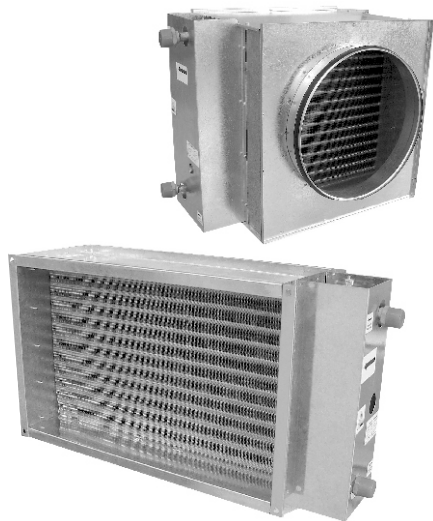


WATER DUCT HEATER “NKV”

OPERATION MANUAL

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Introduction

The present operation manual is combined with technical specification, operating instruction, certificate, information on installation. Device: Water duct heater NKV of VENTS series (further in the text "NKV")

1. Function

Device NKV with water as heat carrier and round or rectangular connection to the air duct is designed for heating of air in the air-conditioning, ventilation and hot-air heating systems and in drying units and warm air curtains.

2. Delivery set contains:

- device NKV - 1 piece
- operation manual - 1 piece
- packing box - 1 piece.

3. Technical specifications

NKV devices are used in enclosed spaces at ambient air temperatures from +1°C to +50°C. Maximum temperature: 100°C, maximum pressure at 100°C : 1.6 MPa (16 bar). NKVs are designed for exploitation in area with moderate and cold climate (UHL 3 by GOST 15150-69).

3.1 Symbolic representation of the device

For rectangular ducts:

NKV XXXxXXX - X

	Number of rows of heating elements (2, 3, 4)
	Sizes of rectangular connecting duct, mm (400x200,500x250,500x300,600x300,600x350, 700x400,800x500,1000x500)
Type of device	NKV water duct heater

For round ducts:

NKV XXX - X

	Number of rows of heating elements (2, 4)
	Sizes of round connecting duct, mm (100,125,150,160,200,250,315)
Type of device	NKV water duct heater

Examples:

NKV 400x200-2 - water duct heater for connecting to rectangular ducts of 400x200mm with two rows of heating elements.

NKV 100-4 - water duct heater for connecting to round ducts of Ø100mm with four rows of heating elements.

4. Design and principle of operation

Design of NKV with rectangular and round connecting to air duct (Picture 1 and Picture 2) consists of the case (1) and the heating element (3) built in the case. The case consists of the wall (6 for round ducts), two protective casings (2) manufactured from high-quality galvanized steel.

Heating block is a package of two or four rows of copper tubes with aluminum ribs set on them, and copper unions. The tubes are joined in groups the ends of which soldered in manifolds made from copper pipes through which the heat carrier goes in and out. For connecting to the external system the manifolds have special unions on the butt end of the heating block providing threaded connection. The output manifold has a nipple with thread (G1/4) with a plug (place П on Picture 1 and Picture 2), instead of which an immersion sensor may be placed for measuring the temperature or for protection from freezing. There is also a air-relief nipple with thread G1/2 (4), a water-drain nipple with thread G1/2 (5) from the butt end of NKV.

The air is heated during its passage through the heat exchanger in the process of interaction with copper tubes and aluminum working plates. All heaters are tested for leaktightness at maximum working pressure of 1.6 MPa and water temperature of 100°C.

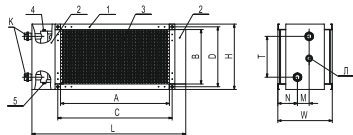
Connection dimensions correspond to connection dimensions of elements of duct ventilation (duct fans, electric duct heaters, duct noise mufflers, etc.)

For NKV a surface mount sensor is possible to apply instead of immersion sensor.

Water heaters are supplied without temperature sensors and frost protection. To avoid emergency situations during exploitation of NKV, please provide the water flow excluding a possibility of freezing of NKV.

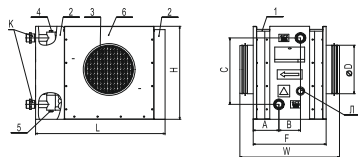
5. Basic parameters and dimensions

Basic dimensions of NKV with round and rectangular connecting to the air duct must correspond to the values listed in tables 1, 2 and on Picture 1 and Picture 2. Basic parameters and technical specifications are listed in tables 3, 4.



Picture 1

Basic dimensions of NKV with rectangular connecting to the air duct



Picture 2

Basic dimensions of NKV with connecting to round air duct

table 1

Basic dimensions of NKV with rectangular connecting to the air duct

Type	A	B	C	D	L	H	W	N	M	T	K	Number of rows of pipes	Weight, kg
NKV 400x200-2	400	200	420	220	565	240	200	72	43	150	G 3/4"	2	7,6
NKV 400x200-4	400	200	420	220	565	240	200	68	65	150	G 3/4"	4	8,1
NKV 500x250-2	500	250	520	270	665	290	200	72	43	200	G 3/4"	2	15,8
NKV 500x250-4	500	250	520	270	665	290	200	68	65	200	G 3/4"	4	16,3
NKV 500x300-2	500	200	520	320	665	340	200	72	43	250	G 1"	2	11,5
NKV 500x300-4	500	300	520	320	665	340	200	68	65	250	G 1"	4	12,0
NKV 600x300-2	600	300	620	320	765	340	200	72	43	250	G 1"	2	21,8
NKV 600x300-4	600	300	620	320	765	340	200	68	65	250	G 1"	4	22,3
NKV 600x350-2	600	350	620	370	765	390	200	72	43	300	G 1"	2	22,4
NKV 600x350-4	600	350	620	370	765	390	200	68	65	300	G 1"	4	22,9
NKV 700x400-2	700	400	720	420	895	440	200	68	47	350	G 1"	2	27,8
NKV 700x400-3	700	400	720	420	895	440	200	67,5	58	350	G 1"	3	28,4
NKV 800x500-2	800	500	820	520	995	540	200	68	47	450	G 1"	2	36,5
NKV 800x500-3	800	500	820	520	995	540	200	67,5	58	450	G 1"	3	37,2
NKV 1000x500-2	1000	500	1020	520	1195	540	200	68	47	450	G 1"	2	44,3
NKV 1000x500-3	1000	500	1020	520	1195	540	200	67,5	58	450	G 1"	3	45,2

table 2

Basic dimensions of NKV with round connecting to the air duct

Type	D	L	H	W	F	A	B	C	K	Number of rows of pipes	Weight, kg
NKV 100-2	100	350	240	300	220	82	43	150	G 3/4"	2	4,5
NKV 100-4	100	350	240	300	220	78	65	150	G 3/4"	4	5,2
NKV 125-2	125	350	240	300	220	82	43	150	G 3/4"	2	4,5
NKV 125-4	125	350	240	300	220	78	65	150	G 3/4"	4	5,2
NKV 150-2	150	400	290	300	220	82	43	200	G 3/4"	2	7,5
NKV 150-4	150	400	290	300	220	78	65	200	G 3/4"	4	8,2
NKV 160-2	160	400	290	300	220	82	43	200	G 3/4"	2	7,5
NKV 160-4	160	400	290	300	220	78	65	200	G 3/4"	4	8,2
NKV 200-2	200	400	290	300	220	82	43	200	G 3/4"	2	7,5
NKV 200-4	200	400	290	300	220	78	65	200	G 3/4"	4	8,2
NKV 250-2	250	470	360	350	270	107	43	270	G 1"	2	10,3
NKV 250-4	250	470	360	350	270	103	65	270	G 1"	4	10,8
NKV 315-2	315	550	440	450	370	157	43	350	G 1"	2	11,5
NKV 315-4	315	550	440	450	370	153	65	350	G 1"	4	12,2

table 3

Basic technical specifications of NKV with rectangular connecting to the air duct for two-row, three-row and four-row execution.

Type	Air flow, m ³ /h	Differential pressure, Pa	Inlet air, °C	Water temperature, °C (inlet/outlet) 80/60			
				Inlet air, °C	Capacity of heater, kW	Water consumption, liters	Water pressure drop, KPa
NKV 400x200-2	1100	62	-5	19	10	0.12	2
			0	23	9,2	0,12	2
			5	26	8,5	0,11	2
			10	29	8,0	0,10	1
NKV 400x200-4	1100	125	-5	35	17	0,21	1
			0	37	15	0,19	1
			5	39	14	0,17	1
			10	4,5	12	0,15	1
NKV 500x250-2	1850	62	-5	20,5	17	0,20	6,5
			0	24	15,3	0,18	6,5
			5	27,5	14,5	0,17	4,5
			10	31	13	0,15	3,5
NKV 500x250-4	1850	125	-5	38	28	0,34	6,1
			0	40	26	0,32	5,1
			5	42,6	24	0,30	5
			10	42,5	22,1	0,27	4
NKV 500x300-2	2350	62	-5	19	20	0,24	3
			0	21	18	0,22	2
			5	25	16	0,21	2
			10	28	15	0,19	2
NKV 500x300-4	2350	125	-5	37	34	0,42	5
			0	39	31	0,40	4
			5	41	29	0,36	4
			10	43	26	0,32	3
NKV 600x300-2	3000	62	-5	18	24	0,3	4
			0	20	22	0,28	3
			5	24	20	0,25	3
			10	27	18	0,23	3
NKV 600x300-4	3000	125	-5	37	42	0,51	9
			0	41	38	0,47	8
			5	42	35	0,43	7
			10	45	32	0,4	6
NKV 600x350-2	3400	62	-5	19	28	0,35	4
			0	20,5	26	0,32	4
			5	24	24	0,29	3
			10	27	22	0,27	3
NKV 600x350-4	3400	125	-5	37	49	0,6	10
			0	39	45	0,55	8
			5	41	41	0,51	7
			10	43	37	0,46	6
NKV 700x400-2	4600	113	-5	21,8	45,3	0,56	4,1
			0	25,2	41,8	0,5	3,6
			5	28,5	38,2	0,47	3
			10	31,9	34,6	0,43	2,6
NKV 700x400-3	4600	170	-5	33	64,2	0,78	10,9
			0	35,8	59,3	0,72	9,4
			5	38,4	54,4	0,67	8,1
			10	41	49,6	0,62	6,8
NKV 800x500-2	6800	128	-5	20,5	63,7	0,78	4,4
			0	23,9	58,7	0,72	3,9
			5	27,3	53,6	0,67	3,2
			10	30,7	48,5	0,62	2,6
NKV 800x500-3	6800	193	-5	29,7	86,7	1,05	5,6
			0	32,5	79,8	0,97	4,8
			5	35,3	72,9	0,89	4
			10	38,2	65,8	0,81	3,2
NKV 1000x500-2	7800	111	-5	22,4	75,4	0,94	7,1
			0	25,7	72,3	0,89	6,1
			5	29	66,2	0,8	5,2
			10	33,6	60,1	0,71	4,8
NKV 1000x500-3	7800	167	-5	32	106,1	1,3	8,7
			0	34,8	97,8	1,19	7,5
			5	37,4	89,5	1,1	6,4
			10	40,8	81,3	0,9	5,3

table 4

Basic technical specifications of NKV with round connecting to the air duct

Type	Air flow, m ³ /h	Differential pressure, Pa	Inlet air, °C	Water temperature, °C (inlet/outlet)			
				Inlet air, °C	Capacity of heater, kW	Water consump- tion, l/s	Water pressure drop, kPa
NKV 100-2	150	20	-5	21,6	1,6	0,02	1
			0	25,9	1,4	0,02	1
			5	30,2	1,2	0,01	0,5
NKV 100-4	150	31	10	34	1,0	0,01	0,5
			-5	36	2,3	0,03	2
			0	39	2,03	0,02	2
NKV 125-2	215	15	5	42	1,75	0,02	2
			10	45	1,5	0,02	1
			-5	18,4	2	0,03	1
NKV 125-4	215	40	0	22,8	1,8	0,02	1
			5	27,3	1,5	0,02	1
			10	31,8	1,2	0,02	1
NKV 150-2	320	28	-5	43	4,8	0,06	10
			0	46	4,3	0,06	9
			5	48	3,8	0,05	8
NKV 150-4	320	41	10	51	3,4	0,05	6
			-5	24	4,1	0,05	8
			0	26	3,8	0,05	6
NKV 160-2	400	31	5	30,5	3,6	0,04	5
			10	35	3,0	0,04	4
			-5	36	6,05	0,06	15
NKV 160-4	400	42	0	40	5,4	0,06	14
			5	42	5,0	0,06	13
			10	46	4,3	0,05	11
NKV 200-2	600	23	-5	26,1	4,4	0,05	9
			0	30,8	4,0	0,05	7
			5	35,3	3,5	0,04	6
NKV 200-4	600	44	10	39	3,0	0,04	4
			-5	38	6,5	0,07	16
			0	42	5,6	0,07	15
NKV 250-2	900	25	5	45,5	5,2	0,06	14
			10	48,3	4,5	0,06	12
			-5	20,6	5,9	0,07	13
NKV 250-4	900	39	0	26,0	5,2	0,06	10
			5	31,0	4,6	0,06	8
			10	35,8	4,0	0,05	7
NKV 315-2	1420	27	-5	36,8	11	0,13	13
			0	40,5	9,8	0,12	11
			5	43,6	8,7	0,11	9
NKV 315-4	1420	37	10	47,2	7,8	0,09	7
			-5	22,3	9,9	0,12	7
			0	27,1	8,9	0,11	6
NKV 315-2	1420	27	5	31,9	7,7	0,09	5
			10	36,6	6,7	0,08	4
			-5	40,4	16	0,2	12
NKV 315-4	1420	37	0	43	14	0,17	9
			5	47	12	0,15	8
			10	49	10,5	0,13	6
NKV 315-2	1420	27	-5	27	18	0,22	9
			0	32	16,3	0,2	8
			5	36,9	14,5	0,18	6
NKV 315-4	1420	37	10	41,2	12,9	0,16	5
			-5	39,6	24	0,3	15
			0	43,2	21,9	0,27	12
NKV 315-4	1420	37	5	46,5	19	0,24	10
			10	49,8	16,8	0,2	8

6. Safety requirements

Requirements of the present operation manual, Rules of safe operation of consumer's electric devices, current building norms and rules, Rules of fire safety in Ukraine shall be observed during installation and operation of NKV. Before starting the NKV please make sure there are no visible damage of the device, no foreign objects in the duct or leaks in the joins.

Connection of NKV shall be carried out by a qualified worker who has admittance to such works. The heated air shall not contain any solid, fiber, adhesive, aggressive admixtures that may cause aluminum, copper and zinc corrosion.

Maximum permissible water temperature is +100°C. Maximum permissible pressure is 1.6 MPa. Working pressure of the heating water is 0.8 MPa. If water is used as heat carrier, a NKV shall be mounted only inside the room with maintained constant temperature not going down to the freezing point. External mounting is possible only in a case if a nonfreezing mixture is used as heat carrier.

Warning!

Do not use a NKV for work with explosive dust air mixture.

Warning!

Damage of copper pipes (deformation and breakup) may occur in the heat exchanger at freezing of water. As a result, leakage of water from the heat exchanger circuit will occur and the heater will be out of order.

Exploitation of the device beyond the temperature range specified in the operation manual and in rooms with the air containing aggressive admixtures is forbidden.

7. Installation

Installed directly in the air ducts in the positions that make possible to join connecting pipes in horizontally, from the side of a NKV or vertically from above.

Connection of pipes vertically from below is impermissible. Water duct heater may be of right or left executions depending on the customer's request. When water is used as the heat carrier, the heaters shall be used in rooms where temperature is above 0°C.

The heater shall be installed in the air ducts of the similar diameter (size). Operating position of the heater shall ensure free access for service maintenance, for joining of pipes with heat carrier. It is recommended to install the air filter in front of a NKV in the direction of air flow.

A water heater may be installed in front of or behind the fan.

If a NKV is placed in front of a fan, its capacity must be adjusted so that the air temperature inside The fan does not exceed the maximum permissible value.

8. Rules for storage and transportation

Keep NKV in the original package in a closed room at temperature from 10°C to +40°C and relative humidity not exceeding 80% (at temperature of 25°C).

Presence in the air of steam and admixtures causing corrosion and failure of isolation and leaktightness is not admitted.

Transportation by any mode of transport is possible on condition of protection from atmospheric precipitation and mechanical damage.

Loading and unloading must be performed avoiding Any bumps and pushes.

9. MANUFACTURER'S GUARANTEES

Manufacturer Closed joint-stock company "VENTS" guarantees that NKV complies with technical specification subject to observing the installation and operation, storage and transportation rules.

Guaranty period of exploitation is 24 months from the date of sale through the retail network. In case of absence of a note about the date of sale, the guarantee period shall be calculated from the date of manufacture.

The guarantee becomes invalid in case a NKV has damages because of the use of the device with the purpose other than it was designed for and because of rough mechanical interference with the device.

10. GUARANTEE CARD

To be filled out by a trade enterprise

Sold by _____
(name of a trade enterprise)

s.s. _____
stamp of a shop

Date of sale _____

(Signature of a salesman)

