

NEW SOFTWARE FOR STÖRK-TRONIC COOLING CONTROLLERS

Störk-Tronic has for a long time been one of the leading companies in the temperature control of cooling equipment. Working closely with customers, we have now developed even further our well established software for cooling applications.

The benefits of the new 212 software are:

- Superheat control implemented
- Enhance flexibility of sensor inputs and use of measured values
- Possibility to optimize the system by using thermostatic or PID logic for every control circuit
- Control of variable speed compressors and fans
- Enhanced system monitoring capability
- Enhanced communication possibilities
- New modular software structure
- Energy efficient control of power relays
- Service timers for maintenance intervals
- Refinement of error messages
- Complete integration in ST-Studio and ST-Cloud
- Automatic detection of 115/230V and 50/60Hz

Superheat control

With the new version of our cooling software, it is possible to run a system with superheat control. It is valid for all types of refrigerants such as R134A, R290 (propane), R600A (isobu

tene), R744 (CO₂) and R1234yf. The superheat function determines the temperature difference between T_{Evap_In} and T_{Evap_Out} and keeps it on a desired level. This is achieved by using a PID control for the valve. The valve configuration can be either, stepper motor, (0-10)V, or PWM.

The superheat control gives an opportunity to optimize the cooling system. Controlling the temperature difference between the inlet and outlet of

the evaporator makes it possible to keep it on a minimum level without risk of having fluid refrigerant enter the compressor. This will also enhance the compressor lifetime. With the flexible valve configuration it is possible to choose the electronic expansion valve from any supplier.

Enhanced flexibility of sensors

The new software version supports multi-sensor inputs. This

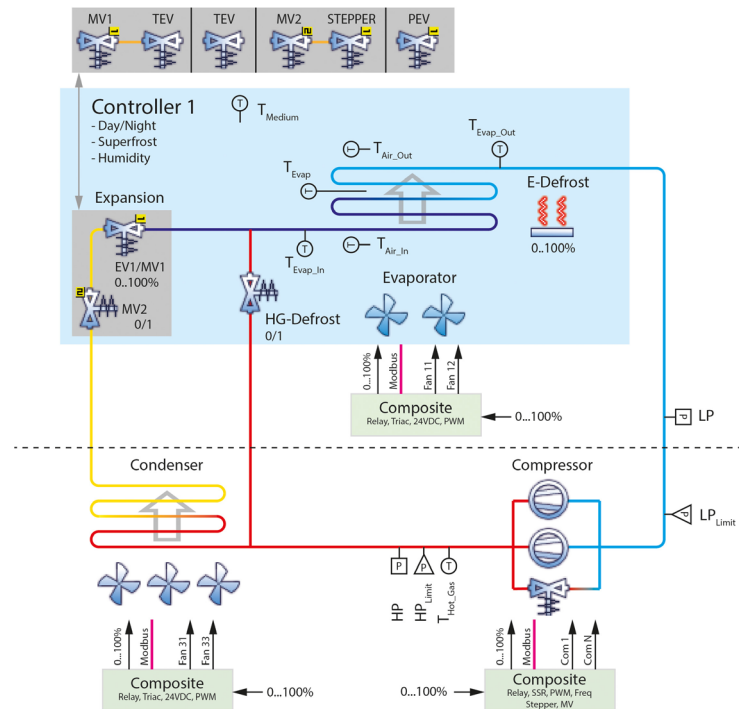


Figure 1 Diagram of complete control system.

means that it will be possible to set up the sensors by simple parametrization. Available options are PTC, Pt100, Pt1000, NTC, (0-10)V, (4-20)mA. In addition to these sensors, there are also four virtual sensors with predefined mathematical functions. This can be used to make mean values, difference and sum of two sensors but can also be used for dew point calculation which can be used to make an energy efficient condensation-free window heater. A temperature-pressure conversion of T(HP) and T(LP) according to the used refrigerant can also be made. The conversion from high pressure to temperature can be used to control the condenser fan speed.

These virtual sensors can be used for any control circuit in the cooling system.

Optimizing the system

By implementing two control alternatives for all circuits i.e. cooling circuit, evaporator fan, condenser fan and compressor. The two alternatives are thermostatic control (two-point) or PID control with anti-windup to prevent over-/undershooting. With the combination of PID control and variable/stepless speed controls it will be possible to optimize the system in the best possible way.

Variable speed compressors and fans

Resulting from the new implemented functionality, variable speed compressors and fans can be controlled via (0-10)V or (0-250)Hz signals. The effect of this is that the compressor do not have to start and stop but run continuously according to the needed output. This will enhance the lifetime of the compressor as well as increase the efficiency of the system.

Communication

Up to 2 RS485 interfaces are supported. One interface is always the ST-Bus. The second interface can be used as ST-Bus for remote networking via the ST-Cloud or as Modbus (Device) for integration into Modbus based external systems. As an option, a Modbus (Master) is also available to control external Modbus (Device) components such as controllable compressors or fans via the new 212 software.

Software structure

The software is structured in a logical, modular form. Each block has defined inputs and outputs which enables the possibility to remove or add additional functions or features to the application software when required. The risk of



Figure 2 The ST-Box 200F is equipped with the new Software 212.



malfunctions is limited also as the finished software consists of proven blocks that have already been tested within their system.

Energy efficient control of power relays

To minimise energy consumption and reduce self-heating, the power relays are controlled in a performance-optimised manner. This allows energy savings of up to 50% per relay.

Enhanced system monitoring

For hardware with integrated current measurement, the new 212 software can monitor load circuits such as compressors, fans, heating elements and/or external safety devices. By detecting an increase or decrease of current, the controller can recognise if the relays or the equipment connected to them are working within its set limits. This data can be used for error messaging or be a part of a preventative maintenance program that flags up a warning signal for a replacement part before any costly break downs occur.

Service timers

Four new service timers have been integrated into the software. These can be used to

set service intervals for certain components based on the hours run counter and/or another option using the software to create a fully functional preventative maintenance program.

Error messages

The messages are now divided into 4 different levels. It is possible to decide how the different levels should be shown on the controller and how they should be reset. Each type of



Figure 3 The new generation of ST181 controllers is also equipped with the new software 212.

alarm can be assigned to one of the four levels. All this is simply done by parametrizing.

Maintaining the system

With the system monitoring your equipment via the current measurement and service timers it will be possible to see if components are not working as they should or are in need of service. This makes it possible to work preventive and avoid unexpected stops of the system. This together with the 4 levels of messages will make it possible to set up a preven-

tive monitoring of the system which clearly shows what actions are needed.

ST-Studio and ST-Cloud

The new 212 software has the possibility to fully integrate with Störk-Tronic operating system ST-Studio or our tamper proof cloud solution ST-Cloud. This means that all data and events can be remotely visualized, analysed or used for proving that temperatures have been within the desired range at a certain time (conforms to HACCP). You can get more information about ST-studio or ST-Cloud by contacting our Störk-Tronic customer service.



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