

Intelligent Batch Solutions.....designed for you

Presentation CTR 200i Intrinsically safe PID-Controller

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Panel Mount, front IP 65

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Features:

- Local set point control
- Slave controller
- Ratio controller
- Splitrange outputs
- Two channel controller
- Cascade controller
- Programmer function
- Set point setter function
- Automatic / manual station

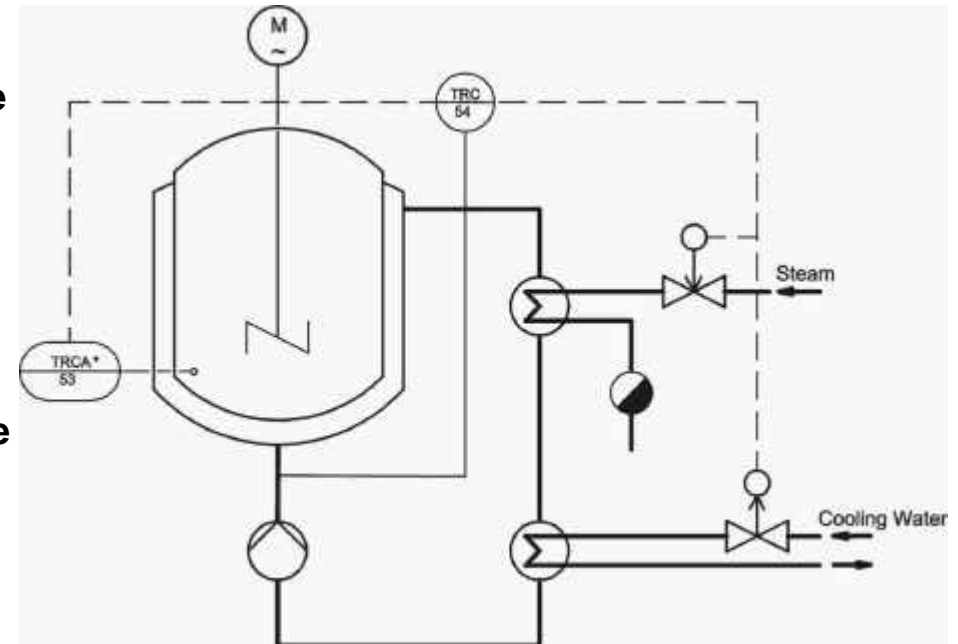


Field housing IP 65

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Special control functions for Batch Reactors:

- Splitrange output for the control of a heating- and a cooling valve
- Cascade control for product-/jacket temperature
- Two parallel controller product/jacket with a minimum selection of the outputs
- 16-step set point programmer function
- No overshoots of the product temperature
- Dynamic limitation of the temperature difference between product- and jacket temperature
- Dynamic activating of the integral algorithm
- Via six digital inputs it's possible, to activate different parameter sets, security outputs, set point ramps or a switching function between product- and jacket temperature controlling.



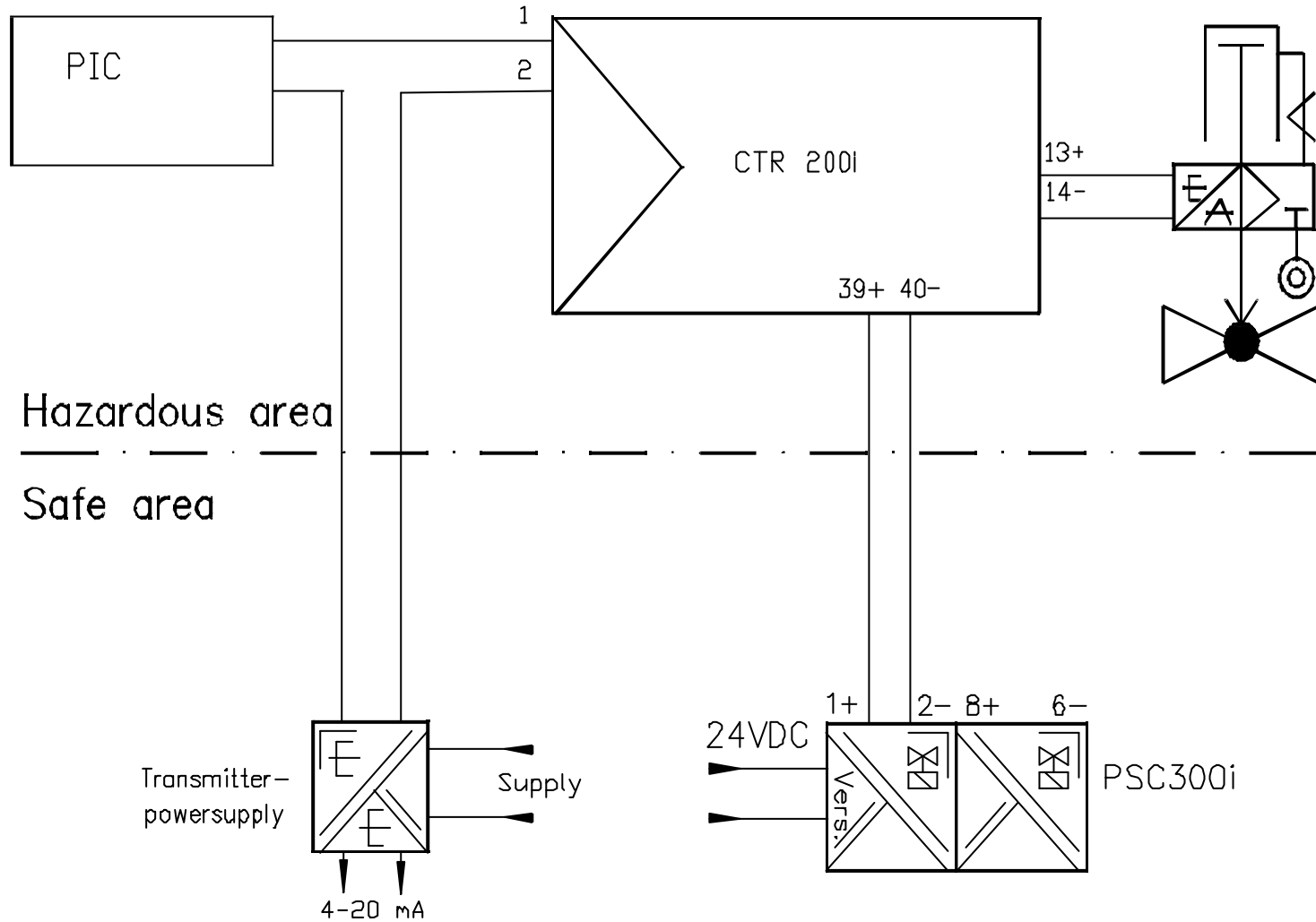
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Technical data:

- DMT 02 ATEX E 148, EEx ib IIC T4
- Temperature range -20°C to 60°C
- Panel mount housing, front IP65, 72 x 144 x 115 mm (W x H x D)
- Field housing IP65 available, 113 x 173 x 205 mm (W x H x D)
- Two power supplies via the PSC 310i
- Three analogue inputs 4 – 20 mA or optional PT100 (3 - wire)
- Two analogue outputs: 4 – 20 mA, load = 800 Ω (with PSC 310i power supply)
- Six passive digital outputs for Alarms
- Six active digital inputs for switch functions
- TTY – interface with Modbus protocol

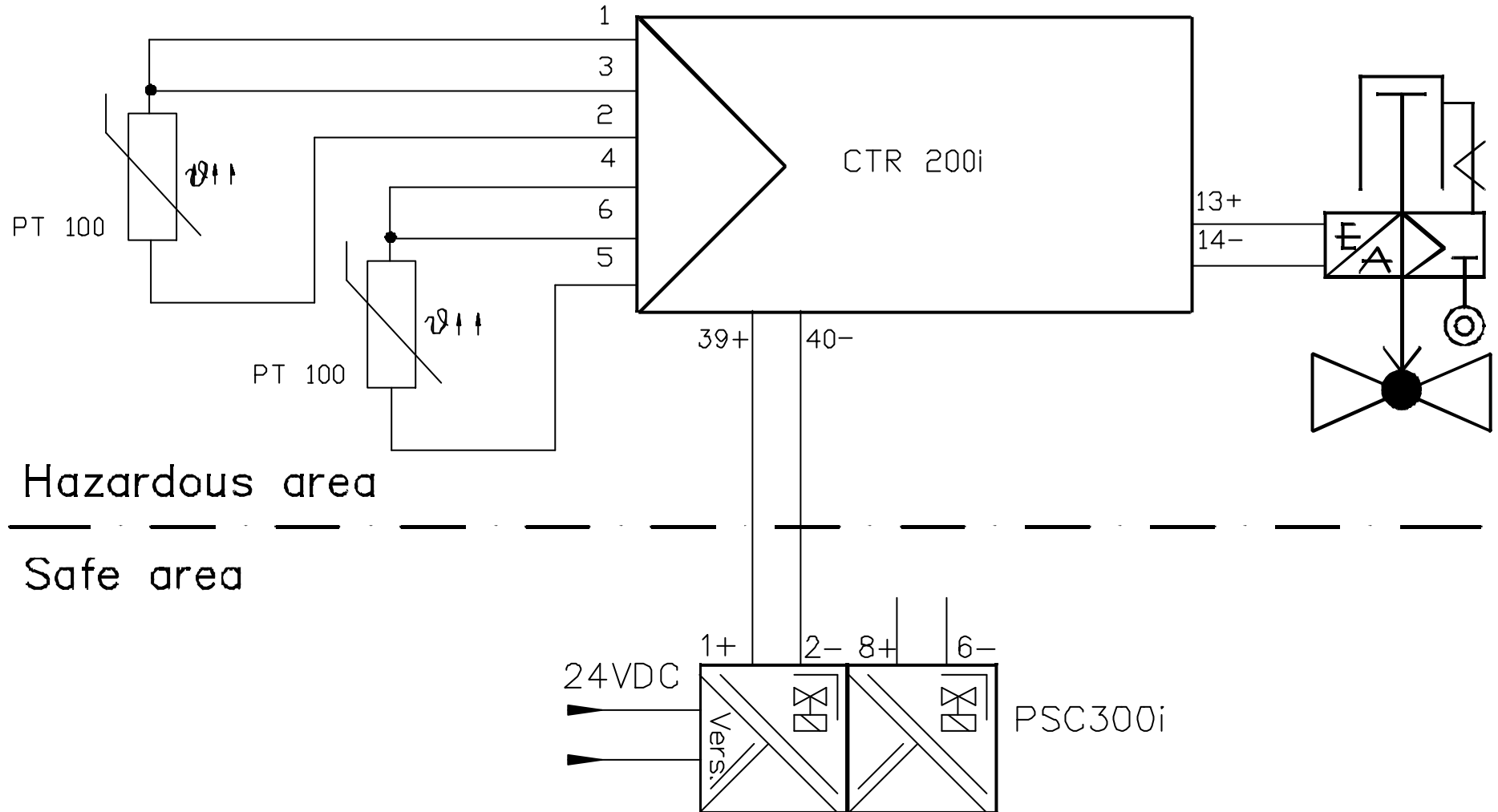
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Drawing CTR 200i with mA-Input:



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Drawing CTR 200i with PT 100 input:



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Inputs/Outputs:

Power supply 1

The PSC 310i card has to be connected. It supplies the electronic of the CTR 200i and the analoge output 1.

Power supply 2

The second channel of the PSC 310i card has to be connected. It supplies the analoge output 2

Analoge input 1 - 3

The 4 - 20 mA inputs are passive with an internal load of 25 Ohm.

Optional, each input can be delivered as a PT 100 input in 3-wire. The PT 100 can be connected directly.

Inputs/Outputs:

Analoge output 1 and 2

The position controller of a valve can be connected directly in the field. The maximum load is 600 Ohm, if PSC 310i is used as power supply. The analoge outputs can work in split range function.

Digital input 1 - 6

The digital inputs are active, thus passive contacts or a simple switches can be connected.

Mostly used functions:

- Security output
- switching between parameter sets
- switch on the setpoint ramp
- switching between product- and jacket temperature controlling
- security setpoint
- hand/manual switch

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Inputs/Outputs:

Digital output 1 - 6

The digital outputs are passive and galvanic isolated. Mostly they are used for Alarms or for on/off switching functions of the step outputs. The signal can be transmitted to the safe area via a switch repeater.

Modbus interface

This TTY interface has to be connected to the IPC 310i card. The IPC 310i is installed in the safe area and has a RS 485 output.

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Functionalities:

Local set point controller:

The set point can be changed via the buttons at the front.

Slave controller:

An external set point is transmitted to the CTR 200i via a 4 – 20 mA signal, connected at the 2. analogue input.

Ratio controller:

The CTR 200i controls the Ratio of two product flows.
The Ratio is calculated by the deviation between analogue input 1 and analogue input 2.

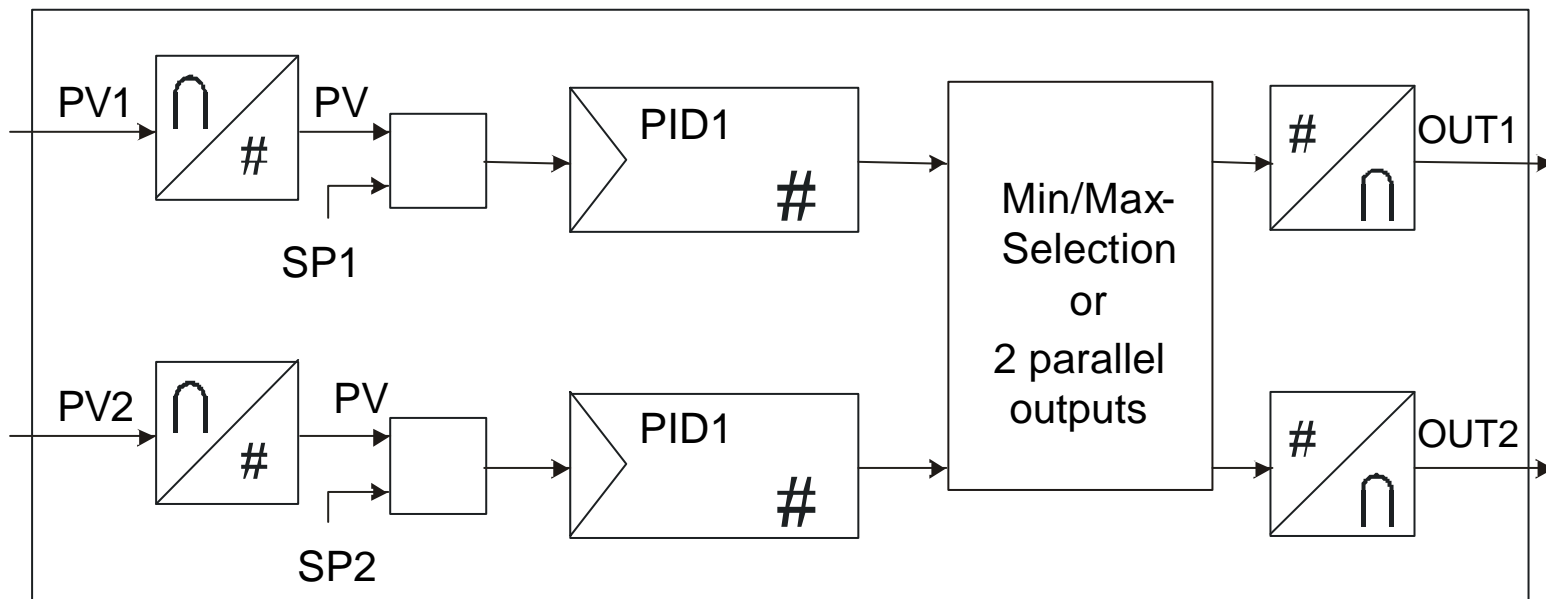
Difference control:

The CTR 200i controls the difference between two temperatures.

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Two channel controller:

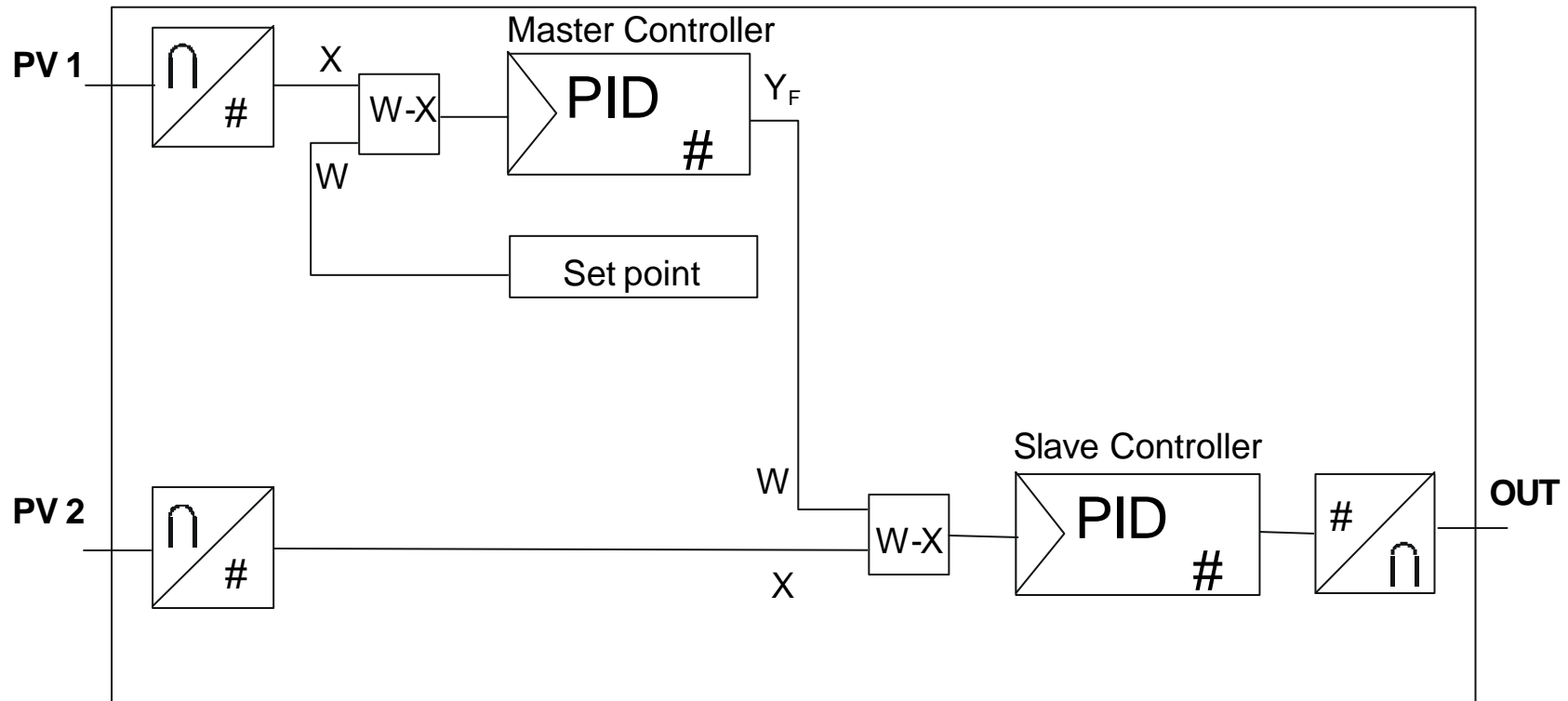
It is possible to have two separate controller in one CTR 200i. The indication in the display can be switched between the two channels. It is possible to have two separate outputs or a min-selection of both.



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Cascade Controller

In this case, two controllers are connected in cascade by the software in one CTR 200i. The output of the first controller is the set point of the second. The indication at the display can be switched between the master and the slave.



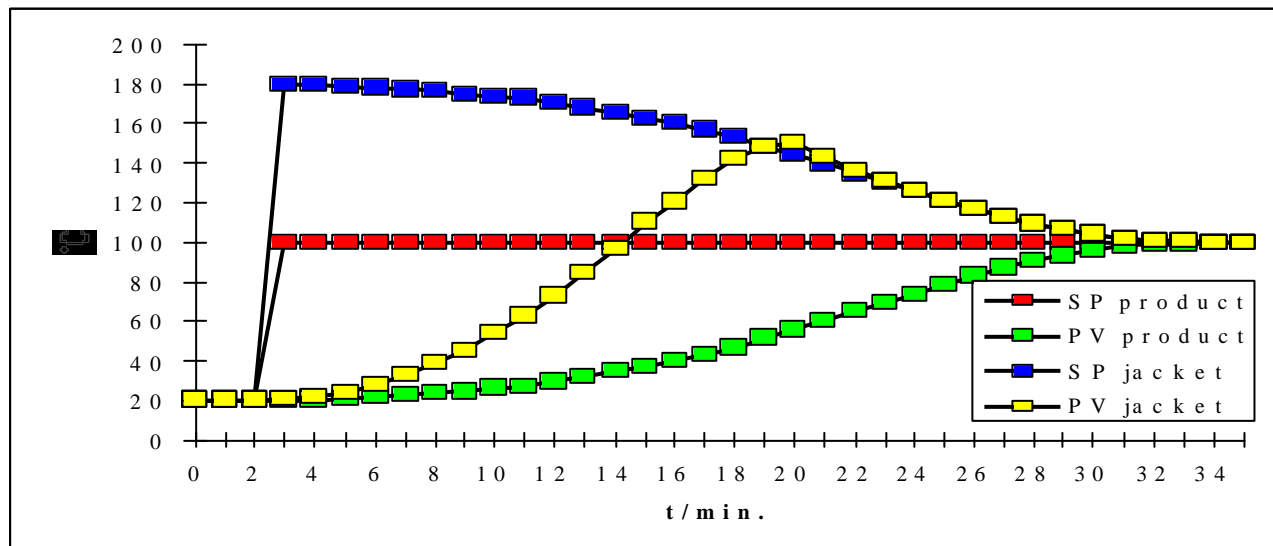
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Heating processes without temperature overshoots

At the temperature control of a batch reactor it's important to reach the product temperature very quickly, without temperature overshoots.

The master of the cascade controls the product temperature. He works as a P – controller, his operating point has the same value like his setpoint.

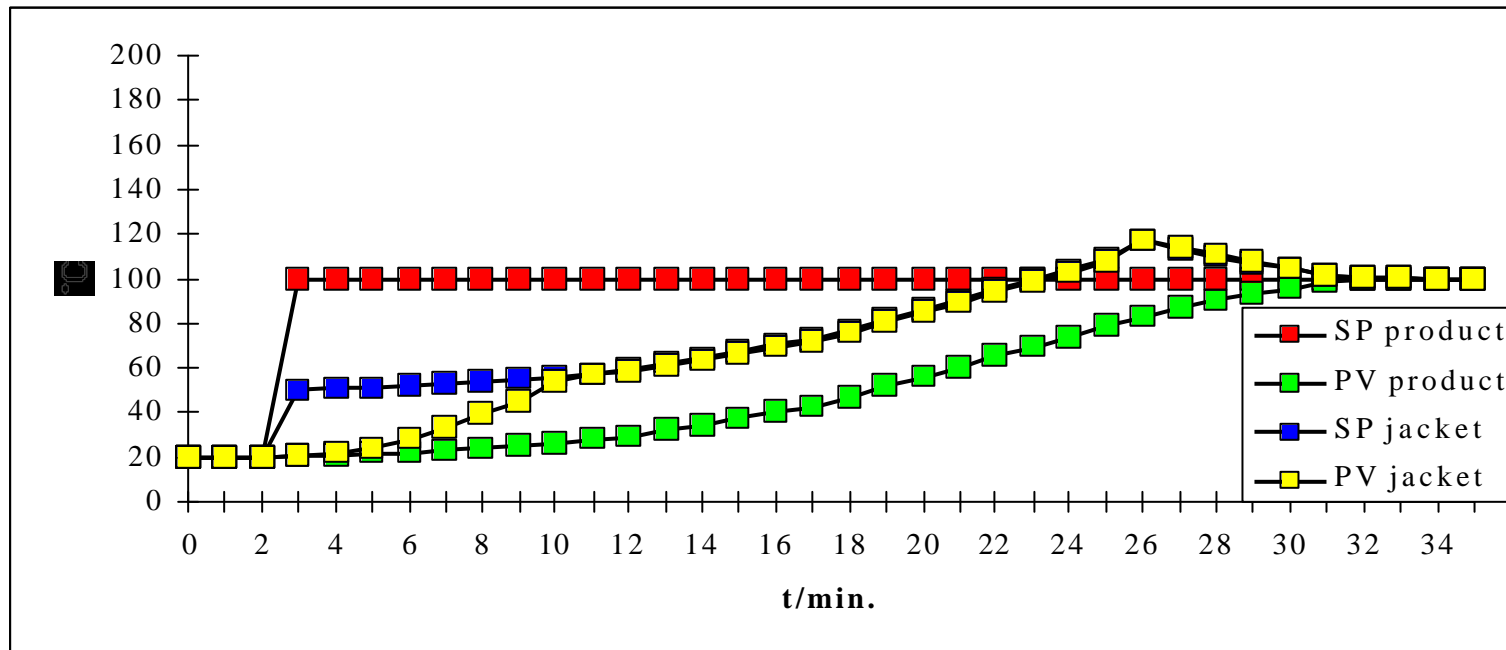
When the product temperature is rising, the value of the control difference is decreasing and the product- and the jacket temperature meet each other at the required setpoint.



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Dynamic limitation of the temperature difference

In the case of cascade control, it's possible to have a dynamic limitation between the product- and the jacket temperature. This prevents chemical reactions of the product at the hot jacket and it prevents the damage of the enamel inside of the reactor.



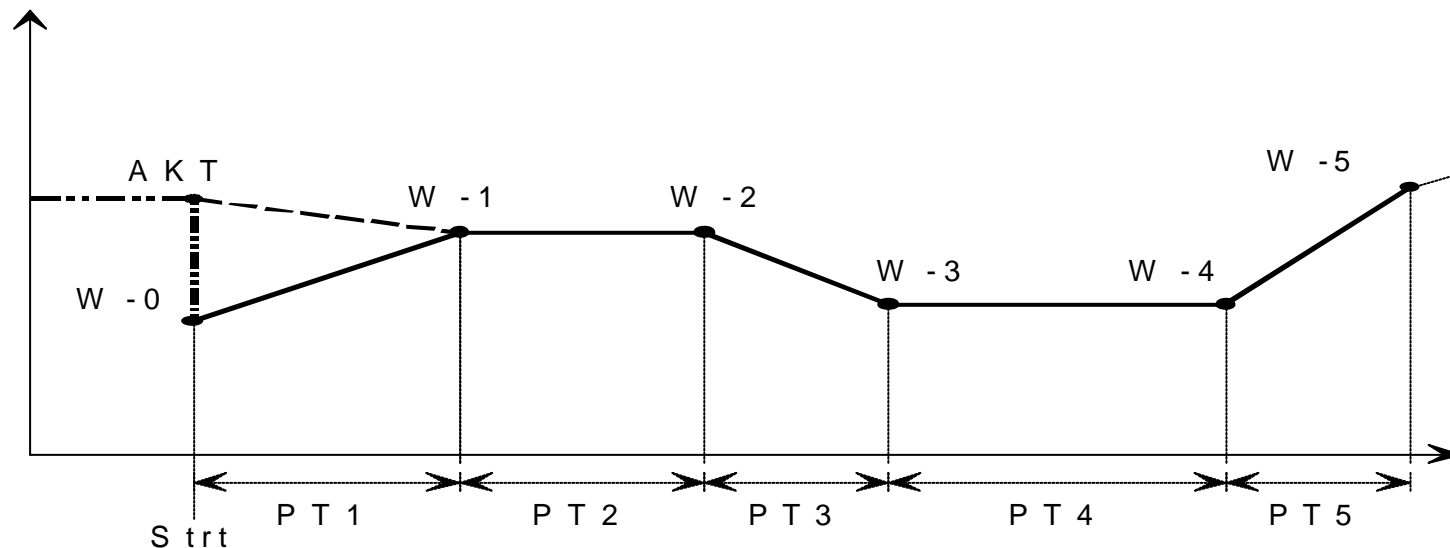
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16-step set point programmer function

It's possible to program a set point -curve with 16 set point steps and 16 time intervals. It's also possible to switch the digital outputs during each program step.

The start, stop and the reset of the program can be activated in a special user level without going into the program levels.

Application: Temperature curves for batch reactors.



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References:

3M, France/Germany

Abbot, Germany

Air Liquide, Germany

Akzo Nobel, China, Netherlands

Astra Zeneca, England

Aventis, Germany

BASF, Belgium, Mexico, China

Bayer, Spain, Germany

British American Tobacco

Butagaz, France

Clariant, Greece/Switzerland

Ciba, Italy/Switzerland/Germany

Coca Cola, Germany

Cognis, Germany

Degussa; Belgium/Germany

Dupont, Germany

DSM Netherlands

GlaxoSmithKline, England

Johnson & Johnson, Germany

Krohne Meßtechnik, Worldwide

Linde, Germany

Lurgi, Germany

Merck, Germany

Novartis, Switzerland

Pfizer, Germany

Rhodia, France/Germany

Roche, Switzerland/Germany

Sanofi, France

Schell, Germany

Sasol, Germany

Total, France,

Wacker Chemie, Germany

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