

65 Cascade, intermediate up to 5 heat pumps

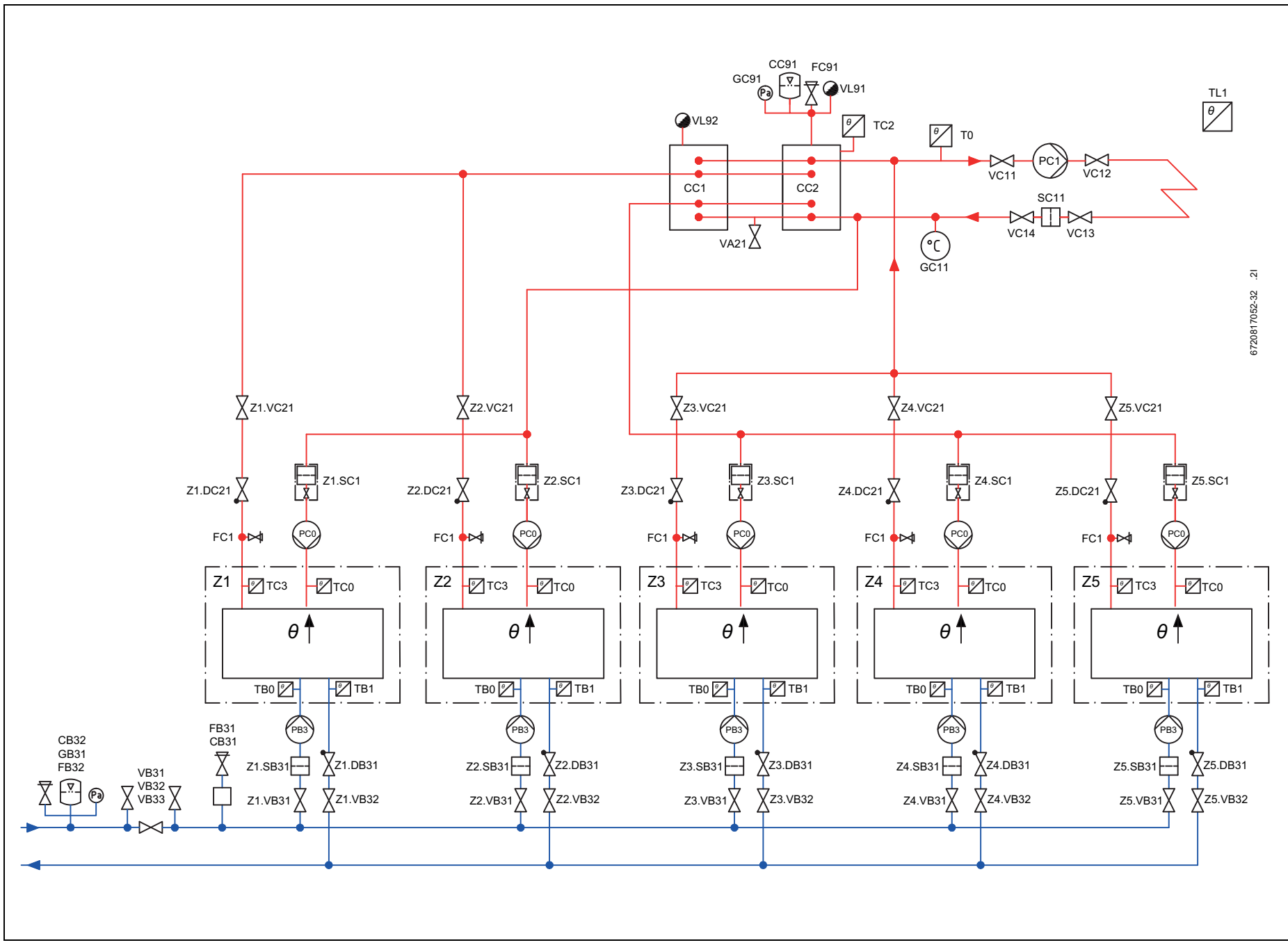


Fig. 59

General specifications

Overview

This system solution is intended for properties with one heating circuit. Maximum system temperature requirement is 80/60 (80° flow, 60° return) at the DOT (Dimensioning Outdoor Temperature) for the region where the properties is. The heat pumps are connected in two groups, for uneven numbers of heat pumps, the group to the right should have the highest number of heat pumps. The buffer cylinders are connected in parallel using the buffer cascade kit.

Heat production from heat pump

The set point value for the flow is calculated from the outdoor temperature TL1 and the heat curve. Adjustments are made against the flow temperature TO. The curve is calculated automatically from the basic settings. The customer has the option of adapting the heat curve at different outdoor temperatures. In case of low heating system flow, start and stop of compressors are done against buffer temperature TC2 in case it shows a higher temperature than TO

De-airing of heating system

The type and positioning in the system of the buffer tank CC1 and CC2 makes it function, together with the vent VL91, and VL92 as a heating system vent. In a system of this size, it is worth having an active expansion vessel system with de-airing function.

Dirt separator for the heating system

The type and positioning in the system of the buffer tanks CC1 and CC2 makes them function also as a sediment separator, but only giving full protection for the right heat pump group. Gathered sediment can be flushed out via VA21. But when a heat pump is installed in an existing heating system, a magnetite filter that also gathers non magnetic sediment is needed (SC11)

Adjustment of heating system flow

The connecting mode according to this system solution works for any low-flow or high-flow system. This way of connecting the two heat pump groups to the heating system gives an optimal range of system flow between the nominal flow of one heat pump group to the total nominal flow of both heat pump groups. With the heat pumps in continuous operation, the temperature difference TO – GC11 should be in the range between TC3-TC0 and two times the difference TC3-TC0. The flow can be adjusted primarily by adjusting the pressure height of the PC1 pumps respectively. However, a correct flow may have the consequence that only part of the heating system becomes hot. This means that the distribution valves of the heating system needs adjusting (radiators/ floor heating).

Capacity control

In winter mode one of the Compressors in the heat pump (ER1 to ER5) starts when TO falls below the preset temperature by the current heat pump hysteresis. When one step in each working* heat pump is started, the 2:nd compressor in each heat pump is allowed to start when TO falls below the preset temperature by the current heat pump hysteresis. *If at least one compressor in a heat pump is in working order. Once stopped, the respective compressor is blocked from restarting for 3 minutes. The hysteresis is floating and individual for each compressor. This means that the starting order of the heat pumps changes; the one with the longest non operating time will start first and the one with the longest operating time will stop first. But only when only one compressor in each heat pump is running, both compressors is allowed to be stopped in a heat pump

Potable hot water production

In winter mode one of the Compressors in the heat pump (ER1 to ER5) starts when TO falls below the preset temperature by the current heat pump hysteresis. When one step in each working* heat pump is started, the 2:nd compressor in each heat pump is allowed to start when TO falls below the preset temperature by the current heat pump hysteresis. *If at least one compressor in a heat pump is in working order. Once

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Additional heat

Additional heat can be connected before the PC1 pumps, to be started by the heat pump control when the heat pumps alone can't manage heating.