

LINAX 4000H

14086B
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Contents

	Page
1 Installation and startup	3
1.1 Scope of delivery	3
1.2 Mounting site	3
1.3 Installation	3
1.4 Connection	4
1.5 Opening the door of the case	6
1.6 Loading the roll chart	6
1.7 Switching the recorder on	6
1.8 Installing the fiber pen insert	6
1.9 Installing the print insert	7
1.10 Positioning the starting point of the recording	7
2 Operation	8
2.1 Changing the chart speed	8
2.2 Access to previous recordings	8
2.3 Removing the recording chart	8
2.4 End-of-paper signalling	9
3 Parameterizing	9
4 Reconfiguration	10
4.1 Replacing scales	10
4.2 Replacing the label for the measuring points	10
5 Maintenance	11
5.1 Fuse replacement	11
6 Technical data	12
7 Packing	15

Important information for your safety! It must absolutely be read and followed!

A condition of correct and safe operation of the continuous-line recorder LINAX 4000H is that it is transported and stored in a suitable manner, competently installed and started as well as correctly operated and carefully serviced.

Only those persons must work on the recorder who are familiar with installation, startup, operation and servicing of comparable equipment and who have the qualification required for their work.

The contents of these operating instructions and the safety notes affixed to the unit are to be observed.

The regulations, standards and directives mentioned in these operating instructions are for the Federal Republic of Germany. When using the recorder in other countries, relevant national rules must be followed.

The recorder is constructed and tested according to DIN EN 61 010-1 "Safety requirements for electronic measuring instruments", it left the factory in safe and proper condition. To maintain this condition and to ensure safe operation, the safety notes in these operating instructions with the heading "Caution" must be followed. Otherwise, persons could be endangered and the unit itself as well as other equipment and facilities could be damaged.

If the information contained in these operating instructions should not be sufficient in certain cases, the GOSSEN-METRAWATT Service will be glad to provide further information.

Reference symbols in the text

<Key>	Designation of the keys in the display and control panel
Display	Non-flashing presentation on the display
Display	Flashing presentation on the display

The information "right", "left" or "top", "bottom" – unless otherwise stated – is on the understanding that the viewer looks at the front.

Supplementary documents

Parameterizing instructions LINAX 4000H	14087B
Interface description LINAX 4000H	14088B

Applications and brief description

The LINAX 4000H is a microprocessor-controlled continuous-line recorder with 1...4 line channels or 1...3 line channels and 1 print channel.

The recorder is connected to transducers and to sensors such as thermocouples or resistance thermometers. Standard temperature sensor curves are stored in the firmware of the recorder and linearized with high accuracy.

The recorder is matched to the measuring task via the software by means of an internal operating panel or via the RS-232C and RS-485 interfaces.

1 Installation and startup

1.1 Scope of delivery

(see Figure 1)

The continuous-line recorder comes with:

- 1 copy of operating instructions
- 2 fasteners **B**

- 1 fiber pen insert **F** per measuring channel
- 1 print insert **D** (Option)
- 1 roll chart **S**
- Depending upon the order, the respective number of screw-plug terminals **K**, one zener diode combination per measuring system and reading ruler(s)

- B** Fastener
- D** Print insert (Option)
- F** Fiber pen inserts
- K** Screw-plug terminals
- S** Chart roll

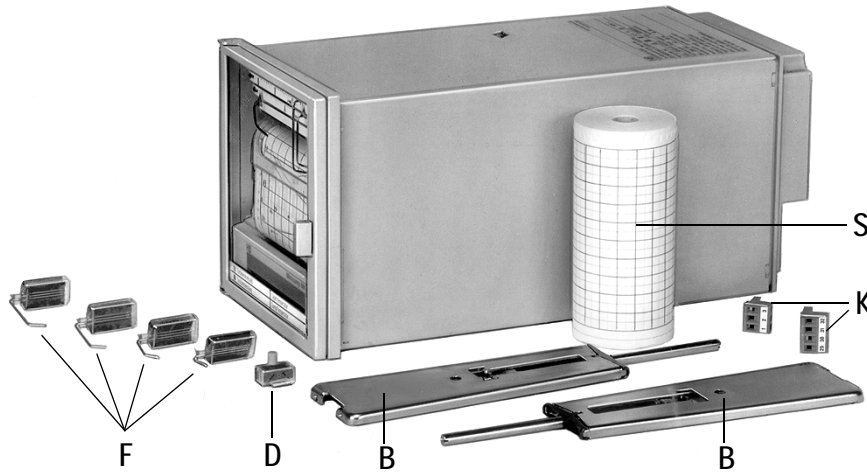


Figure 1 Scope of delivery of the LINAX 4000H

1.2 Mounting site

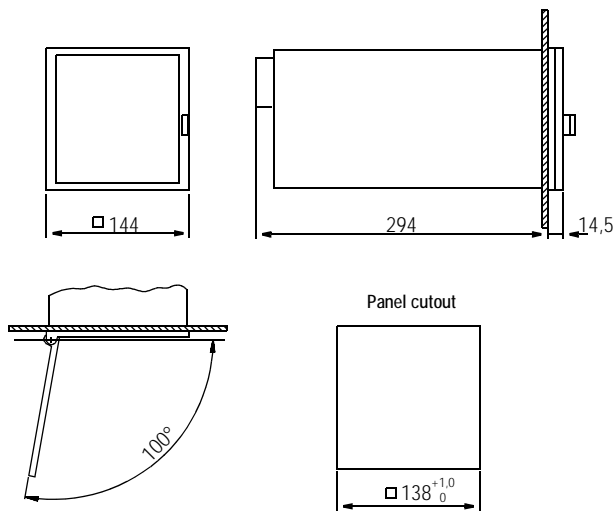


Figure 2 Dimensional drawing LINAX 4000H (dimensions in mm)

Position of use	Inclination to the side $-30^\circ \dots 0 \dots +30^\circ$ Inclination to the rear 20° Inclination to the front 20°
Ambient temp.	$0 \dots 50^\circ\text{C}$
Relative humidity	$\leq 75\%$ annual average, max. 85% , Prevent dewing!

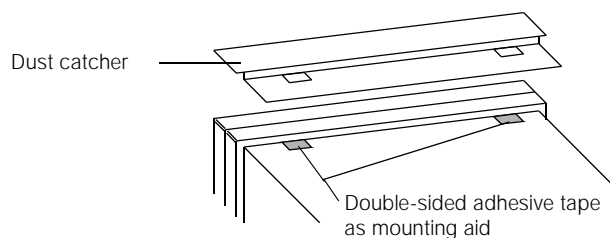


Figure 3 Mounting the dust catcher

1.3 Installation

(see Figure 2 and Figure 3)

The LINAX 4000H is suited for installation in switchboards and grid frames.

Installation in switchboards

1. Insert the recorder into the switchboard from the front.
2. Hang the fastening elements into the cutouts of the case. With side-by-side mounting in horizontal direction, hang the fastening elements into the cutouts arranged at the top and bottom.
3. After aligning, equally tighten the fasteners.

Installation in grid frames

1. Fasten 4 each centering angle bracket (Ordering number A416A) on the grid frame.
2. Hang the fastening elements into the cutouts of the case.
3. After aligning, equally tighten the fasteners

Note

With a high packing density, the ambient temperature range from $0 \dots 50^\circ\text{C}$ must not be exceeded or fallen below.

When using the LINAX 4000H in a particularly dusty environment, use 2 dust catchers as accessories. The dust catchers (on top and bottom of case) prevent dust from falling into the interior of the case when opening the door.

Mounting the dust catcher

1. Stick the double-sided adhesive tape onto the top of the case (see Figure 3).
2. Affix the dust catcher.

1.4 Connection

Caution

The connection between the protective conductor connection and a protective conductor must be made prior to all other connections.

The unit can become dangerous when the protective conductor inside or outside the unit is interrupted or when the protective conductor connection is undone.

The recorder must only be operated in installed condition.

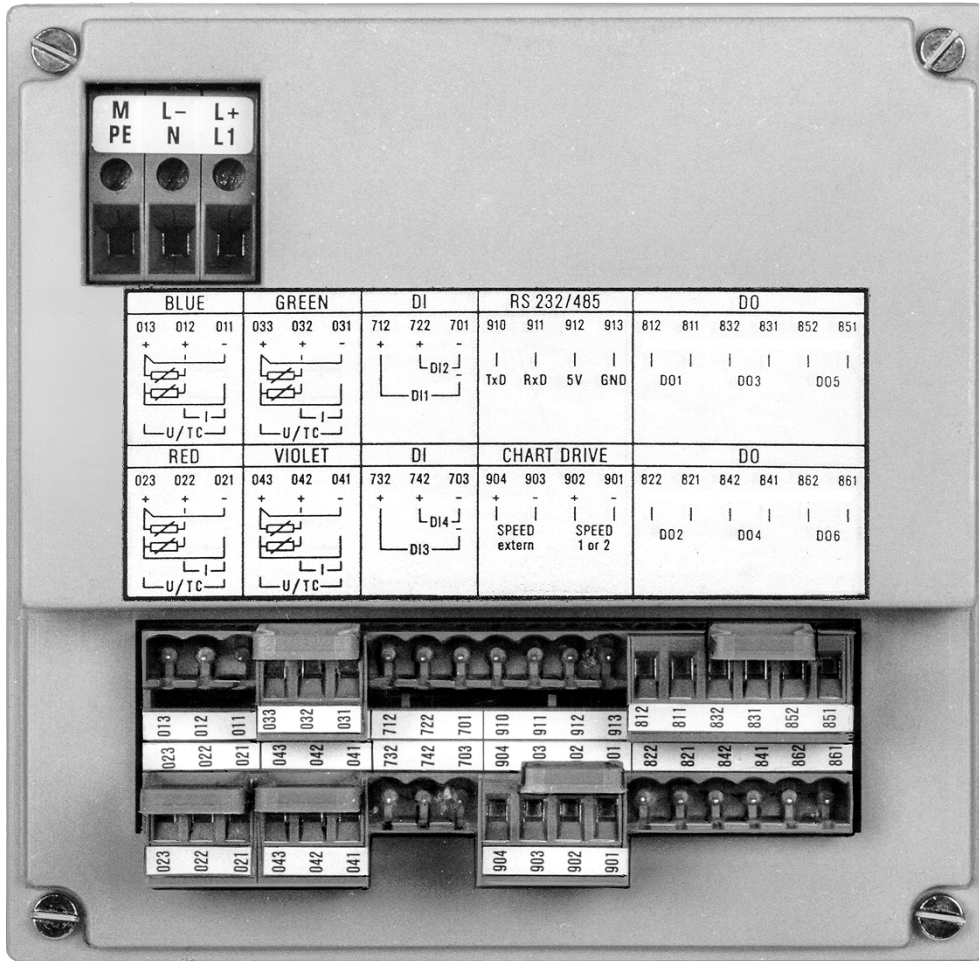


Figure 4 Rear panel with screw-plug terminals

Connecting the input signals

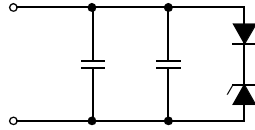
- Fasten the signal leads in the screw-plug terminals, maximum cross section $2 \times 1 \text{ mm}^2$.

Caution

For current measuring points, install a zener diode combination at the connection terminals of each current circuit for protection against device-internal interruption of the measuring circuit. The zener diode combination (ordering number A421A- see data sheet 14491 and/or 14492) is part of the recorder accessories.

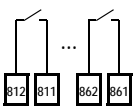
For input quantities such as voltage or resistance, a zener diode combination must not be installed.

The "zener diode combination" consists of 2 counter-connected zener diodes and 2 capacitors which are arranged in parallel to the zener diodes.

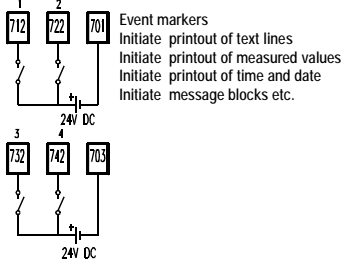


The voltage drop across the zener diodes is 3.9 V. The capacitors cause a flat rise of the load with a recorder-internal current interruption.

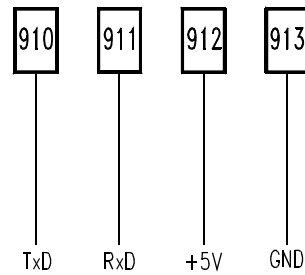
Limit contact outputs



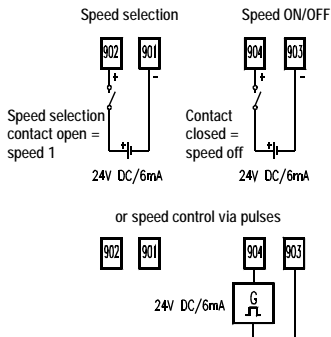
Binary inputs



Interface RS 232C/485



Binary inputs for speed control



Signal inputs

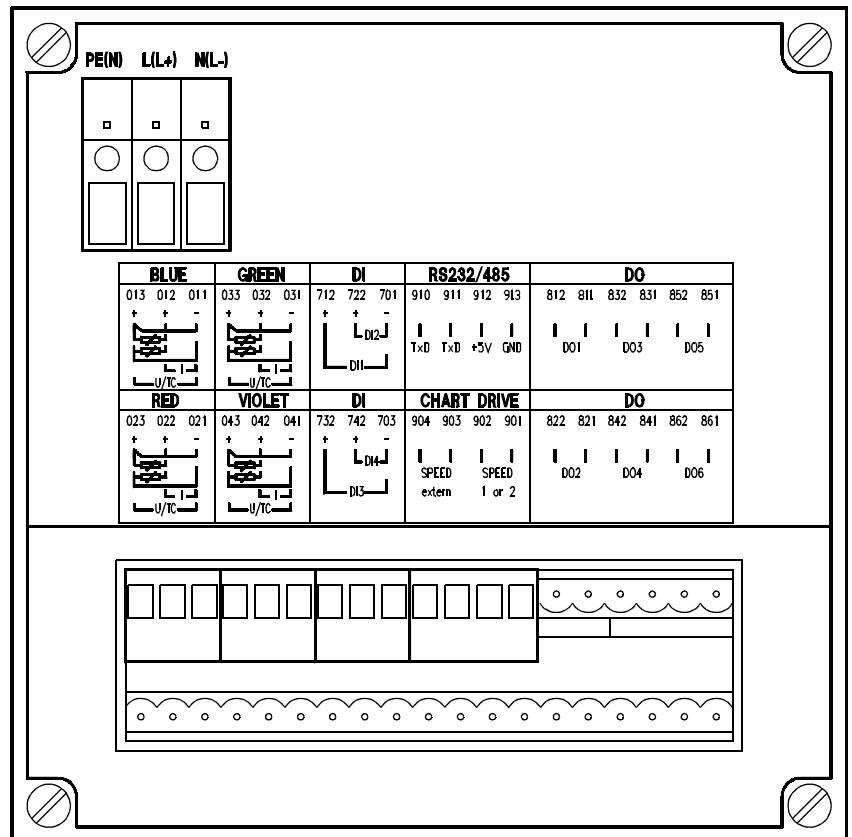
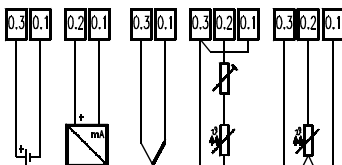


Figure 5 Rear panel with screw-plug terminals

Line connection

- Fasten the wire (max. cross section $2 \times 1 \text{ mm}^2$ in the screw terminals. The cross section of the protective conductor must at least correspond to the cross section of the power cable.

1.5 Opening the door of the case

1. Slightly press the handle to the right.
2. Open the door of the case.

1.6 Loading the roll chart

(see Figure 6 ... Figure 10)

1. Unlock the plug-in unit.



Figure 6

2. Withdraw the plug-in unit.

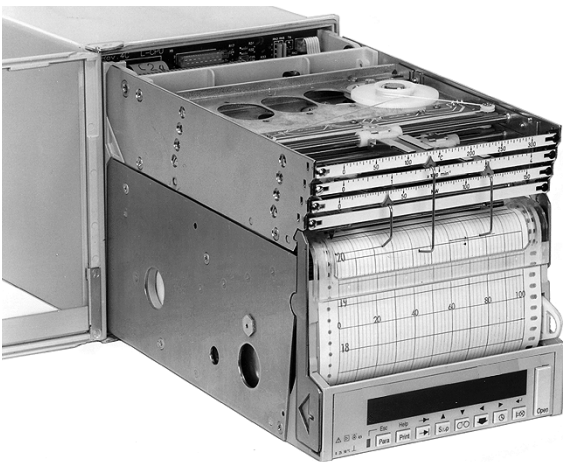


Figure 7

3. Unlock the system carrier

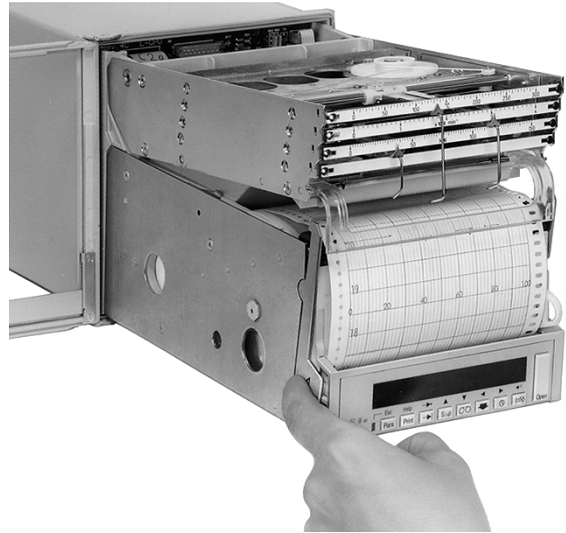


Figure 8 Recording table for fanfold chart

4. Unfold the system carrier up to the stop

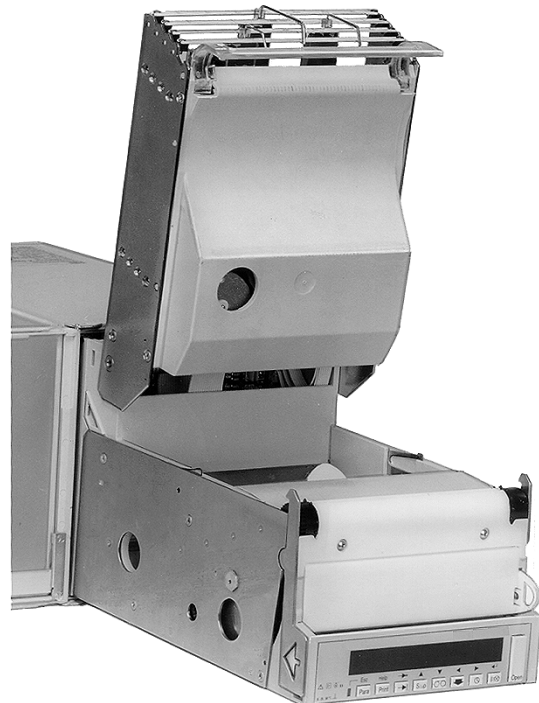


Figure 9

5. Insert the roll chart from the side (see Figure 10).

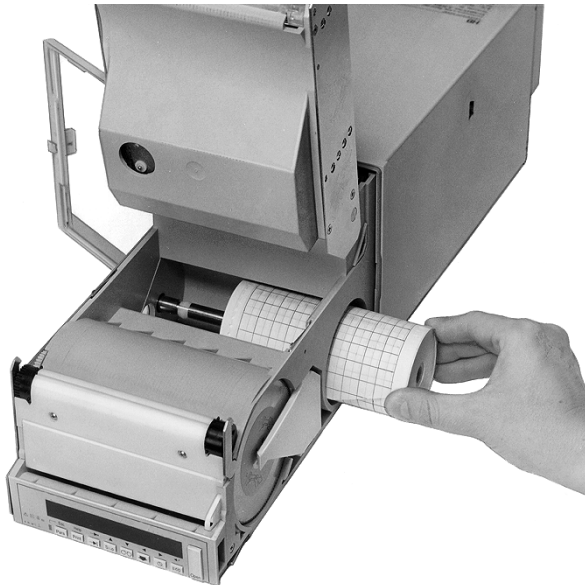


Figure 10

6. Pull the beginning of the chart up to the pin platen and engage the perforation with the pin platen.
7. Fold the system carrier down.
8. Slide the plug-in into the case.

1.7 Switching the recorder on

A power line connection switch of sufficient switching capacity, which permits all-pole disconnection of the recorder from the power line, must be provided within reach of the mounting site. It must not annul the protective effect of the protective conductor.

1.8 Installing the fiber pen insert

1. Keep <Stop> pressed for more than 2 s.
– Measuring systems travel to the park position.
(Only with the stop key function released)
2. Fold the scale upwards.
3. Install the fiber pen insert in the recording carriage (see Figure 11).

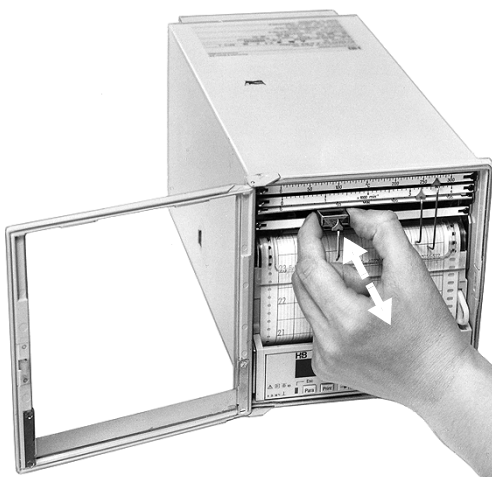


Figure 11 Installing, removing the fiber pen insert

1.9 Installing the print insert

1. Keep <Stop> pressed for more than 2 s.
– Measuring systems travel to the park position.
(Only with the stop key function released)
2. Fold the scale upwards.
3. Install the print insert in the recording carriage (see Figure 12)

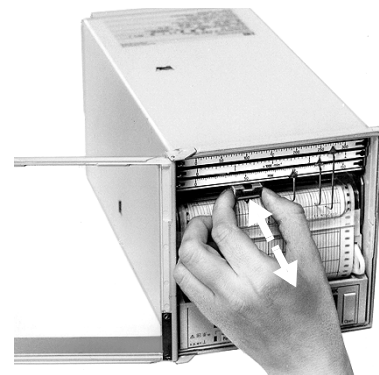


Figure 12 Installing, removing the print insert

1.10 Positioning the starting point of the recording

Press <▼> and release it, when the correct time line is located under the fiber pen insert or the print insert.

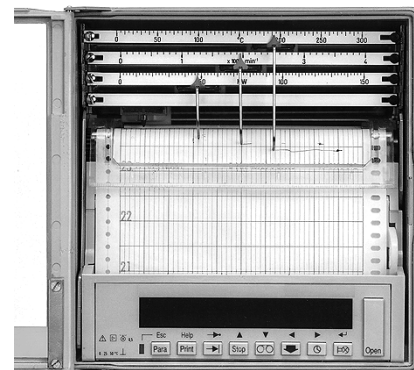


Figure 13 Positioning the starting point of the recording

2 Operation

2.1 Changing the chart speed

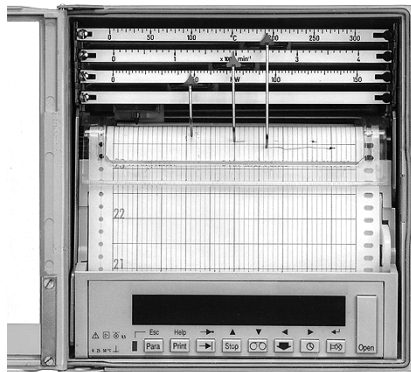


Figure 14 Changing the chart speed

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

1. Press <Para>. "System" is displayed when a password was not defined.

Note

In parameter mode, the red lamp next to <Para> lights.

2. Press <↓>. „Speed 1" is displayed.
3. Press <↓>. Speed value „0000" flashes.
4. Press <▲> or <▼>. Select desired speed 1.
Selectable speeds
0 (Aus) / 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. Confirm selected speed 1 with <↓>.
6. Press <Esc>. "System" is displayed.
7. Press <Esc>. "Param. end?" is displayed.
8. Press <↓>. "Save data?" is displayed.
9. Press <↓>. The selected speed is stored in the EEPROM and is active.

If the recorder is fitted with the option "Limits and binary inputs", 2 speeds can be defined in parameter mode (standard setting: speed 1 = 20 mm/h; speed 2 = 120 mm/h). The two speeds can externally be switched over. In addition, the speed can be switched off externally.

2.2 Access to previous recordings

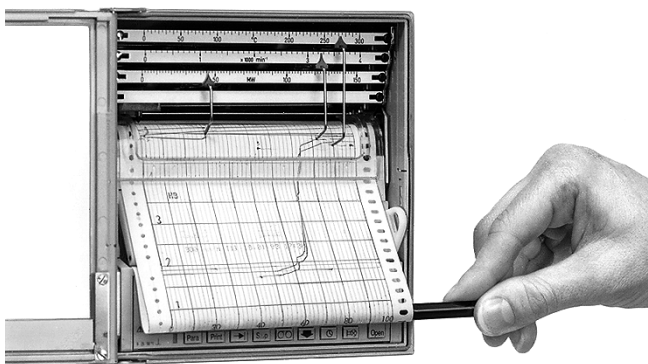


Figure 15 Access to previous recordings

1. Press <∞>. "Take-up stop" is displayed.
2. Place lever H at the right of the plug-in to the top position.
3. Pull the recording chart out to the front.
4. Place lever H to the bottom position.

Note

The lever must engage.

5. Press <∞> again. The recording chart is automatically taken up.

2.3 Removing the recording chart

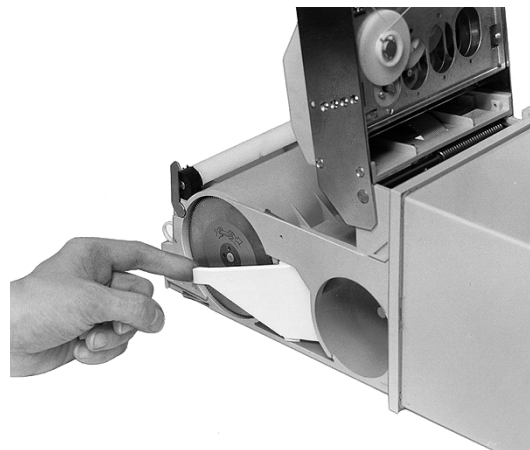


Figure 16 Unfolding the holder of the chart roll

1. Unlock the plug-in and pull it to the front (see Figure 6 and Figure 7).
2. Unlock the system carrier and unfold it up to the stop (see Figure 8 and Figure 9).
3. Unfold the holder of the chart roll up to the stop (see Figure 16).
4. Remove the take-up roll with the recording chart (see Figure 17).
5. Pull off the flange without "handling instructions".
6. Remove the recording chart.
7. Replace the removed flange.
8. Insert the take-up roll.
9. Close the holder of the chart roll with a snap.
10. Insert a new chart roll (siehe Figure 10).
11. Pull the beginning of the chart up to the pin platen and engage the perforation with the pin platen.
12. Fold the system carrier down.
13. Slide the plug-in into the case.

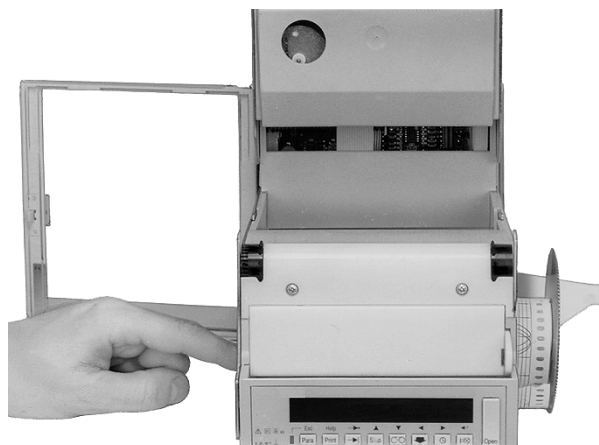


Figure 17 Removing the take-up roll

2.4 End-of-paper signalling

Insert the roll chart (see section 1.6) and enter the length of the roll chart.

1. Press <F0>.
2. Press <PARA>. The parameter "L" appears on the display. The parameter flashes.
3. With the keys <▶> or <◀>, and <▲> or <▼>, enter the length of the inserted roll chart in m. Take into account the negative paper tolerance.

The remaining length of the paper is written into an EEPROM in speed-related time intervals.

Displaying the remaining chart length

Press <F0>. The display shows the remaining chart length. In addition, the time a new chart roll is required is shown with consideration of the active chart speed.

In parameter mode, the correlation between end-of-paper signalling and contact output is made in the main menu item "System" under "Parameter Pap.End.DO". Speed-depending end-of-paper signalling is made 2 hours before the paper supply runs out.

3 Parameterizing

The LINAX 4000H is parameterized via an operating panel in the recorder or from the PC via the RS-232C / RS-485 interface. The program PARATOOL L4000H is available for parameterization of the recorder via this interface (see data sheet 14712).

If access to the parameter level is blocked because a password was defined, the parameter values can be read only. <Press <PARA>. The display shows "Password?". The parameter value „0000" flashes.

With the keys

<▶> or <◀>, and <▲> or <▼>, enter password 9999.

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

4 Reconfiguration

4.1 Replacing scales

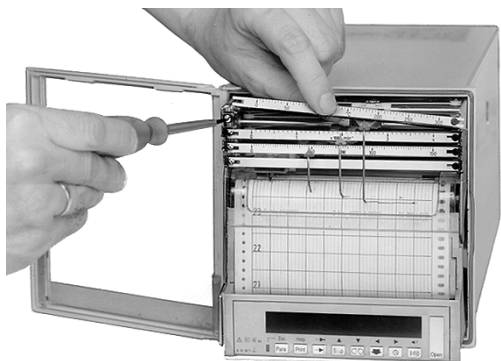


Figure 18 Replacing scales

1. Remove the fiber pen insert from the recording carriage (see Figure 11).
2. Withdraw the plug-in to the front.
3. Undo the scale screws at left.
4. Slide the scales to the right and disengage them from the scale screw.
5. Remove the scales to the left (see Figure 18).
6. Install the scales in reverse order.
7. Set the measuring system to zero.
Press <Para> "System" is displayed.
Press <▼> "Service" is displayed.
Press <↓> "Channel blue" is displayed.
Press <▲> Select desired channel.
Press <↓> "Paper |← x x x x" is displayed.
Press <↓> Pointer travels to zero. „x x x x" flashes.
Check that electrical zero and zero on the chart agree. If balancing is required, press <▶>, until the recording pen is within the recording area. Press <◀> and perform zero balancing.
8. Align the scale with the pointer. Tighten the scale screws.
9. Switch parameter mode over.
Press <↓>, <Esc> "Channel blue (red, green violet)" is displayed.
Press <Esc> "Service" is displayed.
Press <Esc> "Param. end" is displayed.
Press <↓> "Save data?" is displayed.
Press <↓> Recorder is switched to operating mode.

4.2 Replacing the label for the measuring points



Figure 19 How to shorten the label of the measuring points

Door of molded material

Pull the flexible label for the measuring points from its holder.

Door with metal frame

1. Loosen the screws of the holder.
2. Remove the label for the measuring points.
3. Shorten the new label for the measuring points at the break-away points provided for that purpose (see figure 19) and insert it into the holder.
4. Tighten the screws of the holder.

5 Maintenance

5.1 Fuse replacement

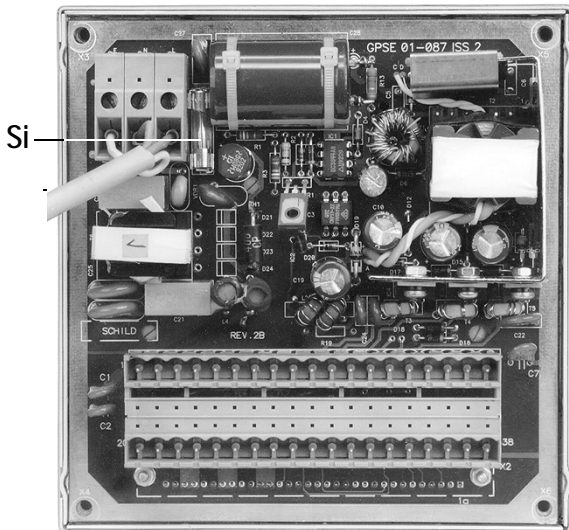


Figure 20 Replacing fuse *Si*

Caution

Make sure that replacement fuses are of the specified type and the specified nominal current rating only. The use of mended fuses or shorting of the fuse holder is not permissible.

Live parts can be exposed when opening covers or removing parts, except where this is possible manually. Also connection points may be live.

1. Remove the screw-plug terminals.
2. Remove the rear panel of the unit.
3. Replace the fuse *Si* (see Figure 20).
4. Screw-tighten the rear panel of the unit.
5. Attach the screw-plug terminals.

Fuse values

230 V	T 1.60 A
24 V	T 3.15 A

6 Technical data

Applied rules and standards

A) International standards

IEC 484	Potentiometric recorders
IEC 1010-1	Electrical safety (test voltages)
IEC 664	Overvoltage category, degree of pollution
IEC 66-2-6	Mechanical stress (vibrations)
IEC 68-2-27	Mechanical stress (shock)
IEC 529	Degrees of protection provided by enclosures
IEC 801, EN 60801	Immunity to interference of electromagnetic influences
IEC 654	Line failures
EN 55011	Radio interference suppression
EN 61010	Safety requirements of measurement and control equipment
IEC 721-3-3	Climatic environmental conditions
IEC 742	Classification VDE 0551 safety transformers

B) German standards

DIN 43802	Scales
DIN 16234	Recording paper
DIN 43831	Cases
DIN 43834	Device fasteners
DIN VDE 0551-1	Transformers and safety transformers
DIN VDE 0100-410	Protection against shock currents
DIN VDE 0106-101	Basic requirements for protective separation

Symbols and their meaning

Symbol	Meaning
X1n / X1	Lower range limit nominal range / lower range limit
X2n / X2	Upper range limit nominal range / upper range limit
X2n – X1n / X2 – X1	Range span nominal range / range span

Analog inputs

Standard version

DC current	0 ... 20 mA; Ri = 50 Ω 4 ... 20 mA; Ri = 50 Ω
DC voltage	0 ... 10 V; Ri > 1 MΩ

Universal version

DC current	0 ... 20 mA; Ri = 50 Ω 4 ... 20 mA; Ri = 50 Ω –2.5 ... +2.5 mA; Ri = 50 Ω –5 ... +5 mA; Ri = 50 Ω –20 ... +20 mA; Ri = 50 Ω
DC voltage	0 ... 25 mV; Ri > 200 MΩ –25 ... +25 mV; Ri > 200 MΩ –100 ... +100 mV; Ri > 200 MΩ 0 ... 2.5 V; Ri > 200 kΩ –2.5 ... +2.5 V; Ri > 200 kΩ 0 ... 10 V; Ri > 200 kΩ –20 ... +20 V; Ri > 200 kΩ

Thermocouples, Ri ≥ 200 MΩ	Type T –270 ... +400 °C Type U –200 ... +600 °C Type L –200 ... +900 °C Type E –270 ... +1000 °C Type J –210 ... +1200 °C Type N –270 ... +1300 °C Type K –270 ... +1372 °C Type S –50 ... +1769 °C Type R –50 ... +1769 °C Type B 0 ... 1820 °C Cold junction compensation internally or externally parameterizable
Resistance thermometer Pt 100	–200 ... +850 °C; –50 ... 150 °C
With 2-wire connection With 3-wire connection	Lead resistance 40 Ω max. Lead resistance 80 Ω max.

Lower range limit parameterizable from X1n ... X1n + 0.8 (X2n – X1n) and

range span parameterizable from 0.2(X2n – X1n) ... (X2n – X1n)

Deadband 0.25 % of range span

Setting time 1 s

Attenuation of the meas. value with low-pass filter of 1st order

Time constant 0 ... 60 s per measuring channel, can be parameterized

Root-extract. funct. can be parameterized with DC current and DC voltage measuring ranges

Linearization of user-specific waveforms for DC current and DC voltage measuring ranges can be parameterized

Reference conditions

Ambient temperature / relative humidity	25 °C ± 1 K / 45 ... 75 %
Auxiliary voltage	Hn ± 2 %, nominal frequency ± 2 %
Mounting position	Front upright ± 2°
Warm-up time	30 min

Accuracy

Deviation for line channels acc. to IEC 484	Class 0.5 referred to nom. range
Deviation for data recording with printer system according to IEC 484	Class 1 referred to nom. range
With displacement of lower range limit and/or upper range limit additionally	± (0.1 % × $\frac{X1}{X2 - X1}$ – 0.1)
With internal cold junction compensation	± 4 K, additionally

Variations

Temperature	≤ 0.2 % / 10 K, additionally ≤ 0.1 % / 10 K with conn. to thermocouple
Humidity	Note influence on recording paper according to DIN 16234
Voltage supply	≤ 0.1 % at 24 V ± 20 % ≤ 0.1 % at 230 V – 15 %, + 10 % ≤ 0.2 % for other voltages up to 110 V – 15 %
AC interference voltages (see perm. interference voltages)	≤ 0.5 % of range span
Magnetic field of ext. origin 2 mT	≤ 0.5 % of range span
Mechanical stress according to DIN IEC 68-2-6/27	During and after the effect ± 0.5 % of range span
Transport Impact: 30 g/18 ms Vibration: 2 g/5...150 Hz	
In funct. Vibration: 0.5 g/± 0.04 mm/5...150 Hz/3 × 2 cycles	

Binary inputs

Number	4 (speed 2, speed off, DI 1, DI 2)
Auxiliary voltage	DC 20 ... <u>24</u> ... 30 V
Input current	6 mA
H signal	20 ... 30 V
L signal	0 ... 1.3 V

Relay outputs

Six potential-free relay contacts	
Contact load:	U _{max} 30 V
	I _{max} 100 mA
	P _{max} 3 W, cosφ = 1

Real-time clock

Function maintained in the case of power failure
 Standard: 5 days with capacitor
 Optionally: 4 years with lithium battery (code P01)

RS-232-/RS-485 interface

In the unit, it is possible to switch from the RS-232 to RS-485 interface. The data protocol of the interface is with reference to the standard of the process field bus.

Options (code H01)

External speed change

It is possible to switch between speed 1 and 2 (terminals 901-902) and to switch the speed off (terminals 903-904).

External speed control

The speed is pulse-controlled (24 V DC, 6 mA).
 Pulse frequency: 0...80 Hz.
 Length of step: 0.025; 0.05; 0.1; 0.2 mm

Event markers

Only for the version with print channel
 4 markers possible
 Recording at 2 %, 5 %, 95 % and 98 % of the recording width

Measured value storage

The measuring systems can be held on the last measured value. Control is via freely selectable binary inputs.

Standby function

The standby function is activated via a freely selectable binary input.

Balancing

Balancing can be selected for each measuring channel. The external control of the balancing interval is via a freely selectable binary input.

End-of-paper signalling

With speeds of ≥ 120 mm/h, 2 hours before the paper runs out.
 With speeds of < 120 mm/h, at least 8 hours before the paper runs out. Signalling is via a relay contact which can be freely assigned. Output: potential-free contact. When changing the recording paper, enter the length of the chart roll into the recorder.

Limit monitoring

2 limits per channel for monitoring of the absolute value.
 1 limit per channel for monitoring of the gradient.
 6 internal relays can be freely assigned to the limits.

Display

Scale

One division per measuring system
 Width of scale sheet/height of characters for
 LINAX 4000H C01 5.0 mm/2 mm
 LINAX 4000H C02 7.5 mm/3 mm
 LINAX 4000H C03 13.4 mm/5 mm

Display panel

16-digit dot matrix display, height of numerals 3 x 5 mm. In operating mode, it serves to display the measured values of the channels, message texts, limit violations, etc.
 In parameter mode, the display panel supports the parameter entry.

Operating panel

8 keys with 2 level assignment.
 First level: operation
 Second level: parameterization

Recording

Arrangement of measuring systems and color correlation

Version without printer channel

		1	2	3	4	No. of line channels
	green			×	×	3rd channel
	red		×	×	×	2nd channel
	blue	×	×	×	×	1st channel
	violet				×	4th channel

Version with printer channel

			2			No. of line channels
	green					
	red					
	blue		×			1st channel
	violet		×			2nd channel

				3		No. of line channels
	green					
	red			×		2nd channel
	blue			×		1st channel
	violet			×		3rd channel

					4	No. of line channels
	green				×	3rd channel
	red				×	2nd channel
	blue				×	1st channel
	violet				×	4th channel

1. Line recording

Fiber recording pen with inkwell of approximately 1.4 ml, line length approximately 1300 m, distance between the tips of the fiber recording pens 2 mm.

2. Printing

A printer system for printing of texts can be installed in place of the lower measuring system. Distance between blue fiber pen and print head 6 mm.
 In addition to the text printout, a measured value can be recorded with the printer system.
 Recording of the measured value is made in the form of a dotted line with equidistant dot spacing.
 Color supply of the print head approx. 1.5×10^6 dots.

Text printout for:

- Eight text lines of 32 characters each.
Each text line is supplemented with time printout. Cyclic initiation, in parameterizable intervals or event-depending by internal limits or external stimulation (binary inputs).
- Printout of chart speed, date and time.
Initiation with recorder ON and with a change in chart speed.
- Printout of time and date.
Cyclic initiation, in parameterizable time intervals or event-depending by external stimulation.
- Printout of actual measured values
Cyclic initiation, in parameterizable time intervals or event-depending by internal/external stimulation.
- Printout of double lines correlated with the individual measuring points.
First line: Scaling line with channel designation and printout of the unit.
Second line: Text specific to the measuring point, max. 32 characters.
- Printout of the balancing table, consisting of:
Annotation line
Start and stop time of the balancing interval
Min./Max. value during the balancing interval
Average and summation value of the balancing interval
Initiation: cyclic and external.
- Printout of 4 message blocks
Text lines, time and date line, lines of measured values can be combined to message blocks. Initiation is event-depending.
Fixed correlation between message block 1 and binary input 1, etc.
- Listing of all active parameters
Manual initiation in parameterizing mode.

Text printout/recording

Maximum possible chart speed with printer channel, in place of fiber pen	300 mm/h
Size of characters	1,5 × 2 mm
Chart speed	2 speeds parameterizable from 0 to 7200 mm/h, can be switched over and disconnected externally (option "limits + binary inputs" required), or externally controllable by pulses 0...80 Hz (option "limits + binary inputs" required)
Recording chart	64 m roll chart
Visible chart length	60 mm
Recording width	100 mm (chart width 120 mm, DIN 16230)
Chart intake (with roll chart)	Via automatic paper take-up device (daily tear-off or wind-up possible)

Auxiliary voltage

24 V AC/DC ± 20 % or
110 ... 230 V AC – 15 % / + 10 %
Frequency range 47,5 ... 63 Hz
Power consumption with max. fitting approx. 18 W, 30 VA

Climatic suitability

Ambient temperature	0 ... 25 ... 50 °C
Transport and storage temperature	–40 ... +70 °C
Relative humidity	≤ 75 % annual average max. RH ≤ 85 % in function
Climatic class	3K3 acc. to IEC 721-3-3

Electrical safety

Test according to IEC 348

Protection class I

Overvoltage category III, degree of pollution 2 acc. to IEC 664

Test voltage

4.0 kV measuring 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 isolation (PELV according to DIN EN 60950)

Between power input – measuring channels, control leads, interface cables acc. to VDE 0100 part 410 and VDE 0106 part 101.

Electromagnetic compatibility

The protection goals of the EMC directive 89/336/EWG as to radio interference suppression according to EN 55011 and as to immunity to interference according to EN 50082-2 are complied with.

Radio interference suppression

Limit class B according to EN 55011 and/or
Post Office decree 243/92.

Immunity to interference: Test according to IEC 801/EN 60801

Type of test	Test severity	Variation	Severity level
ESD (1/30 ns)	6 kV	≤ 1 %	3
HF field 25 MHz ... 1 GHz ¹⁾	10 V/m	≤ 1 %	3
Burst (5/50 ns) on			
Power line	2 kV	≤ 1 %	3
Test lead	1 kV	≤ 1 %	3
Surge (1,2/50 μs) on			
Power line common	2 kV	≤ 1 %	3
differential	1 kV	≤ 1 %	2
1 MHz pulse on			
Power line common	2 kV	≤ 1 %	3
differential	1 kV	≤ 1 %	3

¹⁾ Test frequency deviating from NAMUR

The NAMUR industry standard EMC is met
(Interface cables shielded)

Permissible interference voltages

Perm. interference voltage	Standard version	Universal version
Series mode interference voltage peak-to-peak	≤ 0.3 × meas. span max. 3 V	≤ 20 × meas. span max. 3 V
Push-pull rejection	35 dB	72 dB
Common mode interference voltage	60 V DC/42 V AC	60 V DC/42 V AC
Common mode rejection	75 dB	121 dB

Connection, case and installation

Electrical connections

Protection type IP 20

Screw-plug terminals for signal inputs, control inputs and outputs.

Max. wire cross section $2 \times 1 \text{ mm}^2$

Screw terminals for line connection

Max. wire cross section $1 \times 4.0 \text{ mm}^2$ or $2 \times 1.5 \text{ mm}^2$

Case

Molded material for installation in panels or mechanical grids (see dimensional drawing for dimensions)

Protection type of case according to IEC 529

Front, including door IP 54

Color of case

Silica-gray according to RAL 7032

Door of case

Metal frame (RAL 7032) with mineral glass, anti-glare, or molded material

Fastening of case

With 2 fasteners (optionally for installation in panel or mechanical grid) according to DIN 43834/11.82, centering angle brackets are required for installation in mechanical grids, (accessories A416A)

Position of use

Inclined to the side $[-30^\circ \dots 0 \dots +30^\circ]$

Inclined to the rear 20° ,

Inclined to the front 20°

Mounting distance

Horizontal or vertical 0 mm, it must be possible to open the door of the case through 100°

Weight 5 kg approx.

7 Packing

The fiber pen inserts must be removed before the recorder is transported.

If the original packaging material is no longer available, wrap the recorder in air-cushion foil or corrugated paper and pack it in a sufficiently large crate which is lined with shock-absorbing material (foam rubber or similar material). The thickness of the padding must be matched to the weight of the device and the type of packaging. The crate must be marked "Fragile".

When shipped overseas, air-tight welding of the recorder into a 0.2 mm thick polyethylene foil which contains a drying agent is additionally required. The quantity of the drying agent is to be chosen in line with the packaging volume and the expected duration of the transport (at least 3 months). The crate must additionally be lined with a layer of double bituminous paper.

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