Cascade function

Commissioning, settings and sequence description

General functional description

The cascade function allows two or more fresh water stations to be connected together to form a fresh water cascade. The fresh water stations are installed and connected hydraulically in a cascade circuit. The individual controllers of the fresh water stations must be connected in series with each other using a CAN connection set.
Depending on the flow rate and the set switch-on and switch-off limits, individual stations are switched on or off in order to achieve the set tap temperature for the current tap volume (flow rate).

Commissioning of the cascade function

Controlling a cascade of fresh water systems is a special function and is activated via the hidden menu.

> To access the cascade function in the menu, press and hold the ESC key for 10 seconds when switching on! The function will remain visible the next time you switch on if it has been activated.

> For cascade operation, all controllers in the cascade must be connected using the CAN bus cable provided. The controllers are looped through for this purpose, i.e., connected in series from one controller to the next. A terminating resistor must be inserted at the beginning (1st controller) and at the end (2nd controller).

Activation of the function

The cascade function is activated by assigning a free relay to the cascade in the special functions.

> A relay must always be assigned, even if no switch valve for the cascade is connected to this relay. This may be the case if the cascade is operated with a fixed base station.

In the ‘Special Functions’ menu, select a free relay and assign it to the cascade function, e.g., relay 3. Once the function is activated, all necessary parameters can be set.

Settings Cascade function

Fixed base station

If the cascade is operated with a fixed base station, you can set this controller as the base. This station is then always in operation or on standby.

> If a controller does not have a shut-off valve, a relay must still be assigned to activate the function. In this controller, the “fixed base” setting must be activated in any case!

DF Station+

Here, the upper flow limit is set as a percentage of the VFS. If this limit is exceeded, another station from the cascade is requested.

DF Station-

Here, the lower flow limit is set as a percentage of the VFS. If the flow falls below this limit, the station switches off again. If this is the base station, this lower limit is ignored.

Delay

This parameter is used to set the delay time that is waited for after a switch-on or switch-off operation before switching or requesting again.
The value to be set here depends primarily on the running time of the cascade valves used (time to open and close).

Sequence description

The controllers exchange CAN messages cyclically. This occurs at least every 10 seconds. The cycle shortens when the flow rate changes or when changed settings that need to be transmitted are detected. Each controller builds a list of the entire cascade network. The controllers are numbered consecutively. Each controller knows the flow rate and valve status of all controllers in the network. The total sum is calculated from all flow values and displayed in each controller next to the symbol for the valve.

The sensor values S1 to S6 are exchanged via CAN. First, the system checks whether a local sensor is connected. If so, this sensor is used and its value is transmitted to the connected controllers via the CAN bus. If not, a value from the CAN bus is used, if available.

Special features

1. The circulation pump is not currently controlled via the cascade. If a circulation pump is connected, all necessary settings must be made on the controller to which the pump is connected.

   If the fresh water cascade is operated with a circulation pump, ensure that the circulation pump is correctly integrated hydraulically. In this case, the circulation pump must be integrated hydraulically outside the cascade.

2. If no fixed base is set, the cascade stations alternate with base operation. The total running time of the individual stations is recorded to ensure an even distribution of operating times.

Functional description

Example:

Condition 1. Switching on a station
Example: Set DF+ value 70%, flow sensor maximum 40 l/m

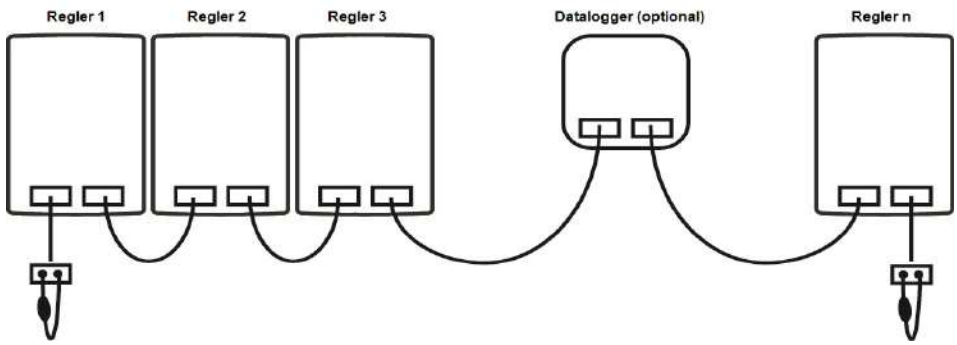
If the flow sensor measures more than 28 l/m, the next controller with a closed valve is searched for in the list of controllers. This controller is then instructed to open its valve. If the flow rate is still too high after the set delay, another station is added. The newly added station is prevented from closing its own valve for the duration of the set delay.

Condition 2. Switching off a station
Example: Set DF value 40%, flow sensor maximum 40 l/m

If the flow sensor measures less than 16 l/m and this station has not just been switched on (delay time is waited for), the valve is closed.

CAN Bus

Two or more controllers can be connected to each other or to the data logger via the CAN bus and exchange data with each other.



1. The controllers are connected in series using the CAN bus cable.
2. The first and last controllers in this series connection must be equipped with a terminating resistor.
   The two CAN sockets can be wired in any configuration.
3. Optionally, the data logger can also be integrated into a CAN bus.