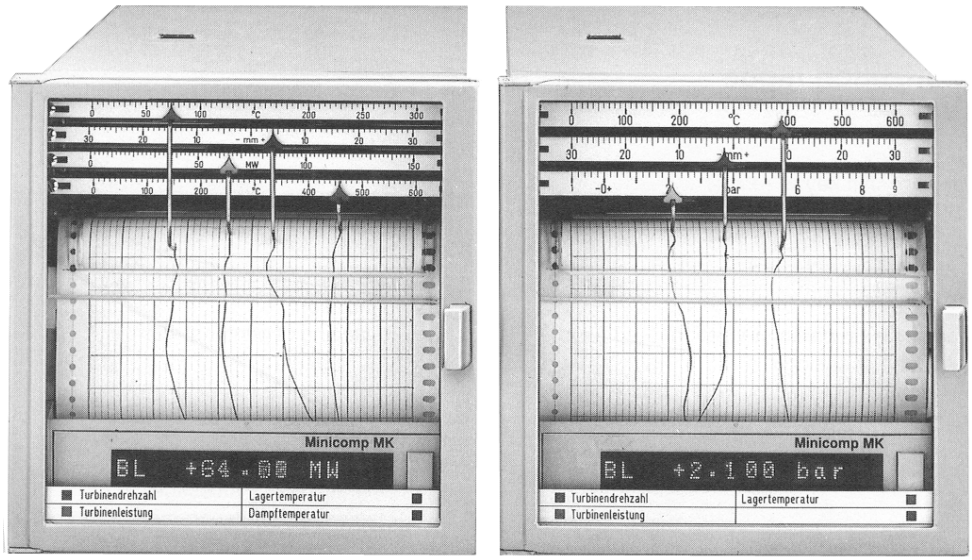
Operating instructions

42/43-20 EN

Minicomp MK

Continuous-line recorder with 1...4 measuring channels



Contents

Depiction of the reference symbols in the text

< Key > Inscription of the keys on the keyboard

Reading Non-flashing readings in the display

Reading Flashing readings in the display

The indications "right", "left" or "top", "bottom" imply that the viewer is looking at the front panel of the instrument unless stated otherwise.

Complementary publication

"Instructions for parameter setting" 42/43-21-1 EN

Important Instructions for Your Safety. Please read and observe.

Correct and safe operation of the continuous-line recorder Minicomp MK calls for appropriate transportation and storage, expert installation and commissioning as well as correct operation and meticulous maintenance.

Only those persons conversant with the installation, commissioning, operation and maintenance of similar apparatuses and who possess the necessary qualifications are allowed to work on the apparatus.

Please take note of
- the contents of this Operating Manual,
- the safety regulations affixed to the Minicomp MK and
- the safety regulations pertaining to the installation and operation of electrical systems.

The directives, norms and guidelines mentioned in this Operating Manual are applicable in the Federal Republic of Germany. When using the Minicomp MK in other countries, please observe the national regulations prevailing in the respective country.

The Minicomp MK has been designed and tested in accordance with DIN/VDE 0411 Part 1/IEC 348 "Safety requirements for electronic measuring apparatuses", and has been supplied in a safe condition. In order to retain this condition and to ensure safe operation, the safety instructions in this Operating Manual bearing the headline "Caution" must be observed. Otherwise, persons can be endangered and the Minicomp MK itself as well as other equipment and facilities can be damaged.

If the information in this Operating Manual should prove to be insufficient in any point, the Hartmann & Braun Service Department will be delighted to give you more information.

Application and short description

The Minicomp MK is a microprocessor-controlled continuous-line recorder with 1 . . . 4 measuring channels or 1 . . . 3 measuring channels with an additional printer channel.

The recorder is connected to transmitters and sensing elements such as thermocouples or resistance thermometers.Standard temperature sensor curves are stored in the recorder firmware and linearized with high precision.

The recorder is geared to the measuring task by programming the software via an internal operator keyboard field or the interface RS 232C and RS 485.

Installation and commissioning

Scope of delivery

The continuous-line recorder comes with the following accessory parts:

2 mounting brackets B
1 fibre pen F for each measuring channel
1 print unit D (optional)
1 roll chart S

The appropriate number of screw-plug terminals K as well as one Zener diode combination and reading rules per measuring system will depend on the order.

1. Selecting the mounting location

Mounting orientation	Lateral -30°...0...+30° Inclination backwards 20°, forwards 20°
Ambient temperature	0...50 °C
Relative humidity	≦ 75 % annual average Max. 85 %
Condensation	To be avoided

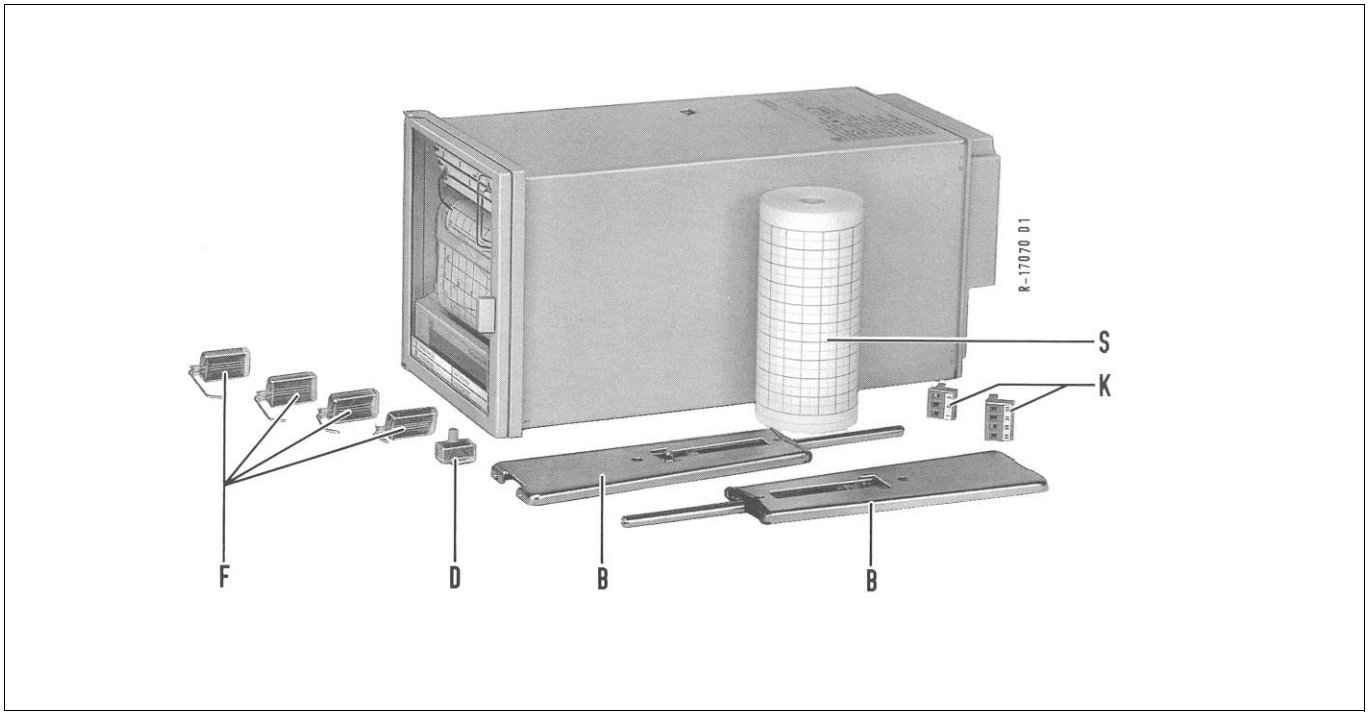


Fig. 1 Minicomp MK with accessory parts
B Mounting brackets
D Print unit (optional)
F Fibre pens
K Screw-plug terminals
S Roll chart

2. Mounting

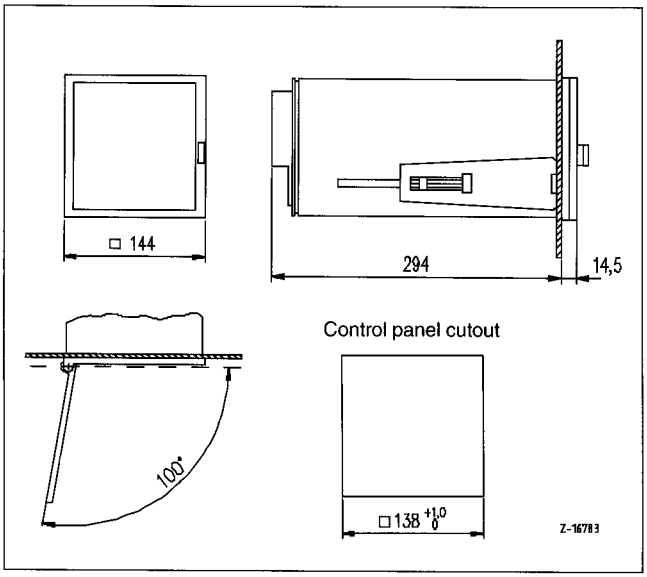


Fig. 2 Dimensional drawing of Minicomp MK (dimensions in mm)

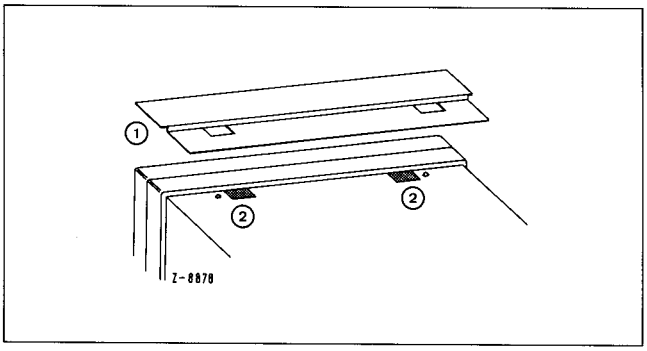


Fig. 3 Mounting the dust guard
① Dust guard
② Double-sided adhesive tape as mounting aid

The Minicomp MK is suited for mounting in control panels and grid systems.

Mounting in control panels

1. Fit the instrument into the control panel from the front.
2. Hang the mounting brackets in the cutouts of the case.

   When mounting instruments in a close horizontal arrangement, hang the mounting brackets in the upper and lower cutouts.
3. Align the mounting brackets vertically and tighten them equally.

Mounting in a grid system

1. Fasten 4 centering brackets (Catalogue No. 92204-4-0457301) to the grid.
2. Hang the mounting brackets in the cutouts of the case.
3. Align the mounting brackets vertically and tighten them equally.

Note
When the instruments are densely packed, do not exceed the permitted ambient temperature (0...50 °C).

Use 2 dust guards when Minicomp MK is installed in a particularly dusty environment. The dust guards (on the upper and the lower side of the case) prevent dust from falling inside the instrument when the door is opened.

Mounting the dust guard
1. Affix double-sided scotch tape on the upper side of the case (see Fig. 3).
2. Fix the dust guard.

3. Connecting

⚠ Caution

Before all other connections are made the protective conductor terminal must be connected to a protective conductor.

The apparatus can be dangerous if the protective conductor is interrupted inside or outside the apparatus or if the protective-conductor terminal is disconnected.

This apparatus may only be operated when properly installed.

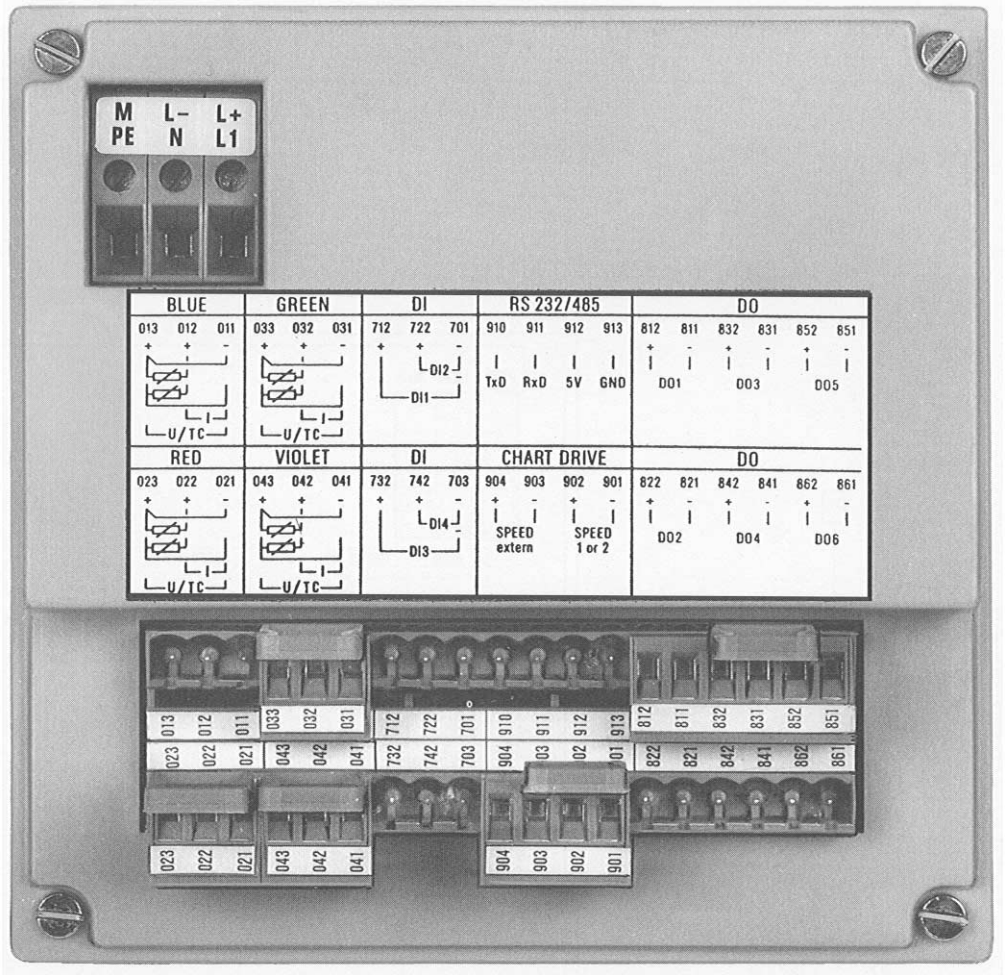


Fig. 4 Back panel with screw-plug terminals

Signal connection

- Fasten wire (max. cross section 2 x 1 mm²) at the screw-plug terminals.

⚠ Caution

Install a Zener diode combination for each circuit at the terminals for current measuring points as protection against interruption of the measuring circuit. Zener diode combination (for Ordering no. see Data Sheet 42-4.15 EN) is part of the scope of delivery of recorder accessory parts.

No Zener diode combination should be installed for input variables voltage or resistance.

Mains connection

- Fasten wire (max. cross section 2 x 1 mm²) at the screw-plug terminals. The cross section of the protective conductor must at least be equal to the cross section of the power supply line.

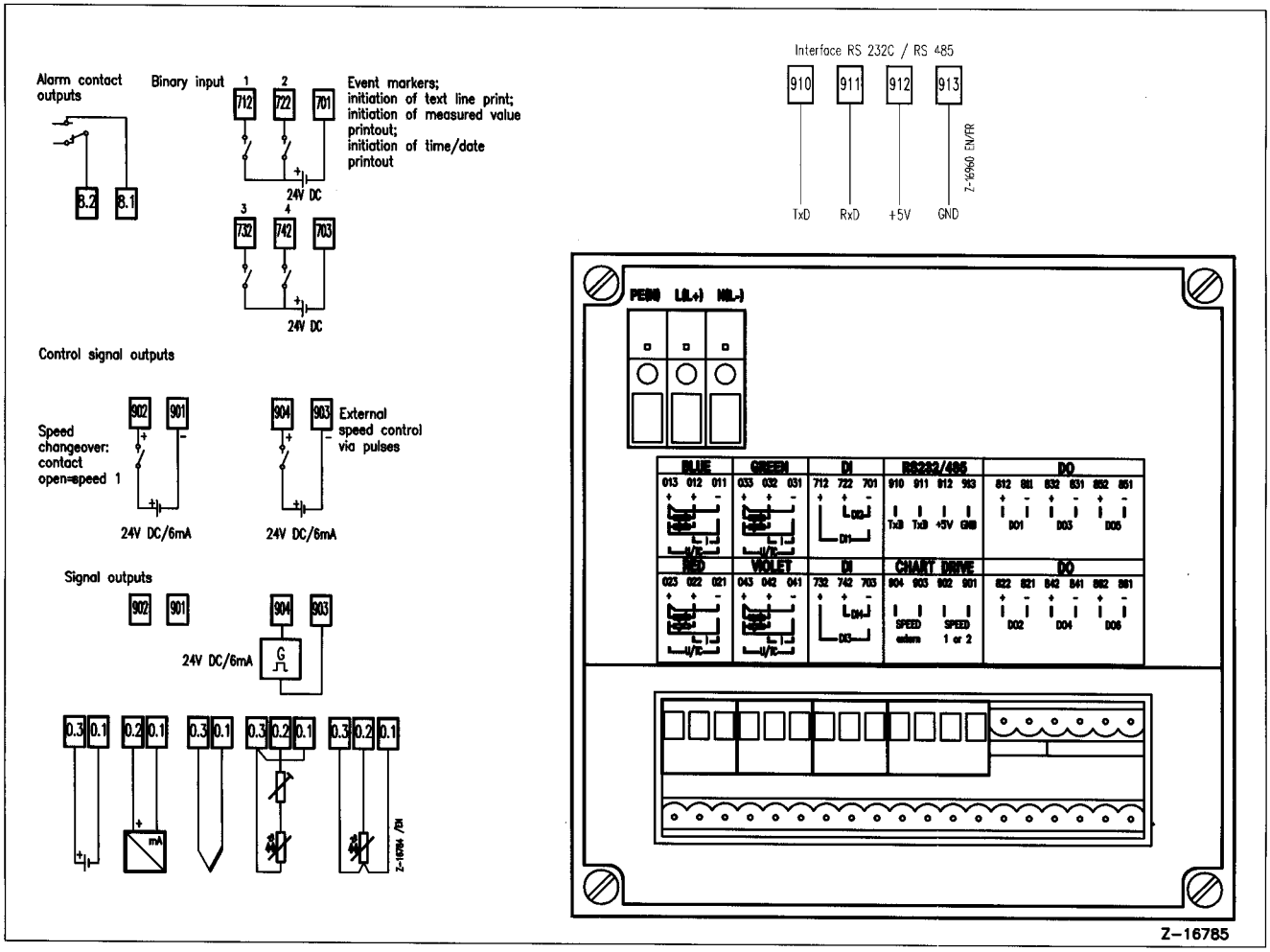


Fig. 5 Back panel with connection diagrams

4. Opening the case door

1. Push handle slightly to the right.
2. Pull open the case door.

5. Fitting the roll chart

(see Figs. 6...10)

1. Unlock slide-in unit.

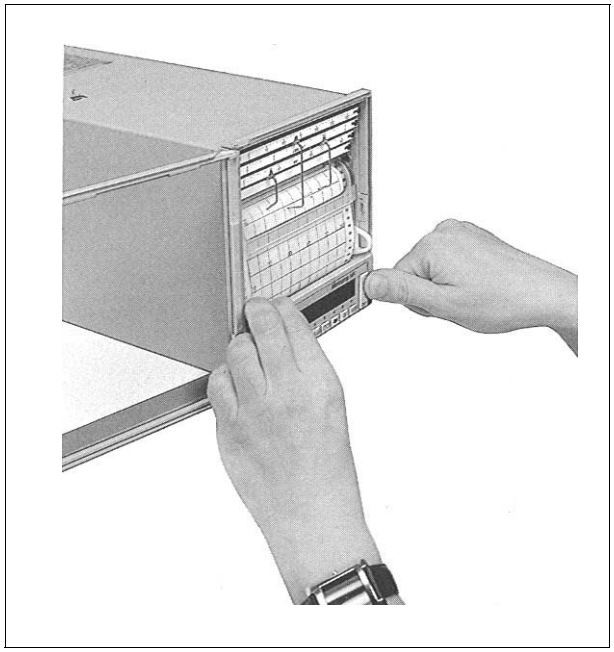


Fig. 6

2. Pull out slide-in unit.

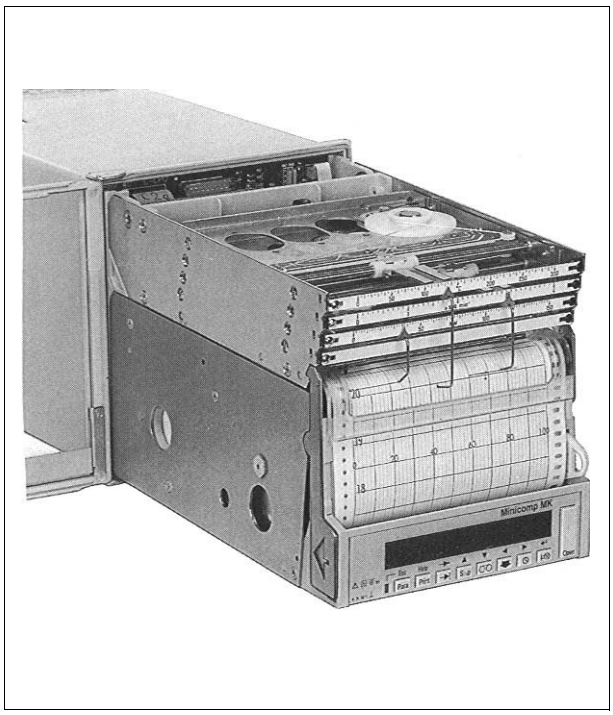


Fig. 7

3. Unlock measuring system carrier.

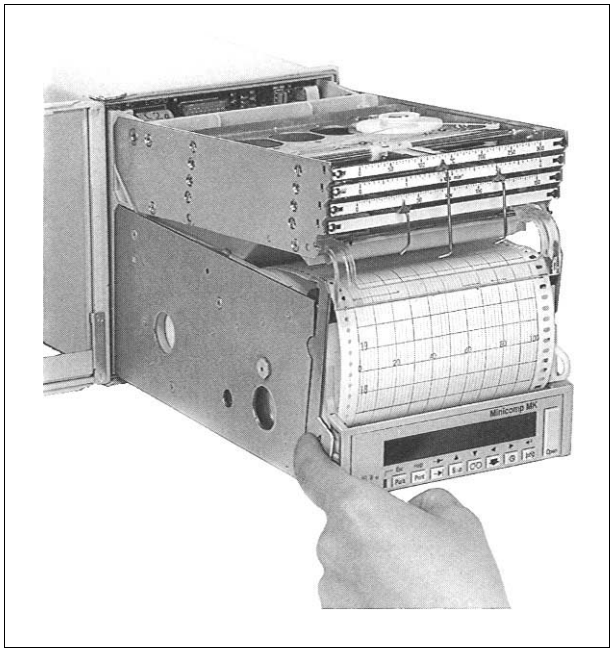


Fig. 8

4. Fold up measuring system carrier to the stop.

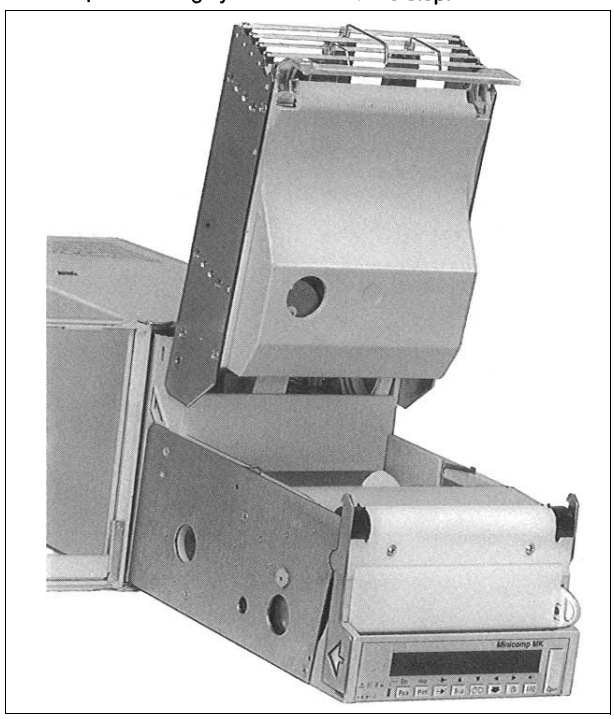


Fig. 9

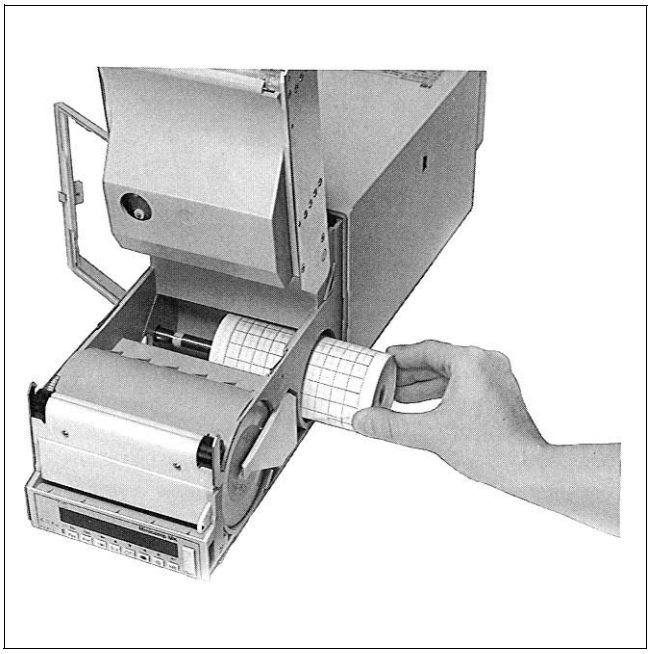


Fig. 10

5. Insert roll chart by the side (see Fig. 10).

6. Pull the beginning of the paper forwards to the sprocket wheel and engage the perforation with the sprockets.

7. Fold down measuring system carrier.

8. Push slide-in unit back into the instrument.

6. Switching on the instrument

Please provide for a mains connection switch with sufficient switching capacity near the mounting location which separates the instrument on all poles from the power system. This switch shall not override the protective effect of the PE conductor.

7. Fitting the fibre pen

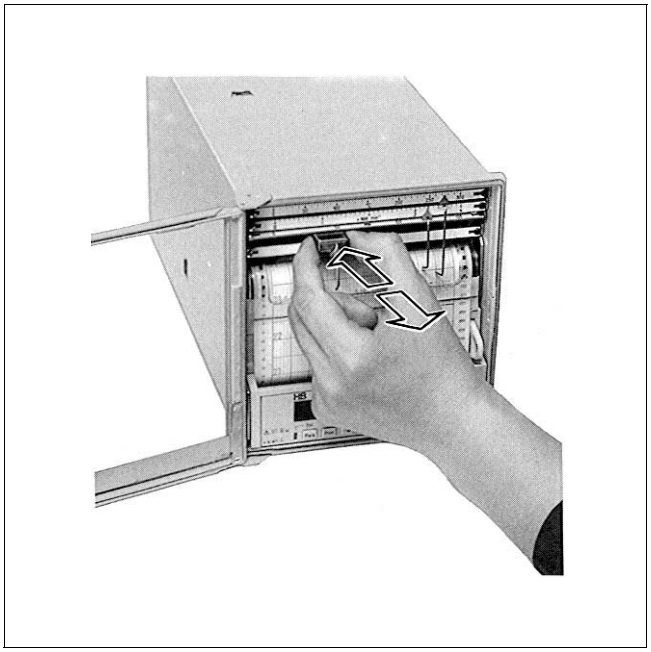


Fig. 11 Fibre pen
⇳ fitting
⇳ removal

1. Push <Stop> and keep depressed for more than 2 s.
   The measuring systems move into parking position (only possible if the stop button function has been enabled in the parameter setting).

2. Fold up scale.

3. Fit the fibre pen into the chart carriage (see Fig. 11).

8. Fitting the print unit

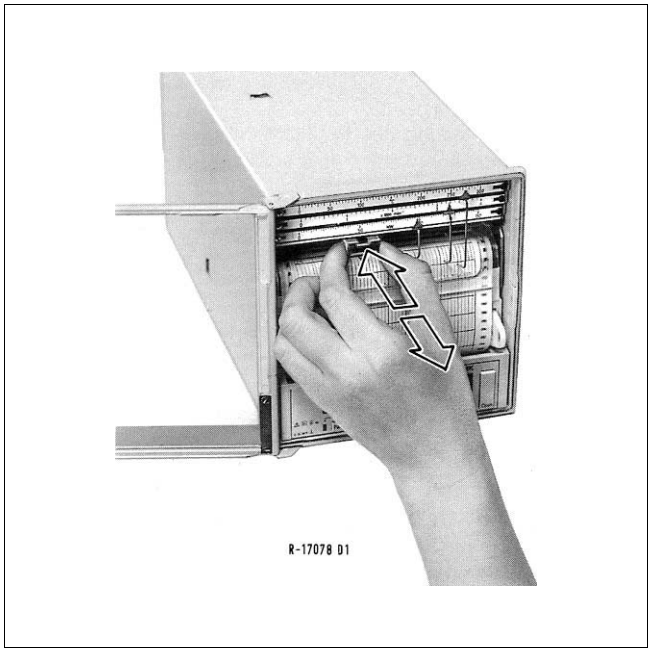


Fig. 12 Print unit
⇳ fitting
⇳ removal

1. Push <Stop> and keep depressed for more than 2 s.
   The measuring systems move into parking position (only possible if the stop button function has been enabled in the parameter setting).

2. Fold up scale.

3. Fit the print unit into the chart carriage (see Fig. 12).

9. Setting the start of recording

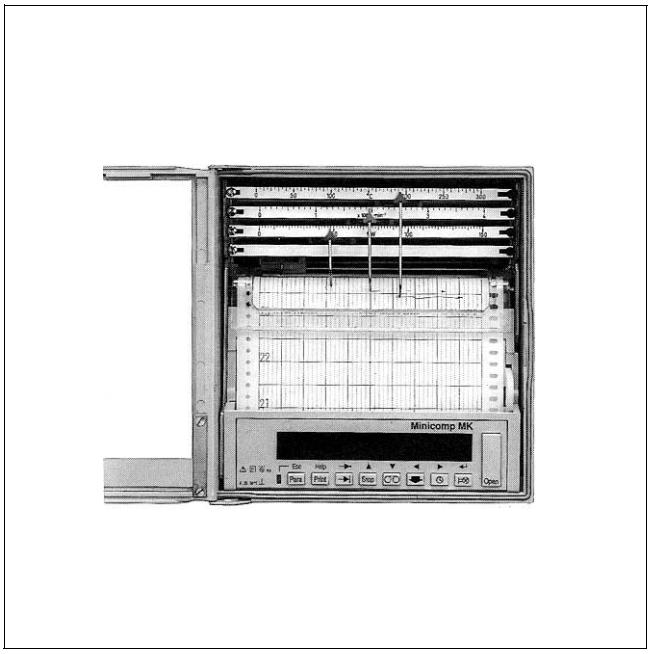


Fig. 13 Setting the start of recording

Push <⇳> and release when the correct time line under the fibre pen or print unit has been set.

Operation

Changing the chart speed

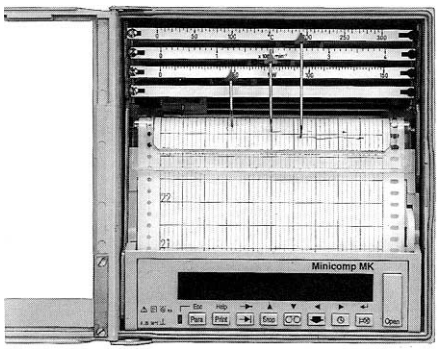


Fig. 14 Changing the chart speed

The standard setting for the chart speed is 20 mm/h. In the parameter setting mode chart speed can be changed as follows:

1. Push <Para>. "System" is displayed if no password has been defined.

Note
In the parameter setting mode the red LED next to <Para> lights up.

2. Push <↵>. "Chart speed 1" is displayed.

3. Push <↵>. Chart speed value "0000" flashes.

4. Push <▲> or <▼>. Select desired chart speed 1.

Selectable chart speed values
0 (Off) / 2.5 mm/h / 5 mm/h / 10 mm/h / 20 mm/h / 30 mm/h
40 mm/h / 60 mm/h / 120 mm/h / 240 mm/h / 300 mm/h / 600 mm/h
1200 mm/h / 1800 mm/h / 3600 mm/h / 7200 mm/h.

5. Acknowledge selected chart speed 1 with <↵>.

6. Push <Esc>. "System" is displayed.

7. Push <Esc>. "Param. End ?" is displayed.

8. Push <↵>. "Save Data ?" is displayed.

9. Push <↵>. The selected chart speed is stored in the EEPROM and is now active.

If the recorder features the option "limit values and binary inputs", 2 chart speeds can be defined in the parameter setting mode (standard setting: speed 1 = 20 mm/h; speed 2 = 120 mm/h). Both speeds can be changed externally. Additionally it is possible to switch off chart speed externally.

Making past behaviour visible

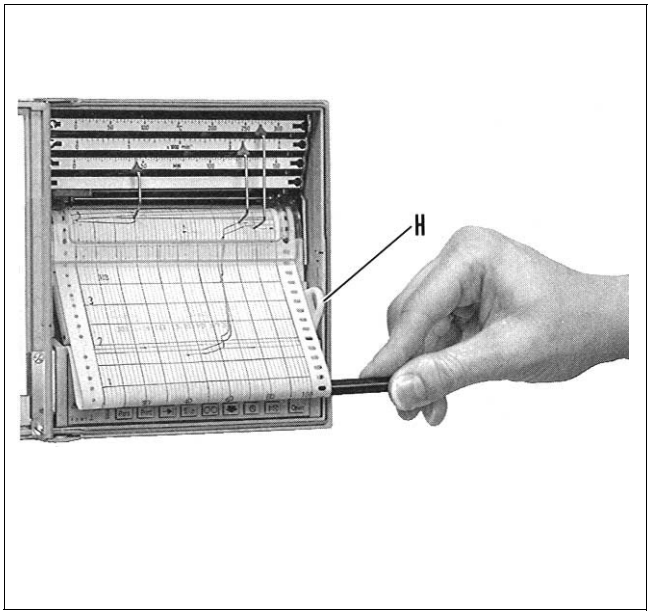


Fig. 15 Making past behaviour visible

1. Push <σ>. "Winding stop" is displayed.
2. Turn up lever H at the right side of the slide-in unit.
3. Pull out the chart paper towards the front.
4. Turn down lever H.

   Note
   Lever must lock.
5. Push <σ> once more. The chart paper is wound up automatically.

Taking out the chart paper

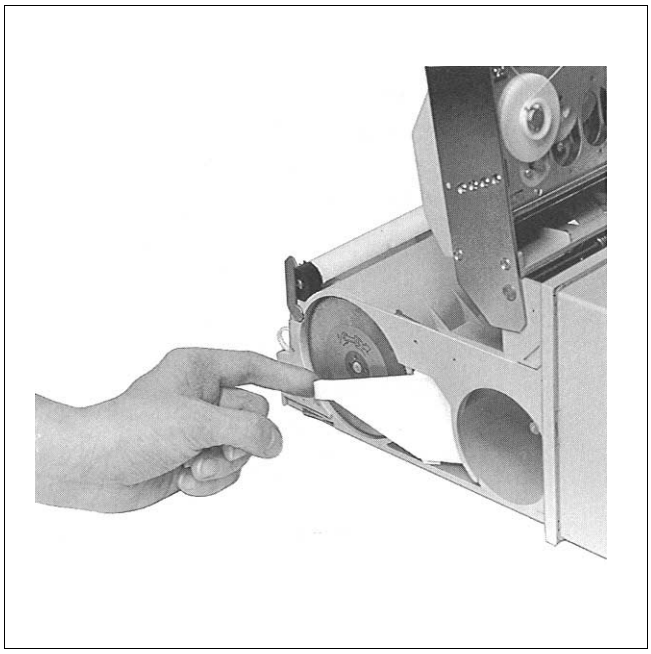


Fig. 16 Folding away roll chart holder

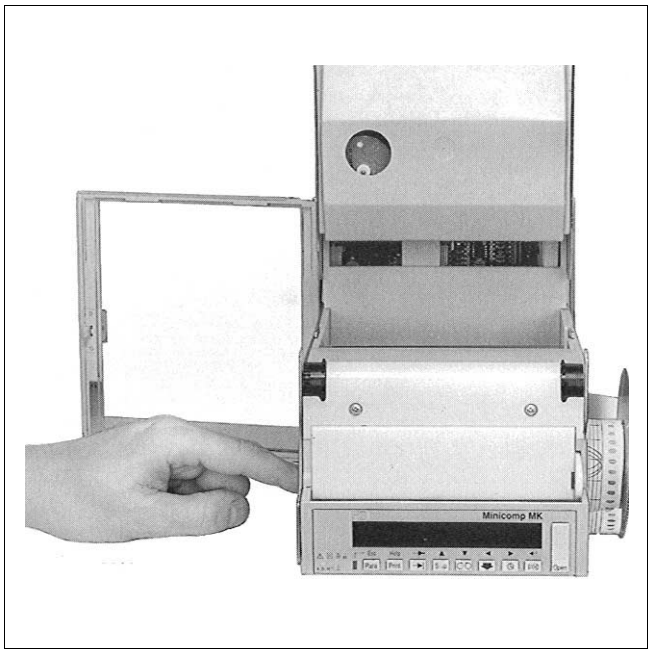


Fig. 17 Removing take-up reel

1. Unlock slide-in unit and pull towards the front (see Figs. 6 and 7).
2. Unlock measuring system carrier and fold up to the stop (see Figs. 8 and 9).
3. Fold away roll chart holder to the stop (see Fig. 16).
4. Remove take-up reel with chart paper (see Fig. 17).
5. Pull off flange without handling instructions.
6. Remove chart paper.
7. Put on flange which has previously been pulled off.
8. Fit take-up reel.
9. Close roll chart holder.
10. Replace new roll chart (see Fig. 10).
11. Pull the beginning of the paper forwards to the sprocket wheel and engage the perforation with the sprockets.
12. Fold down measuring system carrier.
13. Push slide-in unit back into case.

Signalling end of chart paper

Replace roll chart (see Section 5) and enter the length of the roll chart.

1. Push <I=o>.

2. Push < Para>. Parameter "L" is displayed. Parameter value flashes.

3. Enter the length of the roll chart in m with the following keys:
   <▶> or <◀> and
   <▲> or <▼>. Observe the negative paper tolerance!

The remaining paper length is written into an EEPROM in intervals depending on the chart speed.

Indication of the remaining paper length
Push <I=o>. The remaining paper length is displayed. Additionally, the time remaining until the replacement of the paper is displayed, according to the active paper chart speed.

In the parameter setting mode, the assignment of paper end signalling to contact output is made in the main menu "System" under "Parameter Pap.End.DO". Paper end signalling is output 2 hours before the end of paper is reached, according to the chart speed.

Parameter setting

Parameter setting for Minicomp MK is made via an operator keyboard in the recorder or with a PC via interface RS 232C/RS485. The parameter setting for the recorder via this interface can be operated with the programme PARALINE MK (see Data Sheet 42-4.15 EN).

If access to parameter setting level is inhibited by password, parameter values can only be read.

Push <Para>. "Password?" is displayed. Parameter value "0000" flashes.

Enter password 9999 with the keys
<▶> or <◀> and
<▲> or <▼>.

Main menu points and parameters are selected. The parameter values are displayed.

Conversion

Exchanging scales

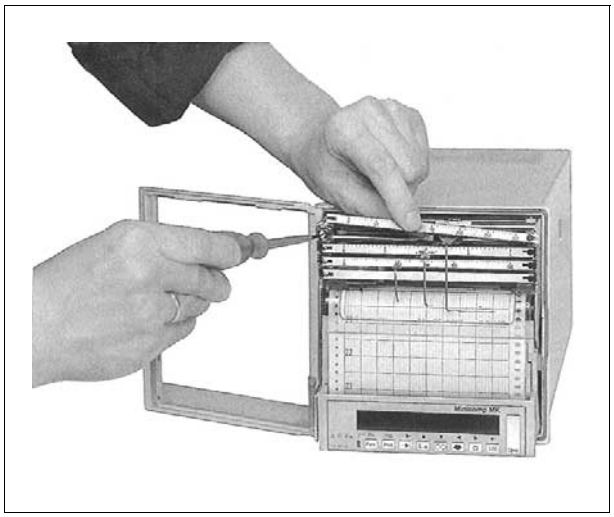


Fig. 18 Exchanging scales

1. Remove fibre pen (see Fig. 11).

2. Pull slide-in unit towards the front.

3. Untighten the scale screws on the left.

4. Push scales to the right and disengage from scale screw.

5. Remove scales by pulling them to the left.

6. Reinstall scales in reverse order.

7. Set measuring system to zero.
   Push <Para>. "System" is displayed.
   Push <▼>. "Service" is displayed.
   Push <↵>. "Channel blue" is displayed.
   Push <▲>. Select desired channel.
   Push <↵>. "Paper I← x x x x" is displayed.
   Push <↵>. Pointer goes to zero. "x x x x" flashes.
   Check for coincidence of electrical zero and paper zero. If alignment is necessary, push <▶> until the pen nib is within the recording range. Push <◀> and make the zero alignment.

8. Align the scale with the pointer. Tighten the scale screws.

9. Change over the parameter setting mode.
   Push <↵>, <Esc>. "Channel blue (red, green, violet)" is displayed.
   Push <Esc>. "Service" is displayed.
   Push <Esc>. "Param. End" is displayed.
   Push <↵>. "Save Data ?" is displayed.
   Push <↵>. Recorder is changed over to operating mode.

Exchanging the measuring point designation plate

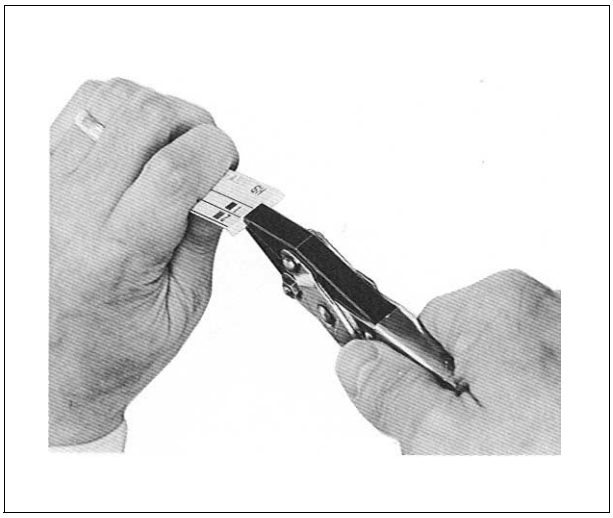


Fig. 19 Shortening the measuring point designation plate

Moulded door
Just pull out the flexible measuring point designation plate.

Metal frame door
1. Remove screws of one holder.
2. Remove measuring point designation plate.

3. Shorten the new measuring point designation plate at the predetermined breaking point (see Fig. 19) and replace into the holder.

4. Tighten screw of the holder.

Maintenance

Replacing the fuse

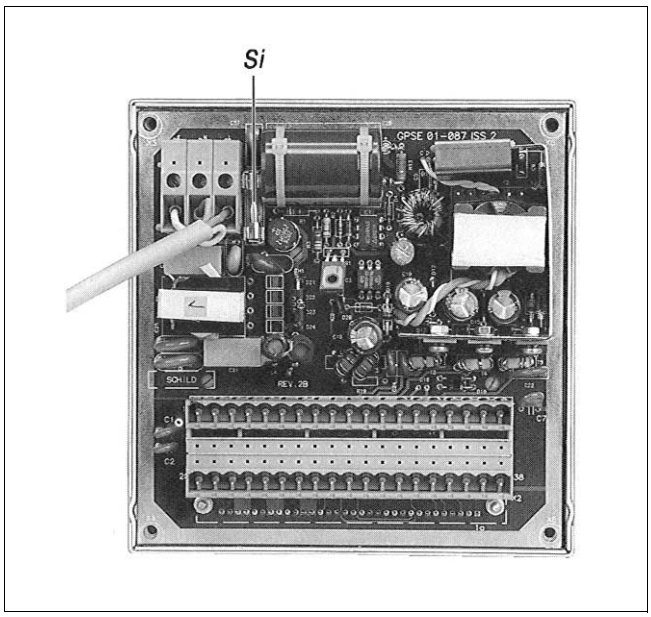


Fig. 20 Replacing the fuse *Si*

⚠ Caution

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 hands is likely to expose live parts. Connecting points may also be live.

Only fuses of the specified type and rated current may be used as replacements. Makeshift fuses must not be used. The fuse-holder may not be short-circuited.

1. Remove the screw-plug terminals.

2. Remove the back panel of the instrument.

3. Replace fuse *Si* (see Fig. 10).

4. Screw tight the back panel of the instrument.

5. Refit the screw-plug terminals.

Fuse values
230 V T 1.6 A
24 V T 3.15 A

Technical data

Measuring section

Measuring deviation
Class 0,5 for measuring channels to IEC 484 referred to the nominal range.
Class 1 for measured value recording with printer system to IEC 484 referred to the nominal range.
Additionally

$$\pm\left(0.1\ \%\ \frac{\text{Nominal range}}{\text{Span}} - 0.1\right)$$

± 0,1% of span with linearization
± 2 K with internal reference point correction.

Dead zone
0.25 % of the span

Response time
1 s

Attenuation of measured value
with 1st order low-pass filter; time constant 0...60 s per measuring channel, parameters can be set

Measured quantity/nominal ranges

Standard version

Direct current
0...20 mA R_i = 50 Ω
4...20 mA R_i = 50 Ω

Direct voltage
0...10 V R_i > 1 MΩ

General-purpose version

Direct current

0...20 mA	R_i = 50 Ω
4...20 mA	R_i = 50 Ω
– 2.5...+2.5 mA	R_i = 50 Ω
– 5...+5 mA	R_i = 50 Ω
–20...+20 mA	R_i = 50 Ω

Direct voltage

0...25 mV	R_i > 200 MΩ
–25...+25 mV	R_i > 200 MΩ
–100...+100 mV	R_i > 200 MΩ
0...2.5 V	R_i > 200 kΩ
–2.5...+2.5 V	R_i > 200 kΩ
0...10 V	R_i > 200 kΩ
–20...+20 V	R_i > 200 kΩ

Thermocouples $R_i \geqq 200$ MΩ

Type B	0...+1820 °C
Type E	–270...+1000 °C
Type J	–210...+1200 °C
Type K	–270...+1372 °C
Type L	–200...+ 900 °C
Type N	–270...+1300 °C
Type R	– 50...+1769 °C
Type S	– 50...+1769 °C
Type T	–270...+ 400 °C
Type U	–200...+ 600 °C

Reference point internal or external
Monitoring of sensor breakage can be set as a parameter

Resistance thermometer
Pt 100 with 2- or 3-wire circuitry
–200...+850 °C; –50...+150 °C

Line resistance max. with
2-wire circuitry 40 Ω
3-wire circuitry 80 Ω

Measuring ranges

Lower range
0...80 % of each nominal range
can be set as a parameter

Measuring scope
from 20...100 % of each nominal range
can be set as a parameter

Root extracting function in direct current and direct voltage nominal ranges
can be set as a parameter

Linearization of user-specific curves in direct current and direct voltage nominal ranges
can be set as a parameter

Effects

of temperature
≦ 0.2 % / 10 K
additionally < 0.1 % / 10 K with thermocouple connection

of supply voltage
≦ 0.1 % at 24 V ± 25 %
≦ 0.1 % at 220 V ± 20 %
≦ 0.2 % at other voltages

of AC interface voltages
≦ 0.5 % of the span

external magnetic field 2 mT
≦ 0.5 % of the span

of mechanical stress
during and after the effect ± 0.5 % of the span

Recording section

Scale

one interval per measuring system
scale plate width/type height
Minicomp MK 4 .5 mm/2 mm
Minicomp MK 3 .7.5 mm/3 mm
Minicomp MK 2 . 13.4 mm/5 mm

Operator keyboard and display

Display
16-digit dot matrix display, numeral height 3 mm x 5 mm. In the operating mode the display shows the measured values of the measuring channels, message texts, limit value infringements etc. In the parameter setting mode it displays the entered data.

Operation
8 keys with 2-level definition
First level for operation
Second level for parameter setting

Recording

Arrangement of measuring systems and color assignment:
Model with 1...4 measuring channels

				No.of measuring channels			
Minicomp	MK 4.	MK.3	MK2.	1	2	3	4
green						x	x
red					x	x	x
blue				x	x	x	x
violet							x

Model with 1..3 measuring channels and measuring/printer channel

				No.of measuring channels		
Minicomp	MK 4.D	MK 3.D	MK 2.D	1	2	3
green						x
red					x	x
blue				x	x	x
violet				Printer channel		

1. Trend recording
   Fiber pen with ink reservoir. Content approx. 1.4 ml, length of line approx. 1300 m. Distance between fiber pen tips 2 mm.
2. Printing
   A printer/measuring channel for text printing can be fitted at the place of the lower measuring channel. Distance between blue fiber pen and print head 6 mm.

   Additionally to text printing, the printer/measuring channel can record a measured value. Measured value recording is made in form of a dot line with equidistant dot intervals. Ink reservoir for print head approx. 150.000 dots.

Text print for:

1. Eight text lines with 32 characters each.
   Each text line is completed by time of day of day print. Triggering cyclical, in parameterizable time intervals or event-controlled by internal limit values or external stimulation (binary inputs).
2. Printout of chart speed, date and time
   Triggering by switching on the recorder and at chart speed changeover.
3. Printout of time and date
   Triggering cyclical, in parameterizable time intervals or event-controlled by external stimulation.
4. Printout of the current measured values
   Triggering cyclical, in parameterizable time intervals or event-controlled by internal/external stimulation.
5. Listing of double lines attributed to measuring points
   First line: scaling line with channel identification and printout of unit of measurement.
   Second line: specific text for measuring point with 32 characters max.
6. Printout of balancing tables with:
   Comment line
   Beginning and ending of balancing interval
   Min/max. values during balancing interval
   Average and summation value for balancing interval
   Triggering: cyclical and external
7. Printout of 4 message blocks
   Text lines, time/date line and measured value line can be combined in message blocks. Triggering is event-controlled. Fixed assignment of message block 1 to binary input 1 etc.
8. Lists of all active parameters
   Triggering manually in the parameter setting mode.

Text print
only possible with chart speeds ≦ 300 mm/h

Type height
1.5 mm x 2 mm

Chart speed
2 chart speeds can be set as parameters from 0...7200 mm/h, external changeover and switch-off; limit values + binary inputs option required.
or external control by pulses of 0...80 Hz
(24 V DC/6 mA; limit values + binary inputs option required).

Roll chart
64 m roll chart

Visible diagram length
65 mm

Recording width
100 mm (chart width 120 mm, DIN 16 230)

Chart feed-in
by automatic rewinding device (daily diagram summary or rewinding of the 64 m is possible).

Power supply

24 V AC/DC ± 20 % or 110...230 V AC,
+ 10 %/–15 %

Frequency range
47.5...63 Hz.

Power consumption
in maximum configuration approx. 18 W, 30 VA

Standards adhered to

International standards

IEC 484	Potentiometric recorders
IEC 348	Electrical safety (Test voltages)
IEC 664	Overvoltage category, pollution
IEC 68-2-6	Mechanical stress (Vibrations)
IEC 68-2-27	Mechanical stress (shock)
IEC 529	Degree of protection IP
IEC 801	Immunity to electromagnetic interference
IEC 654	Power supply failure
EN 55 011	Interference suppression
EN 61 010	Safety requirements for open-loop and closed-loop control units
IEC 721-3-3	Climatic environmental conditions

B) German standards

DIN 43 802	Scales
DIN 16 234	Chart paper
DIN 43 831	Case
DIN 46 834	Instrument mounting
DIN VDE 0551-1	Transformers and isolating transformers
DIN VDE 0100-410	Protection against dangerous shock currents
DIN VDE 0106-101	Basic requirements for protective separation

Original equipment

1 Operating Instructions
2 Mounting brackets DIN 43 834/11.82
1 Roll chart
1 Fiber pen for each measuring channel
1 Print unit (for recorder with printer)

Basic parameter setting

If no individual parameter setting is specified when ordering a recorder, the Minicomp MK will be delivered with the following parameter setting:

All measuring channels with measuring range 0...20 mA.
Response time of all measuring systems = 1 s.
Chart speed 1 = 20 mm/h.
Chart speed 2 = 120 mm/h.
Limit values = 0. Range expansion facility, printer and limit value function are switched off.
No password is defined.
These parameter presettings can be initialized in the service mode of the recorder at any time.

General and safety data

Climatic capabilities

Climatic class
3K3 to DIN IEC 721-3-3

Ambient temperature
0...25...50 °C

Transport and storage temperature
– 40...+70 °C

Relative humidity
≦ 75 % annual average
max. relative humidity ≦ 85 %
Observe effect of humidity on chart paper acc. to DIN 16 234.

Mechanical stress

Test
to DIN IEC 68-2-27
to DIN IEC 68-2-6

During transport
Shock 30g / 18 ms
Vibration 2g /± 0.15 mm / 5...150 Hz

In operation
Vibration 0.5 g / ± 0.04 mm / 5...150 Hz / 3 x 2 cycles

Electrical safety

Test to IEC 348

Class of protection
I

Overvoltage category
III

Degree of contamination to IEC 664
2

Test voltage
4.0 kV channels to energy supply
1.5 kV protective conductor to energy supply
0.5 kV measuring channel to measuring channel

Functional extra low voltage with protective separation between power supply input - measuring channels,control lines, interface lines to VDE 0100 part 410 and VDE 0106 part 101

Electromagnetic compatibility

The safety requirements stated in the EMC directive 89/336/EEC concerning interference suppression to EN 55 011 and immunity to interference to prEN 50 082-2 are fulfilled.

Interference suppression
Limit value class B to EN 55 011 or
Federal German Postal Regulation 243/92

Immunity to interference
Test to IEC 801/EN 60 801

Type of test	Severity of test	Effect	Degree of severity
ESD (1/30 ns) HF field 25 MHz...1 GHz [1]	 6 kV 10 V/m	 ≦ 1 % ≦ 1 %	 3 3
Burst (5/50 ns) on power supply line measuring line	 2 kV 1 kV	 ≦ 1 % ≦ 1 %	 3 3
Surge (1.2/50 ms on power supply line common differential	 2 kV 1 kV	 ≦ 1 % ≦ 1 %	 3 2
1 MHz-pulse on power supply line common differential	 2 kV 1 kV	 ≦ 1 % ≦ 1 %	 3 3

Industrial standard to NAMUR is fulfilled.
(interface lines shielded)

Admissible interference voltage

Adm. Interference voltage	Standard version	Universal version
Series-mode parasitic interference peak - peak	≦ 0,3 x span max. 3 V	≦ 20 x span max. 3 V
Series-mode rejection	35 dB	72 dB
Common-mode interference voltage	60 V DC/24 V AC	60 V DC/42 V AC
Common-mode rejection	75 dB	121 dB

[1] Test frequency differs from NAMUR

Options

Real-time clock
Functional endurance in case of power supply failure
Standard: 5 days with capacitor
Optional: 4 years with lithium battery (Ordering No. 629).

Option Limit Values and Binary Inputs

The following functions are possible:

Limit value monitoring
2 limit values per channel for absolute value monitoring
1 limit value per channel for gradient monitoring
6 internal relays can be freely assigned to the limit values
Output: floating contact
Contact rating: $U_{max} = 30$ V
$I_{max} = 100$ mA
$P_{max} = 3$ W; cos φ =1

External chart speed switchover
Speed 1 and 2 (terminals 901-902) can be switched over and speed can be switched off (terminals 903-904).
Control voltage: 24 V DC / 6 mA external

External chart speed control
Speed is controlled by pulses (24 V DC / 6 mA)
Pulse frequency: 0...80 Hz
Signal element length: 0.025 mm; 0.05 mm; 0.1 mm; 0.2 mm

Event marking
only in version with measuring/printer channel. 4 flags possible.
Recording: at recording width 2 %, 5 %, 95 %, 98 %
Control voltage: 24 V DC / 6 mA external

Measured value storage
The measuring systems can be hold on the last measured value, control via freely selectable binary inputs.
Control voltage: 24 V DC/6 mA external

Standby function
Standby function is activated via a freely selectable binary input. Control voltage: 24 V DC / 6 mA external.

Balancing
Balancing is possible for each measuring channel. External control of the balancing interval is via a freely selectable binary input.
Control voltage: 24 V DC/ 6 mA external.

End of chart paper signalling
For chart speeds ≧ 120 mm/h, 2 hours before end of chart paper. For chart speeds >120 mm/h, at least 8 hours before the end of chart paper. Signalling is made via a freely assignable relay contact. Output: floating contact. When changing the roll chart enter the length of roll chart in the recorder.

Option Interface RS 232C/RS 485

It is possible to switch over from interface RS 232 to RS 485 in the instrument. Data protocol of the interface follows the Profi-standard.

Connection, case and mounting

Connections

Screw-plug terminals for measuring inputs, control input and output and interface.
Max. cross-section for wire 2 x 1 mm^2

Screw-plug terminals for mains connection
Max. cross section of wires 1 x 4 mm^2 or 2 x 1.5 mm^2

Degree of protection
IP 20

Case and mounting

Case
Sheet metal for mounting in control panel or mosaic grid framework (Dimensions see figure 2)

Degree of protection of case to IEC 529
Front panel with door: IP 54
Back panel: IP 20
Terminals: IP 20

Colour of case
Pebble grey to RAL 7032

Case door
Metal frame with mineral glass or moulded material

Mounting of case
with 2 mounting brackets (optionally for control panel or rack) to DIN 43 834/11.82,
for rack centering 4 brackets required,
(Ordering no. 92204-4-0457301).

Mounting orientation
Lateral –30°...0...+30°
Inclination backwards 20°, forwards 20°

Mounting distance
Horizontally or vertically 0 mm,
case door must open at a 100° angle

Weight
Approx. 5 kg

Packing

If the original packing is no longer available, the continuous-line recorder Minicomp MK 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). The thickness of the cushioning should be in accordance with the weight of the instrument and the method of dispatch. Mark the crate "Fragile Article".

For overseas shipment the instruments must additionally be sealed airtight in 0.2 mm thick polyethylene together with a desiccant (e.g. silica gel). The quantity of the desiccant shall be in accordance with the packing volume and the envisaged transportation duration (min. 3 month). Furthermore, the crate should be lined with a double layer of kraft paper.

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