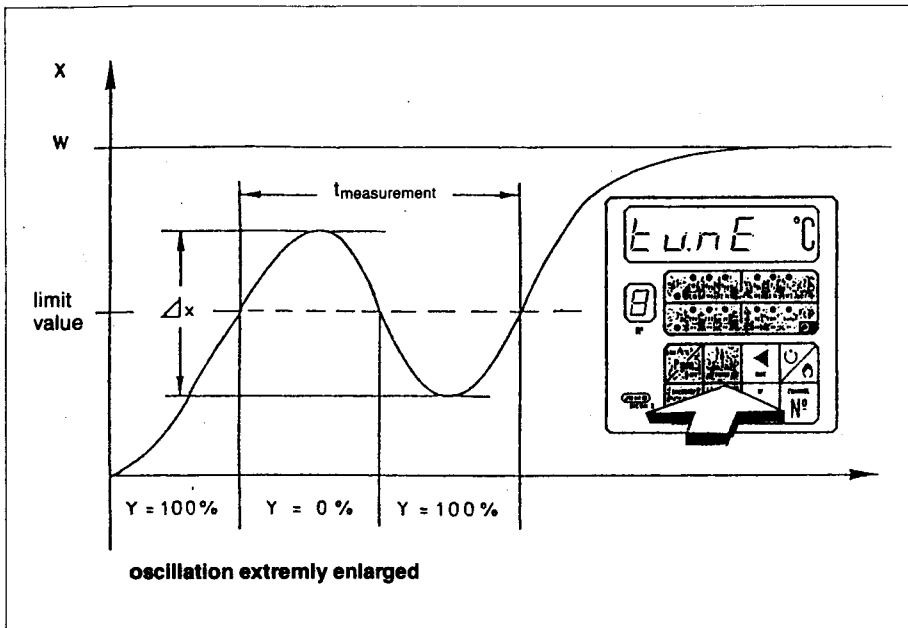

**Multi-channel Microprocessor
Controller
JUMO DICON Z**

**housing to DIN 43 700 for flush panel mounting
bezel 96 x 96 mm**

D 97.500A
11.90/V

Supplement to the operating instructions



oscillation extremely enlarged

9.4 Self-optimisation

The controller is also available with self-optimisation facility (Code 19). This applies to single and double setpoint controllers as well as to proportional controllers. The optimisation procedure is based on the "ZIEGLER" and "NICHOLS" adjustment rules. The controller is optimised for setpoint response. The setpoint response of a control loop refers to the change in the process variable for a sudden change in the setpoint.

It is important for self-optimisation that the difference between process and setpoint is at least 10% of the control range in order to obtain useful results!

The optimisation procedure is started by pressing the ENTER key three times; this is only possible in the normal mode. The start applies to the channel which appears in the channel display. The main display flashes alternatively "TUNE" and the process value. The controller output signal is set to maximum (Y=100%) or minimum (Y=0%) depending on whether the setpoint is above or below the process variable. When half the difference between process and setpoint (limit value) has been reached, the output signal Y is reversed.

After the overshoot or undershoot the process passes again through the limit value. The output signal Y is reversed once more, followed by another undershoot or overshoot. The measuring process is terminated when the limit value has been reached again.

The calculated control parameters are automatically transferred to the parameter level of the controller and the control process begins.

From the difference between the maximum and the minimum of the amplitude (Δx) and the duration of the period (t_{meas}) the controller calculates:

$XP1, XP2 = XP1, Tn, Tv = Tn/4$

$CY = Tn/10, CY2 = CY1$

The parameters determined by self-optimisation can always be called up and modified.

After the start of self-optimisation the controller is automatically set to PID action.

The self-optimisation procedure can be aborted at any time by again pressing the ENTER key three times.

Self-optimisation can also be started through external floating contacts or through the interface.

External contacts:

- terminals 0, 17 external input 1
- terminals 0, 18 external input 2
- terminals 0, 19 external input 3

3 times signal on input 1: start of self-optimisation of channel displayed.

3 times signal on input 2: start of self-optimisation of all channels.

3 times signal on input 3: abort of self-optimisation of channel displayed.

Starting self-optimisation through the interface:

Command from master to controller:

$\langle Bn \rangle$ TUNE 1 $\langle Blank \rangle$ $\langle Bn \rangle$ ON $\langle Bn \rangle$
 $\langle Cr \rangle$ $\langle Cr \rangle$ ($\langle Lf \rangle$)

Explanation:

- $\langle \rangle$ = encloses control characters
- Bn = any number of blanks
- TUNE = identification for self-optimisation
- 1 = channel index (1 to 4)
- Blank = space
- ON = start
- Cr/Lf = termination character
- () = no meaning

Response of controller: OK $\langle Cr \rangle$ $\langle Lf \rangle$
 i. e. self-optimisation has been started.

The three operations of the ENTER key and also the closures of the external contact must take place within 5 sec.