C1   Industrial controller

Short manual   41/61-52 EN   Rev. 02

ABB

Operating

Abbreviated version of Sections 1, 3, 4 and 5
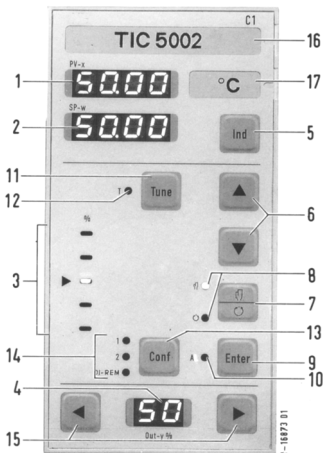
1	Process value display
2	Setpoint display
3	Deviation display
4	Output display
5	Entry options <Ind>
6	Keys < ▲ >/< ▼ > (up/down) for changing setpoint
7	Mode selection < ⟨⟩ >/< ◯ > (manual/automatic)
8	Display of mode selected ⟨⟩/◯ (manual/automatic)
9	Entry confirmation, alarm acknowledgement <ENTER>
10	Alarm indication (A)
11	Selection: self-parameterization <TUNE>
12	Self-parameterization (T)
13	Changeover of operating level <CONF>
14	Operating level selected signal (1; 2; DI-REM)
15	Keys < ▶ >/< ◀ > (increase/decrease) for output setting

Keys for parameterization and configuration

Parameterization level

[CONF]	Press once (enter password if required)

Configuration level

[CONF]	Press once (enter password if required)
[ENTER]	Press once (if no password protection)

Password entry (password displayed in SP-w)

[IND]	Select entry point
[▲] [▼]	Select decimal number
[ENTER]	Confirm password

Parameter entry

[◄] [►]	Select parameter (parameter No. in OUT-y %) (parameter value in SP-w)
[IND]	Select entry point, shift decimal point
[▲] [▼]	Select decimal number
[ENTER]	Confirm parameter

Configuration

[◄] [►]	Select function (function No. in OUT-y %) (question / answer in SP-w)
[IND]	Select question in function
[▲] [▼]	Select answer
[ENTER]	Confirm answer

Operating level

[CONF]	Press several times until LEDs 1 and 2 go off

No.	Parameter	Setting range min.	Setting range max.	Factory setting	Unit	Resolution
00	Software revision			101x		
PID parameters						
01	Amplification Kp	0.01	99.99	1.00		0.01
02	Reset rate Ki	0.00	9999	10.00	1/min	0.001
03	Derivative-action rise Kv	0.01	99.99	4.00		0.01
04	Derivative time Td	0.00	99.99	0.00	min	0.01
05	Manual reset AP for P and PD controllers	0.01	99.99	50.00	%	0.01
06	SCAN time	0.1	99.99	0.10	s	0.01
Analogue input scaling						
10	Start of PV range	0.00	80.00	00.00	%	0.01
11	End of PV range	20.00	99.99	99.99	%	0.01
Display range						
15	PV and SP display min.	−999	9999	0.00	EU	0.001
16	PV and SP display max.	−999	9999	99.99	EU	0.001
Alarm values						
20	PV min.	−999	9999	−999	EU	0.001
21	PV max.	−999	9999	9999	EU	0.001
22	DEV min.	0.000	9999	9999	EU	0.001
23	DEV max.	0.000	9999	9999	EU	0.001
Setpoint						
30	Ramp increased	0.00	9999	9999	EU/s	0.001
31	Ramp decreased	0.00	9999	9999	EU/s	0.001
32	Limit min.	−999	9999	−999	EU/s	0.001
33	Limit max.	−999	9999	9999	EU/s	0.001
Output						
40	OUT hold time	0.01	99.99	0.50	s	0.01
41	Ramp increased	0.000	9999	9999	%/s	0.001
42	Ramp decreased	0.000	9999	9999	%/s	0.001
43	Limit min.	−9.0	109	−9.0	%	0.1
44	Limit max.	−9.0	109	109.0	%	0.1
45	Safety value YS1	−9.0	109	50.0	%	0.1
46	Safety value YS2	−9.0	109	50.0	%	0.1

4

No.	Parameter	Setting range		Factory setting	Unit	Resolution
		min.	max.			
00	Software revision			101x		
Low-pass filtering						
50	Digital low-pass x	0.00	99.99	0.00	s	0.01
Linearization						
55	Linearization 0 %	0.000	1.000	0.000	%	0.001
56	Linearization 10 %	0.000	1.000	0.100	%	0.001
57	Linearization 20 %	0.000	1.000	0.200	%	0.001
58	Linearization 30 %	0.000	1.000	0.300	%	0.001
59	Linearization 40 %	0.000	1.000	0.400	%	0.001
60	Linearization 50 %	0.000	1.000	0.500	%	0.001
61	Linearization 60 %	0.000	1.000	0.600	%	0.001
62	Linearization 70 %	0.000	1.000	0.700	%	0.001
63	Linearization 80 %	0.000	1.000	0.800	%	0.001
64	Linearization 90 %	0.000	1.000	0.900	%	0.001
65	Linearization 100 %	0.000	1.000	1.000	%	0.001
Self-tuning PID						
70	Identification time	0.10	99.99	1.00	s	0.01
71	Amount of change	0.00	99.99	5.00	%	0.00
TAG number entry (interconnected systems only)						
98	Characters	0	9999	.-		
99	Numbers			0000		
Password						
h0	Password	0000	9999	0000		1

Func-tion	Ques-tion	Ans-wer	Function	Fac-tory setting
01			**Controller function PID**	
	1	0	Direction of control action normal: DEV rising → OUT rising	
		1	Direction reversed: DEV rising → OUT falling	1
	2	0	Without D component	0
		1	D component of PV	
		2	D component of DEV	
	3	0	Without I component	
		1	I component of DEV	1
	4	0	Without start-up function	0
		1	With start-up function	
	5	0	Without self-tuning	0
		1	With self-tuning	
02			**Controller output and display**	
	1		Output signal range and display	
		0	Output: 0...20 mA display: 0...100 %	0
		1	Output: 0...20 mA display: 100...0 %	
		2	Output: 4...20 mA display: 0...100 %	
		3	Output: 4...20 mA display: 100...0 %	
	2		Output limit	
		0	In automatic mode only	0
		1	In all operating modes	
03			**Local / remote operation (operating mode)**	
	1	0	LOCAL (manual operation via front panel)	0
		1	DE (operation via binary inputs)	
		2	REMOTE (operation via serial interface)	
		3	DE/REMOTE (operation via binary inputs and serial interface)	
	2	0	DE-REMOTE - switch-off via CONF key not permitted	
		1	DE-REMOTE - switch-off via CONF key permitted	1
	3	0	DE takes precedence over REMOTE	0
		1	REMOTE takes precedence over DE	

Func-tion	Ques-tion	Ans-wer	Function	Fac-tory setting
04			**Signal conditioning process value**	
	1	0	Current (0/4...20 mA) no linearization	0
		1	Current (0/4...20 mA) root extracting	
		2	Current (0/4...20 mA) linearization with par. 55...65	
		3	RTD Pt 100 (–50...+400 °C) 3-wire connection	
		4	RTD Pt 100 (–50...+400 °C) 2-wire connection	
		5	TC Type K via head transmitter	
		6	TC Type L via head transmitter	
		7	TC Type J via head transmitter	
		8	TC Type S via head transmitter	
		9	TC Type B via head transmitter	
		10	TC Type J (0...+1200 °C)	
		11	TC Type E (0...+1000 °C)	
		12	TC Type K (0...+1400 °C)	
		13	TC Type L (0...+1000 °C)	
		14	TC Type U (0...+ 600 °C)	
		15	TC Type R (0...+1700 °C)	
		16	TC Type S (0...+1800 °C)	
		17	TC Type T (0...+ 400 °C)	
		18	TC Type B (0...+1800 °C)	
	2		Temperature compensation with thermocouples	
		0	No compensation	0
		1	Internal compensation	
		2	External 20 °C	
		3	External 50 °C	
	3		Behaviour on disturbance at analogue input	
		0	Measured value = 0 %	0
		1	Measured value = 100 %	
05			**Function of binary inputs**	
	1		Binary input BI 1	
		0	Not assigned	0
		1	Switch-over from AUTO to MANUAL	
		2	Safety value YS 1	
		3	Safety value YS 2	
		4	Safety value YS 1 with interlocking	

Func-tion	Ques-tion	Ans-wer	Function	Fac-tory setting
05			**Function of binary inputs** (continued)	
		5	Safety value YS 2 with interlocking	
		6	ENTER for alarm acknowledgement	
		7	Disabling of parameterization and configuration	
	2		Binary input BI 2	
		0	See answer 0...7 to question 1	0
		.		
		6		
	3		Direction of control action of binary input BI 1	
		0	Normal: external 0 (– 40.0 V ... + 2.0 V) = internal 0	0
			external 1 (+ 4.2 V ... + 40.0 V) = internal 1	
		1	Inverse: external 0 (– 40.0 V ... + 2.0 V) = internal 1	
			external 1 (+ 4.2 V ... + 40.0 V) = internal 0	
	4		Direction of control action of binary input BI 2	
		0	Normal	0
		1	Inverse	
06			**Function of binary outputs**	
	1		Alarm value PV min.	
		0	No signal	0
		1	Binary output BO 1	
		2	Binary output BO 2	
	2		Alarm value PV max.	
		0	No signal	0
		1	Binary output BO 1	
		2	Binary output BO 2	
	3		Alarm value DEV min.	
		0	No signal	0
		1	Binary output BO 1	
		2	Binary output BO 2	
	4		Alarm value PV max.	
		0	No signal	0
		1	Binary output BO 1	
		2	Binary output BO 2	

Func-tion	Ques-tion	Ans-wer	Function	Fac-tory setting
06			**Function of binary outputs** (continued)	
	5		Live zero/sensor break monitoring of analogue input	
		0	No signal	0
		1	Binary output BO 1	
		2	Binary output BO 2	
	6		KEEP-ALIVE, self-test	
		0	No signal	0
		1	Binary output BO 1	
		2	Binary output BO 2	
	7		Signalling of AUTOMATIC operating mode	
		0	No signal	0
		1	Binary output BO 1	
		2	Binary output BO 2	
	8		End of activation	
		0	At alarm end	
		1	Upon acknowledgement	1
		2	Upon acknowledgement and alarm end	
	9		Direction of control action of binary output BO 1	
		0	Meas. value $>$ alarm value $\rightarrow$ BO is active (Curr. fl.)	0
		1	Meas. value $>$ alarm value $\rightarrow$ BO is de-energized (disabled)	
	10		Direction of control action of binary output BO 2	
		0	Meas. value $>$ alarm value $\rightarrow$ BO is active (Curr. fl.)	0
		1	Meas. value $>$ alarm value $\rightarrow$ BO is de-energized (disabled)	
07			**Front panel display and operation**	
	1		Repeat rate for digital displays for x, w, xw and y	
		0	0.1 seconds	
		1	0.5 seconds	1
		2	1 second	
		3	5 seconds	
	2		Display format for digital displays for x and w	
		0	Floating point	

Func- tion	Ques- tion	Ans- wer	Function	Fac- tory setting
07			**Front panel display and operation** (continued)	
		1	1.000 decimal point behind 1st position	
		2	10.00 decimal point behind 2nd position	2
		3	100.0 decimal point behind 3rd position	
		4	1000. decimal point behind 4th position	
	3		Alarm display	
		0	With clearing upon alarm end and acknowledgement	
		1	With clearing upon acknowledgement	1
		2	Suppression of alarm display	
08			**Communication interfacing**	
	1		Station number	
		0	No commmmunication operation	0
		1	Communication operation under No. 1	
		.		
		31	Communication operation under No. 31	
	2		Baud rate of interface	
		0	1200 bauds	
		1	2400 bauds	
		2	4800 bauds	
		3	9600 bauds	3
	3		Parity of interfaces	
		0	No parity	
		1	Reserved	2
		2	Even parity	
	4		Data word length	
		0	Length 7 bits	
		1	Length 8 bits	1
	5		Stop bits	
		0	1 bit	0
		1	1.5 bits	
		2	2 bits	
	6		Interface type	
		0	RS-232	0
		1	RS-422	
		2	RS-485	
	7		Communication protocol	
		0	ASCII	
		1	RTU	1

Displays and keys for fixed-value control

PV-x
$(\overline{50.00})$ **Process value display**

$(\overline{.00})$ **Setpoint display**

▲ ▼ Raise/lower setpoint

⊞ Select MANUAL or AUTOMATIC operating mode
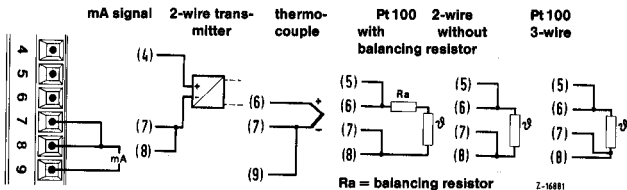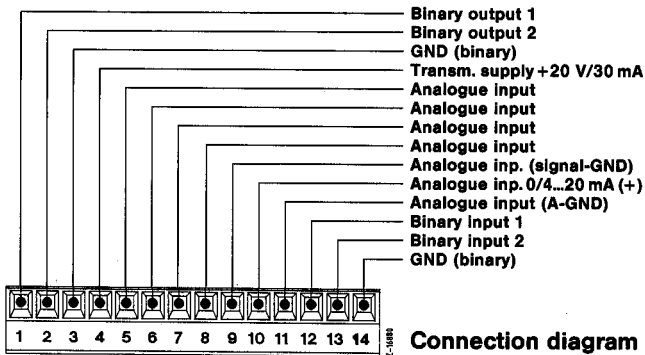
► ◄ Raise/lower output in MANUAL mode

Keys and displays in alarm indication

Flashes if following limits are exceeded

PV-x
$(\overline{50.00})$ PV alarm thresholds

DEV alarm thresholds ───────────▶

SP-w
$(\overline{h})$ **SP-W display shows**

h upon infringement of PV and DEV$_{max.}$
l upon infringement of PV and DEV$_{min.}$

[IND] Press: displays the infringed alarm in SP-W

[ENTER] Press once for alarm confirmation
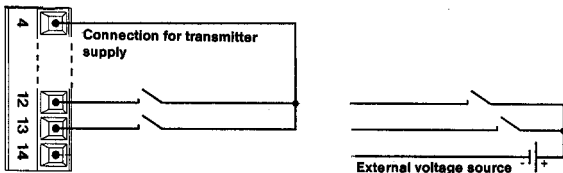Press for 3 s to display the active alarm again

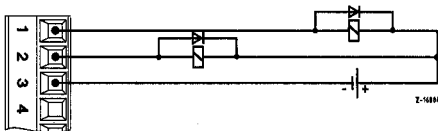# Displays and keys Local/remote operation

Switching level

⊘ DI-REM LED flashes: local operation

● DI-REM LED lights up contin.: remote operation

[CONF] Press three times (LEDs 1 and 2 light up)
(only if the DI-REM flashes or lights up contin.)

[ENTER] Local operation ◄──► remote operation
Controller switches automatic. to operating level

Binary output 1
Binary output 2
GND (binary)
Transm. supply +20 V/30 mA
Analogue input
Analogue input
Analogue input
Analogue input
Analogue inp. (signal-GND)
Analogue inp. 0/4...20 mA (+)
Analogue input (A-GND)
Binary input 1
Binary input 2
GND (binary)

Connection diagram

mA signal 2-wire trans- thermo- Pt 100   Pt 100
           mitter   couple   with   without   3-wire
                                   balancing resistor

(4)
(6)
(7)
(8)
(9)

(5)   Ra   (5)   (5)
(6)   (6)   (6)
(7)   (7)   (7)
(8)   (8)   (8)

Ra = balancing resistor

Analogue inputs

Connection for transmitter supply

External voltage source

Binary input

Binary output

12

Subject to technical changes.

ABB