



reventon

INDUSTRIAL SOLUTIONS

Technical documentation

DESTRATIFICATION FAN TORNADO SERIES

MODELS:

TORNADO XS1
TORNADO XS2
TORNADO XS3
TORNADO XS4
TORNADO XS5
TORNADO XS6



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1. INTRODUCTION

Thank you very much for purchasing destratification fan TORNADO. We would like to congratulate you on excellent choice. Please read and keep this manual.

1.1 PRECAUTIONS

The buyer and the user of the destratification fan Reventon Group brand should read carefully the following instructions and proceed to the content recommendations. Proceeding due to the following instruction guarantees the correct usage and safety. In case of any doubts please contact directly Reventon Group Sp. z o.o. [Ltd.]. The producer reserves the rights to make changes to the technical documentation without previous notice. Reventon Group Sp. z o.o. [Ltd.] is not responsible for the damages which occur due to improper installation, not keeping the device in repair or using the device out of line. The installation should be carried out by the professional installers, who possess the qualifications to install these types of devices. The installers are responsible for making the installation as instructed in the technical data. In case of unserviceable please plug out the device and contact with the authorized for repair person or the supplier. During the installation, use, service and periodical inspections all regulations and safety rules must be followed.

1.2 TRANSPORT

During the acceptance of goods, it is needed to check the device to exclude any damages. During the transport, it is needed to use the proper equipment, it is necessary to carry the device by two people. In case of any damages please fill in the damage report in presence of the supplier.

1.3 PACKAGE CONTENT

- destratification fan
- instruction and warranty card

1.4 USE

In the heated high large-spaces the air mass is located in the upper part of room, which causes the heat loss. Destratification fans also called the drop fans or air mixers are used to save on heating. They steer the air back to work zone at the same time they level out the air temperature in the high room, they also limit the heat loss through the roof. They are used in production halls, warehouses and logistic centres.

2. DEVICE CHARACTERISTICS

2.1 CONSTRUCTION AND PRINCIPLE OF OPERATION

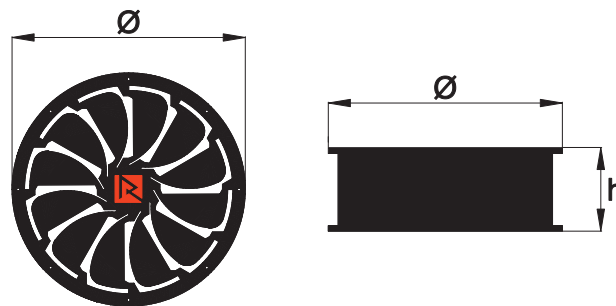
Cylindrical casing: made of powder coated steel. It has mounting holes which make it easy to assemble the destratification fan with e.g. mounting rods.

Diffuser 360°: made of powder coated steel. Using specially shaped air stators the diffuser enables even air distribution in the room.

Axial blowing fan: made of powder coated steel. It has a single-phase motor with the following parameters: protection degree IP44, rated current 0.65 - 3.5 A (depending on the model). The smallest device in the series has diameter 350 mm while the biggest one has diameter 630 mm.

2.2 DEVICE DIMENSIONS

	Ø	h
TORNADO XS1	424	180
TORNADO XS2	466	210
TORNADO XS3	515	210
TORNADO XS4	567	250
TORNADO XS5	640	252
TORNADO XS6	705	250



2.3 DEVICE TECHNICAL DATA

TECHNICAL DATA Product code	TORNADO XS1 DT-XS1-1965	TORNADO XS2 DT-XS2-1966	TORNADO XS3 DT-XS3-1967	TORNADO XS4* DT-XS4-1968	TORNADO XS5 DT-XS5-1969	TORNADO XS6 DT-XS6-1970
Maximum airflow [m³/h]	2200	3600	4500	6400	6750	10200
Maximum vertical range [m]	6	8	9	11	12	15
Supply voltage [V] / Supply frequency [Hz]	230/50	230/50	230/50	230/50	230/50	230/50
Rated motor current [A]	0.65	0.82	1.15	1.75	1.75	2.9
Motor speed [rpm]	1420	1380	1350	1320	1380	1300
Motor power [W]	126	180	250	380	385	660
Protection degree IP [-]	54	54	54	54	54	54
Net weight [kg]	7.1	8.3	10.6	13.6	16.8	23.0
Noise [dB]**	52	55	57	59	59	62

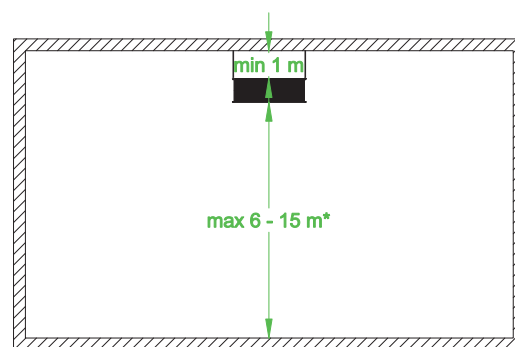
* not compatible with speed controllers like the fan speed controller HC and the thyristor speed controller TRO

** measurement at the distance 5 m

3. ASSEMBLY

3.1. GENERAL PRINCIPLES

During installation, ensure a free air flow to the device and do not restrict the air stream supply. The figures below show the recommended distances between the heater and building partitions:



* the maximum vertical range depends on the model

3.2 MOUNTING HOLES

There are special mounting holes in the back flange of the fan. Using them, it is possible to mount the device with e. g. mounting pins. In order to dampen possible vibrations of the structure, it is recommended to use anti-vibration mounts. Necessary assembly elements, suitable for this type of installation, should be purchased independently.

4. INSTALLATION INSTRUCTIONS

4.1. CONNECTION OF THE DEVICE TO THE ELECTRICAL SYSTEM

- all works concerning electrical installation should be made by the qualified personnel (who possess required authorizations to install electrical equipment), based on wiring schematic diagrams (see 7)
- the electrical installation of the building shall have a residual current device
- it is recommended to check the electric installation and controls before the first start

5. PRECAUTIONS & WARNINGS

The precautions mentioned below must be strictly followed during operation of the device:

- all works concerning electrical installation (disassembly, repair etc.) should be made by the qualified staff, who possess the qualifications due to the domestic and local norms, regarding electrical installations
- before service or exchange of the device it is obligatory to cut off the current supply
- do not limit or cover the inlet and outlet of the device
- do not install, service the device with wet hands or barefoot
- the device should be kept out of reach of children and animals
- after operating time of the device, please utilize it concerning the local norms and regulations
- it is recommended to clean the device periodically (at least twice a year):
 - air stators, fan casing and blades clean from dirt
- failure to comply with cleaning obligations may have a negative effect on technical parameters of the device and lead to loss of warranty
- if the device is not used for a longer time and lead to loss of warranty disconnect the voltage supply
- the device is transported with the closed air stators. It is essential to open them in at least for 30% before first start:
 - opening the air stators of the diffuser 360° must be done by two hands in parallel



6. CONTROLS

Usage of automatic control dedicated to the devices of Reventon Group gives great possibilities of adjusting the efficiency of the unit in different, depending on needs, degree of its operation automation. We can offer the following:

Programmable controller HMI SINGLE

is used to regulate devices equipped with 1-stage fans. It is an advanced controller with many functions i. a. operation in heating, cooling or mixed mode, programmable mode, valve control, automatic selection of the fan speed. Together with the controller an external sensor is provided, which allows to read the temperature in the required place, even remote from the controller. In addition, the device can operate in one of two modes - thermostatic or temperature difference. The second one enables effective controlling of destratification fans. The controller can be integrated with the BMS building control system (using the MODBUS communication protocol).



Voltage/Frequency: 230 V AC / 50 – 60 Hz
Maximum current: 5 A
Operating temperature range: 0 - 45°C
Regulation range: 5°C - 35°C
Regulation accuracy: $\pm 0,5^\circ\text{C}$
External temperature sensor: NTC 10K
Communication: RS485
Dimensions: 86 x 86 x 13,3 mm
Weight: 270 g
Degree of protection (housing): IP 20
Degree of protection (external sensor): IP 68

Fan speed controller HC

designed to change the single-phase fan's speed voltage controlled in industrial supply and heating systems. It is available in several versions. The selection of the appropriate model depends on the number of the devices that have to be connected to the one regulator - the total current of the connected devices cannot exceed the maximum current flow of the regulator.



Voltage/ Frequency: 230 V AC / 50 – 60 Hz
Maximum current output (depending on model):
1.2 A, 3 A, 5 A, 7 A, 14 A
Protection: thermal switch
Weight (depending on model):
1.45 kg, 2.5 kg, 4.5 kg, 5.5 kg or 10.5 kg
Degree of protection: IP 54

Thyristor speed controller TRO

enables reduction of rotational speed by lowering the supply voltage for a single-phase motor by the phase cutting method. It is available in two variants - for motors with a power below 150 W, TRO 150W is recommended, for those with a power between 150 - 600W, TRO 600W is recommended.



Voltage/Frequency: 220 ~ 240 V / 50 ~ 60 Hz
Maximum load:

- 150 W for TRO-150W
- 600 W for TRO-600W

Operating range: $t = -20 - 55^\circ\text{C}$, $20\% < \phi < 90\%$
Housing material: ABS (fireproof)
Dimensions (TRO-150W): 86 x 86 x 42 mm
Dimensions (TRO-600W): 86 x 86 x 40 mm

Manual thermostat HC

controls operation of the heater destratification fan. It switches the unit off automatically, when the set temperature is reached. The total current of the connected devices cannot exceed the maximum current flow of the thermostat.



Power supply/ Frequency: 230 V AC / 50 – 60 Hz
Maximum current: 3 A
Operating temperature: 0 - 40°C
Temperature control range: 10 - 30°C
Control accuracy: $< 1^\circ\text{C}$
Degree of casing's protection: IP 30

Relay Module RM-16A

allows to connect a receiver with higher current consumption than permissible current load of connected regulator.

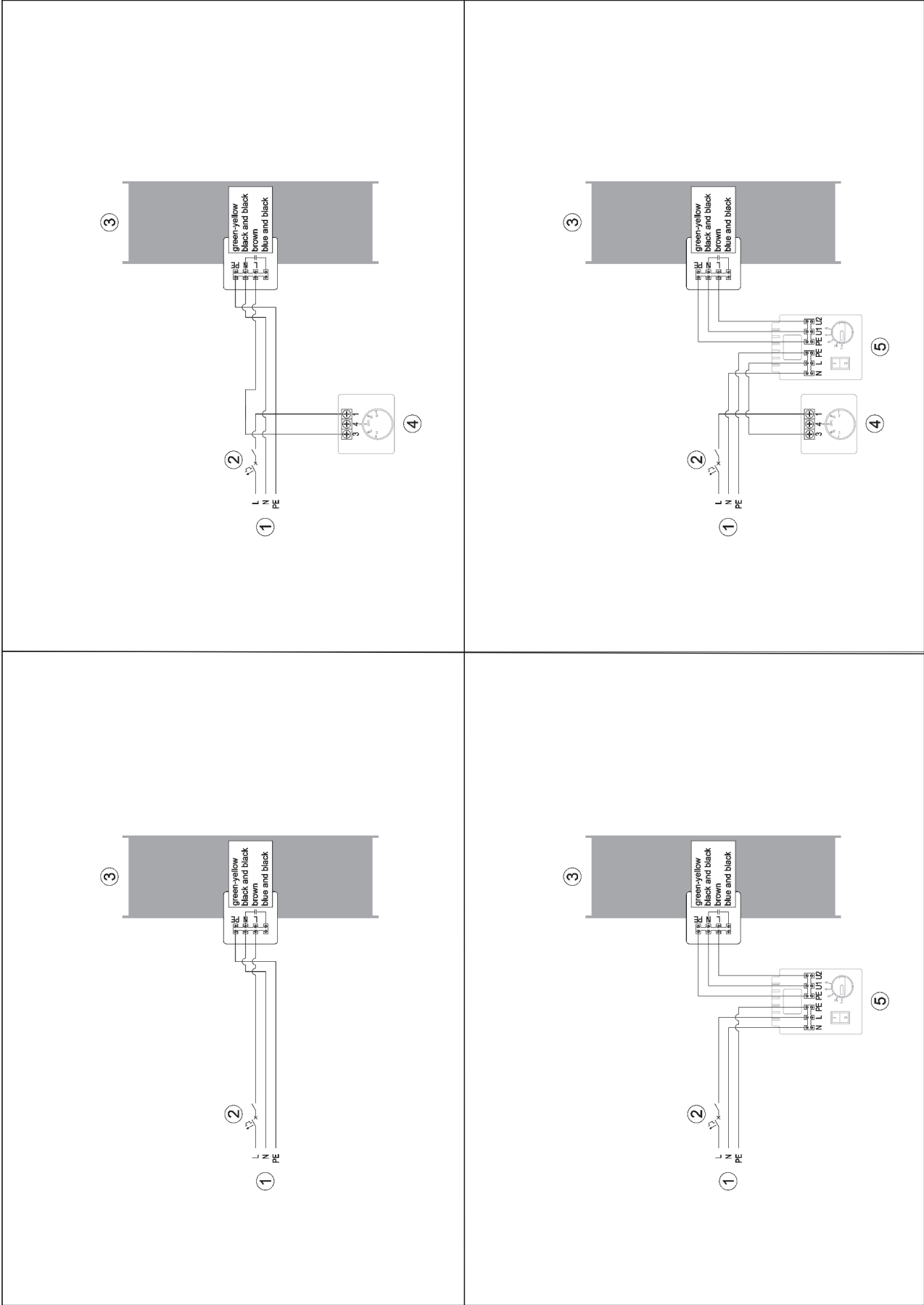


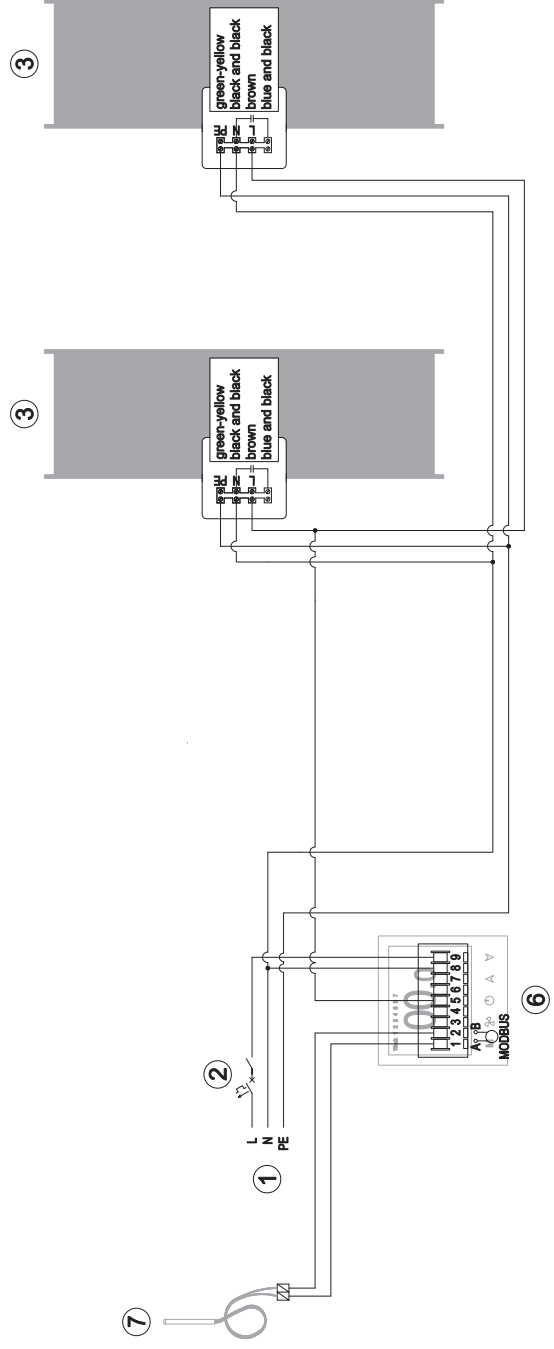
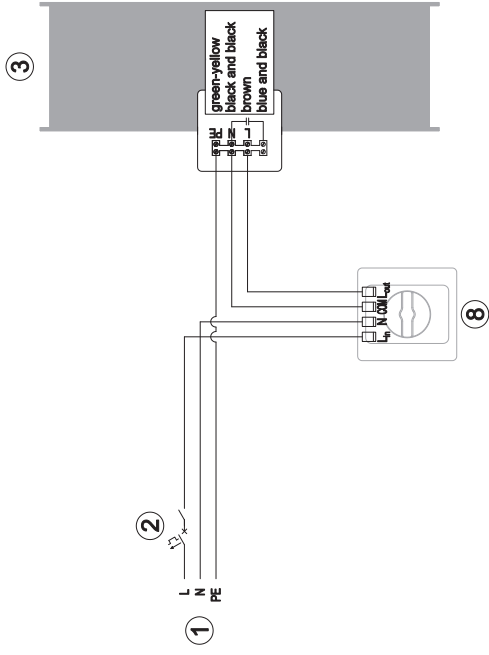
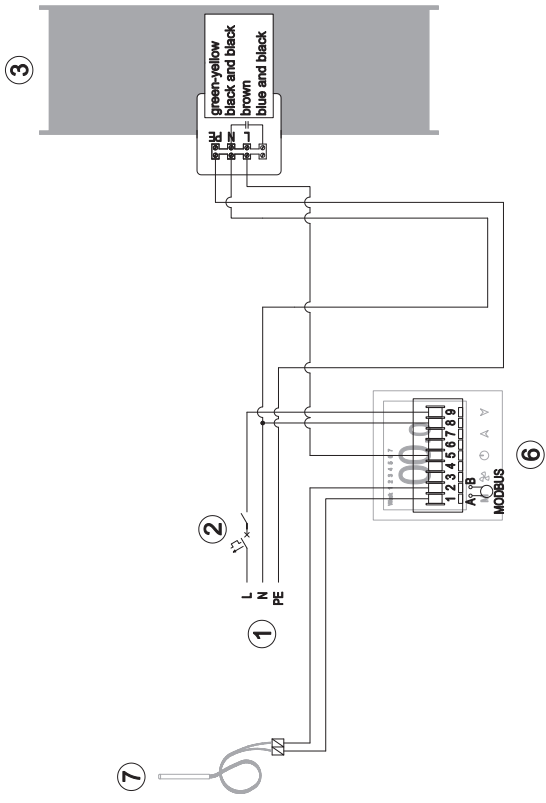
Power supply/ Frequency : 230 V AC / 50 – 60 Hz
Maximum rated current: 16 A
Input: NO/COM
Input: SL Connection of a regulator with the voltage relay 230 V
Dimension: 47 x 47 x 20 mm

7. CONNECTION SCHEMES

- 1. Power
- 2. Main switch, overcurrent circuit breaker*
- 3. Destratification fan TORNADO
- 4. Manual thermostat HC
- 5. Fan speed controller HC
- 6. Programmable controller HMI SINGLE
- 7. External temperature sensor
- 8. Thyristor speed controller TRO

*main switch and safety fuses are not included in the set





8. WARRANTY TERMS

I. The company Reventon Group Sp. z o. o. [Ltd.], hereinafter referred to as the guarantor, provides to the owner 24-month warranty protection period for the following devices:

- destratification fan TORNADO XS1
- destratification fan TORNADO XS2
- destratification fan TORNADO XS3
- destratification fan TORNADO XS4
- destratification fan TORNADO XS5
- destratification fan TORNADO XS6

II. The warranty protection is valid from the purchasing date by end user (i.e. the issue date of invoice) but not longer than 30 months from leaving the warehouse of Reventon Group Sp. z o. o. [Ltd.].

III. The warranty claim should be reported via the complaint form on the website (<https://reventongroup.eu/en/complaints>). The scan or the photo of the fulfilled Warranty Card and the purchase invoice must be attached to the form. The Warranty Card is not required in case of accessories.

IV. The guarantor is committed to consider the claim within 14 working days since the date of reporting (i. e. the day of receipt of the correctly fulfilled warranty form).

V. In exceptional cases, the guarantor reserves the right to extend the time for consideration of the request, especially if the defect is not permanent one and its determination requires a deeper analysis. The extension must be notified by the guarantor before the end of the 14th working day.

VI. Under the warranty, the guarantor provides a repairment, replacement (the device or its component) or refund for the defective item within a specified time.

VII. In the case of replacement of a device component, the warranty protection of the whole unit is not prolonged.

VIII. The guarantor does not cover the costs of disassembly and eventual reassembly of the complaint device.

IX. The guarantor may decide to bring the defective device or its component to the service of Reventon Group Sp. z o. o. [Ltd.]. In such case the transport of the item is organised and paid by the guarantor. The responsibility of the device's owner is to prepare the item for the shipment - the device must be packed in a way which protects it against transport damages and the dimensions and weight of the package must not exceed 660 x 650 x 400 mm and 30 kg respectively. In the case of elements which cannot be packed in this way, the method of shipment must be agreed and approved by Reventon Group Sp. z o. o. [Ltd.]. In the case of sending a non-standard package without agreement of the service of Reventon Group Sp. z o. o. [Ltd.], the guarantor reserves the right to charge the owner of device with all additional transport costs.

X. In the case of arrival of the authorized service of the guarantor or an installer to fix the complaint item, the customer must ensure them seamless access to the device and all required media like electricity, water, lighting etc. free of charge.

XI. The warranty protection does not cover the parts of the device subject to the normal usage and the following cases:

a) mechanical damage of the product

b) defects and damages through:

- improper storage or transport
- improper or non-compliant use and maintenance (i. e. inconsistent with the manual)
- using the device in the improper conditions (too high humidity, too high or too low temperature, impact of the surrounding, sun etc.)
- unauthorized (i. e. by the user or other unauthorized persons) repairs, modifications or construction changes
- connecting equipment inconsistent with the technical documentation
- connecting additional equipment, which is not recommended by the guarantor
- improper power supply
- random events (like fire, flood, storm etc.)

c) elements which wear and tear such as discolour of the housing

If there is any of the above, the claimant will be charged for transport and/or repairs.

XII. During collection of the device, the item must be checked exactly by the receiver to exclude transport damages. If any of them is observed, the damage report in presence of the product deliverer have to be filled - such report is the basement for the warranty claim. The damage report must be provided by the product deliverer.

XIII. The guarantor does not take the responsibility for potential losses and damages related to the downtime of the device during its failure and the complaint considering time.

XIV. Any changes in the Warranty Terms, improper use of the product as well as traces of self repairing (beyond the guarantor service) or alterations cause, the warranty become invalid.

XV. These Warranty Terms do not exclude or limit any rights arising from the pledge.

XVI. Not following to any of the warranty regulations makes the protection invalid.

XVII. All correspondence should be sent to the following address: Reventon Group Sp. z o. o. [Ltd.], 556 Wyzwolenia Street, 43 340 Kozy, Poland or email address: serwis@reventongroup.eu.

Warranty Card

1 - Model and serial number* or product code	2 - Address and place of assembly
3 - Date of connection to:	4 - Stamp and signature of installer:
Heating/cooling installation (if applicable)	
Ventilation installation (if applicable)	
Electrical installation (if applicable)	

* serial number is required only for water heaters HC-3S, HC-EC and FARMER HCF series and recovery units INSPIRO, INSPIRO BASIC and VERTIC series



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