

Series
USWK



■ **Application**

The mixing unit USWK is designed for smooth heat medium flow control in ventilation systems equipped with water heaters or coolers for supply air temperature regulation. The mixing unit controls heat medium flow supplied to the water heat exchanger and in such a way maintains the supply air temperature. The mixing unit USWK is compatible with NKV water heaters, duct coolers OKW as well as all water heat exchangers (both heaters and coolers) integrated into air handling units.

■ **Design and operating logic**

Design of the mixing unit USWK is shown in fig. 1. The circulation pump (1) of the mixing unit ensures ongoing heat medium circulation through the water heat exchanger. The heat medium regulating three-way valve (3) with electric actuator (2) is installed before the circulation pump to mix the water supplied from the heating (cooling) system with the return water supplied through the recirculation pipe (4). The three-way valve is designed to provide the mixing ratio of two water streams and thus to control the heat medium temperature supplied to the water heat exchanger. The three-way valve actuator is controlled by 0-10 V output signal from the ventilation control system.

■ **Connection to water mains**

The mixing unit is connected directly to the water heat exchanger and water mains through rigid and/or flexible pipes.

In case of flexible pipe connection, fix the mixing unit firmly to the wall or another rigid surface with clamps. While installing the mixing unit keep the motor horizontal position to disable any distortions and mechanical loads from the connected pipelines to USWK unit. While connecting the mixing unit to water mains make sure of no loads and distortions that may damage the unit structure and provoke USWK airtightness breach. While connecting the pipelines ensure their quick detachment for scheduled servicing and maintenance operations.

■ **Electric connection**

All electric installations are allowed by qualified electricians with valid permit for electric operations. Before connecting the pump make sure to have grounded it. Make steps to prevent contact with power cables.

■ **Operating conditions**

The pump motor bearings are greased by the pumped medium. The single phase pumps do not require extra overload protection and the three phase pumps must be provided with external overload protection. The maximum allowable heat medium pressure in the unit is 10 bar.

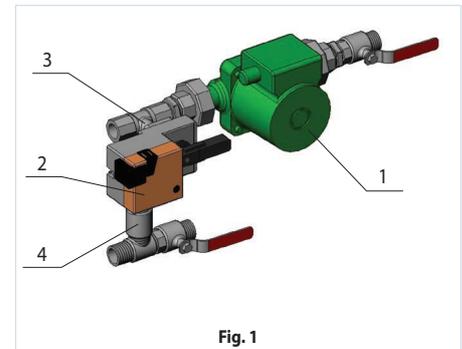
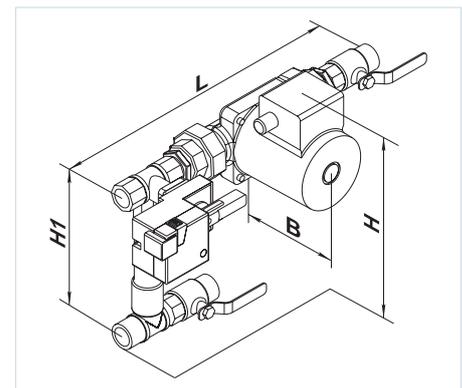


Fig. 1

Overall dimensions

Type	Dimensions [mm]				Mass [kg]
	B	H	H1	L	
USWK 3/4-4	150	290	180	460	4.1
USWK 3/4-6	150	290	180	460	4.1
USWK 1-6	175	320	210	490	6.8
USWK 1-10	175	320	210	490	6.8
USWK 1 1/4-10	175	355	240	500	7.4
USWK 1 1/4-16	175	355	240	500	7.4
USWK 1 1/2-16	266	420	255	610	23.0
USWK 1 1/2-25	266	420	255	610	23.0
USWK 2-25	312	474	290	660	31.0
USWK 2-40	312	474	290	660	31.0



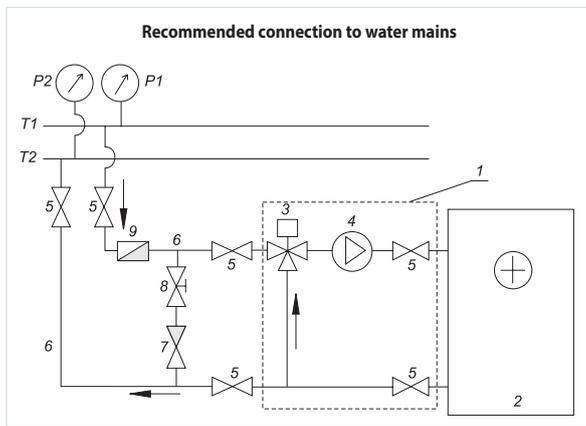
*3-way valve $K_{vs} = \frac{V_{100}}{\sqrt{\frac{\Delta p_{v100}}{100}}}$, where Δp_{v100} — pressure loss at fully opened valve; V_{100} — rated water flow at Δp_{v100} .

Designation key

Series	Connecting diameter	-	3-way valve [Kvs]*
USWK	3/4"; 1"; 1 1/4"; 1 1/2"; 2"		4; 6; 10; 16; 25; 40

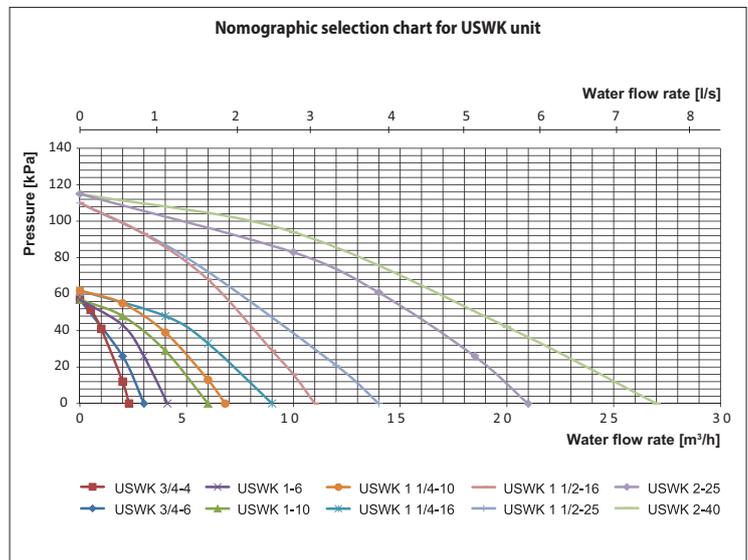
Technical data

	value	USWK 3/4-4	USWK 3/4-6	USWK 1-6	USWK 1-10	USWK 1 1/4-10	USWK 1 1/4-16	USWK 1 1/2-16	USWK 1 1/2-25	USWK 2-25	USWK 2-40	
Circulation pump	-	DAB VA65/180		DAB A50/180XM		DAB A56/180XM		DAB BPH 120/250.40M		DAB BPH 120/280.50T		
Three-way valve regulation mode	-	smooth 0...10 V										
Three-way valve with electric actuator	-	Belimo R317	Belimo R318	Belimo R322	Belimo R323	Belimo R329	Belimo R331	Belimo R338	Belimo R339G	Belimo R348	Belimo R349G	
Three-way valve actuator	-	Belimo LR24A-SR						Belimo NR24A-SR	Belimo SR24A-SR	Belimo NR24A-SR	Belimo SR24A-SR	
Connection	-	Thread						Flange				
Three-way valve nominal diameter	-	DN 20	DN 20	DN 25	DN 25	DN 32	DN 32	DN 40	DN 40	DN 50	DN 50	
Three-way valve K_{vs}	-	4	6.3	6.3	10	10	16	16	25	25	40	
Max. capacity	m ³ /h	2.3	3.0	4.1	6.0	6.8	9.0	11.0	14.0	21.0	27.0	
Max. developed head	kPa	57	57	57	57	62	62	110	110	115	115	
Connecting pipe diameter	inch	3/4"	3/4"	1"	1"	1 1/4"	1 1/4"	1 1/2"	1 1/2"	2"	2"	
Pumped medium temperature	°C	-10...+110						-10...+120				
Max. glycol content in pumped medium	%	30	30	30	30	30	30	30	30	30	30	
Number of pump speeds	-	3	3	3	3	3	3	3	3	3	3	
Phase/ Pump voltage	V	1~230								3~400		
Max. pump power	W	78	78	184	184	271	271	510	510	898	898	



T1 and T2 – supply and return pipeline;
 P1 and P2 – manometers for supply and return pipelines in the water mains;

- 1 – USWK (mixing unit);
- 2 – Water heater;
- 3 – Three-way valve with actuator;
- 4 – Circulation pump;
- 5 – Shutoff valve;
- 6 – Supply and return pipeline from water mains to the water heater;
- 7 – Non-return valve;
- 8 – Balancing valve;
- 9 – Coarse filter.



To select the mixing unit according to the nomographic chart, calculate the required heat medium flow through the water heat exchanger and water pressure drop (water head). These parameters are calculated according to the heating/cooling diagrams specifically for each water heat exchanger stated specifically herein.