CONTROLLERS

Controllers have become increasingly more advanced and are now available with many different functions. So, which one should you choose? And do you even need a controller?

NEWTRONIC

Before choosing your controller, it is important to think through what you need it for and to make sure that a controller is really what you need. For instance, a controller is not necessary if your facility is equipped with a PLC, or your power controller is able to control your application. If you have any doubts it is always a good idea to talk through your needs with a professional first.

WHAT DOES IT CONTROL?

It is a good idea to consider in advance the possible consequences for your facility if the controller fails or brakes. On some controllers it is possible to replace only the panel and the circuit board, and this can be done from the front. This means that you don't have to dismount wiring etc. It is a quick operation and it makes is possible to keep a spare on stock for fast replacement. In this case it is important that it is set up with the same parameters as the defect one.

It is important that you familiarize yourself with what signals are available and what you want to control for. Do you want to install a sensor for temperature measurement? Do you have an external signal from another system that you want to control for? Or are there other considerations?
You also need to find out what you control on the output of the controller. Is it contactors, solid state relays, power controllers? Do you need an output signal? Or should it be via modbus?

Many controllers have no further extension options when you receive it, so it is important that you decide, how much you need it to control and what signals you need it to provide. If you are unsure about this, it might be good idea to choose a model that is extendable.

PLACEMENT

Controllers are often made for front mounting, but it is important that you consider what IP class it is mounted in. You should also consider if it is to be mounted on the inside or the outside as well as what the temperature is on the mounting spot.

PANEL AND DATA VIEWING

The most common sizes are 48mm * 48mm, 48mm * 96mm og 96mm * 96mm. It is a good idea to consider in advance from what distance you should be able to see the viewing on the panel and what you want it to show. Most controllers have different viewing options, but the available information varies. It is often the case that the more advanced the model is, the more it is able to show.

OUTPUT

It is important that the signals that exit the controller fit the equipment that is plugged in and out.

Relay. Used for operation a contactor or solenoid valve for heating and cooling.

Logic. Used for replaceing a solid state relay. The advantages are longevity, no maintenance and the ability to quickly replace heating ovens with a small thermal mass.

Triac. Fixed state switches that are primarily used for operating solenoid valves. They are also ideal for placing motorized gas burner valves.

DC milliamps or volt. Used for positioning control valves and for driving analogue.
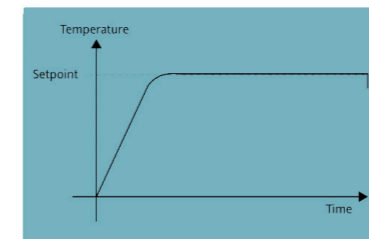
PID CONTROL

Most industrial processes such as plastic extrusion, metal processing and semiconductor processing require stable "strait-line" control of the temperature as shown below.
PID-control is also often called three-term control.

The three expressions are:

P for Proportional
I for Integral
D for Derivative

The control unit output is the sum of the above mentioned three expressions. The combined output is a function of the size and duration of the fail signal and the speed for change of the temperature or process value.

INPUT

A controller needs ways to measure the process value.

In temperature applications a thermocouple or resistance thermometer is often used. The type depends on the temperature area and the environment that it is operating in.

In applications where plugging in a permanent temperature sensor is difficult, temperature measuring can be done using infrared or optical pyrometers.

Many controllers are able to control via an external 4 to 20mA or 0 to 10Vdc signal.

5 **THINGS TO CONSIDER BEFORE CHOOSING YOUR CONTROLLER**

1 What size panel do you need?

2 Where do you want to mount the controller (IP-class)?

3 How much is it controlling (input and output)?

4 Does it have to communicate with other systems?

5 What sensors are installed in your plant?

INDUSTRY

HVAC & BUILDING AUTOMATION
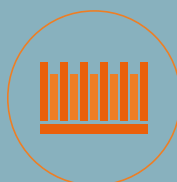
HEAT SINKS

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