Digitric P

Controller for industry and process engineering

Changing software and hardware functions

Operating manual 42/61-29 EN Rev. 03

ABB

Table of contents

User Instructions

This Operating Manual contains descriptions for changing software and hardware functions.

Instead of a verbal description, flow charts are used to illustrate operation, thus considerably rendering instrument operation explanations more comprehensible.

All auxiliary routine modifications are to be saved after successful function check with St.PA (see page 13) and St.Pr (see page 15).

Specifications on mounting, electrical connection, commissioning as well as technical data are to be found in Operating Manual 42/61-28-...EN; knowledge of this manual is presumed so as to understand the following sections.

The front views of formats 96 mm x 96 mm, 72 mm x 144 mm and 19" plug-in card (or format 48 mm x 96 mm) are repeated with all details and numbering of the operator panels on the foldout page at the back of this manual. This illustration is the same as that used in Operating Manual 42/61-28-...EN.

If the information contained in this Operating Manual should prove to be inadequate in any manner, please consult the local Technical Branch Office or representative of **ABB**.

Z-16255/1
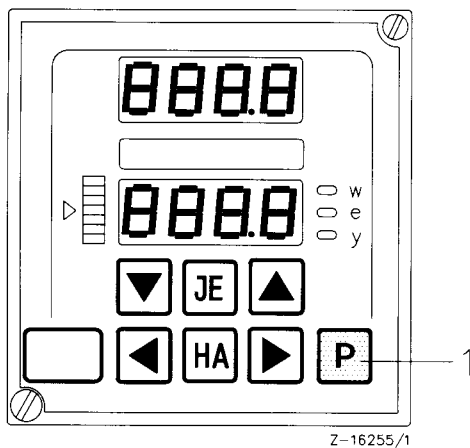
Panel instrument design
96 mm x 96 mm

Z-'6255/2
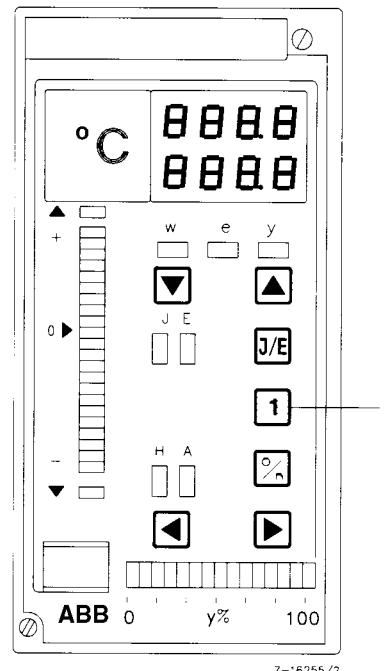
Panel instrument design
72 mm x 144 mm

Explanation of the symbols used
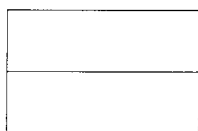
Top line

Bottom line in display

Indication in normal mode

Indication flashes or appears only briefly (approx. 3 s) (letter/figure not filled in)

Adjust by holding a key (symbol: rectangle)

Adjust by tapping a key (symbol: square)

Adjust by pressing a key several times

Adjust by simultaneously holding and pressing several keys

Indication changeover key (1)

3

1 Auxiliary routines

1.1 Program entry

To perform instrument settings going beyond the normal operation, it is necessary to select auxiliary routines.

Example:
From normal indication
to "P I d"

(Exceptions see footnote [1]))

Lights up for approx. 3 s

As long as **nor** is lit up,
tap until the required
routine e.g. "P I d" appears

After brief flashing the se-
lected routine is activated
and can be processed

Z–16256/1EN

1.2 Program exit

Example:
From "P I d" to
normal indication

Lights up for approx. 3 s

As long as e.g. "P I d" is visi-
ble

Flashes for approx. 3 s and
then switches to standard in-
dication

Z–16256/2

2 Parameter definition

2.1 Changing the display functions

Auxiliary routine "diSP"

H/A   Brightness levels 1...4

▲   r   Each indication reverts
after approx. 30 s to
controlled variable x

     n   The selected display
is retained

J/E   Indication loop
L   Small
E   Extended
A   All variables used

Z–16257

▼   Function of the analog
indication (10)
y   Continuous controller
output
b   Binary switching status
d   Control deviation

---
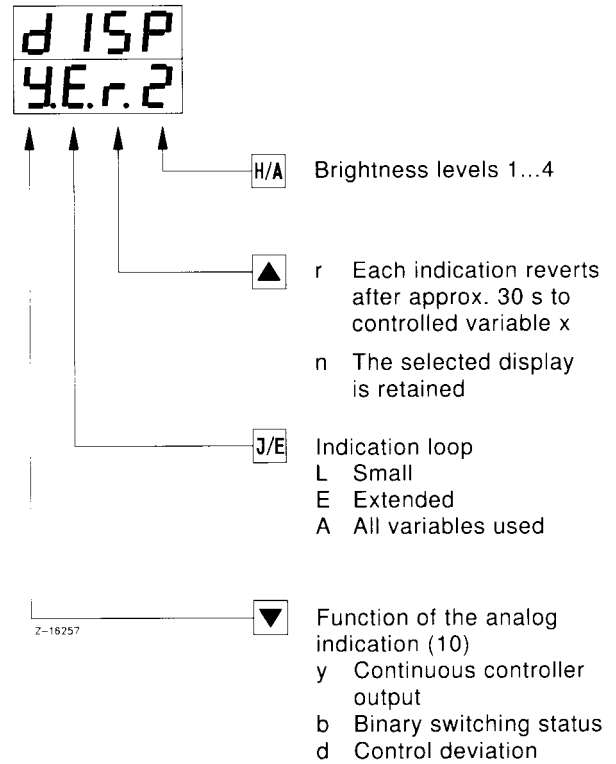
[1]) **Exceptions: Software and hardware inhibit of auxiliary routines**

a) With a software inhibit:

Access via

 more than 12 times
within 5 s
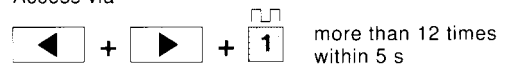
b) With a hardware inhibit:

First remove jumper between

| S 1 | and | ⊥ | (panel instrument) |

| 2 a | and | 26 c | (19" plug-in card) or |

| 2 z | and | 26 d | (19" plug-in card with plug F) |

Then access the program as indicated.

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2.2 Control action
Auxiliary routine "PID"

▼   "P" on/off

J/E   "I" on/off

▲   "D" on/off

P Id
c h.4

H/A   Channel changeover 1...4

▼   Derivative gain 1 or 4

J/E

Differentiation
r   Controlled variable
E   Control deviation

▲

Differentiation
d   Both sides
P   positive
n   negative

d.4.r.d
c h.4

H/A   Channel changeover 1...4

▲

Control characteristic
inu Inverse (falling)
dir Direct (rising)

c . i n u
c h.4

H/A   Channel changeover 1...4

t t t t
c h.4

Z-16069/2

▼

Time range (as from software status "L")
Decimal point position:
t t t t   Seconds (s)
t t t.t   Minutes (min)
t t.t t   Hours (h)
t.t t t   h × 1000

H/A   Channel changeover 1...4

2.3 Self-parameter definition

2.3.1 Automatic parameter entry (standard)

Channel changeover

Sign

tr.x
n.x
FP.x
bn.x
PbH.x
PbL.x
tnH.x
tnL.x
tdH.x
tdL.x
InH.x
InL.x

Exit

Without abort   With abort

◄ + ► + ▣   ▣ + ▲

nor.

Normal mode

Mode indication "H" flashes
as long as self-parameterde-
finition is running.

◄ + ► + ▣   Exit

Normal mode

Z-16258/1
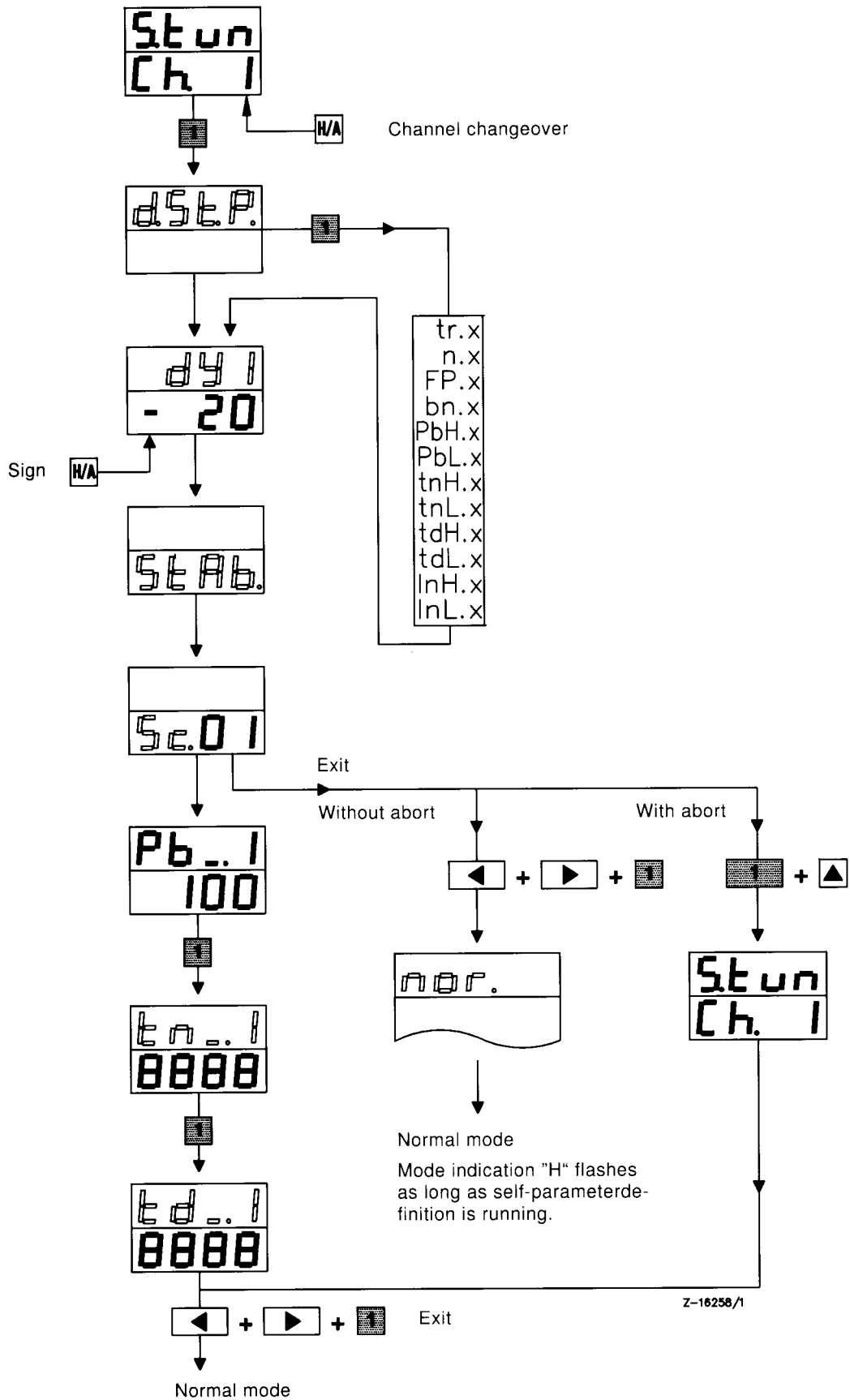
2.3.2 Function codes

The operator can change the function codes listed below.
Switch from one code to the next with key (1):

Press = forwards
Hold = backwards
x = channel number (1 . . . 4)

tr.x   Scanning time:
0.4; 0.8; 1.6; 3.2; 6.4; 12.8; 25.6; 51.2 minutes
or, depending on contents of addresses 84E2
and 84E3:
6.4; 12.8; 25.6; 51.2 minutes/
1.80; 3.60; 7.20; 14.40 hours
No value is set at the factory.

A scanning time which is suitable for the controlled
system must be selected:
Estimate the time needed by the process to go from
one stable state to another, then set the next smallest
scanning time.

n.x   Number of parameter definition runs: 1 . . . 8
Factory setting: 1

FP.x   Parameter factor for Pb; tn and td: 75.0 . . . 199.0
Factory setting 100.0
Values > 100.0 produce a more gently and stable
control activity.

bn.x   Tolerance band: 0.3 . . . 3.0 %
Factory setting: 0.5 % = ± 0.25 %
The value is decisive for the criterion "steady state
condition reached".

PbH.x   Maximum value for proportional range Pb:
0 . . . 1850 %
Factory setting: 1850 %

PbL.x   Minimum value for proportional range Pb:
0 . . . 1850 %
Factory setting: 3 %

tnH.x   Maximum value for integral action time tn:
0 . . . 1999 s or 0 . . . 19.99 h
Factory setting: 1999 s or 19.99 h

tnL.x   Minimum value for integral action time tn:
0 . . . 1999 s or 19.99 h
Factory setting: 0 s or 0.00 h

tdH.x   Maximum value for derivative action time td:
0 . . . 1999 s or 19.99 h
Factory setting: 1999 s or 19.99 h

tdL.x   Minimum value for derivative action time td:
0 . . . 1999 s or 19.99 h
Factory setting: 0 s or 0.00 h

InH.x   Maximum value for analog input En:
− 199.9 . . . + 1999.9 %
(appropriate 0 . . . 100 %)
Factory setting: 100 %

InL.x   Minimum value for analog input En:
− 199.9 . . . + 199.9 %
(appropriate: 0 . . . 100 %)
Factory setting: 0.0 %

dY.x   Amplitude of the control jump:
− 199.9 . . . + 199.9 %
Factory setting: 20 %
dY.x > 100.0 % is not appropriate for continuous
controllers. The sign is switched automatically before
each sequence; it can be switched directly with the
H/A key (6) if dY.x is selected.
100 % corresponds to a run time of 60 s (the position
feedback signal is not evaluated) for step controllers.

If unreasonable values are set e.g. PbL.x > PbH.x the
function returns to the first unreasonable setting on starting
the parameter definition run.

2.3.3 Manual parameter entry

Enter as for automatic entry.
Differences exist only after the end of the parameter
definition run.

Exit

Without abort

With abort

◄ + ► + ▦   ▦ + ▲

Normal mode

Mode indication "H" flashes
as long as the self-parameter
definition is running

Jumps back to S.tune
after calculation of
the parameters

Average value   With n > 1 values of the individual runs

Z-16259
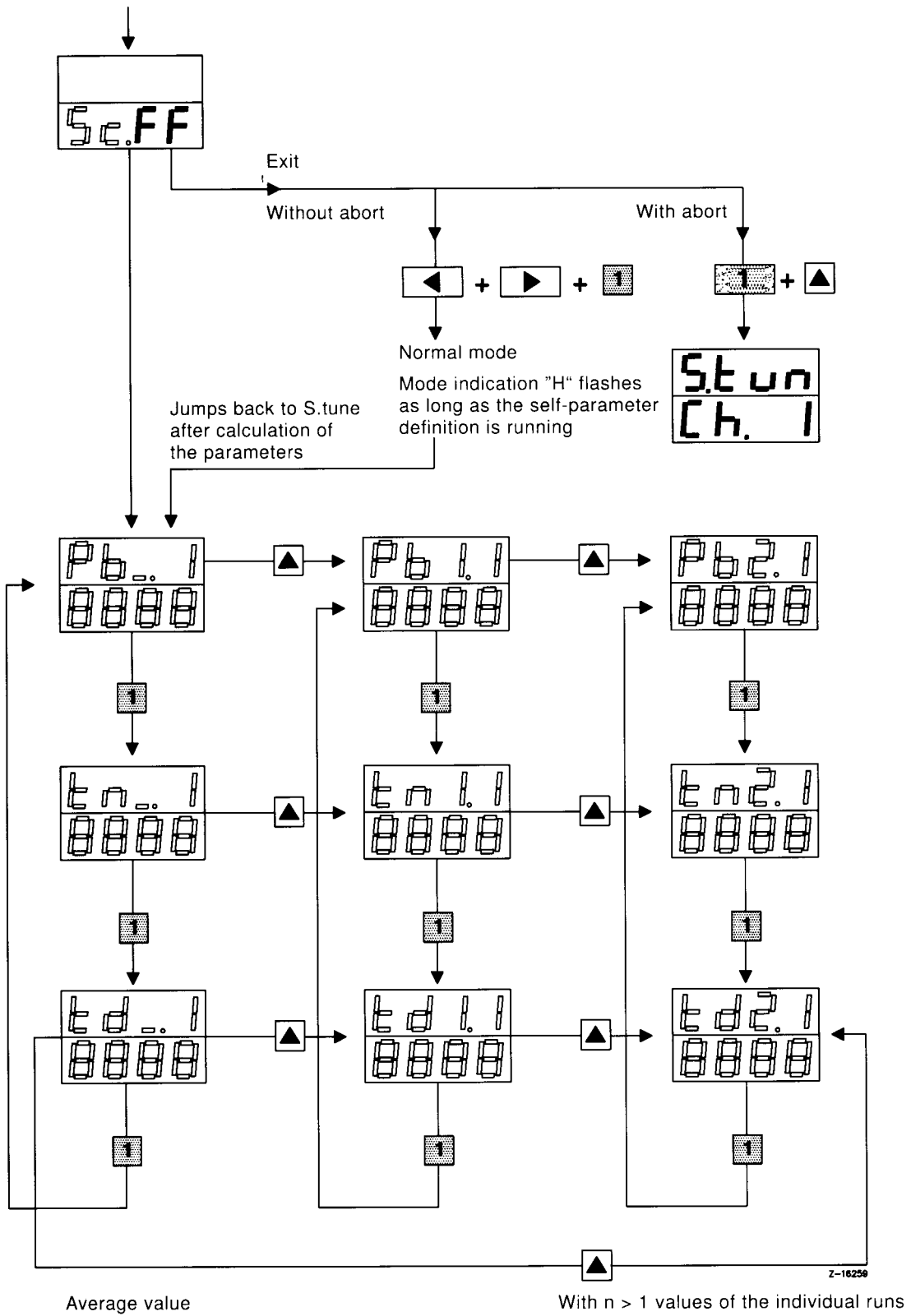
Each of the values displayed flashing, can be entered with **H/A**

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2.3.4 Error messages

During the scanning phase the analog input assigned to the controlled variable is monitored continuously for alarm value infrigements.

If the minimum value InL.x is undershot, the scanning phase is aborted; however, the self-parameter definition is not exited.

If the maximum value InH.x is exceeded additionally, the manipulated variable is set to 0 in the continuous controller and the control step is inverted in the case of the step controller.

If any error occurs, the error bit EST is set and Er.St appears in the display.

The exact cause of the error can be interrogated in the self-tune routine.

Z-16258/2
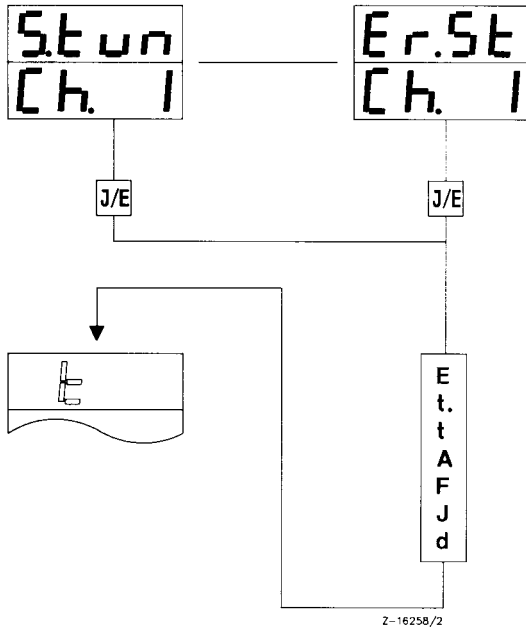
Having aborted the selftune routine "S.tun.", the error message must be acknowledged with key (1).

E	Input signal infringes InH.1 or InL.1
t.	Time range is too long. The steady state condition was already reached after less than 113 scanning cycles.
t	Time range is too short. Occurs if no steady state condition has yet been reached after 51.2 minutes or 14.4 hours when automatically doubling the scanning time, or in the case of a fixed scanning time, if no steady state condition has been reached on expiry of this time.
A	Amplitude of the resulting control deviation too small ($< 7.5\%$)
F	Curve shape error of the step response. Occurs with impermissible controlled system characteristics or in adjusting the setpoint and/or correction value during the parameter definition run.
J	Incorrect controller characteristic
d	Results from different test runs produce too much scatter.

2.3.5 Changing from automatic parameter entry to manual parameter entry

84FBH								
Bit	7	6	5	4	3	2	1	0
Channel	4	3	2	1				
Contents	1	1	1	1				
Hex. figure								

0 = manual entry of the control parameters
1 = automatic entry of the control parameters

3 Function changes

3.1 Software

3.1.1 Setting the measuring ranges

Measurement task

| $InP.$ | Appears approx. 3 s |

$\downarrow$

| $l\ d.c$ |
| $in.\ l$ | Display depends on the input module |

──[H/A] Changeover of the inputs E1...E4

$\downarrow$

| 00 |
| $in.\ Lo$ |

──[H/A] Range start

$\downarrow$

| 100.0 |
| $in.\ Lr$ |

──[H/A] Range span

$\downarrow$

Actual value

| 45.3 |
| $in.\ L\_$ |

[J/E]

Fine correction (as from software status "L")

| 45.3 |
| $CAL.\ l$ |

[▼] Less

[▼] + [▲] Correction value = zero

[▲] Greater

Span $\leq$ 0.775 %
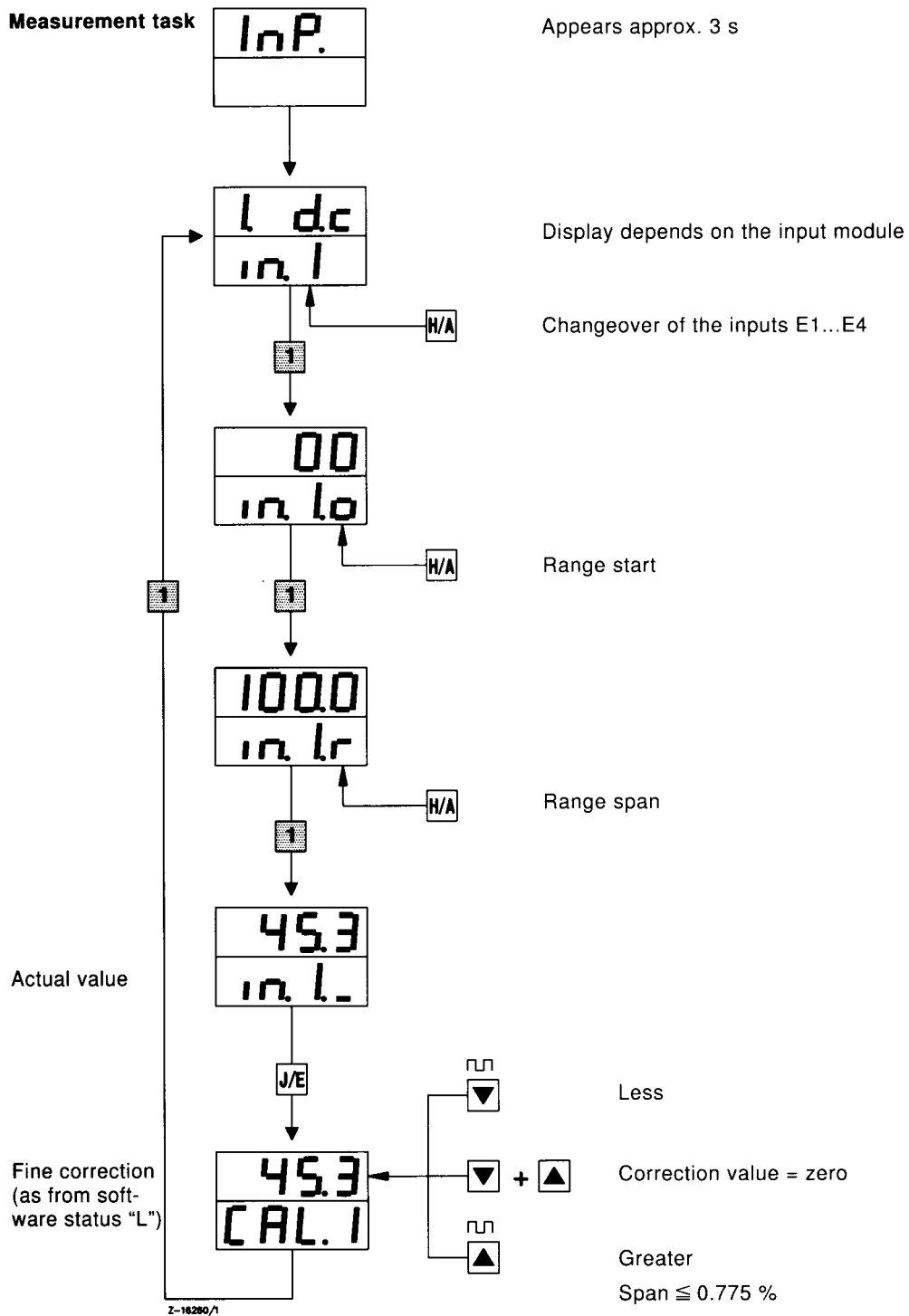
Z-16260/1

Input ranges depending on the modules fitted

Pt 100 modules

```
Pt.2.c
```
Z-16260/3

Pt 2 ⎤
Pt 3 ⎬ Depending on the components fitted
Pt 4 ⎦

mV modules

```
L.      c
```
Z-16260/4 ──────→ ▼
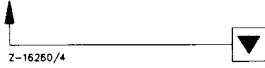
L. Thermocouple Typ L
J. Thermocouple Typ J
Ҏ. Thermocouple Typ K
S. Thermocouple Typ S
d. Thermocouple Typ D
b. Thermocouple Typ B
Et Special curve
Ln. Linear
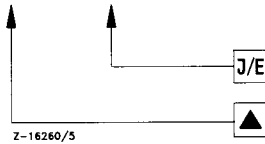
Current/voltage modules

```
I  d.c
```
Z-16260/5

J/E
▲

d. dead zero 0...20 mA/0...10 V
L. live zero 4...20 mA/2...10 V
I. Input mA
U. Input V

```
        c
```
Z-16260/6

▲
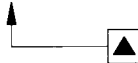
c Standard ranges
u Variable range

t Linearization for mV or mA input
   (can only be switched off here)

Binary modules

```
b   in
```
Z-16260/2

User range (UR)

J/E + ▼ or ▲   Decimal point displacement

Span

```
100.0
Ur. Ir
```

▼ or ▲   Adjustment of the value at decimal point

H/A   UR 1...4

J/E + ▼ or ▲   Decimal point displacement

Zero point

```
0.0
Ur. Io
```
Z-16261/3 EN

▼ or ▲   Adjustment of the value at decimal point

H/A   UR 1...4

11
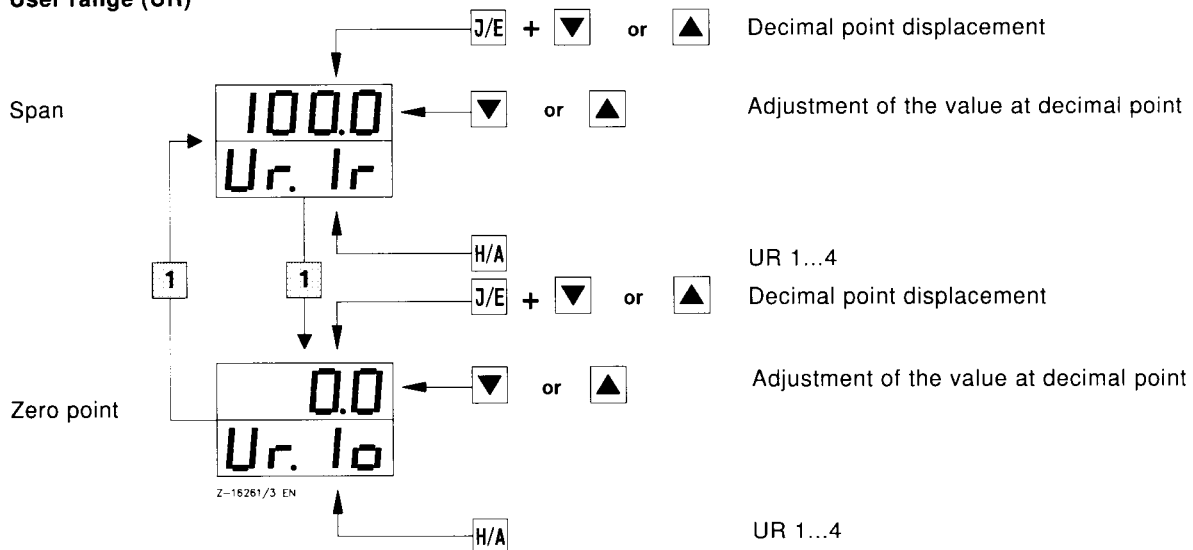
Definition of the reference junction for measurement with thermocouples

Active only if an input module has been entered for mV and thermocouple type (see InP).

```
┌──────────┐
│  t.rEF   │
├──────────┤
│          │
└──────────┘
      │
      ▼
┌──────────┐
│  120.5   │        Actual value of input 1
│  t r. 1_ │
└──────────┘
      │                    ┌───┐
      │◄───────────────────┤H/A│  Input 1...4
 ┌─┐  │ ┌─┐               └───┘
 │1│  ▼ │1│
 └─┘    └─┘
┌──────────┐        ┌───┐    Internal reference junction    int.
│  int.    │◄───────┤ ▲ │    External reference junction     0 °C
│  t r. 1  │        └───┘                                   20 °C
└──────────┘                                                50 °C
Z-16261/2   ▲                                               60 °C
      ┌─────┘ ┌───┐
      └───────┤H/A│  Input 1...4
              └───┘
```
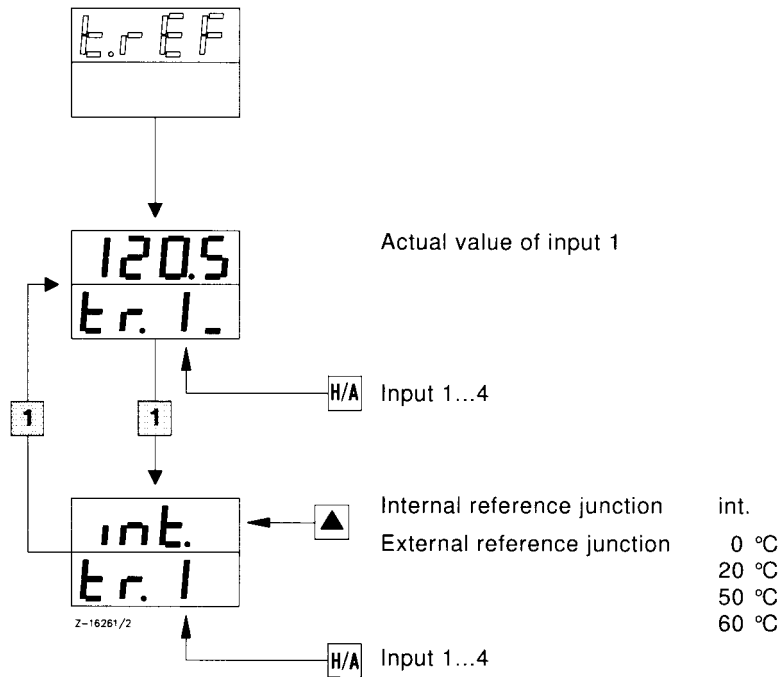
Line balancing with Pt 100 in two-wire circuit

Active only if Pt 100 two-wire circuit is entered (see InP)

```
┌──────────┐
│  r.Lt G  │
├──────────┤
│          │
└──────────┘
   or     │
 ┌────────┼─────┐
 │        ▼
┌──────────┐        ┌───┐       ┌───┐
│   4.0    │◄───────┤ ▼ │ or    │ ▲ │   Setting a known line resistance
│  r L. 1  │        └───┘       └───┘   (in Ω)
└──────────┘
      │  ▲            ┌───┐
      │  └────────────┤H/A│   Input 1...4
    ┌─┐               └───┘
    │1│
    └─┘
      ▼
┌──────────┐        ┌───┐       ┌───┐
│  198.9   │◄───────┤ ▼ │ or    │ ▲ │   Align the indicated value to the known
│  r L. 1  │        └───┘       └───┘   value of the test resistor (e.g. 200.0 Ω)
└──────────┘
Z-16261/1 EN  ▲
      ┌───────┘ ┌───┐
      └─────────┤H/A│   Input 1...4
                └───┘
```

12
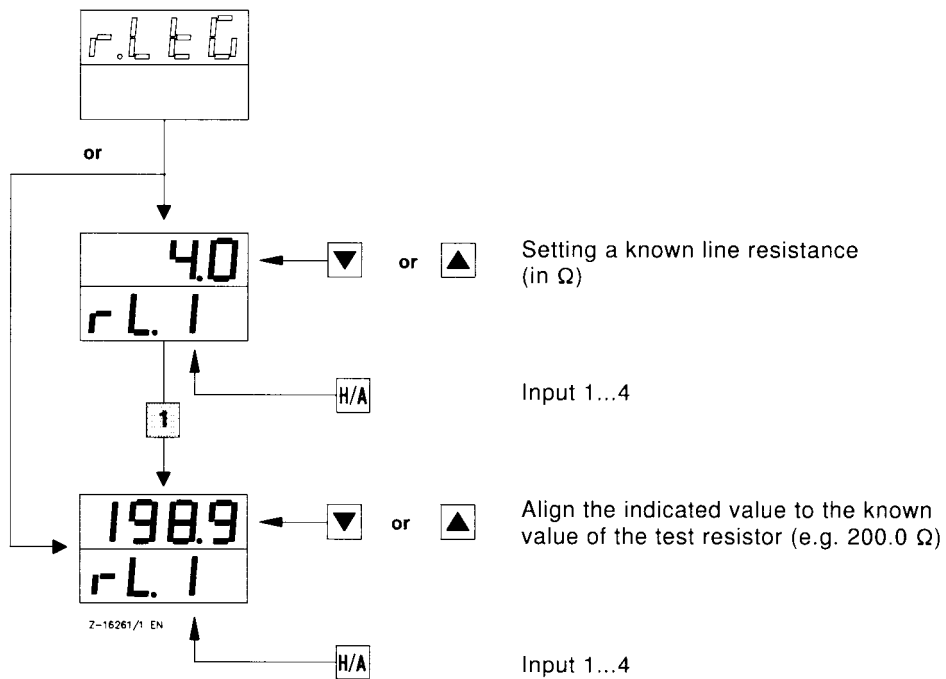
Output ranges based on the modules fitted

Flashes approx. 3 s

Depends on the
output module:

d   dead zero
L   live zero

Current output

Actual value

Output 1...4

d   dead zero
L   live zero

Voltage output

Actual value

Binary output
(optoelectronic coupler)

Relay output

Z-16262
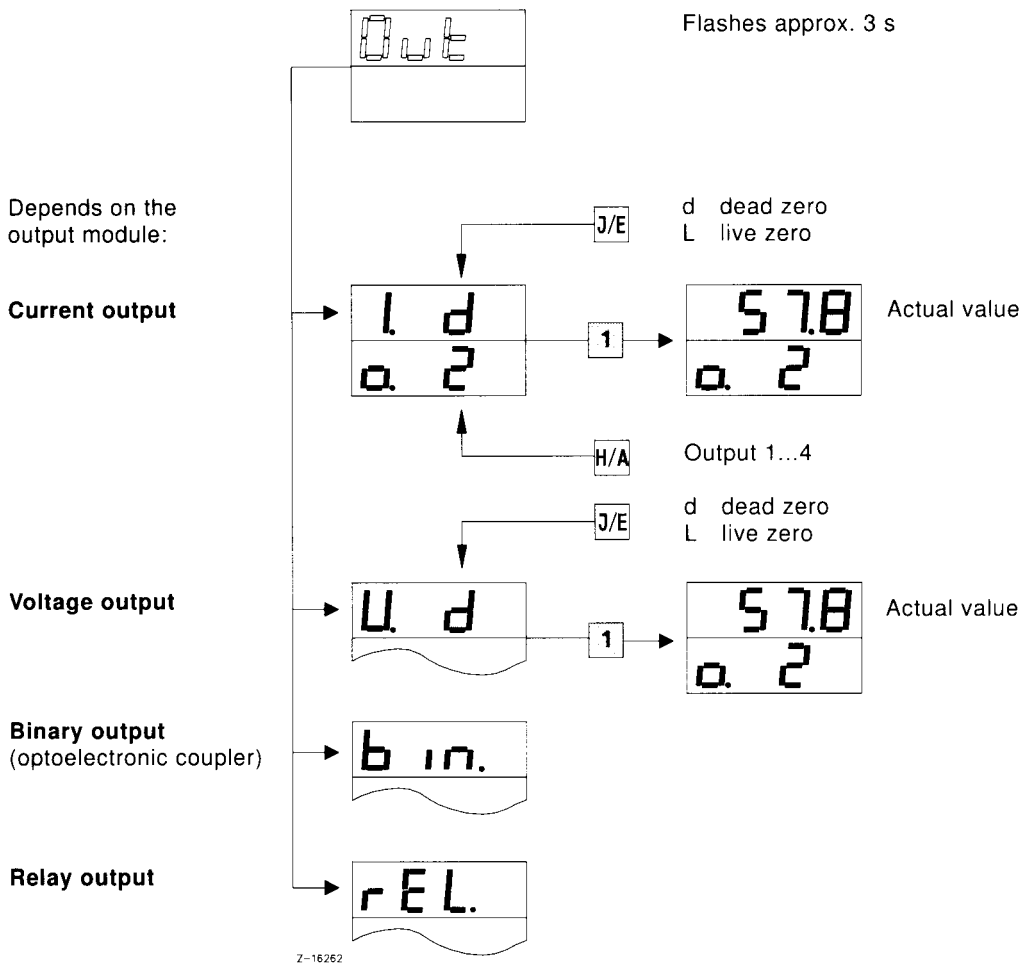
3.1.2 Saving and reloading parameters

Saving parameters from the value list
into the configuration
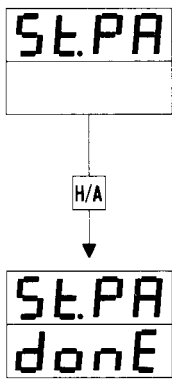
Recalling parameters saved in the configuration
into the value list.

Z-16263/2

Z-16263/1
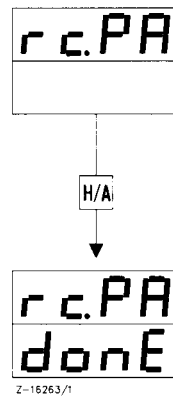
3.1.3 Loading configurations

Standard configuration or
saved application

rc.Pr. including rc.PA
is executed by I/E + H/A

Normal mode

14
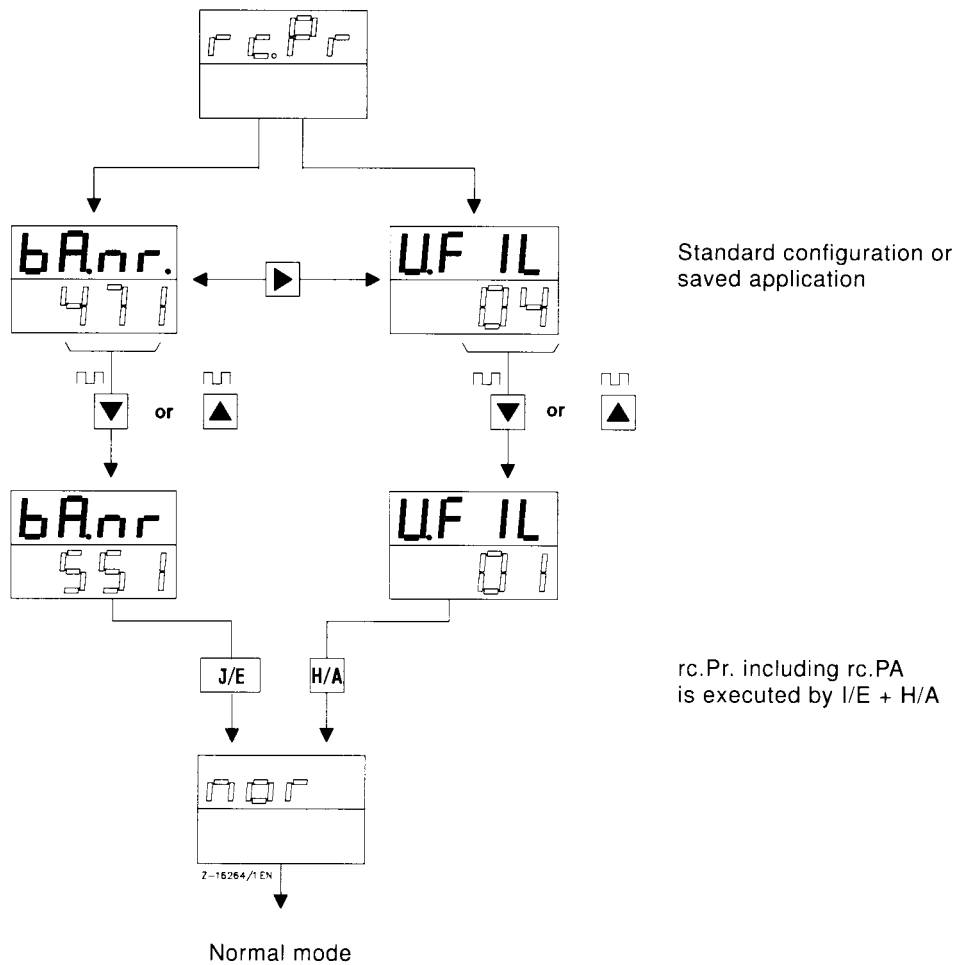
3.1.4 Saving user configurations in the free EPROM range

Before saving, the active parameters should be copied with St.PA into the working memory.

Hardware jumper B3 must be fitted.

```
 St.Pr
    05      Next free user file, e.g. 05
```

`H/A`

```
 FrEd
 5244       Free range (example)
```

`H/A`

```
 LEnd
 0023       Length of the data set to be saved (example)
```

`H/A`

```
 St.Pr          ErnA              FULL
    05
```

Z-16264/2

Successfully	No saving	No saving effected
saved	effected	(EPROM is full)
	(write protection?)	The EPROM must be replaced (see list of components)
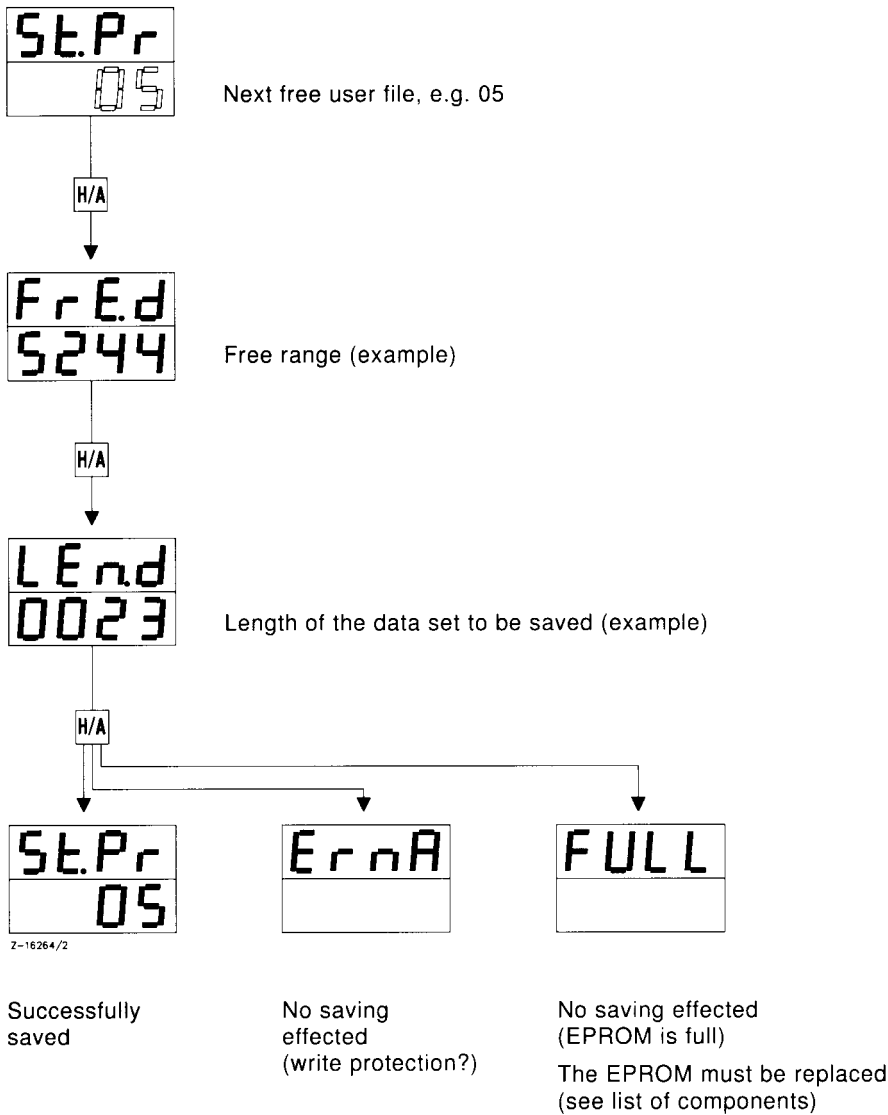
Undo hardware jumper Br 3 again after saving

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3.1.5 Editing and working area

Configuration and parameter definition data area copied from the editing to the working area.
The configuration becomes thus active.

Parameters must be copied with rc.PA into the value list to be active.
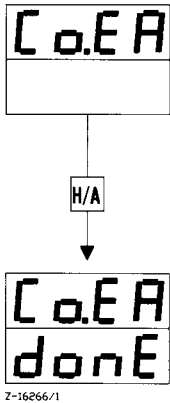
Configuration and parameter definition data are copied from the working area to the editing area.

```
 Co.EA
```

H/A

```
 Co.EA
 donE
```
Z-16266/1

```
 Co.AE
```

H/A

```
 Co.AE
 donE
```
Z-16266/2
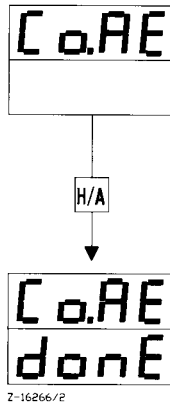
3.1.6 Interface
Controller address on the bus

```
 C.Adr
    68
```
Z-16265/2

▲ O...F

J/E O...F
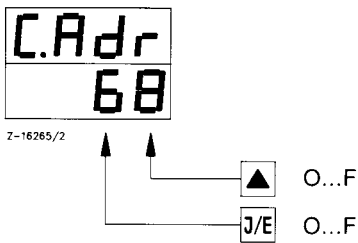
Do not use 7F

Baud rate for data traffic via the rear serial interface

```
 bAud
 19.20
```
Z-16265/1

▲ Switch between

00.30 =	300 bauds
00.60 =	600 bauds
01.20 =	1 200 bauds
02.40 =	2 400 bauds
04.80 =	4 800 bauds
09.60 =	9 600 bauds
19.20 =	19 200 bauds
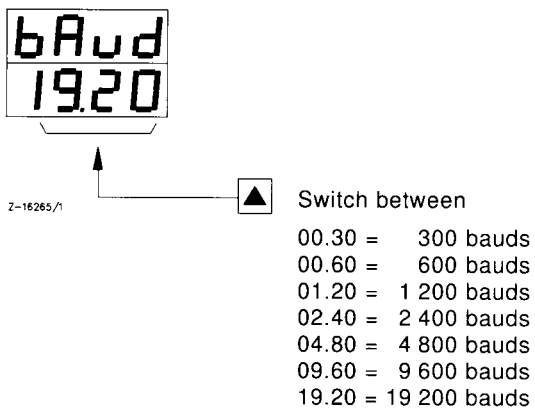
3.1.7 Tables

Active only in special configurations using the
table functions.

```
 ┌─────────┐
 │ t A b.  │
 └────┬────┘
      │         ┌───┐  or  ┌───┐
      │     ┌──▶│ ▼ │      │ ▲ │         Change value
      │     │   └───┘      └───┘
      ▼     │   ┌───┐  ┌─────┐  ⎫
 ┌─────────┐│   │ ▼ │+ │ J/E │  ⎬
 │ - I0.0  ││   └───┘  └─────┘  ⎬  Rapid adjustment
 │ t I.0 I ││   ┌───┐  ┌─────┐  ⎭
 └─────────┘│   │ ▲ │+ │ J/E │
   ▲   ▲    │   └───┘  └─────┘
   │   │    │
   │   └────┼──────────┐ ┌───┐
   │        │          └─│ 1 │     Checkpoint 0...10
   │        │            └───┘
   └────────┼──────────┐ ┌───┐
            │          └─│H/A│     Table 1...4
Z-16265/3 EN             └───┘
```
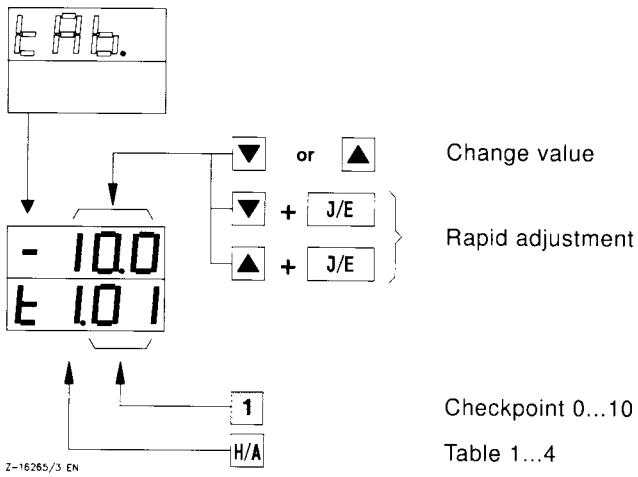
3.1.8 Non-return pointers
Resetting the non-return pointers

```
          ┌──────────┐ ┌───┐
          │          └─│ ▲ │    Input 1...4
          ▼            └───┘    0 is not used
 ┌─────────┐
 │ [ L r 3 │
 │         │
 └────┬────┘
      │
    ┌─┴─┐
    │H/A│          Reset non-return pointers at input 3
    └─┬─┘
      ▼
 ┌─────────┐
 │ [ L r 3 │
 │ d o n E │
 └─────────┘
 Z-16266/3
```
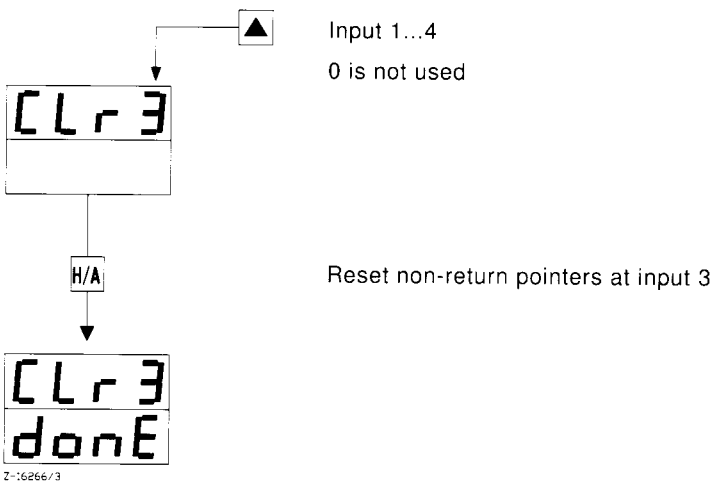
3.1.9 Hold

Switches off the function.
The outputs are frozen

```
 ┌─────────┐
 │ HOL d   │
 │         │
 └─────────┘
 Z-16265/4
```
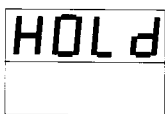
3.1.10 Changing memory addresses for special function changes

```
d.C.t.L.
```
Flashes for approx. 3 s

```
0000.
C 00.
```
Only for test purposes

[1]

```
_ _00.
b    0.
```
Only for test purposes

[1]   [1]

```
_ _00.
d  bd.
```
Only for test purposes

[1]

```
8000.
E  74.
```
Is used as follows in different applications

Z–16267

Working with monitor E

```
8000.
E  d0.
```

▼ or ▲   Changing the value at the decimal point position

J/E + ▼ or ▲   Moving the decimal point

J/E + ◄ or ►   Moving the decimal point

◄ or ►   Changing the value at the decimal point position

```
8.888
E  d0
```
The value flashes after changing

Z–16268/¹ EN

J/E   Fetch back the old value

H/A   Enter the new value (acknowledge)

18

3.1.11 Selected functions

Manual characteristic

4E = channel 1
52 = channel 2
4d = channel 3
51 = channel 4

1   Rising output with ▶
    Display 100% for 20 mA

2   Falling output with ◀
    Display 100% for 0/4 mA
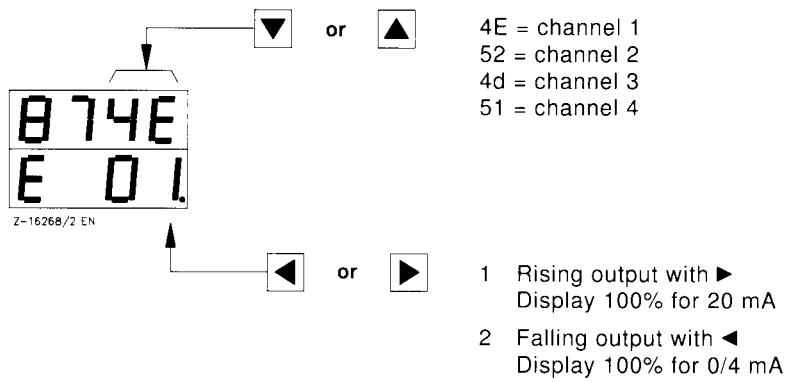
Time ranges for T_n, T_d

(Only important for instruments and software versions
prior to "L". See routine PID for newer versions)

2 = channel 1 and 2
3 = channel 3 and 4

	Continuous and on/off controller		Step controller	
Channel 1 (3)	0	Not active	0	Not active
	4	Seconds	c	Seconds
	5	Minutes	D	Minutes
	6	Hours	E	Hours
Channel 2 (4)				
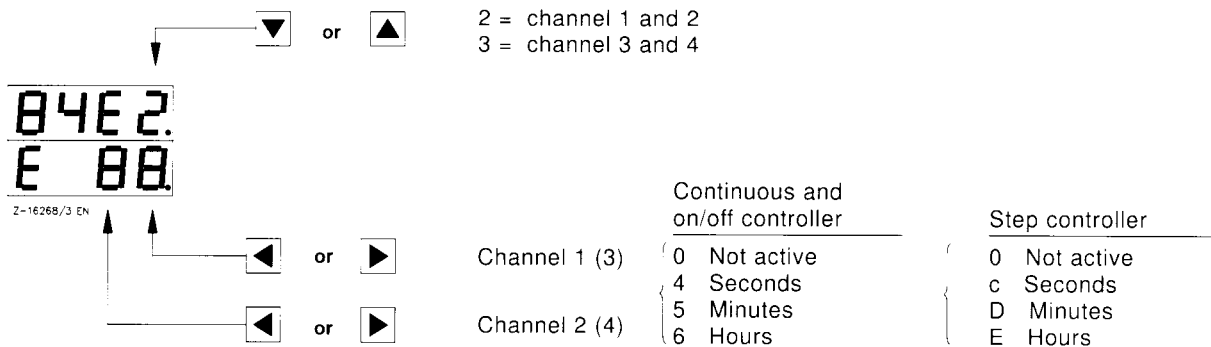
Control outputs for programmer and program controller

In the segments 1 to 7, control outputs P1. to P4. can be set to 0 or 1, independently from one another, by modification of storage contents.

1 = output P1...P4.: transistor conducting or relay energized
0 = output P1...P4.: transistor inhibited or relay de-energized

Channel 1	Segment address 1 = 842AH 5 = 842EH 2 = 842BH 6 = 842FH 3 = 842CH 7 = 8430H 4 = 842DH						
Bit	7	6	5	4	3	2	1	0
Function	–	–	–	–	P4.1	P3.1	P2.1	P1.1
Binary	1	1	1	1	0	1	0	1
Hex. digit	F				5			

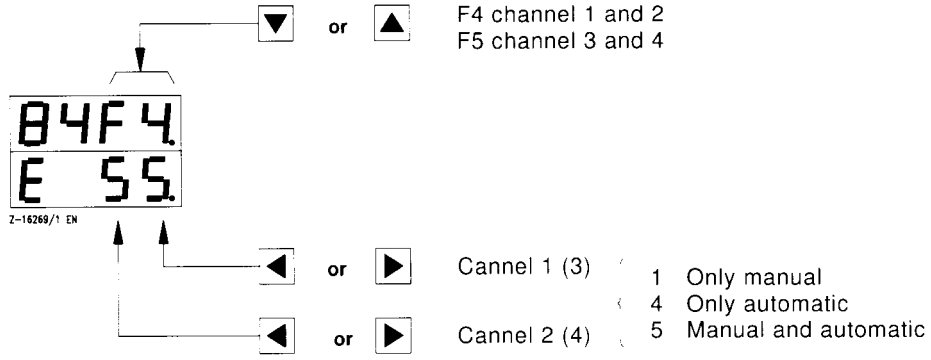| Channel 2	Segment address 1 = 84F5H 5 = 8463H 2 = 8460H 6 = 8464H 3 = 8461H 7 = 8465H 4 = 8462H						
Bit	7	6	5	4	3	2	1	0
Function	–	–	–	–	–	–	P2.2	P1.2
Binary	1	1	1	1	0	0		
Hex. digit	F							
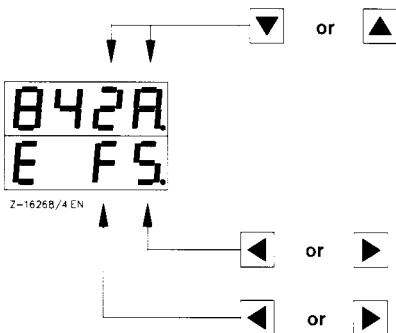
Example:
If adress 842AH is entered as contents F5H, as indicated above, outputs P1.1 and P3.1 are set to "1" for the time of program section 1. Outputs P2.1 and P4.1 remain set to "0".

Mode selector switch (inhibiting individual switch settings)

Manual/automatic

```
                    ┌──── ▼  or  ▲   F4 channel 1 and 2
                    │                F5 channel 3 and 4
        ┌───────────┘
        ▼
      ┌───────┐
      │ 84F4. │
      │ E 55. │
      └───────┘
      Z-16269/1 EN
         ▲   ▲
         │   └──── ◀  or  ▶   Cannel 1 (3)      1  Only manual
         │                                      4  Only automatic
         └──────── ◀  or  ▶   Cannel 2 (4)      5  Manual and automatic
```

Programmer

```
                    ┌──── ▼  ou  ▲   F4 channel 1 and 2
                    │                F5 channel 3 and 4
        ┌───────────┘
        ▼
      ┌───────┐
      │ 84F4. │
      │ E 66. │
      └───────┘
      Z-16269/3 FR                              ⎧ 1  Only stop
         ▲   ▲                                  │ 2  Only run
         │   └──── ◀  ou  ▶   Cannel 1 (3)      │ 3  Run and stop
         │                                      ⎨ 6  Run and repetitive
         │                                      │ 8  Only rapid
         └──────── ◀  ou  ▶   Cannel 2 (4)      │ 9  Rapid and stop
                                                │ A  Rapid and run
                                                ⎩ B  Run and stop and rapid
```

Internal/external

```
                    ┌──── ▼  or  ▲   F6 channel 1 and 2
                    │                F7 channel 3 and 4
        ┌───────────┘
        ▼
      ┌───────┐
      │ 84F6. │
      │ E 55. │
      └───────┘
      Z-16269/2 EN
         ▲   ▲
         │   └──── ◀  or  ▶   Cannel 1 (3)      1  Only internal
         │                                      4  Only external
         └──────── ◀  or  ▶   Cannel 2 (4)      5  Internal and external
```

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Alarm signal outputs

NC operation / NO operation

Optoelectronic coupler output

Z-16270/4 EN

0 for A1
1 for A2
2 for A3
3 for A4

01 NO circuit (conducting if alarm value infringed)
02 NC circuit (highly resistive if alarm value infringed)

Relay output

Z-16270/1 EN

4 for AR1
5 for AR2
6 for AR3
7 for AR4

01 Closed circuit (energized if alarm value infringed)
02 Open circuit   (de-energized if alarm value infringed)
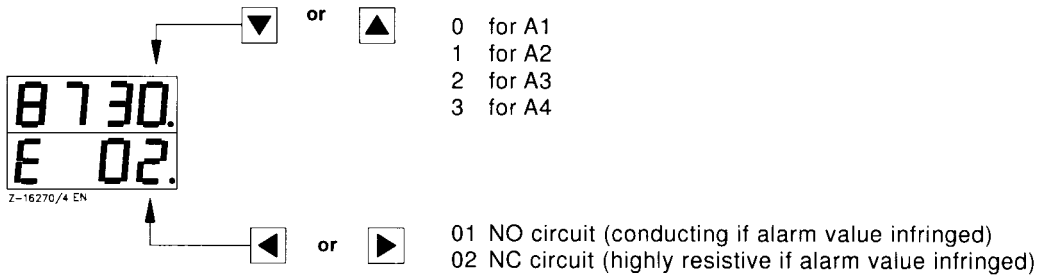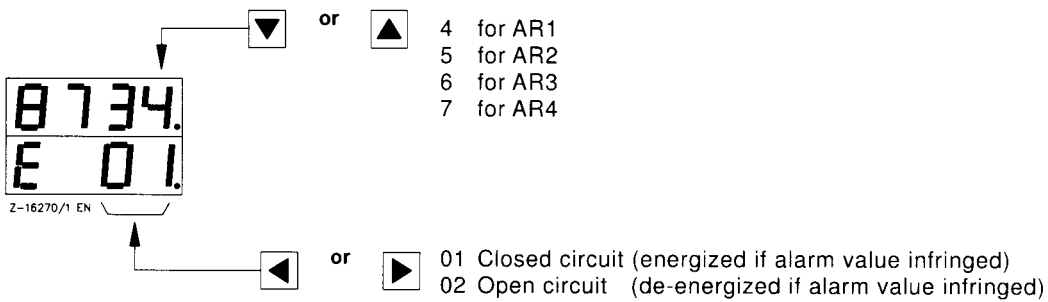
Alarm value functions

Binary/relay outputs intended for alarm signal generation or
for signalling an operating mode can be changed in the
following manner.

Z-16270/3 EN

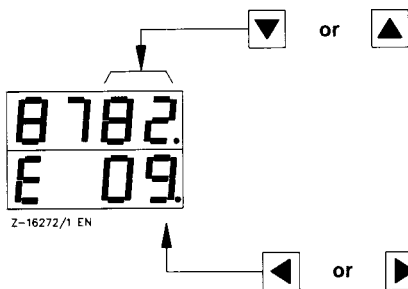0 for A1
1 for A2
2 for A3
3 for A4
4 for AR1
5 for AR2
6 for AR3
7 for AR4

18 for G1.1	20 for G1.3
19 for G2.1	21 for G2.3
1A for G3.1	22 for G3.3
1B for G4.1	23 for G4.3
1C for G1.2	24 for G1.4
1D for G2.2	25 for G2.4
1E for G3.2	26 for G3.4
1F for G4.2	27 for G4.4
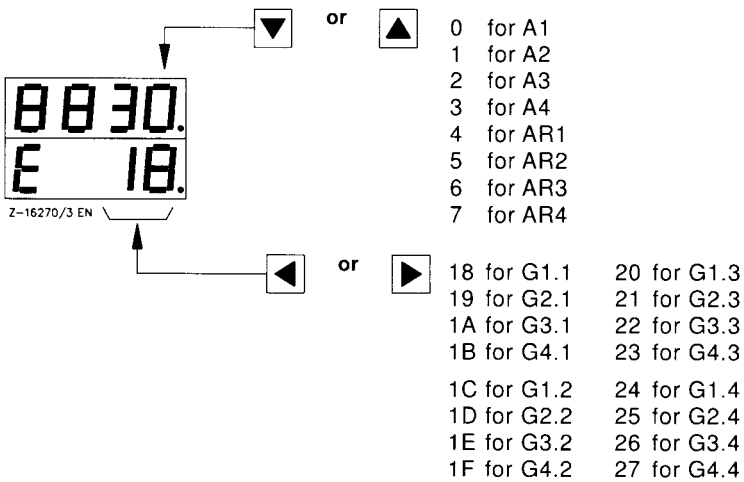
Min./max. contacts

Inversion of the function

Replace address contents

Max. [8818.] [8918.]
     [E 10.] [E 07.]

Min. [8818.] [8918.]
     [E 07.] [E 10.]

Z-16270/2
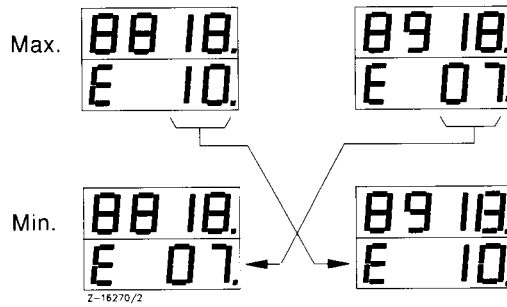
Alarm value	Address	Contents		Alarm value	Address	Contents	
		Max.	Min.			Max.	Min.
G1.1	8818H	10H	07H	G1.3	8820H	7AH	71H
	8918H	07H	10H		8920H	71H	7AH
G2.1	8819H	10H	08H	G2.3	8821H	7AH	72H
	8919H	08H	10H		8921H	72H	7AH
G3.1	881AH	11H	09H	G3.3	8822H	7BH	73H
	891AH	09H	11H		8922H	73H	7BH
G4.1	881BH	11H	0AH	G4.3	8823H	7BH	74H
	891BH	0AH	11H		8923H	74H	7BH
G1.2	881CH	45H	3CH	G1.4	8824H	AFH	A6H
	891CH	3CH	45H		8924H	A6H	AFH
G2.2	881DH	45H	3DH	G2.4	8825H	AFH	A7H
	891DH	3DH	45H		8925H	A7H	AFH
G3.2	881EH	46H	3EH	G3.4	8826H	B0H	A8H
	891EH	3EH	46H		8926H	A8H	B0H
G4.2	881FH	46H	3FH	G4.4	8827H	B0H	A9H
	891FH	3FH	46H		8927H	A9H	B0H

Indication loop

[8782.]
[E 09.]
Z-16272/1 EN

▼ or ▲   82 channel 1
          A4 channel 2
          C6 channel 3
          E8 channel 4

◄ or ►   Change the limit between small and
          extended loop.

9 = Number of value addresses
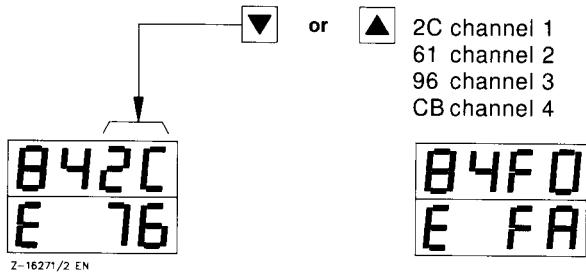   Adresses which are not displayed are also
    counted

Example:
Display only w; e; y = 4

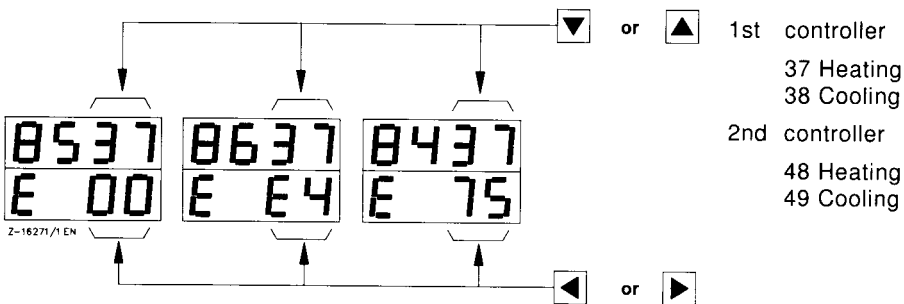Small loop   ⌐→ _; w; e; y; d; G1; G2; G3; G4 ←⌐   _ = non-indicated value is position 1

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Switching frequency of the on/off controllers Z1 and Z2
On/off controller Z1

▼ or ▲ 2C channel 1
61 channel 2
96 channel 3
CB channel 4

Z-16271/2 EN

$\dfrac{n}{min}$		
1	78H	7DH
2		3FH
3		C8H
4	77H	96H
5		78H
6		**FAH**
7		D6H
8		BCH
9		A7H
10		96H
12		7DH
15	76H	64H
20		4BH
25		3CH
30		32H
39		26H
50		1EH
60		19H

On/off controller Z2 (heating/off/cooling controller)

▼ or ▲ 1st controller

37 Heating
38 Cooling

2nd controller

48 Heating
49 Cooling

◀ or ▶

Z-16271/1 EN

				n/min.	
				84xx = 75	84xx = 74
FC		F0		7.5	30
00		**E4**		**6**	24
50		D3		5	20
80		C2		4	16
00		B2		3	12
50		A1		2	08
B0		90		1	04

Changing the modules fitted

On replacing input or output modules, the module data affixed to the module must be entered into the controller of auxiliary routine d.CtL and saved with St.PA, St.Pr. The address in each case depends on the slot provided (input 1 . . . 4/output 1/2 or 3/4).

Output modules (addresses 8980H . . . 8991H)

Example

Output module
Ref. no.: 0342852
2 x analog (0)4...20 mA

1125711971

A1 (mA)	8980	= x 1	8983	8984	–	–
A2 (mA)	8980	= 1 x	–	–	8987	8988
A1 (V)	8980	= x 2	8981	8982	–	–
A2 (V)	8980	= 2 x	–	–	8985	8986
A3 (mA)	8989	= x 1	898C	898D	–	–
A4 (mA)	8989	= 1 x	–	–	8990	8991
A3 (V)	8989	= x 2	898A	898B	–	–
A4 (V)	8989	= 2 x	–	–	898E	898F
A1 binary	8980	= x 8	81 to 84 any			
A2 binary	8980	= 8 x	85 to 88 any			
A3 binary	8989	= x 8	A8 to 8D any			
A4 binary	8989	= 8 x	8E to 91 any			
AR1...AR4	8989	= CC				

Input modules

Example

Input module
Ref. no.: 0342845
Current (0)4...20 mA

0124800000

1)

|					
Slot E1	896C	896D	896E	896F ²)	8970
Slot E2	8971	8972	8973	8974	8975
Slot E3	8976	8977	8978	8979	897A
Slot E4	897B	897C	897D	897E	897F

¹) Module code
²) Necessary only for module codes 09; 0A; 0B; 0C; 0E; 0F

Software inhibit of the auxiliary routines

Hardware inhibit see page 4, footnote 1
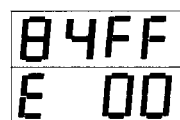
```
8 4 F F
E    0 0
```
Z-16272/2 EN

◄ or ▶   0   No inhibit
Enter through

◄ + ▶ + 1

1   Additional inhibit
Enter through

◄ + ▶ + 1   more than 12 times within 5 seconds

Exit from the auxiliary routines unchanged

◄ + ▶ + 1
Z-16272/3

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3.2 Hardware

Note

The Service Manual 43/61-251 EN contains a detailed description of all service activities.

⚠ **Caution**

The apparatus shall be disconnected from all voltage sources before it is opened for any adjustment, replacement, maintenance or repair.

Any adjustment, maintenance and repair of the opened apparatus under voltage shall be avoided as far as possible and, if inevitable, shall be carried out by a person who is aware of the hazard involved.

If it is necessary to open the instrument, first switch off the power supply at all poles. This also applies to the supply voltages which are present at the relay contacts for external consumers (e.g. contactors).

When the apparatus is connected to its supply, terminals may be live, and the opening of covers or removal of parts except those to which access can be gained by hand is likely to expose live parts.

It must be explicitly stated that non-compliance with these warning instructions means a danger to life since the plug contacts in the case conduct hazardous voltages.

3.2.1 Opening the unit

Loosen the two closing screws (14; 15 – see fig. 3.1) to open the instrument.

The slide-in unit can be pulled out with the closing screw (14) which at the same time serves as a handle.

▲ **Note**

The circuit boards contain CMOS components. When handling them safety precautions governing electronically dangerous components must be taken (ground working surface and personnel).

On assembling, make sure when fitting the slide-in unit into the case that interchanging of cases with different wiring of the output terminals is avoided under any circumstances. The vertically positioned motherboard must be placed in the guide strip in order to fit it into the spring-contact strip, pressing gently.

Then the slide-in is secured again to the case using the two closing screws.
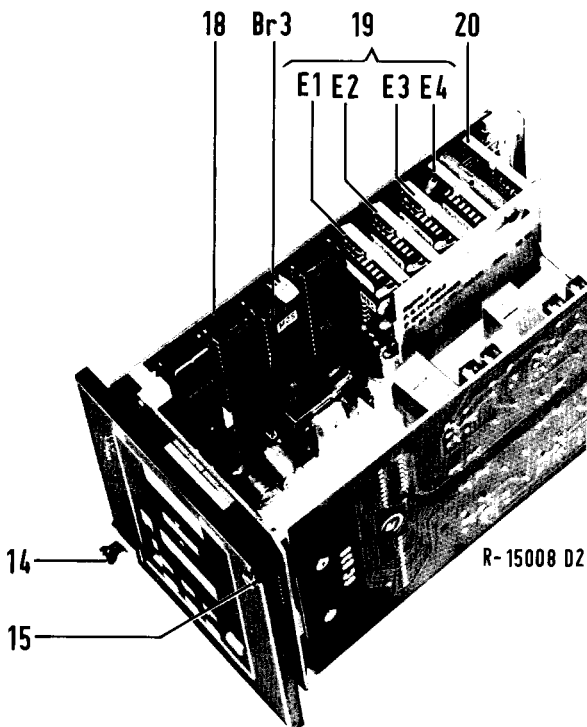
3.2.2 Setting the write protection

Br 3	⊺	without write protection
Br 3	⊺	with write protection (jumper parked on a pin)

Jumper Br 3 is situated next to the IC 17 (EPROM) terminal with socket.

Fig. 3.1 Layout of components for hardware changes

Br 3	Write protection
14	Main closing screw
15	Additional closing screw
18	Main circuit board LP1
19/E1 . . . E4	Input modules of inputs 1 . . . 4
20	Output module

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3.2.3 Thermocouple break monitoring

Note:
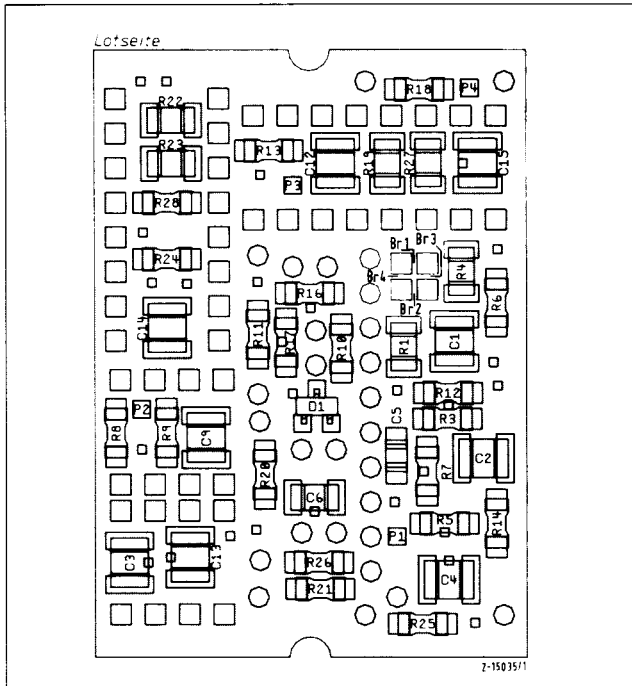
The plastic cover of the modules has been removed.

Fig. 3.2 Thermocouple input module (circuit board 19/E.)

Reaction to sensor break	Jumper position (Br)
As x > w	Br1 ■—■ ■—■ Br2
As x < w	Br4 ■ ■ Br3
Undefined (reduced source resistance influence)	■ ■ ■ ■

3.2.4 Resistance thermometer

3- and 4-wire circuit
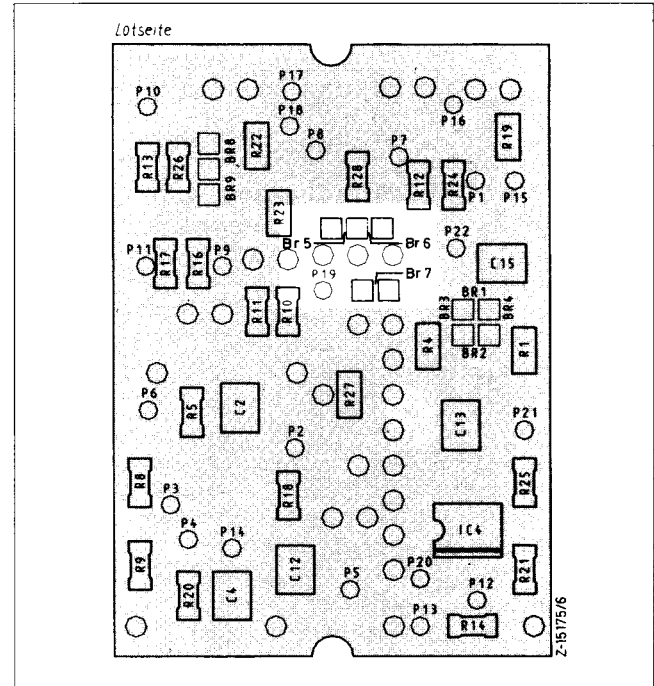
Fig. 3.3 Resistance thermometer module in 3- or 4-wire circuit (circuit board 19/E.)

Input	Jumper position (Br)
3-wire circuit (module code 2 .)	Br 5 ■ ■—■ Br 6 ■—■ Br 7
4-wire circuit (module code 3 .)	Br 5 ■—■ ■ Br 6 ■ ■ Br 7

After resoldering, change the 1st digit of the module code from 2 to 3 or vice versa, depending on whether measurements are to be performed in 3- or 4-wire circuit.

3.2.5 Resoldering the current input to a voltage input

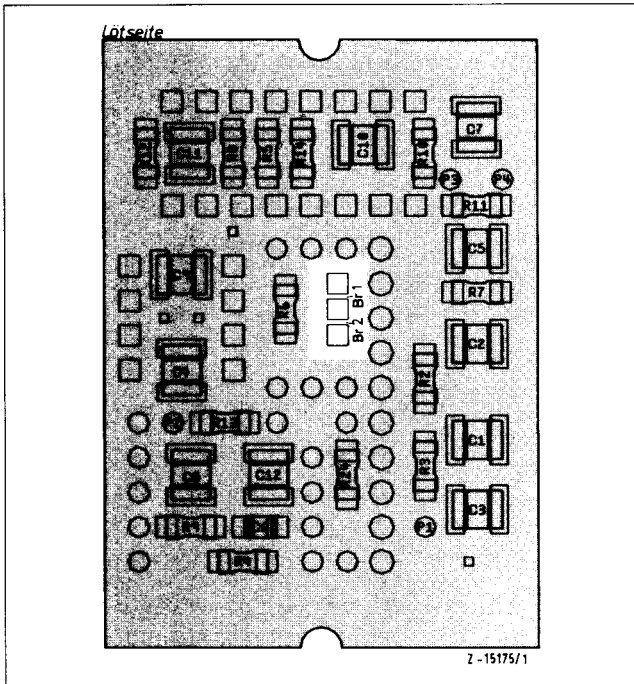The input module can be resoldered from 0 . . . 20 mA to 0 . . . 10 V.

Fig. 3.4 Input module for mA/V (circuit board 19/E.)

Input	Jumper position (Br)
Current 0 . . . 20 mA	Br 1 ▮ Br 2 ▪
Voltage 0 . . . 10 V	Br 1 ▪ Br 2 ▮

A somewhat greater deviation of the input module can be expected after resoldering.

3.2.6 Resoldering the current output to a voltage output

The output module can be resoldered from 0 . . . 20 mA to 0 . . . 10 V.
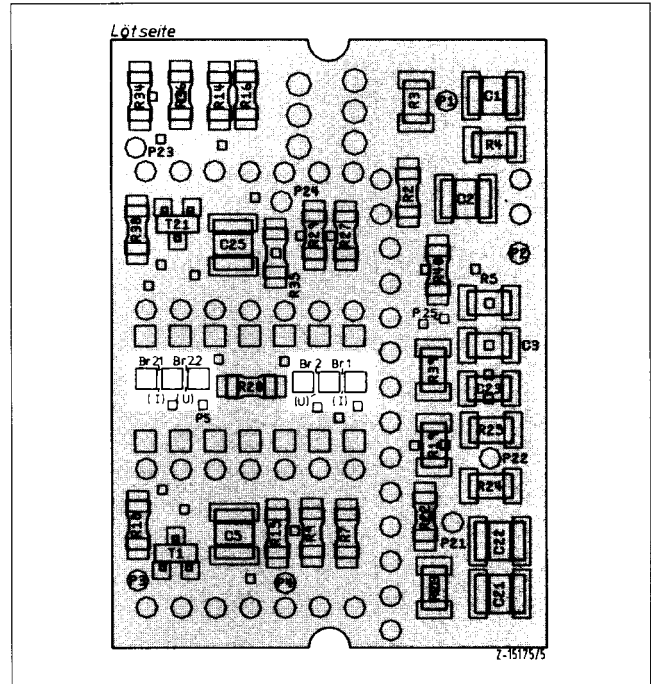
Fig. 3.5 Output module 2 x 0 . . . 20 mA or 2 x 0 . . . 10 V (circuit board 19/E.)

Output	Jumper position (Br)	
Current 0 . . . 20 mA A1 or A3	Br 2 ▪ ▪—▪	Br 1
A2 or A4	Br 21 ▪—▪ ▪	Br 22
Voltage 0 . . . 10 V A1 or A3	Br 2 ▪—▪ ▪	Br 1
A2 or A4	Br 21 ▪ ▪—▪	Br 22

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Lötseite
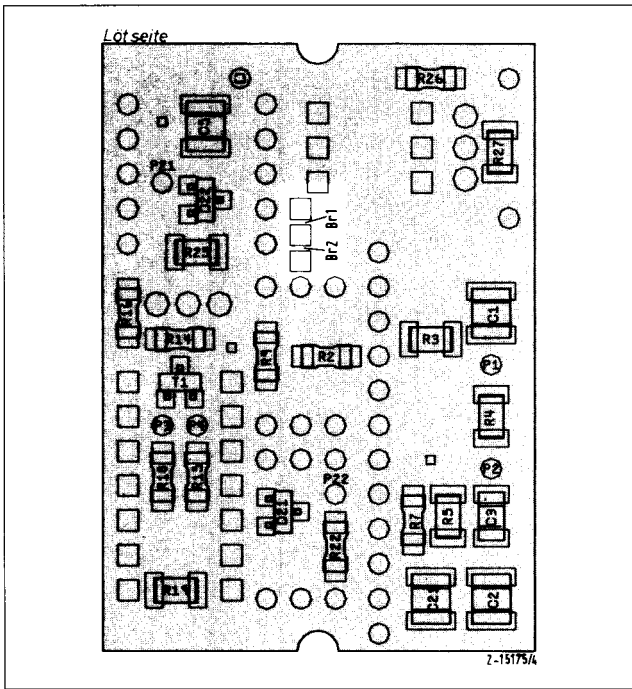
Fig. 3.6 Output module 1 x 0 . . . 20 mA or 0 . . . 10 V and 1 x binary (circuit board 19/E.)

Output A1 or A3	Jumper position (Br)	
Current 0 . . . 20 mA	Br 1	
	Br 2	
Voltage 0 . . . 10 V	Br 2	
	Br 1	

The software need not be informed about a change of module code. If however it is informed, the correction values must also be entered into the corresponding memory locations.

A somewhat greater deviation of the output module can be expected after soldering.

3.2.7 Resoldering the binary inputs for passive transmitters

Input module is standardized for active transmitters. It can be resoldered in order to be able to use passive transmitters (relay points).
Furthermore, the storage contents must be modified (see section 3.1.10).

Binary input	internal	Position of jumpers (Br)	Address
− 3 . . . + 5 V or open	0	Br 2 Br 1	89A8H
			Contents
13 . . . 30 V	1	Br 4 Br 3	FFH

Active transmitters (standard)

Binary input	internal	Position of jumpers (Br)	Address
Short circuit	0	Br 2 Br 1	89A8H
			Contents
open	1	Br 4 Br 3	00H

Passive transmitters

Lötseite

Fig. 3.7 Input module 2 x binary, plastic cover removed (circuit board 19/E.)

3.3 Replacing EPROM (IC 17) or battery

Please find detailed instructions for the replacement in Service Information
43/61-2512-. XA, Replacing EPROM (IC 17)
43/61-2513-. XA, Replacing the battery (Ba 1)

These documents are available from the manufacturer.

4 Test and diagnostic routines

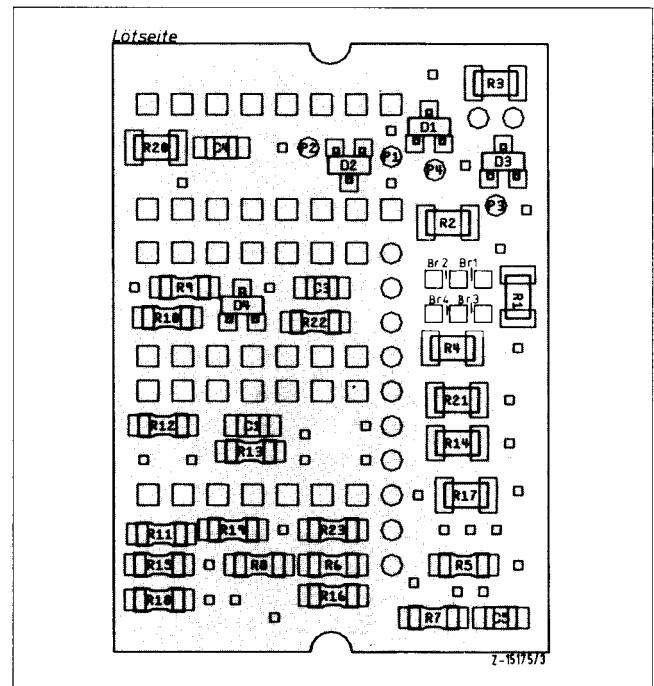The instrument features different test routines which facilitate troubleshooting in the event of a fault. The controller remains in the previously determined mode, e.g. automatic mode for the entire duration of the test run.

Z-16272/5

Illustration in display (9)		Description	Illustration in display (5)
No error	Error		
CO.nE	Er.CO	Code range 0000...0FFF	tSt 0
C7.nE	Er.C7	Code range 2000...7FFF	tSt 1
AE.nE	84E4	Compare working and editing area In the event of an error message, the first incorrect address is super-imposed alternately on display (9). Please consult the configuration instructions for its meaning. With I/E pressed, the number of differences can be shown in hexadecimal form. The error can be eliminated by copy-ing the working or editing area (see Section 3.1.6).	
			tSt 2
rA.nE	Er.rA	External RAM	tSt 3
HP.nE	Er.HP	Auxiliary processor	tSt 4
bA.nE	Er.bA	Storage battery	tSt 5
LP.nE	Er.LP	Power supply	tSt 6
	tric	Auto-manual unit test	diGi

Auto-manual unit test

The function "auto-manual unit test" permits testing of all display and operator functions on the instrument front.

A status display extinguishes each time one of the keys 1 . . . 8 is pressed.

Script wanders

Z-16272/4
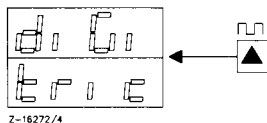
To test, it is sufficient to observe whether on actuating a key the display assigned to it extinguishes.

Display	Key
	I/E (4)
	Indication changeover key (1)
	H/A (6)
	▼ (2)
	▲ (3)
	◄ (7)
	► (8)

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5 Packing instructions

If the original packing is no longer available, the unit must be wrapped in an insulating air foil or corrugated board and packed in a sufficiently large crate lined with shock absorbing material (foamed material or similar) for the transportation.

The amount of cushioning must be adapted to the weight of the unit and to the mode of transport. The crate must be labelled "Fragile".

For overseas shipment the unit must additionally be sealed airtight in 0.2 mm thick polyethylene together with a desiccant (e.g. silica gel). The quantity of the desiccant must correspond to the packing volume and the probable duration of transportation (at least 3 month). Furthermore, for this type of shipment the crate should be lined with a double layer of kraft paper.

6 List of components

The components listed in the Data Sheet overleaf for Digitric P are available as spare parts from the service dept. of the manufacturer.

To prevent processing delays and enquires, spare parts orders must be accompanied by the following ordering information:

– Name of the object
– Catalog No.

Whenever ordering spare parts or making complaints, please state the serial and product numbers given on the rating plate.

Note:

All spare parts are handled by means of EDP; therefore ordering information (= object) in Data Sheet 61–4.90 EN, the ordering confirmation, the shipping note and the invoice are subject to the laws of automatic data processing. Verbal deviations between the designations used here and the functional component designations used in the present Operating Manual are inevitable.

The Catalog No. (B-Nr.) is the sole criterion.

Ordering information

For ordering, the Catalog No. (B-Nr.) suffices.
For additional ordering information, add the appropriate three-digit-supplementary numbers (BA-Nr.).

Catalog No.

Accessories

Holder with conical rivets (for device mounting top/bottom, 2 pcs.)	61404-4-0344060
Screw clamp	94672-4-0831600
Buffer battery (lithium) (VARTA CR 2032 SLF)	61405-4-0344057
Female tab connectors with bush (1 set of 10 pieces)	61004-4-0381527
Slip-on screw terminals (1 set of 15 terminals)	61404-4-0342910
Slip-on screw terminals (1 set of 30 terminals)	61404-4-0342911
Adapter cable with transformer TTL/RS-232C for Digitric P[1) (for connecting of a configuration PC)	61419-4-0342967
Connecting cable[2)	61419-4-0342966

Upgrading parts

Input modules (plug-in)

Input module thermocouple for measuring ranges up to 23 mV	61419-4-0344046
for measuring ranges up to 60 mV	61419-4-0344047

Input module resistance thermometer two-wire measuring circuit

measuring range −150.0...+200.0 °C	61419-4-0344048
measuring range +100.0...+450.0 °C	61419-4-0344049
measuring range −200.0...+800.0 °C	61419-4-0344050

Input module resistance thermometer three-wire measuring circuit[3)

measuring range −150.0...+200.0 °C	61419-4-0344671
measuring range +100.0...+450.0 °C	61419-4-0344672
measuring range −200.0...+800.0 °C	61419-4-0344673

Input module resistance thermometer four-wire measuring circuit[3)

measuring range −150.0...+200.0 °C	61419-4-0344238
measuring range +100.0...+450.0 °C	61419-4-0344239
measuring range −200.0...+800.0 °C	61419-4-0344240
Input module current 0(4)...20 mA	61419-4-0344051
Input module voltage 0(4)...10 V	61419-4-0344052
Input module binary (double) for active transmitters	61419-4-0344053
Input module binary (double) for passive transmitters	61416-4-0344674

Output modules (plug-in)

Output module, 2 analog outputs 0(4)...20 mA	61419-4-0344054
Output module, 2 analog outputs 0(2)...10 V	61419-4-0344058
Output module, 2 binary outputs	61419-4-0344055
Output module, 1 analog output 0(4)...20 mA + 1 binary output	61419-4-0344056
Output module, 1 analog output 0(2)...10 V + 1 binary output	61419-4-0344059
Output module, 1 analog output 0(4)... 20 mA + 1 transmitter supply	61419-4-0344246
Output module, 1 analog output 0(2)...10 V + 1 transmitter supply	61419-4-0344247

Output extensions (plug-in)
for design 96 mm x 96 mm and 72 mm x 144 mm

Output extension,
Basic version (to hold one output module see above)

for design 96 mm x 96 mm	61419-4-0344036
for design 72 mm x 144 mm	61419-4-0344669

Output extension,

Version with: 1 relay output	⎫	61419-4-0344030
2 relay outputs	⎬ for general applications	61419-4-0344031
4 relay outputs	⎭	61419-4-0344032
2 relay outputs for single-channel step controller		61419-4-0344033
4 relay outputs for two-channel step controller		61419-4-0344034
2 relay outputs for single-channel step controller + 2 relay outputs for channel applications		61419-4-0344035

[1) Connecting cable included
[2) For connecting a Digitric P to an existing recorder-/gas analysis (0740818)-/Protronic P adapter cable
[3) Retrofitting of the three- or four-wire circuits is only possible for Digitric P devices which already have a 12-pole socket connec-

tor in the input slot E2 or E4. If this is not the case, complete retrofitting by the manufacturer is recommended.
[4) Transmitter supply: open circuit voltage 19...24 V output voltage at I = 22 mA   16...22 V

Ordering information

For design 19"
19" output extension, 19" plug-in card, standard version   61419-4-0344073
(to hold one output module)

19" output extension (19" plug-in module)

Version with:		Catalog No.
1 relay output ⎫		61419-4-0344037
2 relay outputs ⎬ for general applications		61419-4-0344038
4 relay outputs ⎭		61419-4-0344039
2 relay outputs for single-channel step controller		61419-4-0344040
4 relay outputs for two-channel step controller		61419-4-0344041
2 relay outputs for single-channel step controller		
+ 2 relay outputs for general applications		61419-4-0344042
Output module, 2 analog outputs 0(4)...20 mA		61419-4-0344043
Output module, 2 binary outputs		61419-4-0344044
Output module, 1 analog output 0(4)...20 mA		
+ 1 binary output		61419-4-0344045

Option:
with blade connector "design F" (instead of "design C/D")   Suppl. No. 304

Accessories for configuration 19"

19" standard connection	for configuration C	61419-4-0344236
	for configuration F	61419-4-0344237
	Pre-assembled wiring PCB with two	
	spring contact strips, configuration C or F for	
	simplification of basic wiring between the 19"	
	plug-in card and the 19" output extension card	

Spare parts

Motherboards
without operator and display panels, with calibration data,
with EPROM, with accompanying battery, without module

for design 48 mm x 96 mm; 96 mm x 96 mm

nominal voltage range	220 V AC	61404-4-0344179
	115 V AC	61404-4-0344180
	24 V UC	61404-4-0344181

for design 19" plug-in card

nominal voltage range	220 V AC	61404-4-0344182
	115 V AC	61404-4-0344183
	24 V UC	61404-4-0344184

for design 72 mm x 144 mm

nominal voltage range	220 V AC	61404-4-0344198
	115 V AC	61404-4-0344199
	24 V UC	61404-4-0344200

Indicator module

48 mm x 96 mm	61404-4-0344185
96 mm x 96 mm	61404-4-0344186
96 mm x 96 mm (EMC)	61404-4-0344187
96 mm x 96 mm (IP 54)	61404-4-0344666
96 mm x 96 mm (IP 54 + EMC)	61404-4-0344667
72 mm x 144 mm	61404-4-0344188
72 mm x 144 mm (EMC)	61404-4-0344189
19" plug-in card	61404-4-0344190

EPROM (IC 17) (with firmware)   61405-4-0344065
blank (without firmware)   94682-4-0853875

Case (mounted)

design 48 mm x 96 mm	61404-4-0344066
96 mm x 96 mm	61404-4-0344067
96 mm x 96 mm (EMC)	61404-4-0344191
72 mm x 144 mm	61404-4-0344192
72 mm x 144 mm (EMC)	61404-4-0344193

Ordering information

Front protective foil, printed
for type 48 mm x 96 mm resp. 19" plug-in card,

front colour	pebble grey	61404-4-0344131
	black	61404-4-0344132

for type 96 mm x 96 mm

front colour	pebble grey	61404-4-0344133
	black	61404-4-0344134

front colour	pebble grey, IP 54	61404-4-0344668
	black, IP 54	61404-4-0344670

for type 72 mm x 144 mm

front colour	pebble grey	61404-4-0344135
	black	61404-4-0344136

Interface cover
for configuration 96 mm x 96 mm, front IP 54
with front colour pebble grey or black
5 covers, black   61404-4-0801802

for all other configurations with front colour pebble grey
comprising: 5 covers, grey
                5 cover plates, transparent
                5 sheets bearing labels, white   61404-4-0344137

Front colour black
comprising: 5 covers, black
                5 cover plates, transparent
                5 sheets bearing labels, white   61404-4-0344138

Tags
for configuration 72 mm x 144 mm
for top/bottom, neutral colour pebble grey
packed in bag of 10   61405-4-0344139

for configuration 96 mm x 96 mm, IP 54
2 sheets of 11 each, packed in bag   61405-4-0344665

Parts for output extension

|	
Relay with one-pole change-over switch for general applications	61405-4-0342979
Relay with 2-pole NO contact for step controller	61405-4-0342980
Spark quencher 0.022 μF/100 Ω for general applications	94682-4-0741115
Spark quencher 0.047 μF/100 Ω for step controller	94682-4-0873712

Other spare parts on request.

Appendix

Readings in the top display line

The following readings, sorted alphabetically can appear in the top display line.
Their meaning is given briefly in the table and they are assigned to the relevant routine.

Top display line (5)	Function	Auxiliary routine	Page
...	PID switched off	PId	5
..d	Only D action	PId	5
..di	Part of the word Digitric	tSt–	29
.diG	Part of the word Digitric	tSt–	29
.I.	Only I action	PId	5
.Id	Only ID action	PId	5
1.H2H	Relay 1 high, relay 2 high	Out	13
1.H2L	Relay 1 high, relay 2 low	Out	13
20 °C	Value of the external reference junction	T.reF	12
8888	Numerical sequence	USr, d.CtL	11, 18
–.88	Numerical sequence	d.CtL	18
b. t	Input type B not linearized	InP	10,11
b. u	Input type B variable range	InP	10,11
b. c	Input type B standard range	InP	10,11
b.in	Binary input	InP	10,11
bA.nr	Suppl. No. = Controller function	rc.Pr	14
bAud	Baud rate	bAud	16
bin.	Binary output	Out	13
bn.1	Tolerance band with self-parameter definition	S.tune	6
C.Adr	Instrument address	C.Adr	16
c.dir	Characteristic rising (normal)	PId	5
c.inu	Characteristic falling (reverse)	PId	5
CLr– (1 ... 4)	Clear, reset non-return pointers 1 ... 4	CLr–	17
Co.AE	Call editing area	Co.AE	16
Co.EA	Call working area	Co. EA	16
d.CtL	Monitor	d.CtL	18
d.St.P	Stabilization phase	S.tun	6
d1Ed	Differential adjustment = 1; Xw; + and –	PId	5
d1En	Differential adjustment = 1; Xw; –	PId	5
d1EP	Differential adjustment = 1; Xw; +	PId	5
d1rd	Differential adjustment = 1; X; + and –	PId	5
d1rn	Differential adjustment = 1; X; –	PId	5
d1rP	Differential adjustment = 1; X; +	PId	5
d4Ed	Differential adjustment = 4; X; + and –	PId	5
d4En	Differential adjustment = 4; Xw; –	PId	5
d4EP	Differential adjustment = 4; Xw; +	PId	5
d4rd	Differential adjustment = 4; X; + and –	PId	5
d4rn	Differential adjustment = 4; X; –	PId	5
d4rP	Differential adjustment = 4; X; +	PId	5
diGi	Part of the word Digitric	tSt–	29
dISP	Displays	dISP	4
dY.1	Control jump	S.tun	6
Er.nA	Not accepted	St.PA; St.Pr	13, 15
Er.St	Error message	S.tun	9
Et. c	Special curve standard range	InP	10, 11
Et. u	Special curve variable range	InP	10, 11
Et. t	Special curve not used	InP	10, 11
FP.1	Parameter factor	S.tun	6
FrE.d	Memory area still free	St.Pr	15
Gitr	Part of the word Digitric	tSt–	29
HI	Binary output active (high)	Out	13
HOLd	Stop of the instrument function	HOLd	17
I. L	Current input live zero 0 ...	InP	10, 11
I. d	Current input dead zero 4 ...	InP	10, 11
I. L.c	Current input standard range	InP	10, 11
I. d.c	Current input standard range	InP	10, 11
I. d.c	Current input standard range	InP	10, 11
I. u	Current input variable range	InP	10, 11
ic..	Part of the word Digitric	tSt–	29
iGit	Part of the word Digitric	tSt–	29

Top display line (5)	Function	Auxiliary routine	Page
InF–	Information	InF–	–
InF0	Software status EPROM (IC 17)	InF–	–
InF1	Software status processor	InF–	–
InF2	Software status auxiliary processor	InF–	–
InF3	Cycles per second	InF–	–
InH.1	Max. alarm value input 1	S.tun	6
InL.1	Min. alarm value input 1	S.tun	6
InP.	Input definition	InP.	10
int	Internal reference junction	t.reF	12
itri	Part of the word Digitric	tSt–	29
J. t	Type J not linearized	InP	10, 11
J. c	Type J standard range	InP·	10, 11
J. u	Type J variable range	InP	10, 11
K. c	Type K standard range	InP	10, 11
K. t	Type K not linearized	InP	10, 11
K. u	Type K variable range	InP	10, 11
L. u	Type L variable range	InP	10, 11
L. t	Type L not linearized	InP	10, 11
L. c	Type L standard range	InP	10, 11
LEn.d	Number of bytes required	St.Pr	15
Ln. c	Linear standard range	InP	10, 11
Ln. u	Variable linear range	InP	10, 11
LO	Binary output low	Out	13
n.1	Number of parameter definition runs	S.tun	6
no.Fl	No user file saved	rc.Pr	14
nor	Normal	nor	4
Out	Definition of the outputs	Out	13
P..	Only P action	Pld	5
P.d	PD action	Pld	5
PbH.1	Max. limit Xp	S.tun	6
PbL.1	Min. limit Xp	S.tun	6
PI	PI action	Pld	5
PID	PID action	Pld	5
Pt2.c	Pt 100 2-wire standard range	InP	10, 11
Pt2.t	Pt 100 2-wire non-linear	InP	10, 11
Pt2.u	Pt 100 2-wire variable range	InP	10, 11
Pt4.c	Pt 100 4-wire standard range	InP	10, 11
Pt4.t	Pt 100 4-wire non-linear	InP	10, 11
Pt4.u	Pt 100 4-wire variable range	InP	10, 11
r. 3.0	Line resistance = 3 Ω	r.LtG	12
r.LtG	Line balancing Pt 100 2-wire	r.LtG	12
rc.PA	Recall parameter	rc.PA	13
rc.Pr	Call configuration (program)	rc.Pr	14
rEL	Relay output	Out	13
ric.	Part of the word Digitric	tSt–	29
S. t	Type S non-linear	InP	10, 11
S. u	Type S variable range	InP	10, 11
S. c	Type S standard range	InP	10, 11
S.tun	Start self-parameter definition	S.tun	6
St.Ab	Stabilization	S.tun	6
St.PA	Store parameter	St.PA	13
St.Pr	Store program (configuration)	St.Pr	15
t– –t	Time range	Pld	2.2
t.rEF	Temperature of the external reference junction	t.rEF	12
tAb	Table function	tAb–	17
tdH.1	Max. limit Td	S.tun	6
tdL.1	Min. limit Td	S.tun	6
tnH.1	Max. limit Tn	S.tun	6
tnL.1	Min. limit Tn	S.tun	6
tr.1	Scanning time	S.tun	6
tric	Part of the word Digitric	tSt–	29
tSt–	Test routine	tSt–	29
U. d	Voltage input dead zero 0 . . .	InP	10, 11
U. L	Voltage input live zero 2 . . .	InP	10, 11
U.FIL	User file (configuration)	rc.Pr	
USr.	User range	USr	11
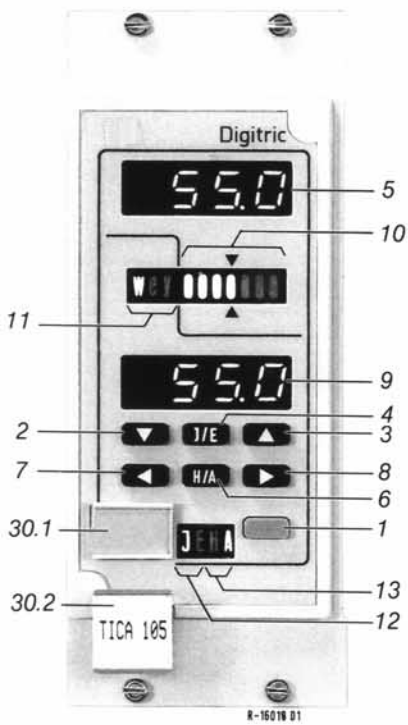
19" plug-in card
(same front view as format 48 mm x 96 mm)
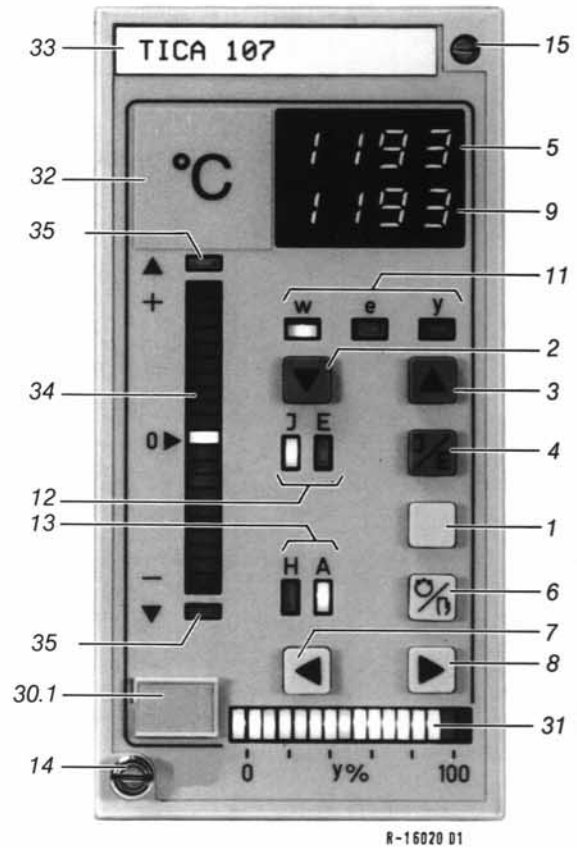
Format 72 mm x 144 mm

Format 96 mm x 96 mm

1	Indication changeover key (designated as 1 in text)
2	Universal setting key "lower" (designated as ▼ in text)
3	Universal setting key "raise" (designated as ▲ in text)
4	Set point changeover (designated as I/E key in text)
5	Top display line (controlled variable, variable names, fault message)
6	Manual/automatic changeover (designated as H/A key in text)
7	Manual setting key "lower" (designated as ◄ in text)
8	Manual setting key "raise" (designated as ► in text)
9	Bottom display line (variable values, channel display)
10	Analog display for control deviation, controller output, switching status
11	Display of the main variables to (9)
12	Status display set point internal/external
13	Status display set point manual/automatic
14	Closing screw and slide-in handle
15	Additional closing screw
30.1	Cover for configuration jack/designation plate
30.2	Designation plate (only with 19" plug-in card)
31	Output display/switching status
32	Adhesive label for specification of the unit of measurement
33	Inscription field

only with format 72 mm x 144 mm:

34	Control deviation display
35	Light emitting diodes for control deviation for more than ± 10 %

Subject to technical changes.

ABB