Cascade regulator CKP09-M

Cascade regulator CPK09-M is a device intended for the control and management of a system of several parallel-connected boilers of the TK-Professional series of the same nominal power, which the user controls as one boiler. Also, the CPK09-M can be connected to the BMS, that is, the centralized monitoring and control system, via the MobBus RTU (RS485) protocol, which gives the possibility of remote control and insight into all parameters of the system as well as of each boiler individually, and thus more precise control, and energy saving.

If the cascade regulator is not connected to the BMS using MobBus RTU (RS485) communication, 3 relay signals are available: "Boiler in operation", "Boiler error" and "Boiler communication error". The relays are with voltage-free, switchable contacts, to which signals can be connected (up to 230VAC 10A) for reporting the 3 basic states of the boiler cascade connection to the centralized monitoring and management system (BMS). If they are not connected to the BMS, the relay contacts can be used directly to activate a signaling device (signal lamp, buzzer...) which remotely signals the basic conditions of the system (boilers in operation / malfunction) without the need to go to the boiler room.

Cascade regulator CPK09-M provides the ability to control up to 10 boilers connected in parallel and set to work in cascade mode. They are displayed as one larger boiler, whose power is equal to the total power of all connected, i.e. all boilers that are allowed to work in the CPK09-M settings. Therefore, it is possible to have 10 boilers in the system, but due to the lower need for heat energy, in a certain period only 4 boilers can be allowed to operate. Setting the set power and set temperature of the pressure line of the system of cascade connected boilers is possible directly on the cascade regulator, as well as remotely via ModBus communication.

The cascade controller distributes power to individual boilers so that all available boilers are loaded as evenly as possible, that is, they work in the most optimal mode for them - so that the working life of each boiler is as long as possible. If during operation there is a communication break between the cascade regulator and one of the boilers, the maximum available power is reduced by the power of the boiler from which the cascade regulator does not receive information. A boiler that does not have communication with the cascade regulator will turn off all heaters, and their activation will be possible only when communication between the boiler and the cascade regulator is established, or if the independent mode of operation is selected on the control unit of that boiler instead of cascade operation. Optionally, the cascade regulator can control the temperature of the distributor according to the external conditions (Outdoor Temperature Compensation).

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Technical characteristics of cascade regulator CPK09-M:

CPK09-M	Unit	
Dimensions (V×Š×D)	mm	400×300×140
Device mass	kg	9
Protection level (water and dust)		IP 54
Protection level (external mechanical influences)		IK 02
Maximum ambient temperature	°C	-20 ÷ 70
Maximum relative humidity of the ambient	%	90
Maximum number of boilers in cascade connection		10
Network voltage	VAC	230
Spring-loaded power cable clamps	mm²	4
Spring clamps of sensors, signals and communication	mm²	2,5
Main Fuse (MCB)	A	1-p B2A
Minimum cross-section of the power cable	mm²	Cu 3×0,75
Device consumption in stand-by mode	W	3
Maximum device consumption	W	11
Measuring range of temperature sensors	°C	-50 ÷ 125
Minimum cross-section of cables for Temperature sensors	mm²	Cu 2×0,2 (AWG24)
Maximum cable length for Temperature sensors	m	20
Minimum cross-section of cables for Communication	mm²	Bus twisted cable 2×0,1 (AWG26)
Maksimalna dužina kablova za Komunikaciju	m	100
Communication protocol of cascade regulator and boilers		RS485 ModBus RTU
Communication protocol of cascade regulator and BMS		RS485 ModBus RTU
Relay signal "Boiler in operation»		Beznaponski kontakt, Imax=10A, 230VAC
Relay signal " Boiler operation error''		Beznaponski kontakt, Imax=10A, 230VAC
Relay signal " Error in Communication with Boiler''		Beznaponski kontakt, Imax=10A, 230VAC
External conditions for boiler operation (remote start / stop)		24VDC
Microprocessor Unit (CPU)		EK_CPU_1_5