

1. INTRODUCTION

- 1.1 PRECAUTIONS
- 1.2 TRANSPORT
- 1.3 PACKAGE CONTENT
- 1.4 USE

2. DEVICE CHARACTERISTICS

- 2.1 DIMENSIONS
- 2.2 TECHNICAL DATA

3. INSTALLATION

- 3.1 GENERAL PRINCIPLES
- 3.2 MOUNTING ELEMENTS
- 3.3 OUTLET GRILLE

4. INSTALLATION INSTRUCTIONS

- 4.1 CONNECTION OF THE DEVICE TO THE HYDRAULIC SYSTEM
- 4.2 CONNECTION OF THE DEIVCE TO THE ELECTRICAL SYSTEM

5. PRECAUTIONS AND WARNINGS

- 6. CONTROLS
- 7. CONNECTION SCHEMES
- 8. TERMS OF WARRANTY

1. INTRODUCTION

Thank you for purchasing air curtain HUMMER. We would like to congratulate on good choice. Please read and save these instructions.

1.1 PRECAUTIONS

The buyer and the user of the device 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 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. Regulations and safety rules must be followed. During the installation, use, service and periodical inspections all regulations and safety rules must be followed. In case of unserviceable please plug out the device and contact with the authorized person or the supplier. All safety requirements must be taken into account during installation, use or inspection.

1.2 TRANSPORT

During the acceptance of goods it is needed to check the device in order 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 or the carrier.

1.3 PACKAGE CONTENT

- air curtain
- operation and maintenance manual and warranty card
- mounting elements (10 pcs.)

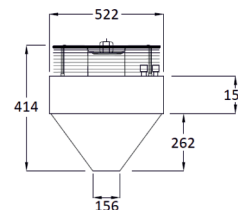
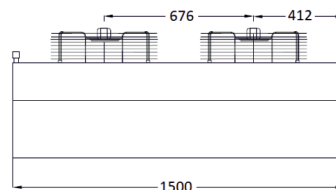
1.4 USE

Industrial curtains HUMMER series are available in two version - with a water heat exchanger (devices with 'W' symbol) or without it (unheated air curtains are marked with the letter 'C') Regardless of the version, the curtain function is to protect the room against heat, cold, dust and insects from the outside. In winter they prevent uncontrolled heat loss and in summer they prevent heat from the room. The curtains with heat exchanger additionally heat up circulating through them air. They are characterized by a large stream and the range of the blown air. For this reason, they are an ideal solution for industrial gate of warehouses, production halls, workshops, garages etc. The devices should not be used in corrosive environments for aluminum, copper and steel as well as heavily dusted (above 0.3 g/m³). The curtains should also not be installed in rooms where they would be exposed to high humidity or direct contact with water.

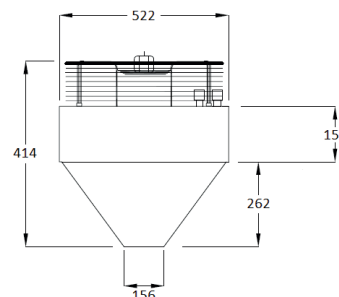
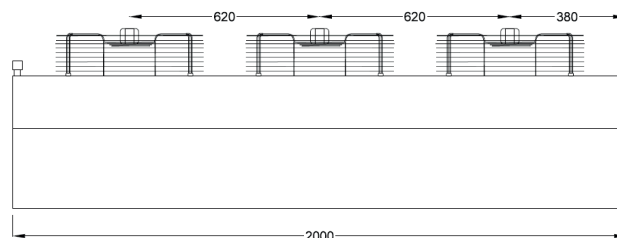
2. DEVICE CHARACTERISTICS

2.1 DIMENSIONS

HUMMER 150C-1P and HUMMER 150W-1P



HUMMER 200C-1P and HUMMER 200W-1P



2.2 TECHNICAL DATA

TECHNICAL DATA Product code	HUMMER 150C-1P ACH150C-1999	HUMMER 200C-1P ACH200C-2000	HUMMER 150W-1P ACH150W-2001	HUMMER 200W-1P ACH200W-2002
Nominal heating capacity [kW]*	n/a	n/a	27.9	34.0
Maximum airflow [m ³ /h]	7200	10500	6500	8500
Maximum range [m]	6.5	7.0	6.5	7.0
Maximum temperature of working fluid [°C]	n/a	n/a	120	120
Maximum working pressure [MPa]	n/a	n/a	1,6	1,6
Connection diameter ["]	n/a	n/a	3/4	3/4
Supply voltage [V] / Supply frequency [Hz]	230/50	230/50	230/50	230/50
Rated motor current [A]	2 x 1.08	3 x 1.08	2 x 1.08	3 x 1.08
Motor power [W]	2 x 240	3 x 240	2 x 240	3 x 240
Protection degree IP [-]	54	54	54	54
Net weight [kg]	40	57	51	70
Noise [dB]**	67	70	66	69

n/a not applicable

* for parameters 90/70°C and 0°C inlet

** measurement at the distance 5 m

Parameters	HUMMER 150W-1P - 6500 m ³ /h				
Supply/return water temperature [°C]	90/70				
Dry bulb air inlet temperature [°C]	0	5	10	15	20
Heating capacity [kW]	27.9	25.9	24.0	22.1	20.2
Dry bulb air outlet temperature [°C]	11.9	16.3	20.6	24.9	29.2
Water flow [m ³ /h]	1.19	1.12	1.00	0.94	0.86
Pressure drop in the heat exchanger [kPa]	13	12	10	9	7

Parameters	HUMMER 150W-1P - 6500 m ³ /h				
Supply/return water temperature [°C]	70/50				
Dry bulb air inlet temperature [°C]	0	5	10	15	20
Heating capacity [kW]	20.3	18.4	16.5	14.6	12.7
Dry bulb air outlet temperature [°C]	8.6	13.0	17.3	21.5	25.8
Water flow [m ³ /h]	0.86	0.79	0.72	0.61	0.54
Pressure drop in the heat exchanger [kPa]	8	6	5	4	3

Parameters	HUMMER 150W-1P - 6500 m ³ /h				
Supply/return water temperature [°C]	60/40				
Dry bulb air inlet temperature [°C]	0	5	10	15	20
Heating capacity [kW]	16.4	14.5	12.6	10.7	8.91
Dry bulb air outlet temperature [°C]	7.0	11.3	15.6	19.8	24.1
Water flow [m ³ /h]	0.72	0.61	0.54	0.47	0.40
Pressure drop in the heat exchanger [kPa]	5	4	3	3	2

Parameters	HUMMER 150W-1P - 6500 m ³ /h				
Supply/return water temperature [°C]	55/35				
Dry bulb air inlet temperature [°C]	0	5	10	15	20
Heating capacity [kW]	14.5	12.6	10.7	8.86	6.84
Dry bulb air outlet temperature [°C]	6.2	10.5	14.7	19.0	23.1
Water flow [m ³ /h]	0.61	0.54	0.47	0.40	0.29
Pressure drop in the heat exchanger [kPa]	4	3	3	2	1

Parameters	HUMMER 150W-1P - 6500 m ³ /h				
Supply/return water temperature [°C]	50/40				
Dry bulb air inlet temperature [°C]	0	5	10	15	20
Heating capacity [kW]	15.5	13.6	11.7	9.89	8.05
Dry bulb air outlet temperature [°C]	6.6	10.9	15.2	19.4	23.7
Water flow [m ³ /h]	1.33	1.19	1.00	0.86	0.68
Pressure drop in the heat exchanger [kPa]	17	14	11	8	5

Parameters	HUMMER 150W-1P - 6500 m ³ /h				
Supply/return water temperature [°C]	40/30				
Dry bulb air inlet temperature [°C]	0	5	10	15	20
Heating capacity [kW]	11.7	9.85	8.00	6.16	4.29
Dry bulb air outlet temperature [°C]	5.0	9.3	13.5	17.8	22.0
Water flow [m ³ /h]	1.00	0.86	0.68	0.54	0.36
Pressure drop in the heat exchanger [kPa]	11	8	5	3	2

Parameters	HUMMER 200W-1P - 8500 m ³ /h				
Supply/return water temperature [°C]	90/70				
Dry bulb air inlet temperature [°C]	0	5	10	15	20
Heating capacity [kW]	34.0	31.6	29.3	27.0	24.8
Dry bulb air outlet temperature [°C]	11.1	15.5	19.9	24.3	28.6
Water flow [m ³ /h]	1.48	1.37	1.26	1.15	1.00
Pressure drop in the heat exchanger [kPa]	23	20	17	15	13

Parameters	HUMMER 200W-1P - 8500 m ³ /h				
Supply/return water temperature [°C]	70/50				
Dry bulb air inlet temperature [°C]	0	5	10	15	20
Heating capacity [kW]	24.9	22.6	20.3	18.0	15.7
Dry bulb air outlet temperature [°C]	8.1	12.5	16.8	21.2	25.5
Water flow [m ³ /h]	1.08	0.97	0.86	0.79	0.68
Pressure drop in the heat exchanger [kPa]	13	11	9	7	6

Parameters	HUMMER 200W-1P - 8500 m ³ /h				
Supply/return water temperature [°C]	60/40				
Dry bulb air inlet temperature [°C]	0	5	10	15	20
Heating capacity [kW]	20.3	18.0	15.7	13.4	11.2
Dry bulb air outlet temperature [°C]	6.6	11.0	15.3	19.6	23.9
Water flow [m ³ /h]	0.86	0.79	0.68	0.58	0.47
Pressure drop in the heat exchanger [kPa]	9	8	6	4	3

Parameters	HUMMER 200W-1P - 8500 m ³ /h				
Supply/return water temperature [°C]	55/35				
Dry bulb air inlet temperature [°C]	0	5	10	15	20
Heating capacity [kW]	18.0	15.7	13.4	11.1	8.87
Dry bulb air outlet temperature [°C]	5.9	10.2	14.5	18.8	23.1
Water flow [m ³ /h]	0.76	0.68	0.58	0.47	0.40
Pressure drop in the heat exchanger [kPa]	8	6	5	3	2

Parameters	HUMMER 200W-1P - 8500 m ³ /h				
Supply/return water temperature [°C]	50/40				
Dry bulb air inlet temperature [°C]	0	5	10	15	20
Heating capacity [kW]	18.9	16.7	14.4	12.2	9.96
Dry bulb air outlet temperature [°C]	6.2	10.5	14.9	19.2	23.5
Water flow [m ³ /h]	1.62	1.44	1.22	1.04	0.86
Pressure drop in the heat exchanger [kPa]	30	24	18	13	9

Parameters	HUMMER 200W-1P - 8500 m ³ /h				
Supply/return water temperature [°C]	40/30				
Dry bulb air inlet temperature [°C]	0	5	10	15	20
Heating capacity [kW]	14.4	12.2	9.92	7.70	5.47
Dry bulb air outlet temperature [°C]	4.7	9.0	13.3	17.6	21.9
Water flow [m ³ /h]	1.22	1.04	0.86	0.65	0.47
Pressure drop in the heat exchanger [kPa]	19	14	9	6	3

3. ASSEMBLY

3.1. GENERAL PRINCIPLE

The curtain can be mounted both horizontally (e. g. with mounting pins) or vertically (attached to building partitions). Before installing the device, make sure that all elements to which the curtain is to be attached are strong enough. All necessary assembly elements, suitable for this type of installation, should be purchased independently.

The width of the curtain should be greater or equal to the width of the door frame - if one device is too short, two or more curtains should be used. As this situation occurs often in the case of long and wide industrial entrance gates, HUMMER series devices have a modular structure, allowing easy connection of two curtains by attached mounting elements (see section 3.2).

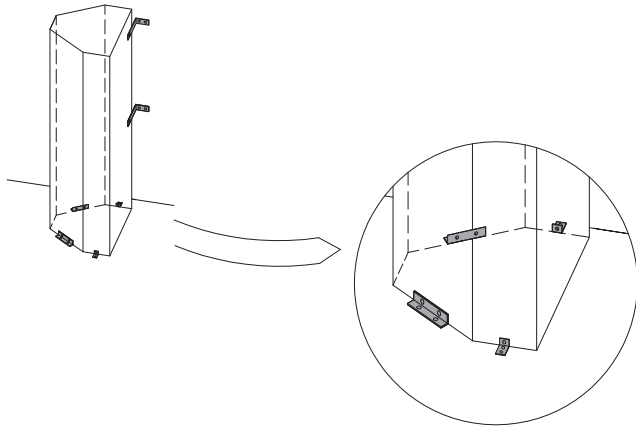
The curtain should be installed in a place, where there is a possibility of easy access to the device and its individual elements. The air outlet from the curtain should be as close as possible to the door opening, blowing air in a direction parallel to this opening (acceptable deviation is up to 15 degrees). Installation in a position other than vertical or horizontal is not allowed. Make sure that there is at least 0.5 meter free space above the fans. The curtain should not be used to mount in gates higher / wider than the maximum range of the curtain.

3.2 MOUNTING ELEMENTS

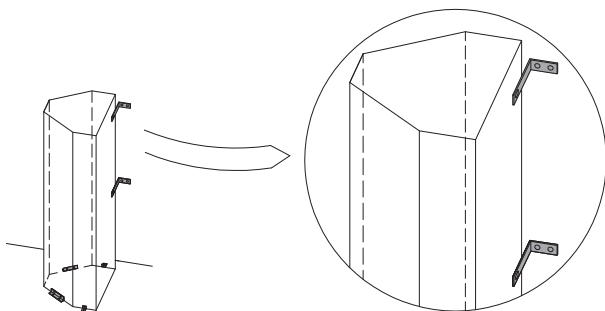
Dedicated set of flat and angle bars is provided together with the curtain. The elements should be used, depending on the installation manner, as describe below. M8 screws, gaskets and rawplugs will be necessary to install the device with mounting elements.

VERTICAL INSTALLATION

Using four angle bars, fix the curtain to the ground in a permanent and stable way, at least in four places - as shown in the figure below.

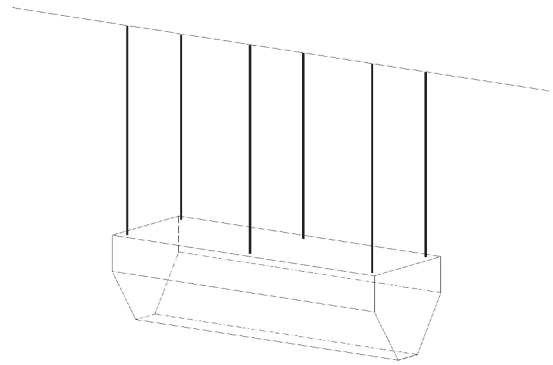


Additionally, the device must be attached to wall in at least two places using dedicated angle bars with one extended arm (the possibility of installing the curtain in the distance from the barrier required by the user).



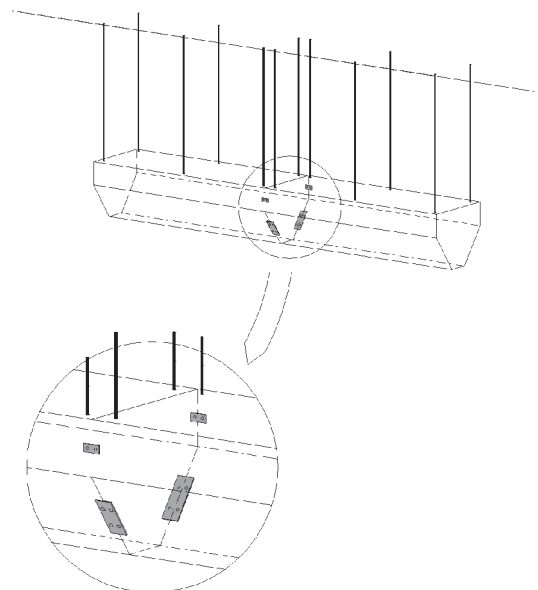
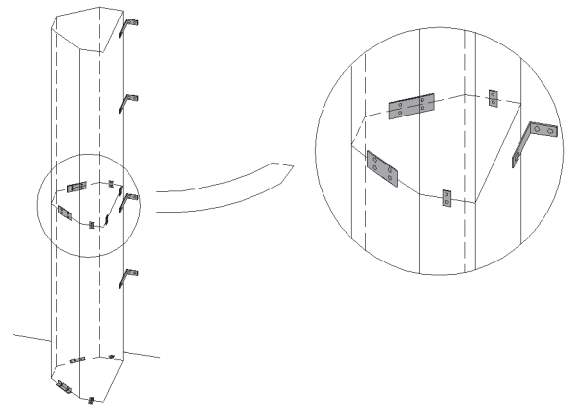
HORIZONTAL INSTALLATION

For horizontal assembly, use the threaded holes on the top of the device, to hang the curtain e. g. on mounting pins. In order to dampen possible vibrations of the structure, it is recommended to use anti-vibration mounts. The elements to hang the HUMMER device are not supplied with the curtain. An exemplary horizontal installation is shown in the figure below.



CONNECTION OF THE CURTAINS

If it is necessary to install more than one curtain, the devices should be connected in four places using the set of flat bars provided.



3.3 OUTLET GRILLE

The HUMMER series curtain has a movable outlet grille that allows adjustment of the airflow angle. The maximum deviation of the stream axis from the perpendicular direction to the grid plane should not exceed the maximum permissible deviation, i.e. 15 degrees.

The grille should be adjusted using allen wrench 5 mm, according to the following instructions:

1) Slightly loosen the three regulation screws on both sides of the curtain to loose the grille



2) Adjust the grille position according to the requirements



3) Block the set grille by screwing the regulation screws



NOTES:

- do not tighten the regulation screws too much - this may result in 'twisting' the rivet nuts
- it is not allowed to 'distort' the grille - its angle of rotation at both ends must be the same
- to screw the grille in a set position, help of other person may be necessary (to hold the grille in the position)

4. ZALECENIA INSTALACYJNE

4.1 CONNECTION OF THE DEVICE TO THE HYDAULIC SYSTEM (only air curtains HUMMER 150W-1P and HUMMER 200W-1P)

- wires should be connected in accordance with the markings on the connectors (stickers red (supply) and blue (return))

- connecting the device to the hydraulic installation, remember to hold the connectors by pipes spanner - not keeping to the recommendation may cause the damages of the heat exchanger

- during vertical installation of the curtain, its connectors should be at the top

- it is recommended to use filter on the water supply pipe

- it is recommended to use the following valves:

- vent valve in the highest place on the hydraulic installation
- cut off valve on the supply and return pipes of the device

- installation has to be secured against excessive increase of pressure

- it is recommended to check the leak tightness of the hydraulic system before plugging the electric supply

4.2 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)

- all fans of the curtain should be supplied in way causing their simultaneously switching on/off at the same stage

- wiring diagrams including dedicated Reventon controls are shown in point 7

- the electrical installation of the building shall have a residual current device

- check the electrical installation and automation before the first start

5. PRECAUTIONS AND WARNINGS

During operation of the device, the following must be respected:

- all works concerning electrical installation (disassembly, repair etc.) should be made by the qualified personnel, who possess the qualifications due to the domestic and local norms, regarding electrical installations

- during intalation or adjustment of the outlet grille, do not tighten the fastening/ regulation screws too much - this may result in "twisting" the rivet nuts

- 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

- when no need heating, turn off the heat source to use it as an unheated air curtain

- the device does not consist of the anti-frost protection - the temperature in the room, where device is installed, should not go below 0°C; if such situation could take place empty the device out of water

- after the turn off, the elements of device may be warm

- after operating time of the device, please utilize it concerning the local norms and regulations

- don't allow water or any liquid to enter the motor

- maintenance and repair work must be carried out by a qualified personnel familiar with local regulations and standards

- always unplug or disconnect the appliance from the power supply before installation, servicing or cleaning the unit

- never use petrol, benzene, thinners or any other chemicals for cleaning the unit

- it is recommended to clean the device periodically (at least twice a year):

- fan blades and grid clean from dirt
- curtain housing wipe with a soft cloth
- heat exchanger blow with compressed air (only HUMMER 150W-1P and HUMMER 200W-1P)

- 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 disconnect the voltage supply

- if any abnormality happens, turn off the product immediately and check the problem

6. CONTROLS

Usage of automatic control dedicated to the air curtains HUMMER gives great possibilities to adjust the efficiency of the curtain, in various ways, to automate its operation. We offer the following controls:

Programmable controller HMI CURTAIN

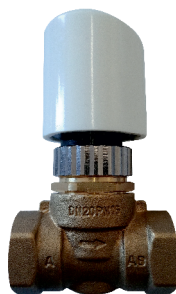
is used to adjust the operation of curtains HUMMER series, which are equipped with three-speed fans. It is an advanced driver with many functions i. e. operation in thermostatic mode (heating or cooling) or in accordance with door sensor, valve operation control, selection of the fan speed. It is also possible to integrate the device 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: $\pm 0.5^\circ\text{C}$
Communication: RS485
Dimensions: 86 x 86 x 13.3 mm 270 g
Degree of protection (housing): IP 20

Two-way valve with actuator HC 3/4"

is used to automatically regulate the flow of the heating medium.



Voltage / Frequency: 230 V AC / 50 - 60 Hz
Power consumption: 2 VA
Kvs coefficient: 6.3 m³/h
Stroke: 3 mm
Operating condition of actuator: -5°C - 60°C
Running time: 3 - 5 min
Degree of protection: IP 54

Three-way valve with actuator HC 3/4"

is used to automatically regulate the flow of the heating medium.



Power supply/ Frequency: 230 V AC / 50 - 60 Hz
Power consumption: 7 VA
Kvs coefficient: 6.5 m³/h
Operating condition of actuator: 0 - 60°C
Running time (motor): 18 s
Running time (return spring): 5 s
Degree of protection: IP 20

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

LEGEND:

1. Power
2. Main switch, overcurrent circuit breaker*
3. HUMMER curtain fan
4. Programmable controller HMI CURTAIN
5. Valve with actuator HC 3/4"
6. Door switch
7. Relay module RM-16A

*Main switch and overcurrent circuit breaker are not included in the device

