THE CONTROLS COMPONENT LIBRARY (GENERAL DESCRIPTIONS)

TYPE 502: THREE STAGE AQUASTAT IN HEATING

A three stage aquastat is modeled to output three ON/OFF control functions that can be used to control a fluid cooling system having up to a three stage heating source.

TYPE 503: THREE STAGE AQUASTAT IN COOLING

A three stage aquastat is modeled to output three ON/OFF control functions that can be used to control a fluid cooling system having up to a three stage cooling source.

TYPE 645: FIVE STAGE ROOM THERMOSTAT

This ON/OFF differential device models a five stage room thermostat which outputs five control signals that can be used to control an HVAC system having a three stage heating source and a two stage cooling source. The controller contains hysteresis effects and is equipped with a parameter that allows the user to set the number of controller oscillations permitted within a single time step before the output values "stick." Type645 was made standard TRNSYS component Type108 with the release of TRNSYS v. 16.

TYPE 658: HUMIDISTAT

This ON/OFF differential device is most often used to control the operation of a humidifier based on the temperatures and relative humidities of the zone and inlet air ventilation stream. The humidistat generates a control function which can have a value of 1 or 0. The value of the control signal is set as a function of the difference between a set point relative humidity and the relative humidity of the zone air, compared with two dead band relative humidity differences. The new value of the control function also depends upon the value of the input control function at the previous time step. The controller is normally used with the input control signal connected to the output control signal, providing a hysteresis effect. However, control signals from different components may be used as the input control signal for this component if a more detailed form of hysteresis is desired.

TYPE 661: DELAYED OUTPUT DEVICE

This component models a "sticky" controller where the outputs are set to the input values from a user-defined previous time step. For example, the user could decide to have the outputs to another component be based on the zone temperatures from the previous hour or even from the previous day.

TYPE 669: PROPORTIONAL CONTROLLER

This component returns a control signal between 0 and 1 that is related to the current value of an input as compared to a user defined minimum and maximum value.

TYPE 671: N-STAGE DIFFERENTIAL CONTROLLER IN HEATING

An N-stage differential controller is modeled to output N ON/OFF control functions that can be used to control a heating system having a N-stage heat source.

The controller commands a first stage control signal at low input values, a second stage control signal at lower input values, a third stage control signal at even lower input values etc. through the n^{th} defined level.

The user has the option to enable or disable the output control functions for levels lower than the critical control function. For example if the model decides that the third stage signal should be ON, the user has the option of then deciding whether stage 1 and stage 2 should be ON or OFF.

TYPE 672: N-STAGE DIFFERENTIAL CONTROLLER IN COOLING

An N-stage differential controller is modeled to output N ON/OFF control functions that can be used to control a cooling system having a N-stage cooling source.

The controller commands a first stage control signal at high input values, a second stage control signal at higher input values, a third stage control signal at even higher input values etc. through the n^{th} defined level.

The user has the option to enable or disable the output control functions for levels lower than the critical control function. For example if the model decides that the third stage signal should be ON, the user has the option of then deciding whether stage 1 and stage 2 should be ON or OFF.

TYPE 698: FIVE STAGE ROOM THERMOSTAT EVALUATING N TEMPERATURES

This ON/OFF differential device models a five stage room thermostat which outputs five control signals that can be used to control an HVAC system having a three stage heating source and a two stage cooling source. This version of the model is designed to allow the user to specify multiple temperatures to watch with the same set of set points. The controller contains hysteresis effects and is equipped with a parameter that allows the user to set the number of controller oscillations permitted within a single time step before the output values "stick."