lid of the terminal box located on the motor casing (Fig. 2).
- Route the power cable wires through the cable gland on the terminal box, then strip the wires for 7-8 mm (Fig. 3).
- Connect the wires to the terminal box in compliance with the wiring diagram and considering the terminal marking. The three-phase motors must be star-connected (Fig. 3 and 4). For doing that insert the wires into the metal part of the terminals against insulation stop and fix those with the screws.
- Cover the terminal box with the lid (Fig. 4).

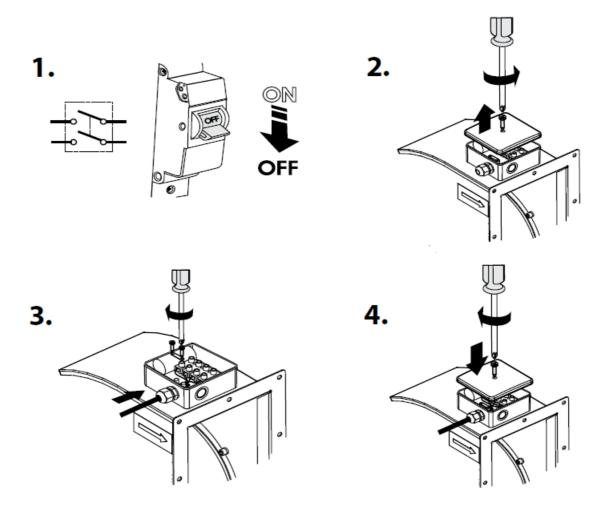


The air direction must match the pointer direction of the fan casing. To check the impeller rotation direction turn the fan on for a short run. If the impeller rotation direction is wrong, change any two phase conductors on the motor terminals. For that change the respective wires on the terminal block in the terminal box.

### WIRING STEPS FOR THE VCU(z) FAN

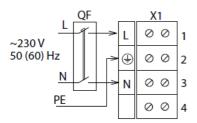
• Make sure the power cable is disconnected from power supply (Fig. 1).

- Take off the lid of the terminal box located on the motor casing (Fig. 2).
- Route the power cable wires through the cable gland on the terminal box, then strip the wires for 7-8 mm (Fig. 3).
- Connect the wires to the terminal box in compliance with the wiring diagram and considering the terminal marking (Fig. 3). For doing that insert the wires into the metal part of the terminals against insulation stop and fix those with the screws.
- Cover the terminal box with the lid (Fig. 4).



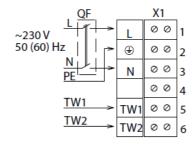
### WIRING DIAGRAMS

### **1.** VCU(z)

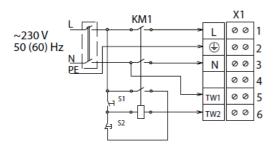


QF: automatic circuit breaker (not included in the delivery set) X1: terminal block

## 2. With a thermal switch



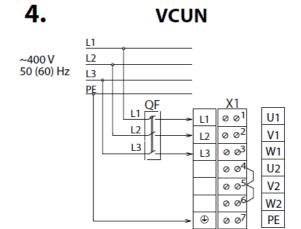
# VCU(z) 3. with a magnetic starter and a thermal switch



QF: automatic circuit breaker KM1: magnetic starter S1, S2: control buttons

(QF, KM1, S1, S2 are not included in the delivery set)

X1: terminal block



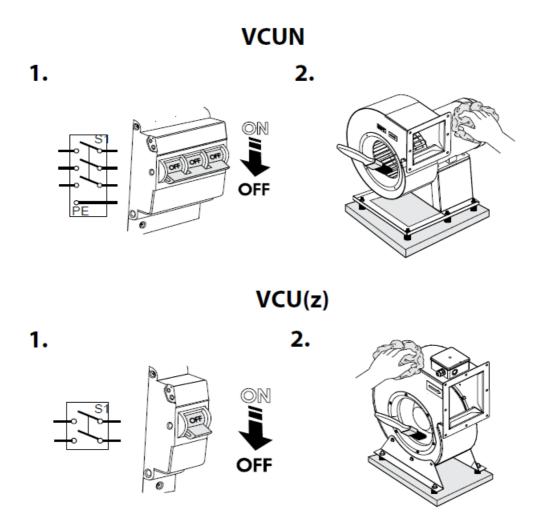
QF: automatic circuit breaker (not included in the delivery set) X1: terminal block

Wiring example for the VCU(z) fan with external leads of the motor overheating protection and a magnetic starter is shown in Fig. 3. The terminals TW1, TW2 are the leads of the normally closed contact of the motor overheating protection. This contact must be connected in series to the power circuit of the magnetic starter coil that starts the motor. In case of the motor overheating, the contact is opened and breaks power supply to the starter coil. This way the motor is stopped.

### **TECHNICAL MAINTENANCE**

Disconnect the unit from the power supply prior to any maintenance operations. Make sure the rotating parts have come to a full stop. The fan maintenance includes regular cleaning of the surfaces of dust and dirt. Clean the impeller blades every 6 months. Impeller blades cleaning is as follows:

- Disconnect the fan from the power supply.
- Provide access to the impeller blades.
- VCUN models: loosen the screws and remove the air intake ring.
- VCU models: loosen the screws and remove the motor-impeller block.
- Clean the impeller blades using a soft dry brush or compressed air.
- In case of high contamination, wet cleaning is recommended. Clean the impeller blades with a soft cloth wet in a neutral detergent solution. Avoid liquid dripping on the motor! After cleaning perform all the operations in the reverse order.



### **MAINTENANCE INSTRUCTIONS**

Perform regular maintenance of the fan to ensure its reliable, safe and efficient operation. General maintenance includes:

- · Daily maintenance.
- Maintenance after every 1000 operating hours.
- Current repair and maintenance after each 10 000 operating hours.
- Overhaul repair after 20 000 operating hours.

All the maintenance operations must be carried out according to the schedule above, no matter of the fan operating condition. Daily maintenance must be performed by a mechanician. Current repair operations and overhaul repair operations must be performed by a plumber and an electrician responsible for the equipment repair and operation.

### Steps for daily maintenance of the fan:

- Check the bolt tightening.
- Check reliability of the earth connection.
- · Check the fan for abnormal noise.

### Steps for maintenance after every 1000 operating hours:

- Fulfill all the daily maintenance operations.
- Troubleshoot any faults of the bolt and welded connections.
- Check the clearance between the impeller and the capacitor.

### Steps for current repair:

- Fulfill all the above operations of the maintenance after every 1000 operating hours.
- · Clean the casing and the impeller.

### Steps for overhaul repair:

- Disconnect the air ducts from the fan.
- Disassemble the fan assembled units.
- Assemble the fan units using the new or repaired parts.
- · Check the bearing grease and perform adjustment and test running.

### TROUBLES AND TROUBLESHOOTING

TROUBLE	POSSIBLE REASONS	TROUBLESHOOTING			
	No power supply.	Check the electric connections and troub leshoot a connection error, if applicable.			
The fan does not start.	Motor jam.	Turn the fan off. Troubleshoot clogging of the impeller. Restart the fan.			
Automatic circuit breaker tripping during the unit turning on.	Increased consumption of electric curren t due to a short circuit in the electrical circuit.	Turn the fan off. Contact the seller of the unit.			
	Contaminated impeller.	Clean the impeller blades.			
	Loose screw connection.	Check the screw connection and tighten the screws if required.			
High noise, vibrations.	Resonance with a mounting construction .	Install the matching vibration dampers V VCr and VVCp for the fan model.			

### STORAGE AND TRANSPORTATION REGULATIONS

- Store the unit in the manufacturer's original packaging box in a dry closed ventilated premise with temperature range from +5 °C to +40 °C and relative humidity up to 70\ %.
- The storage environment must not contain aggressive vapors and chemical mixtures provoking corrosion, insulation, and sealing deformation.

- Use suitable hoist machinery for handling and storage operations to prevent possible damage to the unit.
- Follow the handling requirements applicable for the particular type of cargo.
- The unit can be carried in the original packaging by any mode of transport provided proper protection against precipitation and mechanical damage. The unit must be transported only in the working position.
- Avoid sharp blows, scratches, or rough handling during loading and unloading.
- Prior to the initial power-up after transportation at low temperatures, allow the unit to warm up at operating temperature for at least 3- 4 hours.

### **MANUFACTURER'S WARRANTY**

The product is in compliance with EU norms and standards on low voltage guidelines and electromagnetic compatibility. We hereby declare that the product complies with the provisions of the Electromagnetic Compatibility (EMC) Directive 2014/30/EU of the European Parliament and of the Council, Low Voltage Directive (LVD) 2014/35/EU of the European Parliament and of the Council and CE-marking Council Directive 93/68/EEC. This certificate is issued following test carried out on samples of the product referred to above. The manufacturer hereby warrants normal operation of the unit for 24 months after the retail sale date provided the user's observance of the transportation, storage, installation, and operation regulations. Should any malfunctions occur in the course of the unit operation through the Manufacturer's fault during the guaranteed period of operation, the user is entitled to get all the faults eliminated by the manufacturer by means of warranty repair at the factory free of charge. The warranty repair includes work specific to the elimination of faults in the unit operation to ensure its intended use by the user within the guaranteed period of operation. The faults are eliminated by means of replacement or repair of the unit components or a specific part of such unit component.

### The warranty repair does not include:

- · routine technical maintenance
- unit installation/dismantling
- unit setup

To benefit from a warranty repair, the user must provide the unit, the user's manual with the purchase date stamp, and the payment paperwork certifying the purchase. The unit model must comply with the one stated in the user's manual. Contact the Seller for warranty service.

### The manufacturer's warranty does not apply to the following cases:

- User's failure to submit the unit with the entire delivery package as stated in the user's manual including submission with missing component parts previously dismounted by the user.
- Mismatch of the unit model and the brand name with the information stated on the unit packaging and in the user's manual.
- User's failure to ensure timely technical maintenance of the unit.
- External damage to the unit casing (excluding external modifications as required for installation) and internal components caused by the user.
- Redesign or engineering changes to the unit.
- Replacement and use of any assemblies, parts and components not approved by the manufacturer.
- · Unit misuse.
- · Violation of the unit installation regulations by the user.
- Violation of the unit control regulations by the user.
- Unit connection to power mains with a voltage different from the one stated in the user's manual.
- Unit breakdown due to voltage surges in power mains.

- Discretionary repair of the unit by the user.
- Unit repair by any persons without the manufacturer's authorization.
- Expiration of the unit warranty period.
- Violation of the unit transportation regulations by the user.
- Violation of the unit storage regulations by the user.
- Wrongful actions against the unit were committed by third parties.
- Unit breakdown due to circumstances of insuperable force (fire, flood, earthquake, war, hostilities of any kind, blockades).
- Missing seals if provided by the user's manual.
- Failure to submit the user's manual with the unit purchase date stamp.
- Missing payment paperwork certifying the unit purchase.

FOLLOWING THE REGULATIONS STIPULATED HEREIN WILL ENSURE A LONG AND TROUBLE-FREE OPERATION OF THE UNIT.

USER'S WARRANTY CLAIMS SHALL BE SUBJECT TO REVIEW ONLY UPON PRESENTATION OF THE UNIT, THE PAYMENT DOCUMENT AND THE USER'S MANUAL WITH THE PURCHASE DATE STAMP.

www.ventilation-system.com

### **CERTIFICATE OF ACCEPTANCE**

Unit Type	Centrifugal fan in scroll casing
Model	
Serial Number	
Manufacture Date	
Quality Inspector's Stamp	

### **SELLER INFORMATION**

Seller	
Address	
Phone Number	
E-mail	
Purchase Date	
This is to certify acceptance of wledged and accepted.	the complete unit delivery with the user's manual. The warranty terms are ackno
Customer's Signature	



### **INSTALLATION CERTIFICATE**

The unitser's manual.	is installed pursuant to the re	equirements stated in the present u				
Company name						
Address						
Phone Number						
Installation Tech nician's Full Na me						
Installation Date:		Signature:				
The unit has been installed in accordance with the provisions of all the applicable local and national construction, electrical and technical codes and standards. The unit operates normally as intended by the manufacturer.						
Signature:						



**WARRANTY CARD** 

Unit Type	Centrifugal fan in scroll casing
Model	
Serial Number	
Manufacture Date	
Purchase Date	
Warranty Period	
Seller	



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### **Documents / Resources**



<u>VENTS V16EN Centrifugal Fan In Scroll Casing</u> [pdf] User Manual V16EN, Centrifugal Fan In Scroll Casing, V16EN Centrifugal Fan In Scroll Casing

### References

• <u>VENTS - manufacture of ventilation and air conditioning systems</u>

Manuals+,