

ESUCH – distribution nodes of water coolers



proposal and consultation
tel.: 602 259 205



ErP conform



EC motor

Technical parameters

■ ESUCH – distribution node

The distributor node is used to control the flow of cooling water to the MKW (IKW) water coolers. Nodes are labeled ESUCH Cxx-Vyy A, where xx in the type designation indicates the pump type and yy indicates the “kVS” value of the distribution valve. The valve is controlled by a BELIMO servo drive. It is supplied in version “A” with a servo drive controlled by analog 0–10V.

Using a 0–10V signal, the external control system ensures smooth control of the water cooler performance by changing the flow of cooling water to the water cooler (so-called quantitative control method). The water flowing through the node must not contain impurities, solid impurities and aggressive chemical substances that damage copper, brass, stainless steel, zinc, plastics, rubber. The permitted operating parameters are as follows:

- maximum fluid operating temperature +105 °C
- minimum fluid operating temperature -10 °C
- maximum water pressure 1 MPa

- minimum water pressure 20 kPa
- maximum relative humidity of ambient air (non-condensing environment) 90 % RH
- max. concentration of ethylene glycol 40 %

Parameters of distribution nodes

- max. concentration of propylene glycol 40 %
- range of ambient temperatures at the installation site of the node 0 °C ÷ 50 °C

The minimum operating water pressure ensures that air is not sucked in by the vent valve, which must be mounted at the highest point of the water circuit.

When designing the location of the ESUCH node, we recommend following the following principles:

- follow the manufacturer’s instructions for applying the water cooler
- the distribution node must always be fixed so that the shaft of the pump motor is in a horizontal position
- the distribution node must be in such a position that it can be vented later

- when placed in a suspended ceiling, it is necessary to maintain inspection and service access to the distribution node and venting valve

■ Dimensions and materials

Manifold assemblies are produced in a performance series of nine sizes, which differ in pump type, three-way valve size and connecting pipe diameter. The cooling water connection is unified on copper pipes with a diameter of 22 and 28 mm. The flow rate and pressure loss of the distribution node is determined by the size of the control valve (kVS in the range of 0.6 to 16).

■ Variant

The distribution node is equipped with two ball valves at the inlet to ensure the possibility of disconnecting the cooling circuit during repairs. On the side of the connection to the water cooler, the node is equipped with flexible steel hoses that allow easy adjustment of the spacing of the inlet nozzles of the water cooler. The entire node is thermally insulated with 13 mm thick Armaflex insulation. The Grundfos pump is

Parameters of distribution nozzles

distribution node	pump	servo drive	connecting ball valves [“]	connection of flexible hoses [“]	Q recommended cooling capacity* [kW]	Q recommended cooling capacity** [kW]
ESUCH C40-V0.6 A	ALPHA1 L 25-60		3/4“ male	3/4“ female	2	3
ESUCH C40-V1.0 A	ALPHA1 L 25-60		3/4“ male	3/4“ female	4	5
ESUCH C40-V1.6 A	ALPHA1 L 25-60		3/4“ male	3/4“ female	6	8
ESUCH C40-V2.5 A	ALPHA1 L 25-60		3/4“ male	3/4“ female	9	12
ESUCH C40-V4.0 A	ALPHA1 L 25-60	HT 24SR-T	3/4“ male	3/4“ female	14	20
ESUCH C40-V6.3 A	ALPHA1 L 25-60		3/4“ male	3/4“ female	17	31
ESUCH C80-V6.3 A	MAGNA 1 25-80		3/4“ male	3/4“ female	22	–
ESUCH C80-V10 A	MAGNA 1 25-80		1“ male	1“ female	36	49
ESUCH C80-V16 A	MAGNA 1 25-80		1“ male	1“ female	42	79

* Applies to ESUCH design with auxiliary pump. The recommended output corresponds to a pressure loss on the valve of 20 to 30 kPa. Estimated water cooler pressure loss 10 to 25 kPa.

** Applies to ESUCH design without auxiliary pump. The recommended output corresponds to a pressure loss on the valve of 50 kPa. At the inlet of the cooling water to the ESUCH in the central distribution, it is necessary to have sufficient available pressure to overcome the pressure loss of the radiator circuit and the three-way valve! The above values are calculated for a cooling water temperature drop of 6/12 °C (without glycol additive).

For the exact design of ESUCH nodes, contact the technical department of ELEKTRODESIGN ventilatory, s.r.o

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equipped with an external insulating cover. A filter with a removable and cleanable filter insert is placed between the inlet ball valve and the pump. The three-way valve is controlled by a BELIMO servo drive of the HT series. The distribution node is exclusively equipped with a HT 24-SR-T servo drive, which is intended for continuous regulation (control by analog signal 0 to 10V). The supply voltage of the HT 24-SR-T servo drive is AC/DC 24V.

The ESUCH node is supplied in 2 versions:

- with pump – ESUCH Cxx Vyy A
- without pump – ESUCH C00 Vyy A

Regulation

The distribution node is installed in front of the water cooler. The pump ensures water circulation through the water cooler in cases where sufficient pressure potential is not available in the central cold water distribution. In the case of a demand for the maximum output of the water cooler, all cooling water flows through the water cooler. In the case of a requirement for the minimum capacity of the cooler, a part of the three-way valve at the water outlet from the water cooler is closed, and the cooling water flows from the inlet port through the three-way valve to the return (in this case, the cooling water flow through the water

cooler is equal to 0m³/h). When a request for a partial capacity of the cooler is made, part of the water is let into the water cooler and part of the water is returned to the return of the cooling water distribution.

Installation and maintenance

The distribution node connects to the cooler. The distribution node must never be exposed to load by the tension and twisting of the connected pipe. It is convenient to mount the distribution nodes on separate hangers using heating sleeves on the wall, pipes or auxiliary structure. When placed under a soffit, it is necessary to maintain inspection and service access to the node for easy cable connection and possible maintenance. When assembling the node, it is necessary to turn the filter with the sludge container downwards. If the filter is not in the correct position, there is a risk of increased clogging of the filter and its contamination. Reduced permeability or even non-permeability of the filter results in a significant reduction in the performance of the cooler.

Above all, during the test run, it is necessary to check and clean the filter's draining container. If the filter is often clogged, the entire cooling circuit must be cleaned. Even during normal operation of the device, a

regular check of the filter is necessary. When cleaning the filter, it is necessary to close all water ways to minimize water leakage from the system. The distribution node must always be installed so that air can escape to the vents of the water cooler or the entire cooling circuit.

The distribution node must always be fixed so that the shaft of the pump motor is in a horizontal position.

After flooding the cooling water distribution system, it is necessary to vent the circulation pump according to the manufacturer's instructions (Grundfos). On each pump, it is possible to switch the speed (pump characteristics) using a button on the front side.

Information

In case of a request for larger valve dimensions (KVS = 25 or 30), please contact the technical department of ELEKTRODESIGN ventilátory, s.r.o. For these larger dimensions, a separate supply of a three-way valve and a pump in a flange design is possible for the purpose of installation in the cooling water distribution by the installation company. Nodes of these larger dimensions can no longer be attached to the air handling unit.

Supplementary image

