R7426D

MicroniK 200

UNIVERSAL INPUT CONTROLLER

INSTALLATION & START-UP INSTRUCTIONS

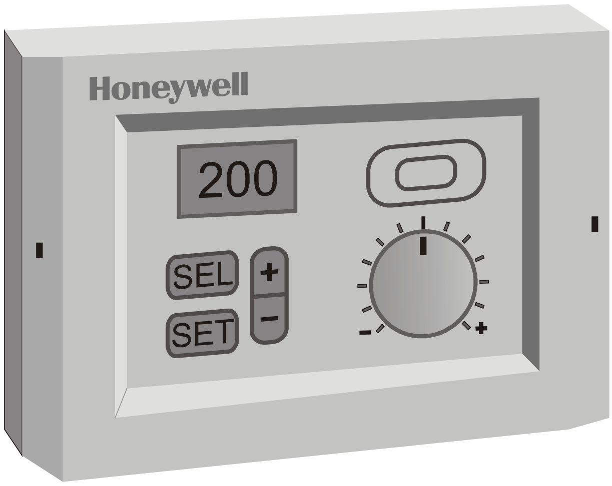


Fig. 1. Temperature Controller

Contents

GENERAL

This document provides instructions and procedures for installing and starting up the Micronik 200 R7426D controller. No special tools are required for mounting and installation. The user interface and LC display allows accurate and easy parameter setting and output adjustment.

BEFORE INSTALLATION NOTE

- **Visually inspect equipment for shipping damage. Report any damage to the appropriate Honeywell representative.**
- **Refer to job drawings for specific installation information and mounting location.**
- **Verify the controller will be adequately separated from the main power supply, relays or other equipment which can possibly generate electromagnetic interference.**
- **Verify that the ambient temperature and the humidity at the controller will be within the limits of 0...50°C (32...122°F) and 5 to 95% rh.**
- **Use shielded wiring in areas with high EMI.**
- **All wiring should be separated from power lines by at least 150mm (6”).**
- **Do not install controllers near frequency converters or other high frequency sources.**

MOUNTING

The controller can be mounted in an electric cabinet or an other suitable enclosure. It is suitable for back panel, DIN rail, wall or front panel mounting with an additional available front panel mounting frame. The mounting sequence of each as well as dimensions and panel cut-out is illustrated in the mounting instruction sheet EN1B-0202GE51 supplied with the controllers.

If the compensation sensor signal (T3) is received from another controller (parallel connection of compensation sensor inputs), the jumper W303 must be cut before mounting the controller (see Fig. 2). This disconnects the sensor from the internal power supply.

WIRING

Screwless type, spring loaded terminals are provided on the controllers for wiring. These terminals are suitable for solid conductors as well as tinned or with multicore cable end, stranded wires up to 1.5mm². To make a termination, push the wire into the terminal or insert a small screwdriver from the front of the controller into the spring-release hole and insert the wire. Check for proper connection by short pull on the wire.

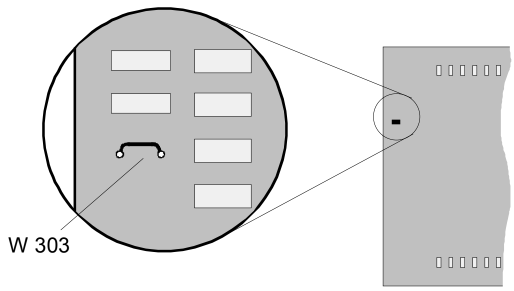
Wiring should be done only according to the actual job wiring diagrams or wiring diagrams shown in the mounting instruction sheet EN1B-0202GE51. The wiring to the CPA/SPA potentiometers is described in Table 1. All wiring must conform to local applicable codes, ordinances, and regulations. The maximum allowed wiring length per wire size are shown in Table 2.

Controller to CPA/SPA Potentiometer	
R7426D	**43193982-001**
Terminal 2	Terminal 3
Terminal 4	Terminal 1

Table 1. Terminal Connection

Wiring run	Type of wires	Length max.	
		1.0mm²	**1.5mm²**
From controller to all input and output devices	local standard	100m	150m

Table 2. Wire Dimensions



Jumper[1)]	State	Description
W303	closed open	T3 supplied by this controller T3 supplied from another controller

[1)] Default jumper position = closed
Only cut (open) jumper W303, if the T3 input is fed from another controller (parallel connection, max. 6 devices). This disconnects the T3 input from the internal power supply.

Fig. 2. Parallel Connection of Compensation Sensor T3

POWER SUPPLY AND GROUNDING

1. Refer to job drawings and verify correct supply voltage to transformer (230Vac) and controller (24Vac).
2. Connect line power conductors to transformer primary. Line power must be supplied from a breaker panel with dedicated controller circuit. Do not turn the line power on until all wiring has been checked against job drawings.
3. Connect transformers 24Vac secondary to the controller terminals 18 and 19. Connect one conductor to terminal marked 24V~ and the other to terminal marked 24V⊥. If controllers are interconnected all terminals 19 must be connected to the same potential 24V⊥ level.

CONFIGURATION AND CONTROL PARAMETERS

<table>
<tr><th colspan="2">Config. Par.</th><th colspan="4" rowspan="2">Description</th><th rowspan="2">Default Setting</th><th rowspan="2">Actual Value</th></tr>
<tr><th>No.</th><th>Name</th></tr>
<tr><td rowspan="2">C.01</td><td rowspan="2">DIR/REVY1</td><td colspan="4">Selects the output action of Y1 to adapt the valve or damper direction</td><td rowspan="2">Dir</td><td rowspan="2"></td></tr>
<tr><td>Dir
Rev</td><td colspan="3">Direct acting output signal
Reverse acting output signal</td></tr>
<tr><td rowspan="3">C.05</td><td rowspan="3">CPATYP</td><td colspan="4">Selects the Control Point /SetPoint Adjustment type</td><td rowspan="3">0</td><td rowspan="3"></td></tr>
<tr><td></td><td>Potentiometer range</td><td>CPA/SPA range</td><td>Sensor / Remote Setpoint Unit Type Numbers</td></tr>
<tr><td>0
1
2</td><td>internal
100kΩ...0Ω
100kΩ...0Ω</td><td>CPA: ±10%
CPA: ±10%
SPA: 0...100%</td><td>internal
43193982-001
43193982-001</td></tr>
<tr><td rowspan="2">C.06</td><td rowspan="2">YRange</td><td colspan="4">Selects the output control range</td><td rowspan="2">1</td><td rowspan="2"></td></tr>
<tr><td>0
1</td><td colspan="3">2 ... 10Vdc
0 ... 10Vdc</td></tr>
<tr><td rowspan="2">C.12</td><td rowspan="2">X2ext</td><td colspan="4">Enable / Disables the X1 sensor input to be used for both X1 and X2 inputs</td><td rowspan="2">0</td><td rowspan="2"></td></tr>
<tr><td>0
1
2</td><td colspan="3">X2 installed
X1 signal used for X2
X2 disabled</td></tr>
<tr><td rowspan="2">C.13</td><td rowspan="2">LimTyp</td><td colspan="4">Limitation type determines whether the limit function is low or high.</td><td rowspan="2">1</td><td rowspan="2"></td></tr>
<tr><td>0
1</td><td colspan="3">Low limit
High limit</td></tr>
<tr><td rowspan="2">C.14</td><td rowspan="2">Senstyp</td><td colspan="4">Sensor type determines automatic detection or manual selection of NTC sensor type</td><td rowspan="2">0</td><td rowspan="2"></td></tr>
<tr><td>0
1</td><td colspan="3">Auto detection T3
NTC sensor type T3</td></tr>
<tr><td rowspan="2">C.15</td><td rowspan="2">Y1CTRF</td><td colspan="4">Control function</td><td rowspan="2">1</td><td rowspan="2"></td></tr>
<tr><td>0
1</td><td colspan="3">Direct control behaviour
Reverse control behaviour</td></tr>
<tr><td rowspan="2">C.22</td><td rowspan="2">Adr1)</td><td colspan="4">Sets the serial communication address, used for service or maintenance.</td><td rowspan="2">254</td><td rowspan="2"></td></tr>
<tr><td>0
255</td><td colspan="3">Min.
Max.</td></tr>
<tr><td rowspan="2">C.23</td><td rowspan="2">DefProg</td><td colspan="4">Initiates the default programming.</td><td rowspan="2">0</td><td rowspan="2"></td></tr>
<tr><td>0
1</td><td colspan="3">No Defaultprogramming
Initiates Defaultprogramming</td></tr>
<tr><td rowspan="2">C.24</td><td rowspan="2">UStartPoint</td><td colspan="4">Start point (0%) of X1 and X2 span adjustment</td><td rowspan="2">0</td><td rowspan="2"></td></tr>
<tr><td>0
10V</td><td colspan="3">Min.
Max. (resolution 0.1V)</td></tr>
<tr><td rowspan="2">C.25</td><td rowspan="2">UEndPoint</td><td colspan="4">End point (100%) of X1 and X2 span adjustment</td><td rowspan="2">10</td><td rowspan="2"></td></tr>
<tr><td>0
10V</td><td colspan="3">Min.
Max. (resolution 0.1V)</td></tr>
<tr><td rowspan="2">C.26</td><td rowspan="2">OffDelay</td><td colspan="4">Off delay for On/Off output</td><td rowspan="2">0</td><td rowspan="2"></td></tr>
<tr><td>0
60min</td><td colspan="3">Min.
Max. (resolution 1min)</td></tr>
</table>

1) actual value will not be changed during reset to default parameter

For detailed information of configuration parameters see chapter *Configuration Settings*.

Table 3. Configuration Parameters R7426D

Control Par.		Description	Setting			Reso-	Unit	Actual Value
No.	Name		Low	High	Def.	lution		
P.01	**W1**	Main setpoint for input X1	0	100	50	0.5	%	
P.02	**Wlim**	Limit setpoint (low or high) for input X2	0	100	90	1	%	
P.03	**Wcomp**	Compensation changeover point for input T3	-5	40	20	1	°C	
P.04	**Wi**	Winter compensation authority	-350	+350	0	2	%	
P.05	**Su**	Summer compensation authority	-350	+350	0	2	%	
P.06	**Wcas**	Submaster or cascade setpoint	Off, 0	100	Off	0.5	%	
P.07	**Rcas**	Cascade reset span adjustment	0	50	10	0.5	%	
P.08	**Xp1**	Throttling range (main control loop) for X1	1	50	10	0.5	%	
P.09	**Xp2**	Throttling range (cascade or limit control loop) for X2	1	50	10	0.5	%	
P.12	**tr1**[1)]	Reset time (main control loop)	Off,20sec	20min	Off	10/0.5	sec/min	
P.13	**tr2**[1)]	Reset time (cascade control loop)	Off,20sec	20min	Off	10/0.5	sec/min	
P.15	**Ystart**	Start point for mid range shift of output Y1	-50	+50	0	0.5	%	
P.17	**X1Cal**	Calibration of input X1	-20	+20	0	0.1	%	
P.18	**X2Cal**	Calibration of input X2	-20	+20	0	0.1	%	
P.19	**T3Cal**	Calibration of temperature sensor T3	-20	+20	0	0.1	K	
P.27	**td**	Derivative decay time for P+I+D control	1	60	1	1	s	
P.28	**vd**[2)]	Derivative amplification for P+I+D control	0	5	0	0.1	-	

1) for tr > 2 min resolution = 0.5 min , for tr < 2 min resolution = 10 sec

2) 0 = derivative function disabled

For detailed information of control parameters see chapter *Parameter Settings and Adjustment.*

Table 4. Control Parameters R7426A,B,C

CONFIGURATION SETTINGS

All configuration parameters have to be set to select the correct control functions as required for the job application.

Direct - Reverse Action Dir/RevY1 (C.01)

The output action of the analog output must sometimes be reversed for a correct opening and closing direction of the valve or damper. This depends on whether the output controls a 2-way or 3-way valve or on the direction the damper shaft moves to open the damper (cw or ccw). It is only needed, if the actuator does not provide a direction selector switch, plug or similar.

Note: The analog output signal Y1 can be displayed in the standard display mode. The selected action of signal Y1 does not influence the display indication.

Control Point / Setpoint Adjustment CPATYP (C.05)

The control point or setpoint can be adjusted via the internal or an external potentiometer connected to the CPA/SPA input. The potentiometer type is selected by **CPATYP** (see Table 3).

Output Control Range Selection YRange (C.06)

YRange is required to select the output control range (0...100%) to either 2...10Vdc (**YRange** = 0) or 0...10Vdc (**YRange** = 1).

Supply of Input Signal X2ext (C.12)

X2ext has to be set to 1, if the sensor input X1 is also used for high or low limit control. This interconnects the X1 and X2 input internally and the sensor has to be connected only to the X1 input.

When using a limit sensor X2, the parameter **X2ext** has to be set to 0 (default). If sensor X2 is not used, the input has to be deactivated by setting **X2ext** to 2.

Limit Type LimTyp (C.13)

LimTyp allows the selection of high or low limit control. High limit control is performed if **LimTyp** = 1 and low limit control is performed if **LimTyp** = 0.

Sensor Type Senstyp (C.14)

Three different sensor types can be used on input T3 with the controller (see Table 5).

Automatic identification of sensor type	Temperature range	Characteristics
Pt 1000	-30....+130°C	1000Ω at 0°C
BALCO 500	-30....+130°C	500Ω at 23.3°C
NTC 20kΩ	-30....+85°C / -30....+130°C[1)]	20kΩ at 25°C

1) NTC sensor is detected automatically, if during power up the sensor temperature is within -30....+85°C and **Senstyp** = 0.
NTC sensor is selected manually, if **Senstyp** is set to 1.

Table 5. Sensor Types

Automatic identification of sensor type is selected, if **Senstyp** = 0 (default). After power up reset the controller detects automatically the type of sensor, which is connected to the temperature input T3. For a correct auto detection, it is necessary that the measured temperature is in the specified range (see Table 5).

Output Control Function Y1CTRF (C.15)

The R7426D controller performs direct control behaviour, if **Y1CTRF** is set to 0. A rise in the measured variable will increase the output value from 0...100% (direct acting). The control action must be reversed for reverse control behavior by setting **Y1CTRF** to 1. A rise in the measured variable will decrease the output value (100..0%).

Note: The analog output signal Y1 with the selected control behavior is displayed in % in the standard display mode.

Serial Communication Address Adr(C.22)

The parameter **Adr** sets the serial communication address, used for controller start-up, service or maintenance purposes via the bus.

Default Programming DefProg (C.23)

Setting **DefProg** to 1 resets all control and configuration parameters to defaults (see Table 3 and Table 4). Default programming is indicated by a display of ***def***.

After default programming, the parameter **DefProg** is reset to 0.

Span Adjustment UStartPoint / UendPoint (C.24 / C.25)

The universal inputs X1 and X2 accept any analog inputs within the range of 0...10Vdc and provides an input span adjustment to match the range of the connected transmitters.

The start / end point of the input span can be adjusted by the parameters **UStartPoint** / **UendPoint** and is converted to a 0...100% input range.

The parameters **UStartPoint** and **UEndPoint** are common for both inputs X1 and X2.

Off Delay for On/Off Output (C.26)

The On/Off output is controlled by the Plant / System On/Off input and provides an Off switching output with adjustable delay time e.g. to operate the fan still for a certain time after humidification.

On/Off Input	Controller Function	On/Off Output: Delay
On	Normal control	Off → On: 0 min
Off	Output Y1 = 0%	On → Off: 0...60 min

The off time delay can be adjusted by the parameter **OffDelay**.

PARAMETER SETTINGS AND ADJUSTMENT

Main Setpoint W1 (P.01)

The main setpoint is either set by the parameter **W1** (**CPATYP** = 0 or 1) or by the external setpoint potentiometer (**CPATYP** = 2).

High/Low Limit Setpoint W_{lim} (P.02)

For high or low limit control, the control parameter $\mathbf{W_{lim}}$ is used as setpoint.

During limit control, the throttling range **Xp2** and reset time **tr2** are active.

Limit control will be active only, if the X2 signal (**X2ext** = 0) is available or alternatively the sensor X1 (**X2ext** = 1) is used also for limit control.

For cascade control the limit setpoint $\mathbf{W_{lim}}$ determines the control point at which the submaster setpoint ($\mathbf{W_{cas}}$) maintains the limit value and is not shifted anymore by the master control loop.

High or low limit control is in accordance with the parameter **LimTyp** (C.13).

Submaster Setpoint W_{cas} (P.06)

The R7426D controller provides cascade control which uses two control loops, master and submaster to maintain the master setpoint CTRP1. Cascade control will be active, if sensor X2 is connected and the control parameter $\mathbf{W_{cas}}$ is set to any value other than Off.

This adjustment sets the control point of the submaster control loop, cascade input (X2), at zero deviation of the master control loop. If the controlled input X1 deviates from the master setpoint CTRP1, the submaster setpoint $\mathbf{W_{cas}}$ is automatically altered (CTRP2).

Cascade control is disabled, if the submaster setpoint $\mathbf{W_{cas}}$ is set to Off.

Low limit of CTRP2 is performed if control parameter **LimTyp** = 0 and high limit of CTRP2 is performed if control parameter **LimTyp** = 1.

Reset Span Adjustment R_{cas} (P.07)

The reset span adjustment $\mathbf{R_{cas}}$ determines the reset effect in %, the submaster setpoint $\mathbf{W_{cas}}$ is altered, if the main input (X1) deviates by 50% of the throttling range **Xp1**.

Throttling Range Xp1 / Xp2 (P.08 / P09)

Throttling range X_p adjustment determines the controller variable change, required at the main sensor (X1) and limit or cascade sensor (X2) to operate the output device from full open (100%) to full closed (0%) or vice versa.

Xp1 is the throttling range for the main control loop, **Xp2** is the throttling range for limitation or cascade control (submaster control loop).

Application	Sens.	Xp1	Xp2	tr1	tr2	vd/td
R7426D Controller						
Main Control	X1	x		x		x
High or Low Limit Control	X2		x		x	x
Cascade Control						
Master	X1	x		x		
Submaster	X2		x		x	x

Table 6. Throttling Range, Reset and Derivative Time Reference

Setting Guidelines for Proportional Band of P, P+I and P+I+D Control

To estimate the proportional band (throttling range X_p) for stable control under all different load conditions the control or correcting range X_h of the controlled variable by the final controlling element has to be known. This is the maximum difference in the controlled variable between the fully closed and fully open position of the final controlling element (e.g. valve).

The proportional band X_p for discharge air control can be calculated by using the following rule-of thumb formula:

$$X_p = \frac{X_h}{5}$$

For room control the following rule-of-thumb formula can be used:

$$X_p = \frac{X_h}{10}$$

In P+I or P+I+D control the same proportional band can be used as for P control.

The following rule-of-thumb formula are used for P+I control:

- Discharge air control $X_p = \frac{X_h}{4...5}$
- Room control $X_p = \frac{X_h}{8...10}$

The following rule-of-thumb formula are used for P+I+D control:

- Discharge air control $X_p = \frac{X_h}{5...6}$
- Room control $X_p = \frac{X_h}{10...12}$

Resetting Time tr1 / tr2 (P.12 / P13)

In the case of combined action including proportional and integral components (P+I control) the reset time (tr) is defined as the required time after which the integral part is equal to the change due to the proportional action for a predetermined step change in the input variable. See Fig. 3.
The control parameter **tr1** sets the reset time of the P+I main control loop. For limit or submaster cascade control (input variable X2) the control parameter **tr2** sets the reset time of these control loops (see Table 6).

If only proportional control is required parameter tr has to be set to Off.

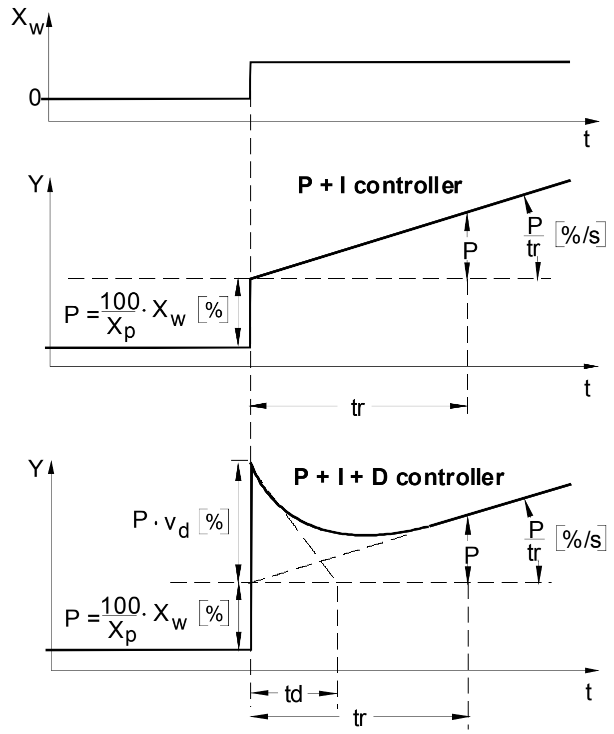


Fig. 3. Step change response of P+I and P+I+D control

Note: P+I+D control is available for main control and main control with limitation control.
In cascade control the submaster is P+I+D controlled while the master is P+I controlled.

Setting Guidelines for Reset Time of P, P+I and P+I+D Control

The reset time **tr** should be adjusted to 2...3 times of the response time T_u , which is the time interval between the beginning of a sustained disturbance (e.g. rapid step change of valve position) and the instant when the resulting change in the output signal reaches a specified fraction of its final steady-state value, either before overshoot or in the absence of overshoot.

The response time T_u in discharge air control is normally in the range of 0.1 to 0.6min, which allows adjustments of the reset time tr in a range of 0.2 to 2min.

In room control the response time T_u is in the range of 0.5 to 5min, which results in a setting of 1 to 15min.

Derivative Decay Time td and Amplification vd (P.27 / P.28)

The Proportional + Integral + Derivative (P+I+D) control adds the derivative function to P+I control to enhance the control behavior. The derivative function opposes any change and is proportional to the rate of change (derivative).

If the controlled input X1 deviates from the master setpoint (CTRP1), the derivative function outputs a corrective action to bring the control variable X1 back more quickly than by integral action alone.

The derivative amplification **vd** determines the effect of derivative action after a rate of change of the controlled input X1.

The decay time **td** determines the decay of the control output Y1 after derivative action (see Fig. 3).

Note: In main control and cascade control applications the control parameters **td** and **vd** determines the derivative function. In main control with limitation control these parameters determines the two derivative functions of main control and limitation control.

Setting Guidelines for Derivative Amplification and Decay Time of P+I+D Control

The proper setting depends on the time constants, e.g. the response time T_u , of the system being controlled.

The parameter **vd** and **td** can be set in the following relation:

$$td = \frac{0.42 \cdot T_u}{vd}$$

In other words, with derivative amplification **vd** set to 1, the decay time **td** should be set to approx. $0.42 \cdot T_u$ or approx. $(0.15...0.25) \cdot tr$.

The response time T_u in discharge air control is normally in the range of 0.1 to 0.6min, which allows adjustments of the decay time **td** in a range of 2.5 to 15sec.

Start Point Ystart (P.15)

The start point setting determines the relationship between the midrange shift of the output Y1 and the corresponded calculated control point.

It is calibrated in %, e.g. r.h., and is the change (plus or minus) from the control point.

In humidification and dehumidification control the start point has to be shifted by minus 50% of the proportional band **Xp1**. Example:

- Set **YCTRF** to 1, reverse control behavior
- Set **Xp1** at 6%
- Set start **Ystart** at minus 3%

With these settings, the humidifier valve will be fully closed, if the actual humidity value is equal to the calculated control point CTRP1 (zero deviation) and fully open at 6% r.h. below CTRP1. At 6% r.h. above CTRP1, the controller provides an output signal of plus 1200mV (100%) to fully open the cooling valve by the plant temperature controller for dehumidification.

In P+I+D and P+I control the start point has to be set to the same value as for P control.

Compensation Changeover Point W_{comp} (P.03)

The control parameter $\mathbf{W_{comp}}$ defines the start point of summer or winter compensation. Above the compensation changeover point ($\mathbf{W_{comp}}$) summer compensation and below $\mathbf{W_{comp}}$ winter compensation is performed.

Summer / Winter Compensation Authority Su / Wi (P.04 / P.05)

These authority settings determine the reset effect (T_{Comp}) of the compensation sensor (T3) on the main setpoint **W1** in percentages.

To calculate winter and summer authority for e.g. humidity control, the throttling range has to be considered in proportional only control according to Table 7.

Control Schedule	Room Humidity (X1)	Outdoor Air Temp. ($T3/T_{comp}$)	Throttling Range (X_P)
Winter (neg. compensation)	50%rh	20°C	5%rh
	40%rh	-15°C	5%rh
	Aut Wi = $\frac{\Delta X1 + X_P}{\Delta t \text{ Outside Air}} \cdot 100\% = \frac{(40-50)+5}{35} \cdot 100\% =\approx -14\%$		
Summer (pos. compensation)	50%rh	20°C	5%rh
	60%rh	35°C	5%rh
	Aut Su = $\frac{\Delta X1 - X_P}{\Delta t \text{ Outside Air}} \cdot 100\% = \frac{(60-50)-5}{15} \cdot 100\% =\approx +33\%$		
Compensation change-over at +20 °C outdoor air temperature			

Note: With P+I and P+I+D control $X_p = 0$

Table 7. Calculation of Summer/Winter Compensation

Calibration of Sensors X1CAL, X2CAL or T3CAL (P.17...P.19)

The controllers include a calibration setting and are factory calibrated. In case of an offset as a result of long wiring lengths the sensor inputs (X1, X2 and T3) can be adjusted separately by the control parameters **X1CAL**, **X2CAL** and **T3CAL**.

OPERATING OVERVIEW

Display and Operation Elements

The MicroniK 200 user interface is described in Fig. 4

Note: Pushing the **+** or **-** button increments/decrements values or scrolls through the parameter list:

- pushing one time: single step
- pushing without release: automatically inc./dec. or scroll
- after 3 sec pushing without release: fast automatically inc./dec. or scroll

Changing Operating Modes

Fig. 5 shows the six operating modes. After power-up the controller version is displayed and the controller enters the standard display mode (Fig. 6). In this mode selected input or output values are displayed. The controller mode is permanently displayed by a corresponding icon (Fig. 4).

Pushing the **+** and **-** button simultaneously for approximately 1 sec the controller leaves the standard display mode and enters the parameter/configuration selection mode (Fig. 7). This mode is used for application configuration and to select parameters for adjustment.

Pushing the **SET** button the controller accepts the selected parameter or configuration no. and enters the adjustment mode (Fig. 8), which is used to adjust configuration/parameter values. After adjustment the controller returns to selection mode by pushing the **SET** or **SEL** button. Pushing the **SEL** button leads back to standard display mode.

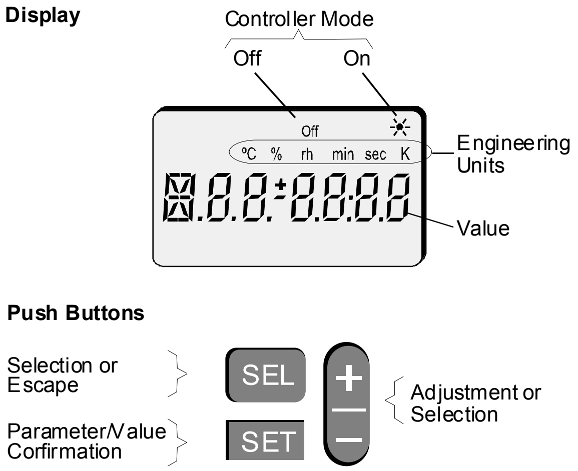


Fig. 4. User Interface

Pushing the **SET** and **SEL** button simultaneously for approximately 1 sec the controller leaves the standard display mode and enters the output data selection mode (Fig. 9).

Pushing the **SET** button enters the output adjustment mode (Fig. 10). This mode is used for manual override of the output value. The return to standard display mode is shown in Fig. 5.

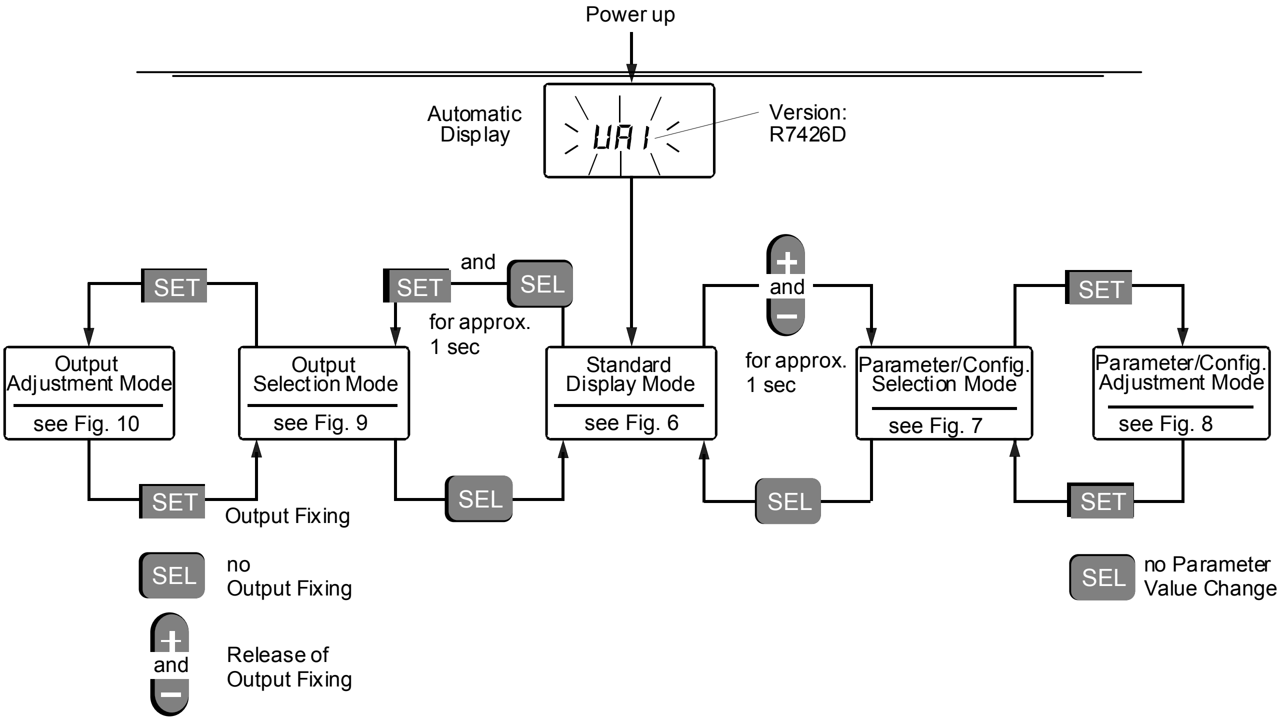


Fig. 5. Operating Overview

Time Out

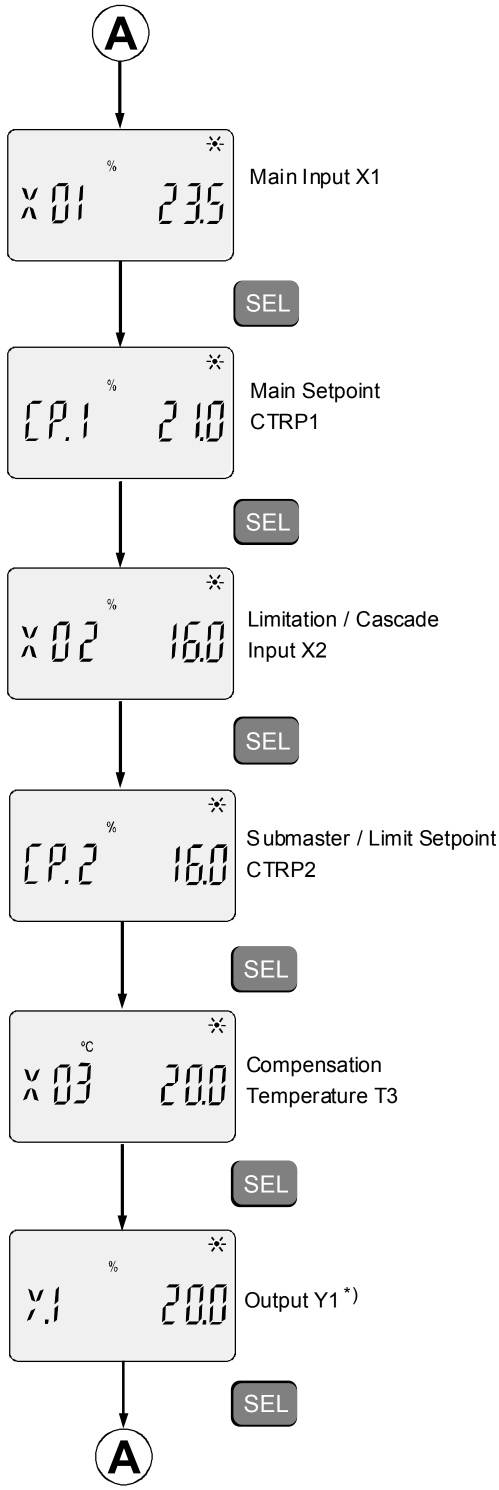
After approximately 10 min of inactivity (no button has been pressed: time out) each mode returns automatically to standard display mode. Inputs that have not been confirmed by the **SET** button are ignored by the controller and old parameter values will be retained.

Displaying Actual Values

In the standard display mode one of six actual values, can be selected and displayed (Fig. 6) by pushing the **SEL** button.

The icons of the permanently displayed controller mode are described in the following table:

Controller Mode / Status	Display
Off	Off - icon
On	Sun - icon



*) The output data (Y1) are displayed between the following ranges:

Output type	Control range	Output range
0...10Vdc	0...100%	0...120% 0...12V (Dir) -20...100% 12...0V (Rev)
2...10Vdc	0...100%	-25...125% 0...12V

Fig. 6. Standard Display Mode

Selecting Parameters

The parameter/configuration selection mode is used to select control and configuration parameters (Fig. 7) for adjustment. The displayed parameter no. corresponds with the number in Table 3 and Table 4. Default programming is indicated by a display of ***def***.

Pushing the **+** or **-** button scrolls through the parameter list. Pushing the **SET** button enters the adjustment mode.

Adjusting Configuration / Parameter Values

The adjustment mode is used to adjust configuration and parameter values (Fig. 8). In this mode the selected parameter no. is displayed and the corresponding value flashes.

Pushing the **+** or **-** button increments or decrements the value of the selected parameter. Parameter ranges are shown in Table 3 and Table 4. An adjustment example is shown in Fig. 12.

Pushing the **SEL** button retains the old parameter value. Pushing the **SET** button accepts the parameter value and returns to parameter/configuration selection mode.

Resetting Parameter Values to Default Values

Pushing simultaneously the **+** or **-** button during the power up or setting the control parameter **DefProg** (C.26) to 1 resets all control and configuration parameters to defaults (see Table 3 and and Table 4). Default programming is indicated by a display of ***def***.

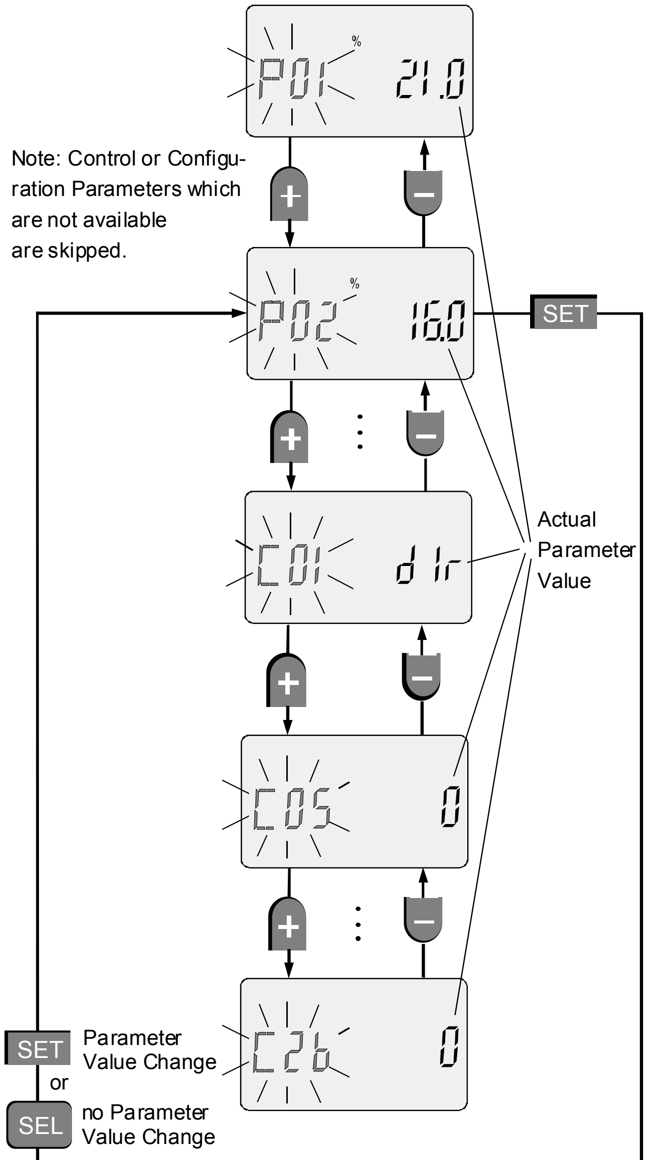


Fig. 7. Parameter/Configuration Selection Mode

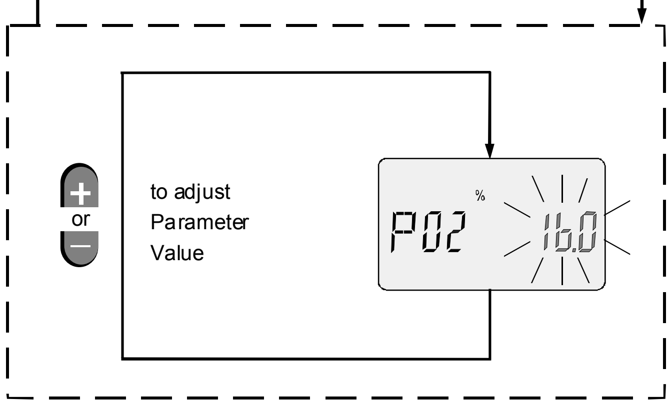


Fig. 8. Parameter/Configuration Adjustment Mode

Selecting Output Values

The output selection mode displays the output value and indicates the manual override (see Fig. 9). An activated manual override is indicated by a displayed ***F*** (fixed).

Pushing the **SET** button enters the adjustment mode.

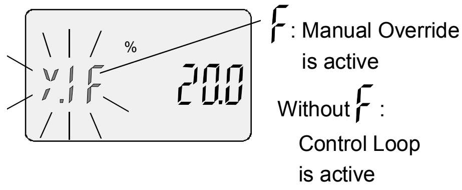


Fig. 9. Output Selection Mode

Manually Overriding Output Values

The output adjustment mode is used for manual override adjustment of the output value (see Fig. 10). In this mode the selected output no. is displayed and the actual output value flashes.

Pushing the **+** or **-** button increments or decrements the value of the selected output for manual override purpose. The output range is displayed in correspondence with the nominal control range as shown in Fig. 6.

To return to output selection mode three options are available:

- Pushing the **SET**-button after adjustment activates the manual override (fixing) of output value.
- Pushing the **SEL** button, causes that the output value is still determined by the control loop (no fixing).
- To release the manual override (fixed) of the output, enter output adjustment mode and push the **+** and **-** button simultaneously.

Pushing the **SEL** button leads back to standard display mode.

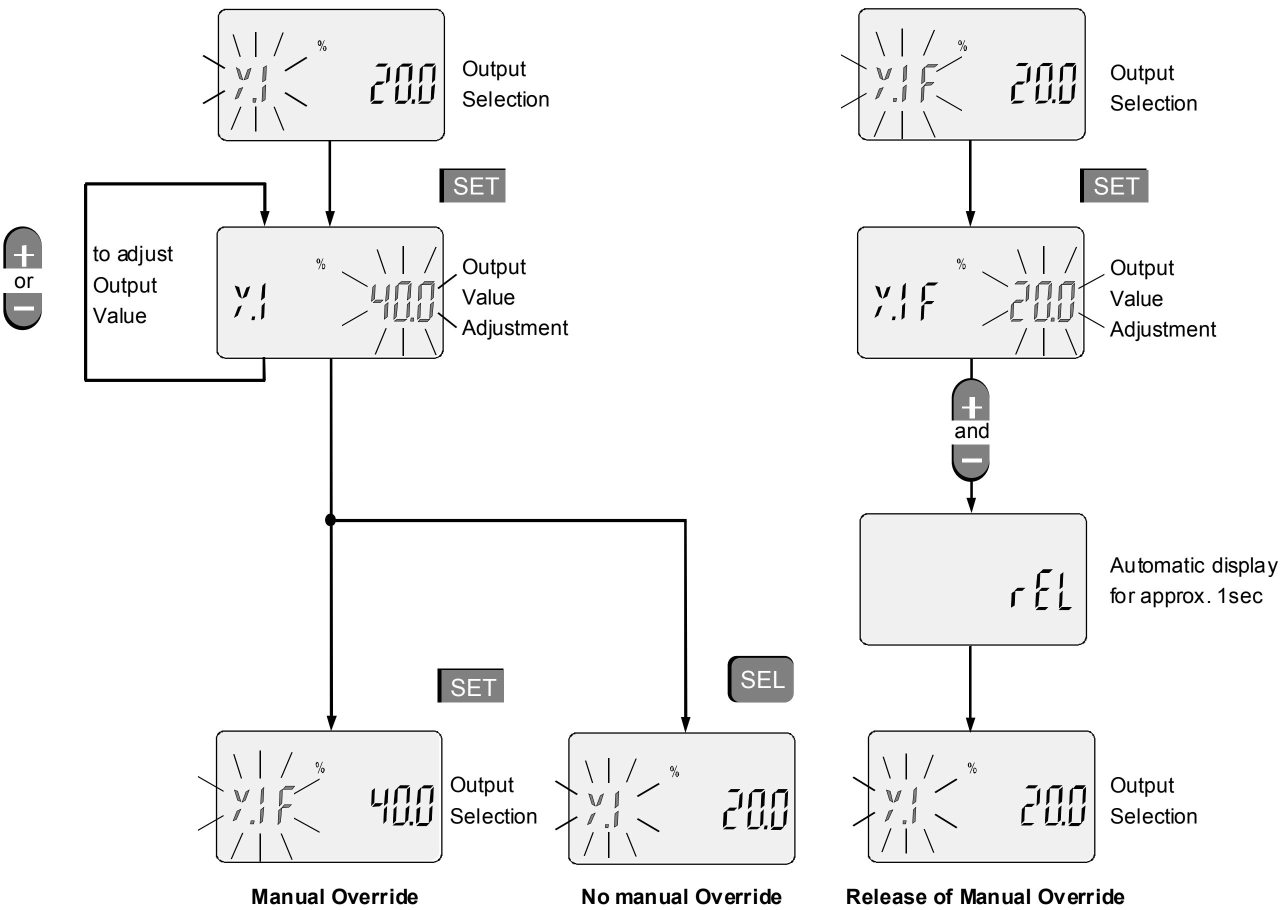


Fig. 10. Output Value Adjustment for Manual Override

Interpreting Error Messages

Different analog input errors can be identified by the controller (Error handling). The defective input (X1, X2, T3) will be displayed in the standard display mode (see Fig. 11) after the corresponding value is selected.

Note: For the external CPA/SPA potentiometer input, no error message is indicated if the potentiometer or wiring is defective. In this case for control point or setpoint calculation the following values are used:

- for CPATYP 0 or 1 CPA value = 0
- for CPATYP 2 SPA value = control parameter W1

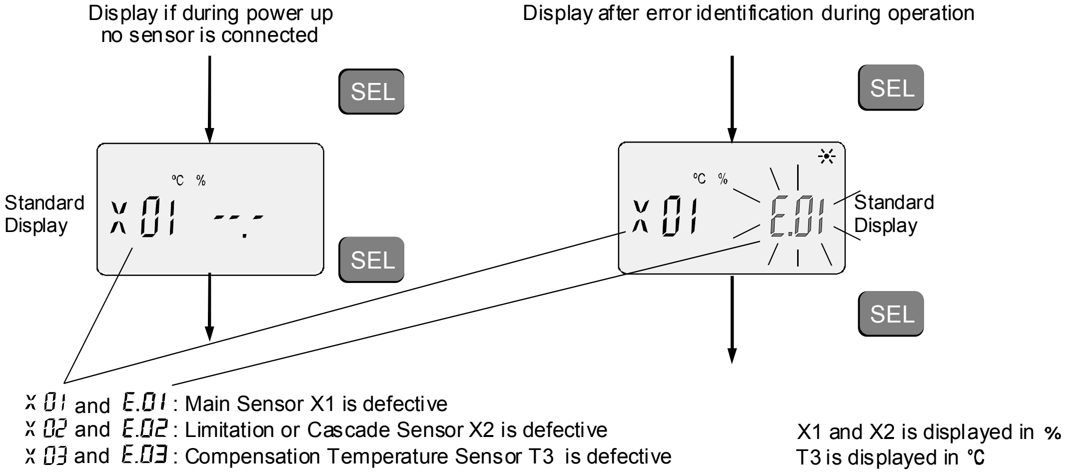
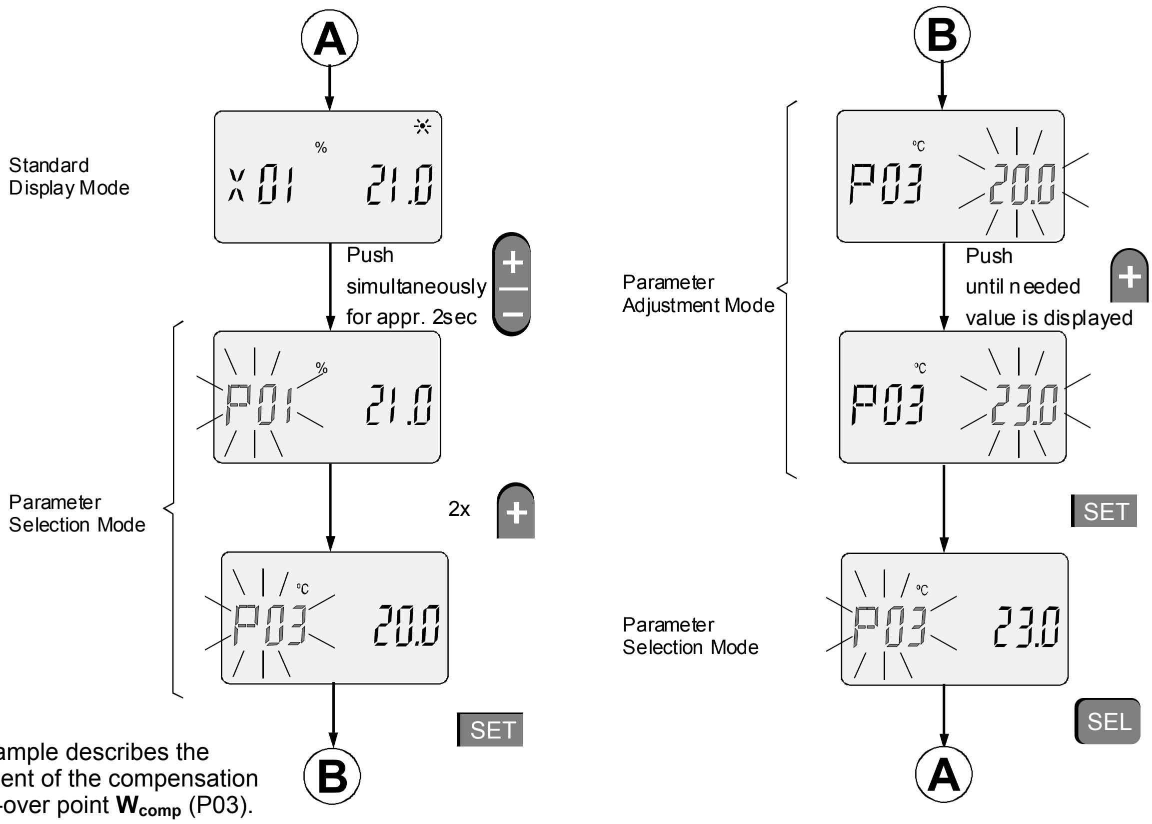


Fig. 11. Error Handling



This example describes the adjustment of the compensation change-over point W_{comp} (P03).

Fig. 12. Adjustment Example

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