

Technical documentation

# **VOLCANO**



**VOLCANO VR Mini**  
**VOLCANO VR1**  
**VOLCANO VR2**  
**VOLCANO VR3**  
**VOLCANO VR-D**

Check us on



VOLCANO VR Mini  
VOLCANO VR1  
VOLCANO VR2  
VOLCANO VR3  
VOLCANO VR-D

## ORIGINAL INSTRUCTION

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## 1. INTRODUCTION

### 1.1 PRECAUTIONS, REQUIREMENTS, RECOMMENDATIONS

Read the documentation carefully, install and use the equipment according to the specifications, and follow all the safety regulations in order to ensure proper and safe use of the device. Any use that is incompatible with these instructions can cause serious injuries. Restrict access by unauthorized persons and train the operational personnel. The term **operational personnel** refers to people who are suitably trained and have appropriate experience and knowledge of relevant norms, documentation and occupational health and safety regulations, and are authorized to conduct the required work and can identify possible threats and avoid them. This operation and maintenance manual, which is delivered with the device, includes detailed information on all possible configurations of the heaters, examples of their assembly, start, use, repair and maintenance. To operate this device correctly, this manual includes instructions sufficient for qualified personnel. **The documentation should be placed close to the device for ease of access by the service team. The manufacturer reserves the right to introduce changes to the manual or the specifications of the device, which may alter its operation, without prior notice. VTS POLSKA Sp. z o.o. shall not be held liable for current maintenance, servicing, programming, damage caused by standstill of the device awaiting warranty service, any damage to customer's possessions other than the device, or faults resulting from the wrong assembly or use of the device.**

### 1.2 TRANSPORT

Prior to the installing and taking the device out of the cardboard box, it is required to check whether the cardboard box has not been damaged in any way and/or the adhesive tape (installed at the company) has not been broken off or cut. It is recommended to check whether the device's casing has not been damaged in transport. Should any of the above situation occur, please contact us through telephone or e-mail: Tel. 0 801 080 073, email: vts.pl@vtsgroup.com, fax: (+48) 12 296 50 75. **The device should be transported by two people. Use appropriate tools, when transporting the device, so as to avoid the damaging of goods and potential hazard to health.**

### 1.3 INITIAL STEPS TAKEN BEFORE THE INSTALLATION

Record the **serial number** of the device in the warranty card, prior to the commencement of the installation process. **It is required to properly fill-in the warranty card, after the completion of the assembly.** Prior to the commencing of any installation or maintenance work, it is required to disconnect power supply and protect it against unintentional activation.

## 2. STRUCTURE, INTENDED USE, PRINCIPLE OF OPERATION

### 2.1 INTENDED USE

VOLCANO VR has been designed to ensure ease of use and optimum performance.

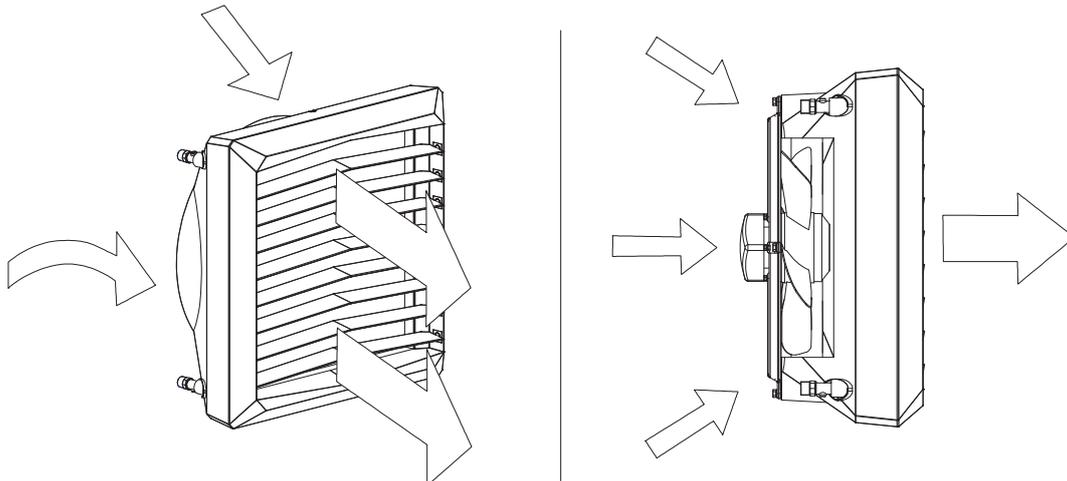
The device is available in four versions:

- VOLCANO VR Mini (3-20 kW, 2100 m<sup>3</sup>/h)
- VOLCANO VR 1 (5-30 kW, 5300 m<sup>3</sup>/h)
- VOLCANO VR 2 (8-50 kW, 4850 m<sup>3</sup>/h)
- VOLCANO VR 3 (13-75 kW, 5700 m<sup>3</sup>/h)
- VOLCANO VR-D (6500 m<sup>3</sup>/h)

VOLCANO combines state-of-the-art technology, innovative design and high effectiveness. Unique technical solutions such as the design of the heat exchanger, improved fan and increased range of air stream, allow the VOLCANO heater to achieve optimal heating power, perfect for the size and type of room. **APPLICATION:** production halls, warehouses, wholesale outlets, sports facilities, greenhouses, supermarkets, church buildings, farm buildings, workshops, health care facilities, pharmacies, hospitals. **MAIN ADVANTAGES:** high effectiveness, low maintenance costs, full parameter control, easy and quick assembly.

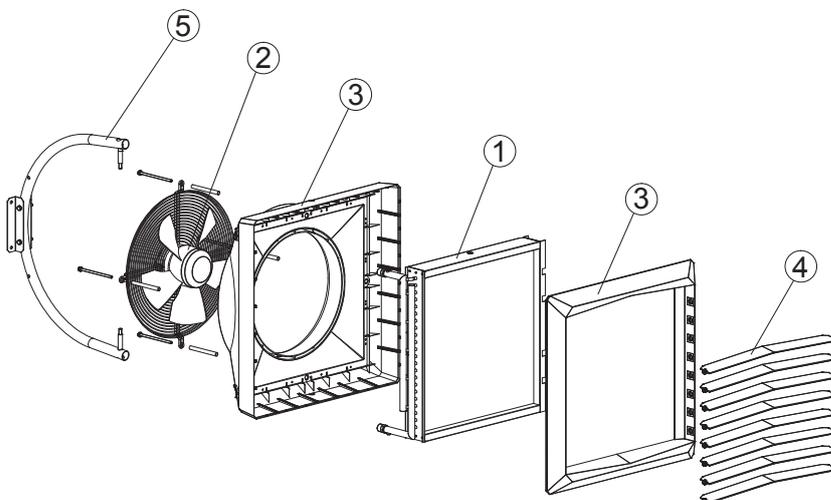
### 2.2 PRINCIPLE OF OPERATION

The heating medium (hot water) gives up heat to the heat exchanger using a highly developed heat exchanger, ensuring great heating power (Volcano VR Mini – 3-20 kW, VR 1 – 5-30 kW, VR 2 – 8-50 kW, VR 3 – 13-75 kW). A highly effective axial fan (1100-5700 m<sup>3</sup>/h) draws air in from the room, pumps it through the heat exchanger and then sends it back into the room. Volcano VR-D de-stratifies the heated air from the sub-ceiling zone to the above-ground zone. Hot air exhaust results in a leveling of the temperature gradient in particular air layers and contributes to reducing the costs of heating by lowering the temperature in the ceiling zone, thus limiting heat loss through the roof. The VOLCANO VR-D de-stratifier will be the most effective in combination with VR Mini, VR1, VR2 and VR3 air heaters. Cooperation of both of these device types will allow for achieving optimal temperature comfort fast due to the support of the heating system through more efficient distribution of hot air.



VOLCANO VR Mini  
 VOLCANO VR1  
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2.3 DEVICE STRUCTURE (VOLCANO)

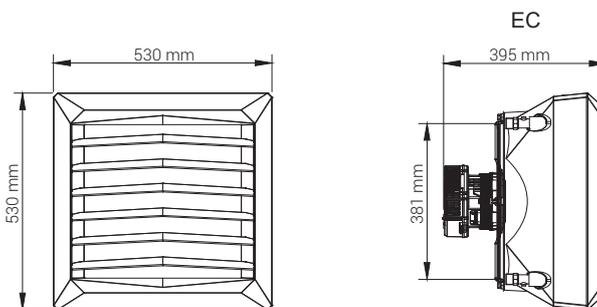


- 1. HEAT EXCHANGER;
- 2. AXIAL FAN;
- 3. COVER;
- 4. AIR GUIDES;
- 5. SAMPLE CONSOLE

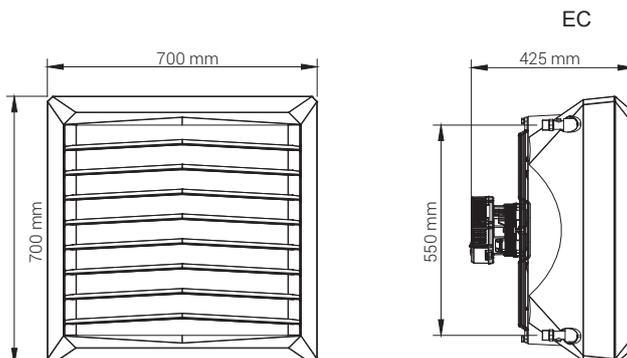
1. **EN: HEAT EXCHANGER:** maximum parameters of a heating medium for a heat exchanger are: 130°C, 1,6MPa. Aluminium and copper construction using copper tubes, coil pipe and aluminium lamellas. Connecting ferrules (male thread 3/4") are on the back panel of the unit. Our series of types includes a single-row heat exchanger in VOLCANO VR1 5-30 kW and two-row heat exchanger in VOLCANO VR Mini 3-20kW and VOLCANO VR2 8-50kW and in VOLCANO VR3 13-75kW - three-row heat exchanger.
2. **AXIAL FLOW FAN:** maximum working temperature is 60°C, nominal power supply voltage is 230V/50Hz. EC Engine protection is IP44, insulation class F. Air feed is performed by the axial flow fan, which is secured with a protective grate. Adequate blade profile and proper bearings guarantee silent and unfailing operation of the device. High engine power allows for achieving high efficiency at low power consumption rates, maintaining full air feed regulation. Properly profiled housing lowers the noise emission levels, which makes the device particularly user-friendly, suitable for buildings with higher acoustic requirements.
3. **HOUSING:** consists of the body and the front panel, made of high quality plastic guaranteeing compatibility with devices powered by heating medium with temperature parameter up to 130°C. Colorful side panels allow for matching the device color to the interior décor. Volcano VR-D operates circulation air, improving its distribution and performing the de-stratification function.
4. **AIR GUIDES:** allow the hot air stream to be directed in 4 directions. Optimum air stream range and direction are achieved through the special fan blade profile.
5. **ASSEMBLY CONSOLE:** an element of additional equipment - its ergonomic, light structure allows for rotating the device on the horizontal plane for -60°±0±60°, to direct the stream of hot air wherever it is necessary.

2.4 OVERALL DIMENSIONS

VOLCANO VR Mini



VOLCANO VR1, VR2, VR3, VR-D



### 3. TECHNICAL DATA

$T_z$  – inlet water temperature;  $T_p$  – outlet water temperature;  $T_{p1}$  – inlet air temperature;  $T_{p2}$  – outlet air temperature;  $P_g$  – heating capacity;  $Q_w$  – water flow;  $Q_p$  – air flow rate;  $\Delta p$  – pressure drop in the heat exchanger

Volcano VR Mini																	
Parameters $T_z/T_p$ [°C]																	
		90/70 [°C]				80/60 [°C]				70/50 [°C]				50/30 [°C]			
$T_{p1}$ [°C]	$Q_p$ [m³/h]	$P_g$ [kW]	$T_{p2}$ [°C]	$Q_w$ [m³/h]	$\Delta p$ [kPa]	$P_g$ [kW]	$T_{p2}$ [°C]	$Q_w$ [m³/h]	$\Delta p$ [kPa]	$P_g$ [kW]	$T_{p2}$ [°C]	$Q_w$ [m³/h]	$\Delta p$ [kPa]	$P_g$ [kW]	$T_{p2}$ [°C]	$Q_w$ [m³/h]	$\Delta p$ [kPa]
0	2100	20.7	29.5	0.92	13.9	17.9	25.4	0.79	10.7	15.1	21.4	0.66	7.9	9.2	13.1	0.4	3.4
	1650	18.1	32.6	0.8	10.7	15.6	28.2	0.69	8.3	13.1	23.7	0.58	6.1	8	14.6	0.35	2.6
	1100	14.1	38.3	0.63	6.8	12.2	33.2	0.54	5.3	10.3	27.9	0.45	3.9	6.3	17.2	0.28	1.7
5	1650	16.9	35.6	0.75	9.5	16.6	28.6	0.73	9.3	13.7	24.5	0.6	6.6	7.6	16.1	0.34	2.5
	2100	19.4	32.6	0.86	12.3	14.5	31.1	0.64	7.2	12	26.6	0.53	5.2	6.8	17.4	0.3	2
	1100	13.3	40.9	0.59	6	11.3	35.8	0.5	4.6	9.4	30.5	0.41	3.3	5.4	19.6	0.23	1.3
10	2100	18.1	35.7	0.8	10.8	15.3	31.7	0.67	8	12.4	27.6	0.54	5.5	6.4	19.1	0.28	1.7
	1650	15.8	35.5	0.7	8.4	13.3	34.1	0.59	6.2	10.8	29.5	0.47	4.3	5.6	20.1	0.24	1.4
	1100	12.4	43.5	0.55	5.3	10.4	38.3	0.46	3.9	8.5	33	0.37	2.8	4.4	21.9	0.19	0.9
15	2100	16.8	38.8	0.74	9.4	13.9	34.8	0.61	6.7	11	30.7	0.48	4.4	4.9	22	0.22	1.1
	1650	14.6	41.4	0.65	7.3	12.1	37	0.54	5.2	9.6	32.4	0.42	3.5	4.3	22.8	0.19	0.9
	1100	11.5	46.1	0.51	4.6	9.5	40.9	0.42	3.3	7.6	35.5	0.33	2.2	3.3	24.1	0.15	0.5
20	2100	15.5	41.9	0.69	8	12.6	37.9	0.56	5.6	9.7	33.7	0.42	3.5	3.3	24.7	0.14	0.5
	1650	13.5	44.3	0.6	6.2	11	39.8	0.48	4.3	8.4	35.2	0.37	2.7	2.8	25.1	0.12	0.4
	1100	10.6	48.6	0.47	4	8.6	43.4	0.38	2.8	6.6	38	0.29	1.8	1.9	25.2	0.08	0.2

$T_z$  – inlet water temperature;  $T_p$  – outlet water temperature;  $T_{p1}$  – inlet air temperature;  $T_{p2}$  – outlet air temperature;  $P_g$  – heating capacity;  $Q_w$  – water flow;  $Q_p$  – air flow rate;  $\Delta p$  – pressure drop in the heat exchanger

Volcano VR1																	
Parameters $T_z/T_p$ [°C]																	
		90/70 [°C]				80/60 [°C]				70/50 [°C]				50/30 [°C]			
$T_{p1}$ [°C]	$Q_p$ [m³/h]	$P_g$ [kW]	$T_{p2}$ [°C]	$Q_w$ [m³/h]	$\Delta p$ [kPa]	$P_g$ [kW]	$T_{p2}$ [°C]	$Q_w$ [m³/h]	$\Delta p$ [kPa]	$P_g$ [kW]	$T_{p2}$ [°C]	$Q_w$ [m³/h]	$\Delta p$ [kPa]	$P_g$ [kW]	$T_{p2}$ [°C]	$Q_w$ [m³/h]	$\Delta p$ [kPa]
0	5300	29.9	16.8	1.33	26	25.8	14.5	1.14	20	21.7	12.2	0.95	14.6	13.2	7.5	0.58	6.2
	3900	25.4	19.4	1.12	19.1	21.9	16.7	0.97	14.7	18.4	14.1	0.81	10.8	11.3	8.6	0.49	4.6
	2800	21.2	22.6	0.94	13.6	18.3	19.5	0.81	10.5	15.4	16.4	0.68	7.8	9.4	10.1	0.41	3.3
5	5300	28	20.8	1.24	23	23.9	18.4	1.05	17.3	19.7	16.1	0.87	12.3	11.3	11.3	0.49	4.6
	3900	23.8	23.2	1.05	16.9	20.3	20.5	0.9	12.8	16.8	17.8	0.74	9.1	9.6	12.3	0.42	3.4
	2800	19.9	26.2	0.88	12.1	16.9	23.1	0.75	9.1	14	19.9	0.62	6.6	8	13.6	0.35	2.5
10	5300	26.1	24.7	1.16	20.2	22	22.4	0.97	14.8	17.8	20	0.78	10.2	9.2	15.2	0.4	3.2
	3900	22.2	27	0.98	14.9	18.7	24.3	0.82	10.9	15.1	21.6	0.66	7.6	7.9	16	0.34	2.4
	2800	18.5	29.7	0.82	10.6	15.6	26.6	0.69	7.8	12.7	23.5	0.56	5.4	6.6	17	0.29	1.8
15	5300	24.2	28.6	1.07	17.5	20	26.3	0.88	12.5	15.8	23.9	0.7	8.2	7.2	19	0.31	2
	3900	20.5	30.7	0.91	12.9	17	28	0.75	9.2	13.5	25.3	0.59	6.1	6.1	19.7	0.27	1.5
	2800	17.2	33.3	0.76	9.2	14.2	30.2	0.63	6.6	11.3	27	0.5	4.4	5.1	20.4	0.22	1.1
20	5300	22.2	32.5	0.99	15	18.1	30.2	0.8	10.3	13.8	27.8	0.61	6.4	5	22.8	0.22	1.1
	3900	18.9	34.5	0.84	11.1	15.4	31.8	0.68	7.6	11.8	29	0.52	4.8	4.2	23.2	0.18	0.8
	2800	15.8	36.8	0.7	7.9	12.9	33.7	0.57	5.5	9.9	30.5	0.43	3.5	3.5	23.7	0.15	0.6

**VOLCANO VR Mini**  
**VOLCANO VR1**  
**VOLCANO VR2**  
**VOLCANO VR3**  
**VOLCANO VR-D**

$T_z$  – inlet water temperature;  $T_p$  – outlet water temperature;  $T_{p1}$  – inlet air temperature;  $T_{p2}$  – outlet air temperature;  $P_g$  – heating capacity;  $Q_w$  – water flow;  $Q_p$  – air flow rate;  $\Delta p$  – pressure drop in the heat exchanger

<b>Volcano VR2</b>																	
<b>Parameters <math>T_z/T_p</math> [°C]</b>																	
		90/70 [°C]				80/60 [°C]				70/50 [°C]				50/30 [°C]			
$T_{p1}$ [°C]	$Q_p$ [m³/h]	$P_g$ [kW]	$T_{p2}$ [°C]	$Q_w$ [m³/h]	$\Delta p$ [kPa]	$P_g$ [kW]	$T_{p2}$ [°C]	$Q_w$ [m³/h]	$\Delta p$ [kPa]	$P_g$ [kW]	$T_{p2}$ [°C]	$Q_w$ [m³/h]	$\Delta p$ [kPa]	$P_g$ [kW]	$T_{p2}$ [°C]	$Q_w$ [m³/h]	$\Delta p$ [kPa]
0	4850	50.1	30.7	2.21	23.8	43.1	26.5	1.9	18.3	36.2	22.3	1.59	13.5	22.3	13.7	0.97	5.7
	3600	41.9	34.7	1.86	17.2	36.5	30	1.6	13.3	30.5	25.3	1.34	9.8	18.8	15.6	0.82	4.2
	2400	32.7	40.6	1.45	10.8	28.3	35.2	1.25	8.4	23.9	29.7	1.05	6.2	14.8	18.4	0.64	2.7
5	4850	46.7	33.7	2.07	21.1	39.9	29.5	1.76	15.9	33.1	25.3	1.45	11.4	19	16.7	0.83	4.3
	3600	39.3	37.5	1.74	15.2	33.6	32.8	1.48	11.5	27.9	28.1	1.22	8.3	16.1	18.3	0.7	3.1
	2400	30.6	43.1	1.36	9.6	26.2	37.6	1.16	7.3	21.8	32.1	0.96	5.3	12.6	20.7	0.55	2
10	4850	43.6	36.8	1.93	18.5	36.7	32.6	1.62	13.6	29.8	28.4	1.31	9.4	15.6	19.6	0.68	3
	3600	36.6	40.4	1.62	13.4	30.9	35.6	1.36	9.9	25.2	30.9	1.11	6.8	13.2	21	0.58	2.2
	2400	28.6	45.5	1.27	8.4	24.2	40	1.07	6.3	19.7	34.5	0.87	4.4	10.4	22.9	0.45	1.4
15	4850	40.4	39.8	1.79	16	33.5	35.6	1.48	11.5	26.6	31.3	1.17	7.6	12.2	22.5	0.53	1.9
	3600	34	43.1	1.51	11.6	28.2	38.4	1.25	8.3	22.4	33.6	0.99	5.5	10.3	23.5	0.45	1.4
	2400	26.5	48	1.18	7.3	22.1	42.5	0.98	5.3	17.6	36.9	0.77	3.5	8	25	0.35	0.9
20	4850	37.2	42.8	1.65	13.7	30.3	38.6	1.34	9.5	23.3	34.3	1.02	5.9	8.4	25.2	0.37	1
	3600	31.3	45.9	1.39	10	25.5	41.1	1.13	6.9	19.7	36.3	0.86	4.3	7	25.8	0.31	0.7
	2400	24.5	50.4	1.09	6.3	20	44.8	0.88	4.4	15.5	39.2	0.68	2.8	5.3	26.6	0.23	0.4

$T_z$  – inlet water temperature;  $T_p$  – outlet water temperature;  $T_{p1}$  – inlet air temperature;  $T_{p2}$  – outlet air temperature;  $P_g$  – heating capacity;  $Q_w$  – water flow;  $Q_p$  – air flow rate;  $\Delta p$  – pressure drop in the heat exchanger

<b>Volcano VR3</b>																	
<b>Parameters <math>T_z/T_p</math> [°C]</b>																	
		90/70 [°C]				80/60 [°C]				70/50 [°C]				50/30 [°C]			
$T_{p1}$ [°C]	$Q_p$ [m³/h]	$P_g$ [kW]	$T_{p2}$ [°C]	$Q_w$ [m³/h]	$\Delta p$ [kPa]	$P_g$ [kW]	$T_{p2}$ [°C]	$Q_w$ [m³/h]	$\Delta p$ [kPa]	$P_g$ [kW]	$T_{p2}$ [°C]	$Q_w$ [m³/h]	$\Delta p$ [kPa]	$P_g$ [kW]	$T_{p2}$ [°C]	$Q_w$ [m³/h]	$\Delta p$ [kPa]
0	5700	75.1	39	3.31	32.6	64.5	33.8	2.85	25.1	54.3	28.4	2.39	18.4	33.6	17.6	1.46	7.8
	4100	60.6	44.1	2.69	22	52.5	38.2	2.32	17	44.3	32.2	1.95	12.5	27.5	20	1.2	5.4
	3000	49.5	49.2	2.19	15	42.9	42.7	1.89	11.6	36.3	36.1	1.59	8.6	22.6	22.5	0.98	3.7
5	5700	69.9	41.6	3.1	28.9	59.8	36.3	2.64	21.7	49.6	31	2.18	15.5	28.7	20	1.25	5.8
	4100	56.8	46.3	2.52	19.5	48.7	40.4	2.15	14.8	40.5	34.4	1.78	10.6	23.5	22.1	1.02	4
	3000	46.4	51.1	2.06	13.3	39.8	44.6	1.76	10.1	33.1	37.9	1.46	7.3	19.3	24.2	0.84	2.8
10	5700	65.2	44.1	2.89	25.3	55	38.8	2.43	18.6	44.8	33.4	1.97	12.8	23.7	22.4	1.03	4.1
	4100	53	48.6	2.35	17.1	44.9	42.6	1.98	12.7	36.6	36.6	1.61	8.8	19.4	24.1	0.84	2.8
	3000	43.3	53.1	1.92	11.7	36.7	46.5	1.62	8.7	30	39.8	1.32	6.1	15.9	25.8	0.69	2
15	5700	60.4	46.6	2.68	21.9	50.2	41.3	2.22	15.7	40	35.9	1.76	10.3	18.4	24.6	0.8	2.6
	4100	49.2	50.8	2.18	14.9	41	44.8	1.81	10.7	32.7	38.8	1.44	7.1	15.1	26	0.66	1.8
	3000	40.2	55	1.78	10.2	33.6	48.4	1.48	7.4	26.8	41.6	1.18	4.9	12.4	27.3	0.54	1.2
20	5700	55.6	49.1	2.47	18.8	45.4	43.8	2	13	35	38.3	1.54	8.1	12.8	26.7	0.56	1.3
	4100	45.3	53	2.01	12.8	37.1	47	1.64	8.9	28.7	40.9	1.26	5.6	10.4	27.5	0.45	0.9
	3000	37.1	56.9	1.64	8.8	30.4	50.2	1.34	6.1	23.6	43.4	1.04	3.9	8.3	28.2	0.36	0.6

Parameter	Unit of measure	VOLCANO VR Mini	VOLCANO VR1	VOLCANO VR2	VOLCANO VR3	VOLCANO VR-D
Number of rows in the heater		2	1	2	3	---
Maximum air flow rate	m <sup>3</sup> /h	2100	5300	4850	5700	6500
Heating power range	kW	3-20	5-30	8-50	13-75	-
Maximum temperature of the heating agent	°C	130				-
Maximum operating pressure*	MPa	1.6				-
Maximum horizontal air stream range	m	14	23	22	25	28
Maximum vertical air stream range	m	8	12	11	12	15
Water capacity	dm <sup>3</sup>	1.12	1.25	2.16	3.1	-
Ferrule diameter	"	3/4				-
Weight of the device	kg	14	21	21,5	24,5	15,5
Power supply voltage	V/Hz	1 ~ 230/50				
Motor power EC	kW	0.095	0.25		0.37	
Motor current EC	A	0.51	1.3		1.7	
Motor speed	rpm	1450	1430		1400	
Motor IP EC			44			

**NOTE** Data concerning VOLCANO working parameters for a heating agent with a different temperature can be provided upon request

**VOLCANO VR Mini**  
**VOLCANO VR1**  
**VOLCANO VR2**  
**VOLCANO VR3**  
**VOLCANO VR-D**

<b>Volcano VR Mini</b>				
fan speed		III	II	I
air flow	m <sup>3</sup> /h	2100	1650	1100
noise level for Volcano EC*	dB(A)	50	40	27
EC motor electric power**	W	95	56	39
horizontal air stream range	m	14	8	5
vertical air stream range	m	8	5	3

\* reference conditions: room volume 1500m<sup>3</sup>, measurement taken at a distance of 5m.

\*\* EC motor electric power for the air flow mentioned in the table

<b>Volcano VR1</b>				
fan speed		III	II	I
air flow	m <sup>3</sup> /h	5300	3900	2800
noise level for Volcano EC*	dB(A)	54	49	38
EC motor electric power**	W	250	190	162
horizontal air stream range	m	23	20	15
vertical air stream range	m	12	9	7

\* reference conditions: room volume 1500m<sup>3</sup>, measurement taken at a distance of 5m.

\*\* EC motor electric power for the air flow mentioned in the table

<b>Volcano VR2</b>				
fan speed		III	II	I
air flow	m <sup>3</sup> /h	4850	3600	2400
noise level for Volcano EC*	dB(A)	54	49	38
EC motor electric power**	W	250	190	162
horizontal air stream range	m	22	19	14
vertical air stream range	m	11	8	6

\* reference conditions: room volume 1500m<sup>3</sup>, measurement taken at a distance of 5m.

\*\* EC motor electric power for the air flow mentioned in the table

<b>Volcano VR3</b>				
fan speed		III	II	I
air flow	m <sup>3</sup> /h	5700	4100	3000
noise level for Volcano EC*	dB(A)	55	49	43
EC motor electric power**	W	370	285	218
horizontal air stream range	m	25	22	17
vertical air stream range	m	12	9	7

\* reference conditions: room volume 1500m<sup>3</sup>, measurement taken at a distance of 5m.

\*\* EC motor electric power for the air flow mentioned in the table

<b>Volcano VR-D</b>				
fan speed		III	II	I
air flow	m <sup>3</sup> /h	6500	4600	3400
noise level for Volcano EC*	dB(A)	56	50	43
EC motor electric power**	W	370	285	218
horizontal air stream range	m	28	24	19
vertical air stream range	m	15	11	9

\* reference conditions: room volume 1500m<sup>3</sup>, measurement taken at a distance of 5m.

\*\* EC motor electric power for the air flow mentioned in the table

## 4. ASSEMBLY

**NOTE** Installation location should be suitably selected with special consideration of potential loads and vibrations.

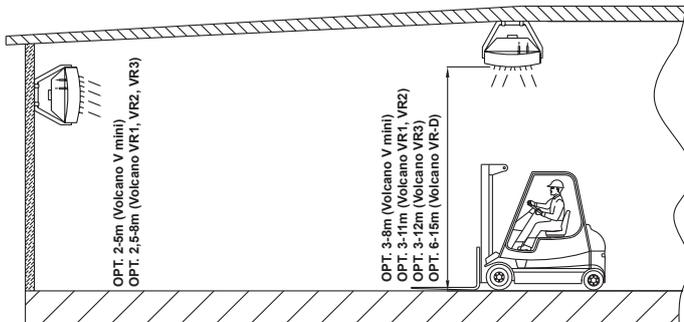
Prior to any installation or maintenance works, disconnect the device from the power supply and secure it against accidental power-up.

Use filters in the hydraulic system. Before you connect the hydraulic lines (especially supply lines) to the device, you should clean/rinse the installation by draining two litres out of it.

**NOTE** It is necessary to maintain a minimum distance of 0.4m from the wall or the ceiling; otherwise the device can malfunction, the fan can be damaged or its operating noise can increase.

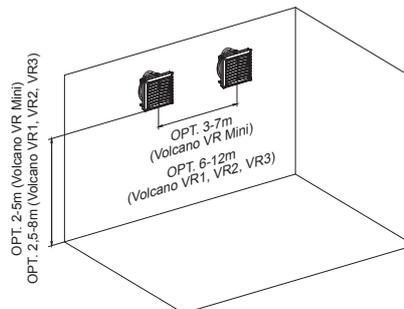
If the device will be installed on a wall or under a ceiling, observe the following factors:

mounting height

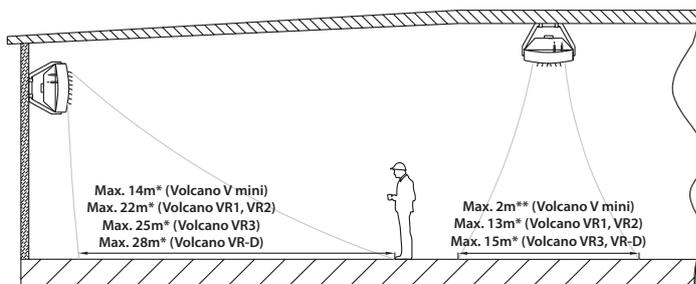


\* for vertical air guides adjustment

distance between units – recommended distance 6-12m (Volcano VR1, VR2, VR3), 3-7m (Volcano VR Mini), in order to ensure even hot air diffusion



range of air stream



\* for horizontal air guide adjustment

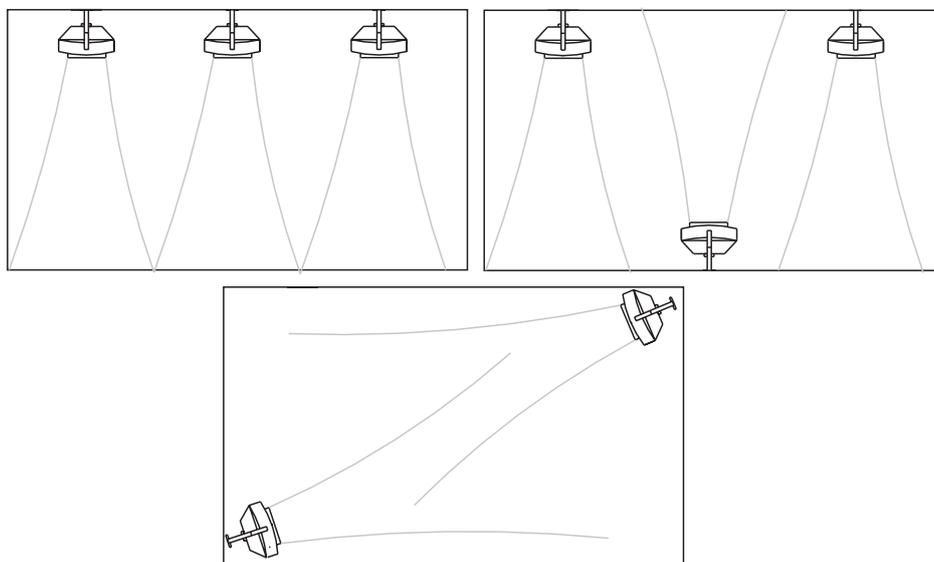
\*\* for symmetric air guide adjustment at an angle of 45°

- device noise level (depending on acoustic characteristics of a room)
- operation mode of the heating device, e.g. it can also operate as an air mixing device preventing air stratification
- direction of air distribution should be controlled in a way that prevents draughts. Air stream must not be directed at walls, brackets, girders, cranes, shelves, machines, etc.

VOLCANO VR Mini  
 VOLCANO VR1  
 VOLCANO VR2  
 VOLCANO VR3  
 VOLCANO VR-D

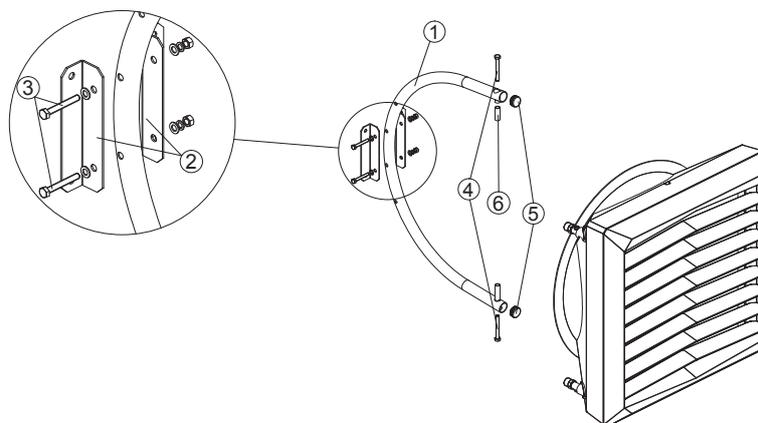
Examples of arrangement of air heating units mounted on a wall

Top view



#### 4.1 INSTALLATION WITH A BRACKET

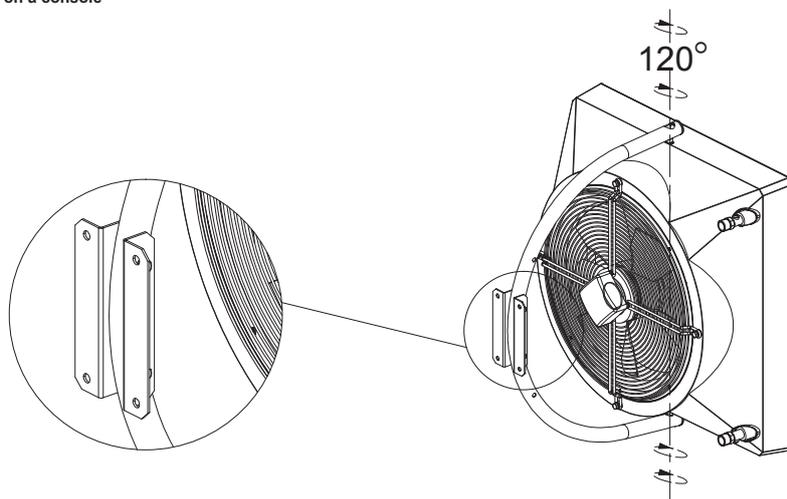
The bracket is optional. In order to attach a bracket to the device, use crown drill bits to drill holes in the top and bottom panels of the heating unit (in places marked by 6), and insert sleeves into the holes. Slide holder arms onto the sleeves. Insert M10x80mm screws into the top and bottom sleeves, and fix the bracket position in relation to the heater while tightening the screws. When you adjust the device in the right position, fit plugs onto the bracket.



The bracket unit consists of:

1. ARM (1 piece); 2. HOLDER; 3. M8x60mm SCREW WITH A WASHER AND NUT FASTENING THE CLAMP (2 sets); 4. M8x60mm SCREW FASTENING THE HOLDER TO THE UNIT HEATER (2 pieces); 5. PLUG (2 pieces); 6. MOUNTING SLEEVE (2 pieces)

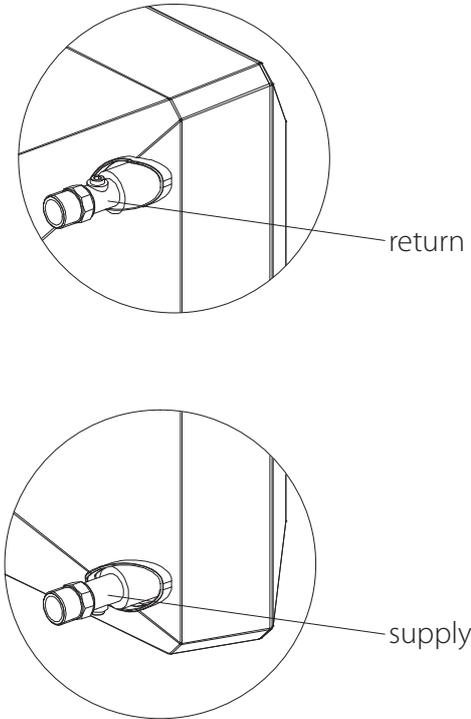
rotation of the device when mounted on a console



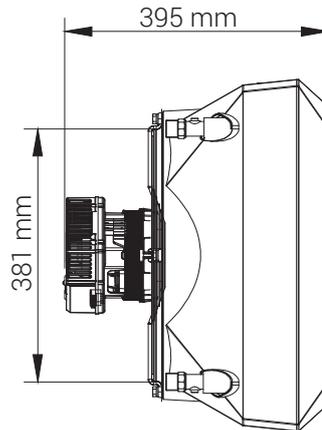
## 4.2 INSTALLATION INSTRUCTIONS AND MOUNTING DISTANCES

**Installation of the heating medium supply system** While installing the piping for the heating medium, secure the exchanger connection against twisting 1. The piping should not overload the heater connections. It is possible to connect the piping with flexible connections (adjustable angle of the airflow).

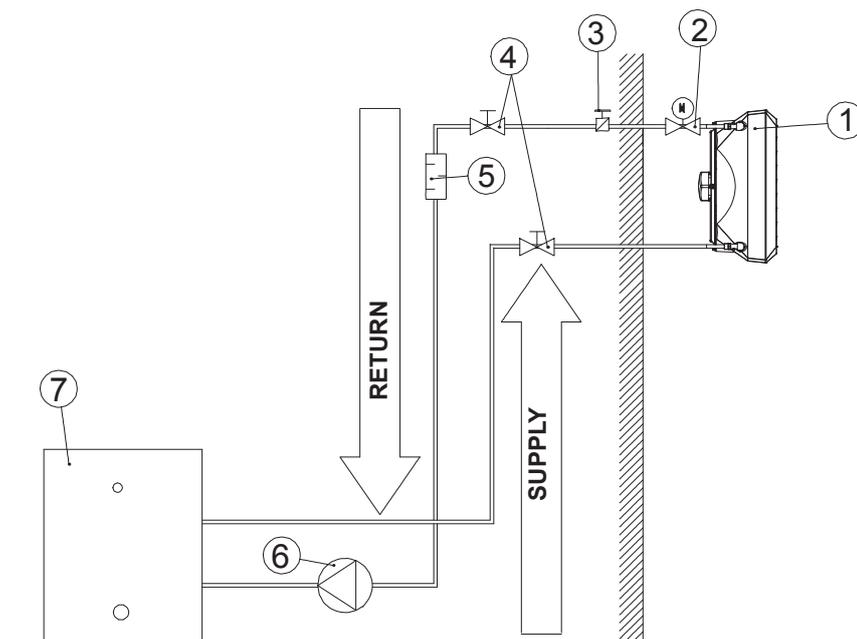
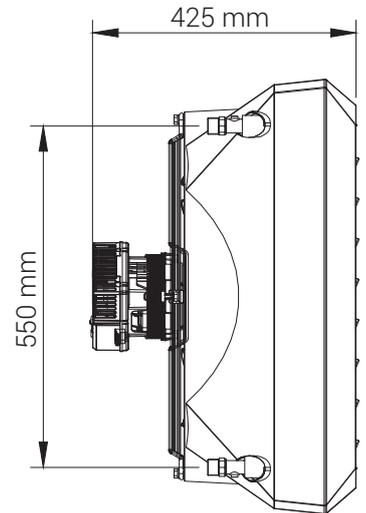
**VOLCANO VR Mini, VR1, VR2, VR3**



**VOLCANO VR Mini**



**VOLCANO VR1, VR2, VR3, VR-D**

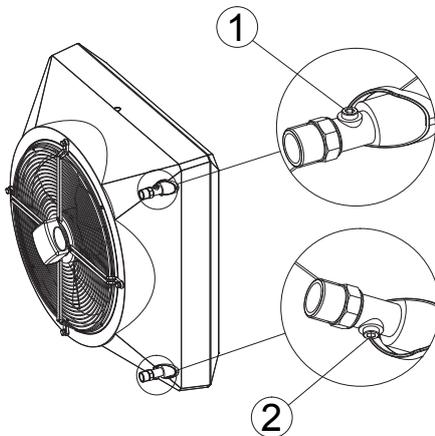


**EXAMPLE OF A HYDRAULIC SYSTEM:**  
 1. UNIT HEATER; 2. POWER-OPERATED VALVE; 3. VENT VALVE; 4. CUT-OFF VALVE; 5. FILTER; 6. CIRCULATION PUMP; 7. BOILER

**VOLCANO VR Mini**  
**VOLCANO VR1**  
**VOLCANO VR2**  
**VOLCANO VR3**  
**VOLCANO VR-D**

**Heater vent/ heating medium drain**

The device will be vented when you loosen the vent bolt 1 placed on the connection pipe. The heating medium is drained through the drain plug 2, placed on the bottom connection pipe. When starting the device after the heating agent has been drained, remember to vent the heater.  
**You need to pay special attention to secure the device against water accidentally getting into the heater casing during the agent draining process.**



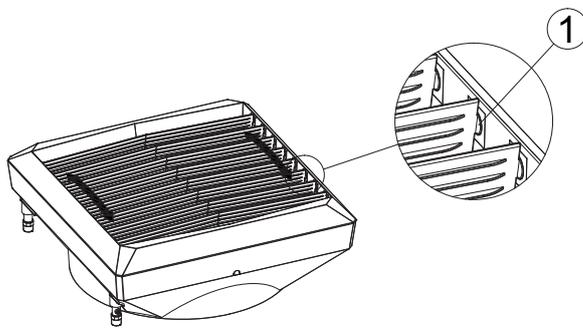
**Connecting to the power supply**

**NOTICE** The installation must be equipped with disconnectors at all power supply poles. **Recommended safety: overload disconnector VOLCANO VR Mini – 1 A, VOLCANO VR1, VR2 – 2 A, VOLCANO VR3, VR-D - 4A) and differential current safety. VOLCANO VR Mini, VR1, VR2, VR3, VR-D (fan) are equipped with a terminal block accepting 7 x 2,5 mm<sup>2</sup> electric wires. NOTICE We recommend connecting the wires to the terminal block with pre-installed bushings.**

<p><b>VOLCANO VR Mini, VR1, VR2, VR3, VR-D/ EC</b></p>	<p><b>Power supply: 3 x 1,5mm<sup>2</sup> Control: 0-10Vdc: LiYCY 2x0,75 (shielded)</b></p>	
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**Adjusting the air guides**

Volcano air guides are mounted on the pivot 1, which provides smoothly change of air direction 4. In order to change position of air blade should turn it in both hands (grasping the edges of the enclosure) to turn the blade at the same time on both pins.



**VOLCANO VR Mini, VR1, VR2, VR3, VR-D/**

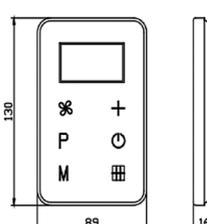
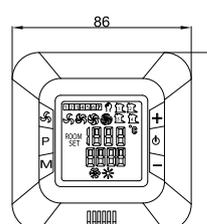
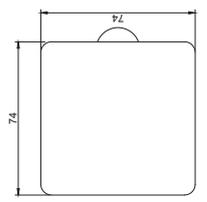
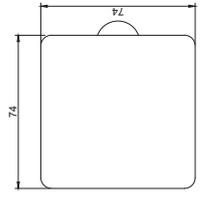
## 5. AUTOMATICS

### 5.1 ELEMENTS OF AUTOMATICS

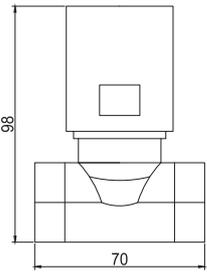
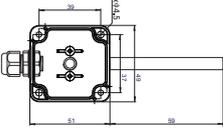
Electric connections may only be made by well-trained electricians, and according to:

- Occupational health and safety regulations
- Assembly instructions
- Technical documentation for each of the automatic elements

**NOTE** Before starting the assembly process and connecting the system, familiarize yourself with the original documentation attached to the automatic devices.

MODEL	SCHEMAT	DANE TECHNICZNE	UWAGI
<b>CONTROLLER VOLCANO EC</b> VTS: 1-4-0101-0457		<b>VOLCANO EC CONTROLLER</b> <ul style="list-style-type: none"> <li>● power supply: 1~230V +/-10%/50Hz</li> <li>● maximum output current for valve or valves with actuator: 3(1)A</li> <li>● power consumption: 1.5VA</li> <li>● temperature set-up range: -10~+99°C</li> <li>● parameters of the working conditions: 0~50°C</li> <li>● relative humidity: 10-90%, without condensation</li> <li>● display: blue backlight</li> <li>● built-in sensor: NTC 10K</li> <li>● outside sensor: option to connect the outside NTC sensor</li> <li>● accuracy of measurement: + 1°C (measurement every +0.5°C)</li> <li>● weekly calendar scheduling: 5+1+1</li> <li>● operating mode: heating/cooling</li> <li>● control options: automatic (0-10V)/manual (30%, 60%, 100%)</li> <li>● clock: 24h</li> <li>● displayed temperature: room temperature or set temperature</li> <li>● programming of heating/cooling: two periods of heating per 24h (5+1+1) or continuous operation</li> <li>● anti-frost protections: valve opening due room temperature drop below 8°C</li> <li>● ingress protection rating: IP30</li> <li>● mounting method: flush mounted box fi60mm</li> <li>● operating: external keyboard</li> <li>● maximum length of the signal cable: 120m</li> <li>● casing: ABS</li> <li>● dimensions/weight: 89x130x16 mm/0,19 kg</li> <li>● external communication: MODBUS RTU</li> <li>● suggested diameter of supply cable: 2x1mm<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>● Detailed description of the programmable temperature regulator, see manual at <a href="http://www.vtsgroup.com">www.vtsgroup.com</a></li> <li>● Thermostat and programmable temperature regulator should be installed in a visible location.</li> <li>● Avoid places directly exposed to solar radiation, electromagnetic waves, etc.</li> <li>● The automation element drawings are only a visualization of sample products.</li> </ul>
<b>HMI VR (VTS: 1-4-0101-0169)</b>		<b>HMI VR CONTROLLER</b> <ul style="list-style-type: none"> <li>● power supply: 1~230V +/-10%/50Hz</li> <li>● maximum output current for valve or valves with actuator: 3(1)A</li> <li>● power consumption: 1.5VA</li> <li>● temperature set-up range: 5~40°C</li> <li>● parameters of the working conditions: 5~50°C</li> <li>● relative humidity: 0,85</li> <li>● display: gray, blue backlight</li> <li>● built-in sensor: NTC 10K, 3950 Ohm at 25°C</li> <li>● outside sensor: option to connect the outside NTC sensor</li> <li>● accuracy of measurement: + 1°C (measurement every +0.5°C)</li> <li>● weekly calendar scheduling: 5+1+1</li> <li>● operating mode: heating/cooling</li> <li>● control options: automatic (0-10V)/manual (30%, 60%, 100%)</li> <li>● clock: 24h</li> <li>● displayed temperature: room temperature or set temperature</li> <li>● programming of heating/cooling: two periods of heating per 24h (5+1+1) or continuous operation</li> <li>● anti-frost protections: valve opening due room temperature drop below 8°C</li> <li>● ingress protection rating: IP30</li> <li>● mounting method: flush mounted box fi60mm</li> <li>● operating: external keyboard</li> <li>● maximum length of the signal cable: 120m</li> <li>● casing: ABS UL94-5 (fire retardant plastic)</li> <li>● colour: RAL 9016</li> <li>● dimensions/weight: 86x86x54mm/0,12kg</li> <li>● external communication: RS485 (MODBUS)</li> <li>● suggested diameter of supply cable: 2x1mm<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>● Detailed description of the programmable temperature regulator, see manual at <a href="http://www.vtsgroup.com">www.vtsgroup.com</a></li> <li>● Thermostat and programmable temperature regulator should be installed in a visible location.</li> <li>● Avoid places directly exposed to solar radiation, electromagnetic waves, etc.</li> <li>● The automation element drawings are only a visualization of sample products.</li> </ul>
<b>POTENTIOMETER VR EC (0-10V)</b> VTS: 1-4-0101-0453		<b>POTENTIOMETER VR EC (0-10V)</b> <ul style="list-style-type: none"> <li>● power supply: ~230/1/50 V/ph/Hz</li> <li>● permissible load: 0,02 A for 0-10 V</li> <li>● working mode: manual</li> <li>● output signal 0-10 V DC</li> <li>● protection rating: IP30</li> </ul>	<ul style="list-style-type: none"> <li>● Power connection should be done with a cable min. 2 x 0.75 mm<sup>2</sup>.</li> <li>● Automation element drawings are only a visualisation of sample products.</li> </ul>
<b>POTENTIOMETER WITH THERMOSTAT VR EC</b> VTS: 1-4-0101-0473		<b>POTENTIOMETER WITH THERMOSTAT VR EC</b> <ul style="list-style-type: none"> <li>● power supply: ~230/1/50 V/ph/Hz</li> <li>● permissible load: 0,02 A for 0-10 V</li> <li>● setting range: 5...40°C</li> <li>● temperature measurement integrated in the device</li> <li>● output signal 0-10 V DC</li> <li>● protection rating: IP30</li> </ul>	<ul style="list-style-type: none"> <li>● Power connection should be done with a cable min. 2 x 0.75 mm<sup>2</sup>.</li> <li>● Automation element drawings are only a visualisation of sample products.</li> </ul>

**VOLCANO VR Mini**  
**VOLCANO VR1**  
**VOLCANO VR2**  
**VOLCANO VR3**  
**VOLCANO VR-D**

MODEL	SCHEMAT	DANE TECHNICZNE	UWAGI
<b>TWO-WAY VALVE WITH VR ACTUATOR VR</b> VTS: 1-2-1204-2019		<p><b>TWO-WAY VALVE</b></p> <ul style="list-style-type: none"> <li>• Connection diameter: 3/4"</li> <li>• Operation mode: on/off</li> <li>• Maximum differential pressure 90 kPa</li> <li>• Pressure degree PN 16</li> <li>• Airflow degree factor kvs: 4.5 m³/h</li> <li>• Maximum heat agent temperature: 105°C</li> <li>• Work environment parameters: 0-60°C</li> </ul> <p><b>VALVE ACTUATOR</b></p> <ul style="list-style-type: none"> <li>• Power consumption 7 VA</li> <li>• Power supply voltage: 230 V AC +/- 10%</li> <li>• Closing/opening time 4-5/9-11s</li> <li>• Item without supply: closed</li> <li>• Type of protection: IP54</li> <li>• Work environment parameters: 0-60°</li> </ul>	<ul style="list-style-type: none"> <li>• Two-way valve should be installed on the return (outlet) pipeline.</li> <li>• Automation element drawings are only a visualisation of sample products.</li> <li>• Power connection should be done with a cable min. 2 x 0.75 mm².</li> <li>• Automation element drawings are only a visualisation of sample products.</li> </ul>
<b>NTC TEMP SENSOR</b> VTS: 1-2-1205-0007		<p><b>NTC temp sensor</b></p> <ul style="list-style-type: none"> <li>• resistant sensing element: NTC 10K</li> <li>• ingress protection rating: IP66</li> <li>• mounting method: wall mounted</li> <li>• maximum length of the signal cable: 100m</li> <li>• parameters of the working conditions: -20...+70°C</li> <li>• temperature measurement range: -20...+70°C</li> <li>• dimensions: 36x49x71mm (w/o a probe)</li> <li>• suggested diameter of supply cable (shielded cable): 2x0,5mm²</li> </ul>	<ul style="list-style-type: none"> <li>• NTC temperature sensor should be installed in the representative location</li> <li>• Avoid places directly exposed to sunlight, electromagnetic waves etc.</li> <li>• The automation element drawings are only a visualisation of sample products</li> </ul>

## 6. START-UP, OPERATION, MAINTENANCE

### 6.1 START-UP/PUTTING INTO OPERATION

- Prior to any installation or maintenance works, disconnect the device from the power supply and secure it against accidental power-up.
- Use filters in the hydraulic system. Before you connect the hydraulic lines (especially supply lines) to the device, you should clean/rinse the installation by draining a few litres out of it.
- Install vent valves at the highest point of the installation.
- Install cut-off valves directly behind the device, so it can be easily disassembled.
- Secure the device against pressure increase according to the permitted maximum pressure value of 1.6 MPa.
- Hydraulic pipes need to be free from any stresses and loads.
- Prior to the first start-up of the heater, check the hydraulic connections (vent and collector air-tightness, installed fittings).
- Prior to the first start-up of the heater, check the electric connections (connection of automatic devices, power supply, fan).
- It is suggested to use additional external current differential protection.

**NOTE** All connections should be made according to this technical documentation and the documentation enclosed with the automatic devices.

### 6.2 OPERATION AND MAINTENANCE

- Device casing does not require any maintenance.
- Heat exchanger needs to be regularly cleaned of dirt and grease. Especially before the heating season, the heat exchanger needs to be cleaned with the use of compressed air on the side of the air guides (but the device does not need to be disassembled). Pay attention to the exchanger's lamellas, as these are delicate.
- If lamellas bend, straighten them with a special tool.
- The fan motor does not require any maintenance. It may only require cleaning of the protective mesh, fan blades and dust and grease deposits.
- If the device is not used for a long time, disconnect the voltage supply.
- Heat exchanger does not have fire protection.
- It is recommended to periodically blow through the heat exchanger, preferably with compressed air.
- The heat exchanger can freeze (fracture) when the room temperature falls below 0°C and the heating agent temperature decreases at the same time.
- The level of air pollutants should meet the criteria allowable concentrations of pollutants in indoor air, for non-industrial areas, the level of dust concentration up to 0.3 g / m³. It is forbidden to use device for the duration of the construction works except for the start-up of the system.
- The equipment must be operated in rooms used throughout the year, and in which there is no condensation (large fluctuations in temperature, especially below the dew point of the moisture content). The device should not be exposed to direct UV rays.
- The device should be operated at the supply water temperature up to 130 ° C with working fan.

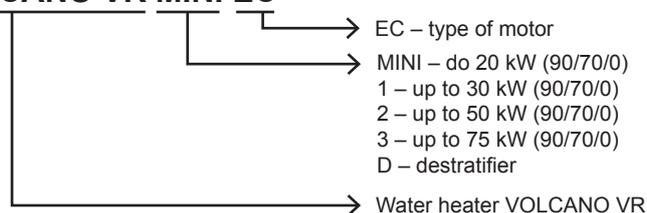
## 7. INDUSTRIAL SAFETY INSTRUCTION

### Special instructions concerning safety NOTE

- Prior to any work connected with the device, the device must be disconnected from the power supply and be secured properly. Wait until the fan stops.
- Use stable assembly platforms and hoists.
- Depending on the heating agent temperature, piping, parts of the casing, heat exchanger surface can be very hot, even after the fan stops.
- There may be some sharp edges! During transport, use protective gloves, protective clothing and safety shoes.
- The health and safety instructions must be followed.
- Loads can be fastened only in places designed for it in a transport unit. While devices are lifted by an assembly unit, their edges need to be secured. Distribute the load evenly.
- The device needs to be protected against moisture and dirt and should be stored in rooms secured against atmospheric influences.
- Disposal: Take care to dispose of used materials, packaging material and spare parts in a safe way, one which is not harmful to the environment and is in accordance with local regulations.

## 8. CODING

### VOLCANO VR MINI EC



## 9. TECHNICAL INFORMATION TO THE REGULATION (EU) NO 327/2011 IMPLEMENTING DIRECTIVE 2009/125/EC

Model:	VOLCANO VR Mini EC	VOLCANO VR1/VR2 EC	VOLCANO VR3 EC
1.	28.5%	27.5%	28%
2.	B		
3.	Static		
4.	21		
5.	VSD-No		
6.	2016		
7.	VTS Plant Sp. z o.o., KRS 0000144190, Polska		
8.	1-2-2701-0304	1-2-2701-0289	1-2-2701-0290
9.	0,41kW, 2826m <sup>3</sup> /h, 145Pa	0,48kW, 4239m <sup>3</sup> /h, 124Pa	0,68kW, 6006m <sup>3</sup> /h, 128Pa
10.	1376RPM	1370RPM	1372RPM
11.	1,0		
12.	<p>Disassembly of the machine must be carried out and/or supervised by qualified personnel with appropriate expert knowledge.</p> <p>Contact a certified waste disposal organization in your vicinity. Clarify what is expected in terms of the quality of dismantling the machine and provision of the components.</p> <p>Dismantle the machine using the general procedures commonly used in mechanical engineering.</p> <p><b>WARNING</b></p> <p>Machine parts can fall The machine is made up of heavy parts. These parts are liable to fall during dismantling. This can result in death, serious injury, or material damage.</p> <p>Follow the safety rules:</p> <ol style="list-style-type: none"> <li>1. Disconnect all electrical connections.</li> <li>2. Prevent reconnection.</li> <li>3. Make sure that the equipment is at zero voltage.</li> <li>4. Cover or isolate nearby components that are still live.</li> </ol> <p>To energize the system, apply the measures in reverse order.</p> <p><b>Components:</b></p> <p>The machines consist for the most part of steel and various proportions of copper, aluminum and plastics and rubber-neoprene (seat of bearings/hub, gasket). Metals are generally considered to be unlimitedly recyclable.</p> <p>Sort the components for recycling according to whether they are:</p> <p>Iron and steel, aluminum, non-ferrous metal, e.g. windings (the winding insulation is incinerated during copper recycling), insulating materials, cables and wires, electronic waste (capacitor ect.), plastic parts (impeller, junction box, winding cover ect.), rubber parts (neoprene). The same goes for cloths and cleaning substances which have been used while working on the machine.</p> <p>Dispose of the separated components according to local regulations or via a specialist disposal company.</p>		
13.	<p>Long failure-free operation depends on keeping the product/device/fan within performance limitations described by selection software or maintenance manual.</p> <p>For proper operation, read carefully maintenance manual, with special attention on "installation", "start-up", and "maintenance" chapters.</p>		
14.	Inlet ring, fan grid		

- 1) general efficiency ( $\eta$ )
- 2) measurement category used to determine the energy efficiency
- 3) efficiency category
- 4) efficiency coefficient in the point of optimal energy efficiency
- 5) whether rotational speed regulation was taken into account in the calculation of fan efficiency
- 6) year of manufacture
- 7) manufacturer's name or trademark, business register number and place of manufacture
- 8) product model number
- 9) rated motor power consumption (kW), flow volume and pressure in the point of energy efficiency
- 10) rotations per minute in the point of energy efficiency
- 11) characteristic coefficient
- 12) essential information to facilitate disassembly, recycling or dispose of the product after the end of its use
- 13) essential information to minimize the effect on the environment and to guarantee optimum use period, referring to disassembly, use and technical service of the fan
- 14) description of additional elements used in determining the energy efficiency of the fan

## 10. SERVICING

### 10.1 PROCEDURES IN CASE OF DEFECTS

VR Mini, VR1, VR2, VR3, VR-D		
Problem	Check points	Description
Heat exchanger leaking	<ul style="list-style-type: none"> <li>assembly of the exchanger connections with two wrenches (adjustment), which safeguards against internal twisting of the collectors,</li> <li>Check if the leakage may be associated with mechanical damage to the exchanger,</li> <li>Vent valve or drain plug leaking,</li> <li>Heating agent parameters (pressure and temperature) – should not exceed permitted values,</li> <li>type of heating agent (it cannot be aggressive to Al and Cu),</li> <li>Circumstances when the leakage appears (e.g. during the first, tentative installation start-up, when the installation is filled up after the heating agent has been drained) and outside temperature at the time of failure (risk that the exchanger may freeze),</li> <li>Possibility of operating in aggressive conditions (e.g. high concentration of ammonia in the air in a sewage-treatment plant),</li> </ul>	Pay special attention that the exchanger may freeze during winter time. 99% of registered leakages appear during installation start-up/pressure tests. The defect can be removed by pulling back vent or drain valve.
Fan works too loud	<ul style="list-style-type: none"> <li>check the device assembly for conformity with the instructions in operation and maintenance manual (e.g. distance from wall/ceiling),</li> </ul>	min. 40 cm
	<ul style="list-style-type: none"> <li>Device appropriately level led,</li> <li>Correctness of electric connections and qualifications of the wireman,</li> <li>Inlet current parameters (e.g. voltage, frequency),</li> <li>noise at lower gears (possible controller failure?),</li> <li>Noise only at higher gears (regular situation explained by aerodynamic characteristics of the device, if there outlet air chokes),</li> <li>type of other devices operating in the building (e.g. induced draught fans) – intensified noise caused by simultaneous operation of many machines,</li> <li>Does the fan rub against the casing?</li> <li>Is the fan evenly screwed to the casing?</li> </ul>	Level of operating noise of VOLCANO devices is perceived subjectively. If the device is made of plastic, it should operate quietly. It is recommended to unscrew the clamping screws and tightening them up again. If the fault does not disappear, you should make a complaint.
Fan does not work	<ul style="list-style-type: none"> <li>Correctness and quality of electric connections and qualifications of the wireman,</li> <li>Inlet current parameters (e.g. voltage, frequency) on the clamp block of fan engine,</li> <li>Correctness of operation of other devices installed in the building,</li> <li>Correctness of wire connections on the engine side acc. to the manual, in comparison to wires clamped in the engine terminal strip,</li> <li>PE conductor voltage (if present, may mean there is a break-down),</li> <li>Is N conductor correctly connected to the fan.</li> </ul>	Electrical connection need to be done strictly according to the drawings in the manual.
Damaged casing	<ul style="list-style-type: none"> <li>Circumstances when it was damaged – notes on the bill of ladings, stock issue confirmation, condition of the box,</li> </ul>	If the casing is damaged, make photos of the box and device, and photos confirming that the device serial number on the device and on the box are the same. If the device was damaged during transport, it is necessary to write down an appropriate statement by the driver, who delivered the damaged device.
Actuator does not open the valve	<ul style="list-style-type: none"> <li>Correctness of electric connections and qualifications of the wireman,</li> <li>Correctness of the thermostat operation (characteristic tick sound during change-over),</li> <li>Inlet current parameters (e.g. voltage),</li> </ul>	The most important is to check whether the actuator responded to the electric impulse.



It is forbidden to place, dispose of and store worn-out electric and electronic equipment, together with other waste. Dangerous compound contained in electronic and electric equipment have a very adverse impact on plants, micro-organisms, and, most importantly, on humans, as they damage our central and peripheral nervous system, as well as circulatory and internal system. Additionally, they cause serious allergic reactions. Worn-out equipment is to be delivered to a local collection point for used electric equipment, which carries out a selective collection of waste.

#### REMEMBER!

The user of equipment intended for households, and which has been worn out, is obliged to transfer such equipment to a collecting unit that collects worn-out electric and electronic equipment. The selective collecting and further processing of waste from households contributes to the protection of environment, reduces the penetration of hazardous substances into the atmosphere and surface waters.

### 10.2 COMPLAINT PROCEDURE

In order to report a problem with the device or elements of automation, please fill in and send the appropriate form, using one of the three available ways:

1. E-mail: [vts.pl@vtsgroup.com](mailto:vts.pl@vtsgroup.com)
2. Fax: (+48) 12 296 50 75
3. Website: [www.vtsgroup.pl/PRODUKT/VTS\\_Service/formularz\\_zgloszeniowy](http://www.vtsgroup.pl/PRODUKT/VTS_Service/formularz_zgloszeniowy)

Our service department will contact you immediately.

In the case of damage in transport, send a complaint notification, including the delivery documentation (bill of lading, inventory issue) and photographs showing the defects.

Should you have any questions, please contact us, using this telephone number: 0 801 080 073

#### IMPORTANT!

The complaint procedure shall be initiated when the Service Department has received a correctly filled complaint notification, a copy of the purchase invoice and the Warranty Card, filled by the company that carried out the installation.

### Complaint Form

<b>VTS POLSKA Sp. z o.o.</b> Al. Grunwaldzka 472 A 80-309 Gdańsk Polska  www.vtsgroup.com						
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The company submitting the notification:
The company that installed the equipment:
Date of notification:
Type of device:
Factory number*:
Date of purchase:
Date of installation:
Place of installation:
Detailed description of defect:
Contact person:
Name and surname:
Telephone:
E-mail:

\* This field must be filled, if the complaint notification refers to the following equipment: VR Mini, VR1, VR2, VR3, VR-D.

<b>VTS POLSKA Sp. z o.o.</b> Al. Grunwaldzka 472 A 80-309 Gdańsk Polska  www.vtsgroup.com						
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