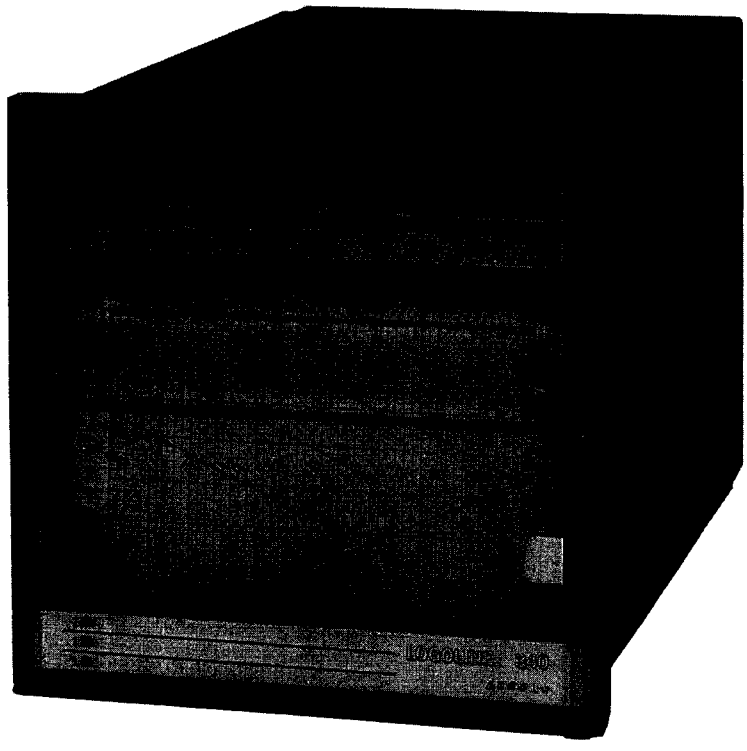
JUMO

MEASUREMENT AND CONTROL

LOGOLINE 340

Microprocessor Pen Recorder

with isolated signal inputs



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Operating Manual

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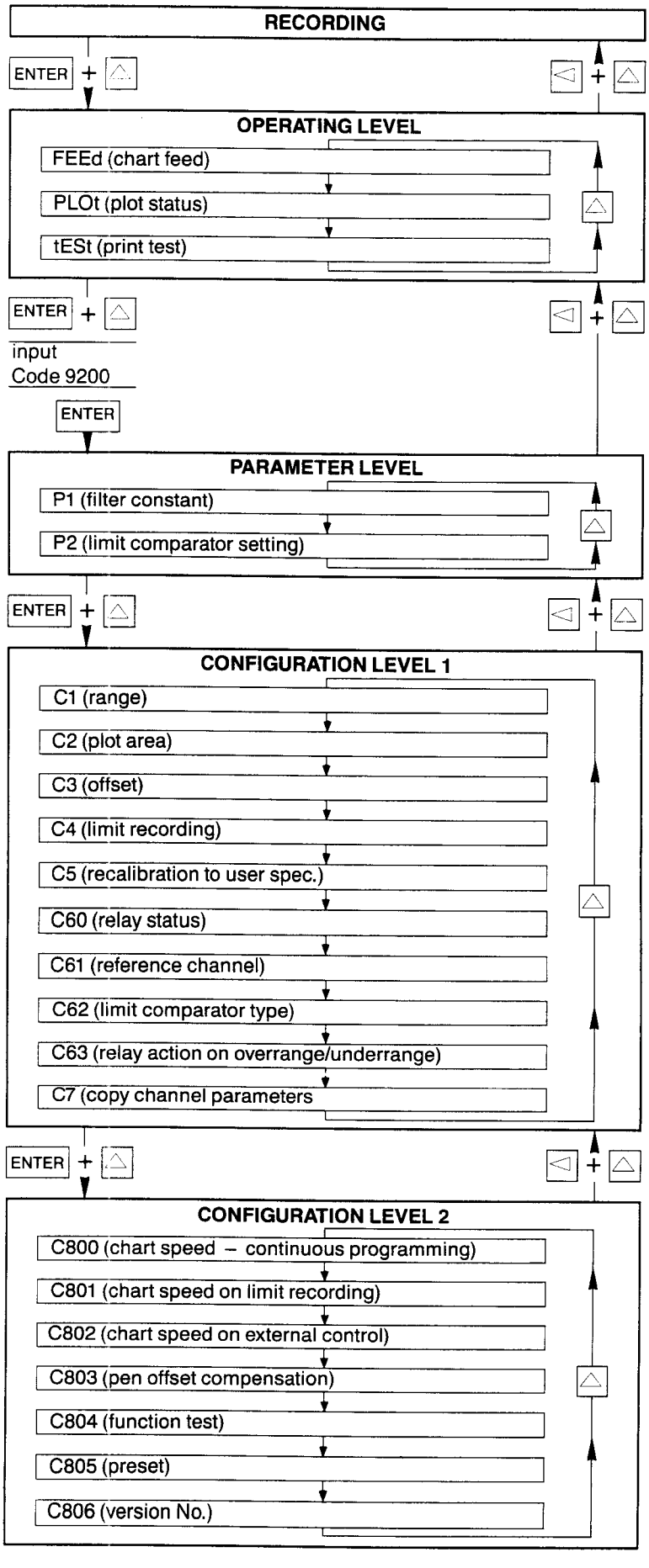
SUMMARY OF PARAMETERS



CONTENTS

CONTENTS

NOTE

All necessary settings and, where appropriate, alterations are described in this Operating Manual. If any difficulties should still arise during start-up you are asked not to carry out any manipulations on the unit which are not permitted. You could endanger your rights under the instrument warranty!

Please contact the nearest office or the main factory.

Phone (Germany): (06 61) 60 03 – 725
(abroad): (int. + 49) 661 60 03 – 725
Fax (Germany): (06 61) 60 03 – 681
(abroad): (int. + 49) 661 60 03 – 681

1 ABOUT THIS OPERATING MANUAL

1.1 Introduction

Please read this Manual carefully before starting up the instrument. Keep the Manual in a place which is at all times accessible to all users.

Please assist us to improve this Manual where necessary.

Criticisms, suggestions, improvements and additions should be addressed directly to our department

Technical Documentation GB II
Phone Germany (0661) 60 03–305
abroad (int.+ 49) 661 60 03–305
Fax Germany (0661) 60 03–500
abroad (int.+ 49) 661 60 03–500

The description of the setup program can be found in a separate manual!

1.2 Typographical conventions

Format

The following conventions apply to this Manual: The page header contains the number and the name of the section. The page numbering is arranged in the centre at the bottom.

1.2.1 Warnings

The words **Danger** and **Warning** are used in the Manual under the following conditions:

Danger This marking used when there may be **danger to personnel** if the instruction is not followed accurately or disregarded.

Warning This marking is used when there may be **damage to equipment or data** if the instruction is not followed accurately or disregarded.

1.2.2 Notes

Note This symbol is used if your **special attention** is drawn to a remark.

⇒ **Reference** This symbol refers to **additional information** in other handbooks or sections.

abcd[1] **Footnote** Footnotes are notes which refer to **certain points in the text**. Footnotes consist of 2 lines:
the text marking and the footnote text.

The text markings are arranged as continuous raised numbers.

The footnote text (in smaller typeface) is placed at the bottom of the page and starts with a number and a full stop.

1.2.3 Presentation

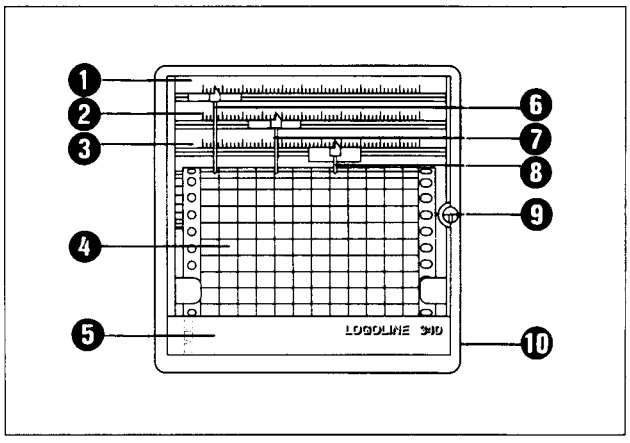
△ Enter **Keys** Keys are shown in a frame. Symbols and texts are both possible. When a key has multiple functions (function keys) the text shown always corresponds to the current function.

2 DESCRIPTION

2.1 Design features

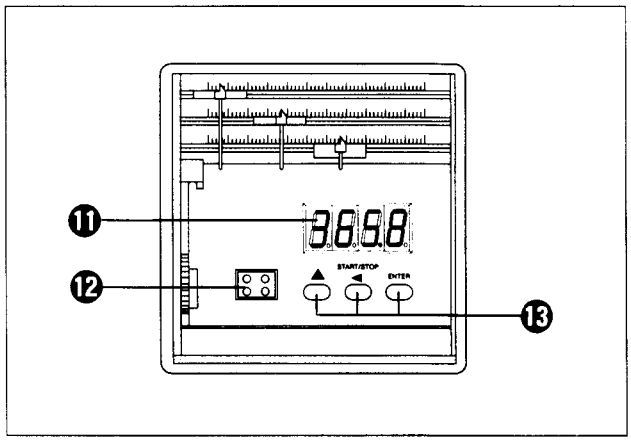
Indications and controls on the front

❶ scale channel 3
❷ scale channel 2
❸ scale channel 1
❹ recording chart
❺ channel label
❻ fibre pen channel 3, green
❼ fibre pen channel 2, red
❽ fibre pen channel 1, blue
❾ door closure
❿ steel housing for panel mounting to DIN 43 700



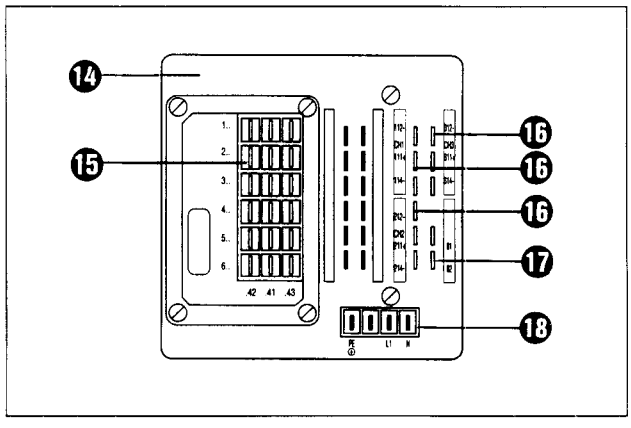
. . . with chart cassette removed

⓫ 4-digit LED display
⓬ 4-pin connector for setup interface
⓭ keys for operation and programming



Rear view

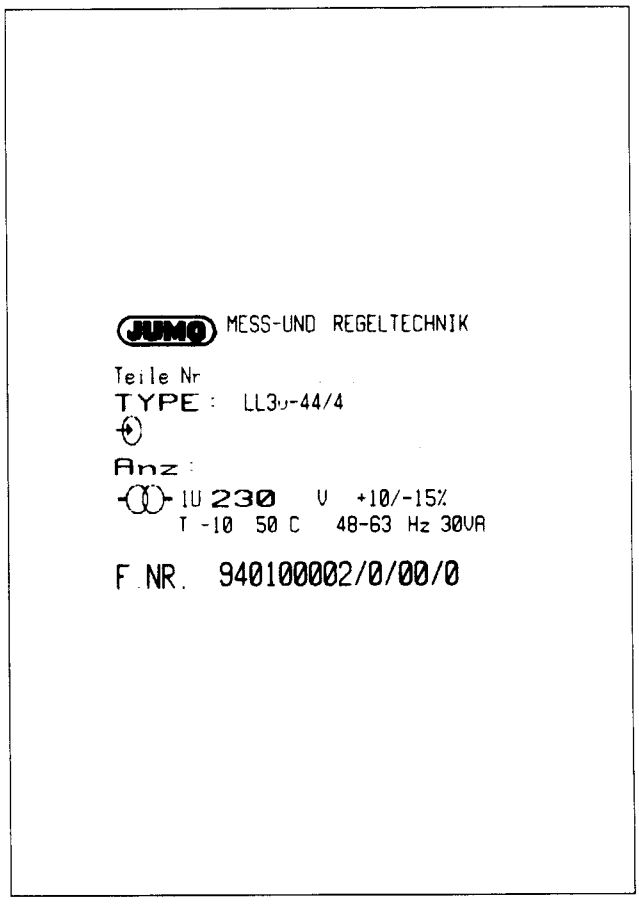
⓮ back panel, plastic
⓯ tag connections for limit contacts (extra Code)
⓰ tag connections for signal inputs channel 1, 2, 3
⓱ tag connections for external chart speed control
⓲ tag connections for supply



3 INSTALLATION

3.1 Identifying the instrument version

After unpacking the instrument and examining it for possible transport damage, check the instrument version on the instrument label.



Type designation

LL.v–44/4

LL	Pen recorder LOGOLINE 340
1	with 1 channel
2	with 2 channels
3	with 3 channels
v	amplifier
–44	bezel size 144 mm x 144 mm
/4	Type 4

Extra Codes
Input circuit

sk	special scale, e.g. in m³/h, bar etc. (according to calibration chart if non-linear)
lk	6 limit comparators with relay output which can be freely assigned to the 3 channels
FK12	plug adaptor with screw terminals

Recording system

ak16	cassette for 16 m roll chart, with automatic take-up
fp	fanfold cassette for fanfold chart, 16 m long
r32	cassette for roll chart, 32 m long
nfs	refillable fibre pens

Housing

as	chart run-out slot in housing door (roll chart cassette only)
ab	housing for wall mounting. The panel-mounting housing is fitted in a carrier and can be swung out through 90°.
ka	housing with terminal cover
tm	housing with carrying handle, rubber feet and terminal cover, also 3 m mains cable with grounded plug
TRS–36	portable recording station, hard-wired

Standard accessories

2 mounting brackets
1 disposable fibre pen per channel or
1 refillable fibre pen per channel
1 roll chart or
1 pack fanfold chart
2 keys for housing door
1 Operating Manual B 95.3523
1 Brief Operating Instructions B 95.3523.1
1 Operating Manual "PC Programs" B 95.3523.3

Special accessories

Connection cable with interface

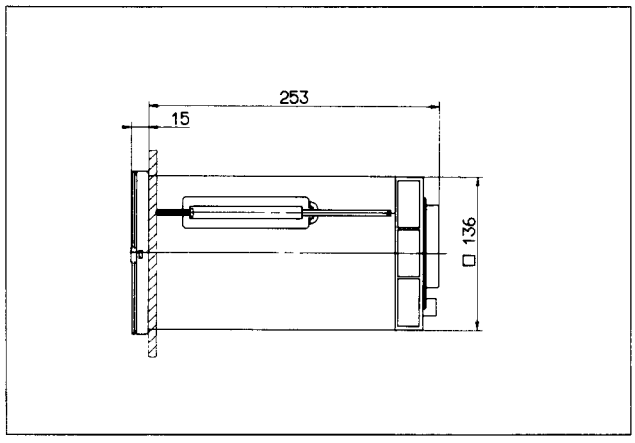
Diskette 3–1/2" or 5–1/4" with setup program

3.2 Location and climatic conditions

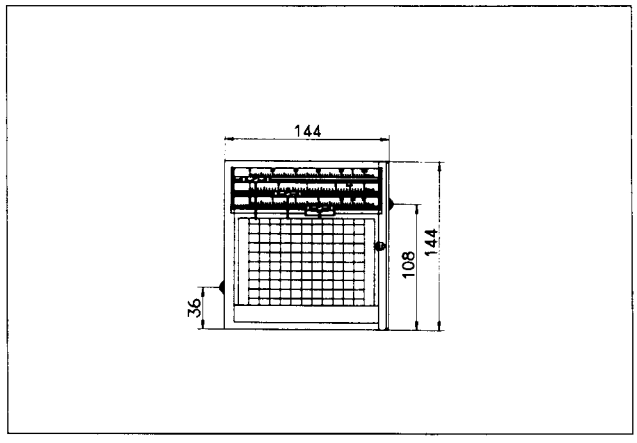
The recorder location should as far as possible be free from shock and vibration. Stray electro-magnetic fields, e.g. from motors, transformers etc., should be avoided. The ambient temperature at the location may be between −10 and +50°C at a relative humidity not exceeding 75%. Corrosive air or fumes have an unfavourable effect on the life of the recorder.

3.3 Fitting in position

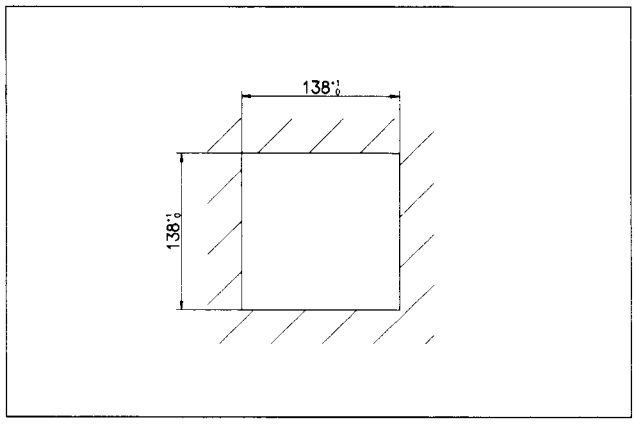
Side view



Front view



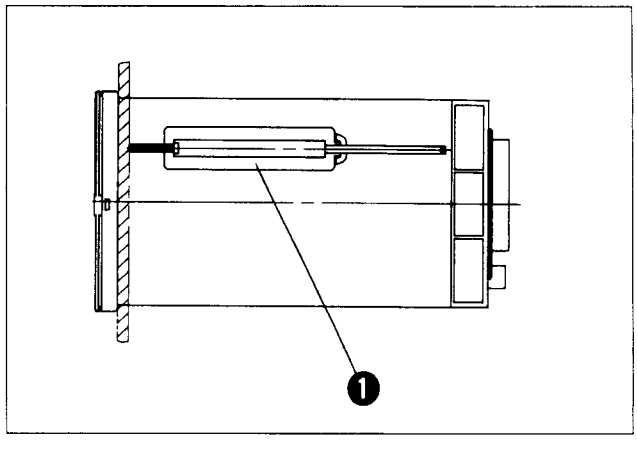
Panel cut-out



Insert the LOGOLINE recorder from the front into the panel cut-out.

From the back of the panel hook the two mounting brackets ❶ into the cut-outs in the sides of the housing. The flat bracket faces must lie against the housing.

The brackets are then placed against the rear of the panel and tightened evenly.



4 ELECTRICAL CONNECTION

4.1 Important notes on installation

- Where possible run all probe and signal lines separately from control and supply cables.

- Where several electronic instruments are installed it is advantageous for each to have its own supply cable together with protective ground.

- Use screened signal cables and ground them only at one end at the recorder.

- Where possible ensure mechanical separation between electronic instruments and contactor circuits.

- If inductive loads such as contactors, solenoid valves etc. are located in the neighbourhood of the recorder it is recommended to fit an RC module to the contactor coil for interference suppression.

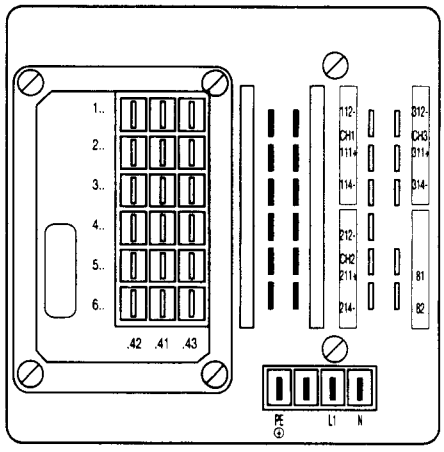
- Do not connect control circuits (relays, contactors) to the supply terminals of the recorder.

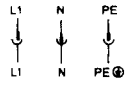
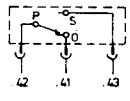
4 ELECTRICAL CONNECTION

4.2 Connection diagram

The choice of cable and the installation of the supply line must meet the requirements of VDE 0100 "Regulations on the Installation of Power Circuits with nominal voltages below 1000 V" or the appropriate local regulations.
The electrical connection to the recorder is made through tags 6.3x0.8 mm or twin 2.8x0.8 mm to DIN 46 244/A.

WARNING!
Mixed connection of safety low-voltage circuits (SELV) and mains voltage circuits to the relay contacts (*) is prohibited.

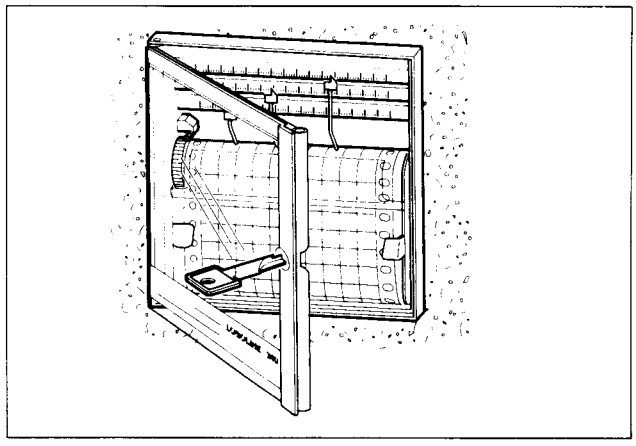


Connection for	Code	Terminals		Diagram
Supply as on label		L1 line N neutral PE protective ground	Loading P = 30 VA max.	
Signal input	e	**Input · = channel 1, 2, 3; isolated inputs**		
current input		·11 + ·12 –		
voltage input		·11 + ·14 –		
Limit contacts	relay 1	142 (P) common 141 (O) n.c. (opening) 143 (S) n.o. (closing)	* relay 250 V 3 A a.c. 30 V 3 A d.c.	
	relay 2	242 (P) common 241 (O) n.c. (opening) 243 (S) n.o. (closing)		
	relay 3	342 (P) common 341 (O) n.c. (opening) 343 (S) n.o. (closing)		
	relay 4	442 (P) common 441 (O) n.c. (opening) 443 (S) n.o. (closing)		
	relay 5	542 (P) common 541 (O) n.c. (opening) 543 (S) n.o. (closing)		
	relay 6	642 (P) common 641 (O) n.c. (opening) 643 (S) n.o. (closing)		
Logic control input		81 82	external control, contact current 10 mA max.	

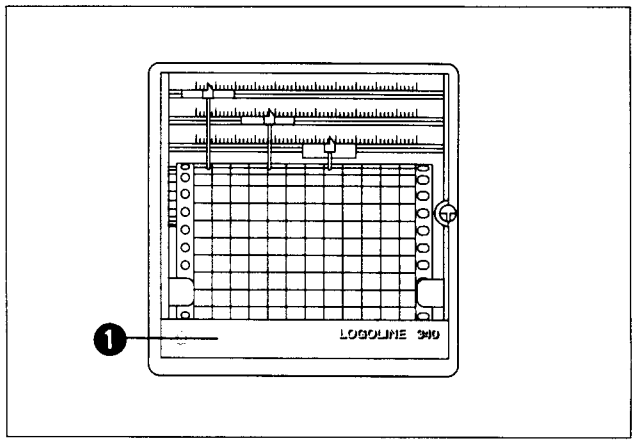
5 STARTING UP

5.1 Opening the housing door and marking the channel label

The accessories include two keys for the housing door. After turning the key anticlockwise a quarter turn the door can be opened. Grasp the right side of the door with the finger tips and pull it forward to open.



The channel designation and the corresponding range should be marked on the channel label ❶ (specify plot area and offset where appropriate).



5.2.Preparing the fibre pen for fitting

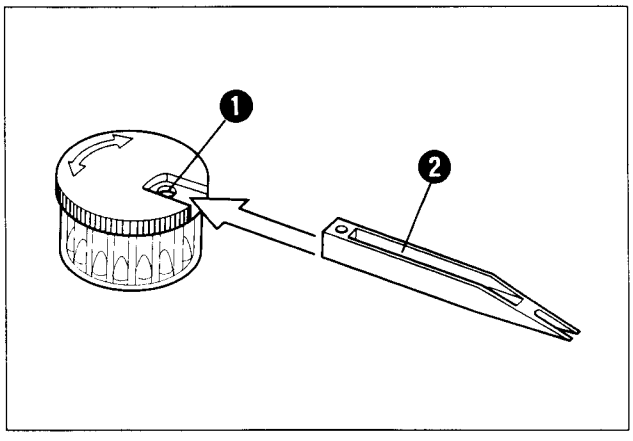
Disposable pen

Pull off the sealing cap

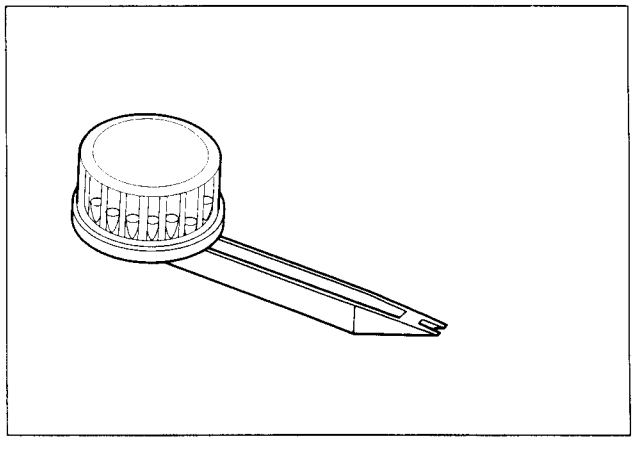
Refillable fibre pen (Code nfs)

The refillable fibre pens are already filled when supplied. The pen tip is not yet fitted.

Pull off the sealing cap, unpack the tip carrier and the fitting clip. Rotate the red cover of the carrier so that the opening ❶ is located above one of the tips. Slide the fitting clip ❷ into the cover cut-out.

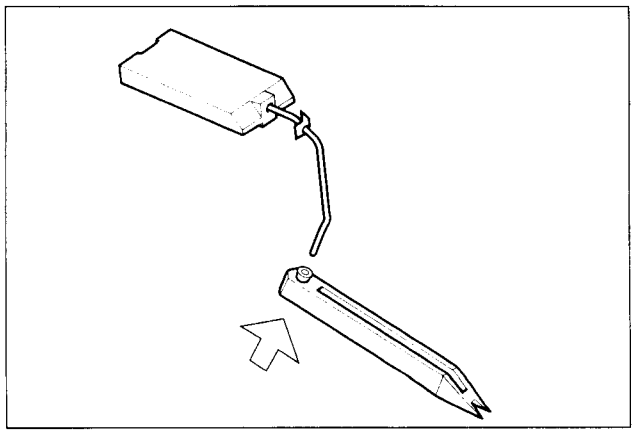


Rotate everything through 180° so that the tip drops into the fitting clip (see ill.).



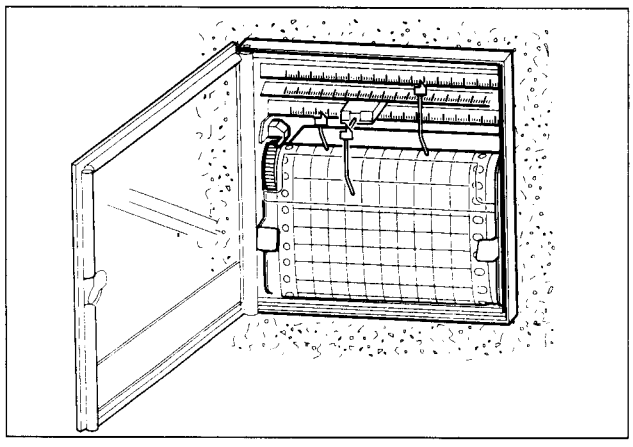
Push the tip on to the ink capillary (see ill.).

It is advisable the wet the tip with ink so that it becomes usable more quickly.



5.3 Inserting the fibre pen

Open the housing door. Swing up the scale. Slide the fibre pen **halfway** into its carrier.
Swing the scale down and push the pen in fully until it clicks home.



The scale must be located **behind** the scale pointer.

On multi-channel recorders, ensure the correct colour sequence:
channel 1 = blue,
channel 2 = red
channel 3 = green

6 PROGRAMMING

6.1 Operating and display field

After removing the chart cassette (Fig. 1) the operating and display field is accessible (Fig. 2). The LOGOLINE recorder can be programmed either using the 3 keys (❸, ❹, ❺, Fig. 3) together with the 4-digit LED display ❶, Fig 3), or with a setup program on a PC using the connector (❷, Fig 3).

Fig. 1

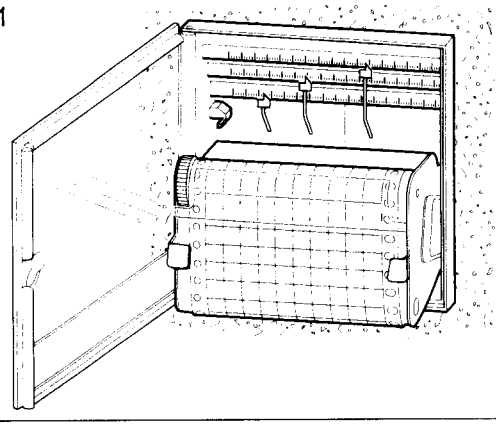
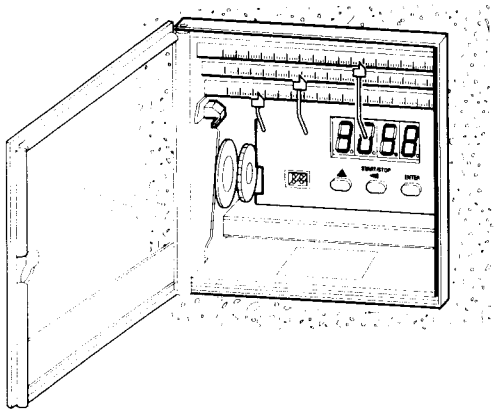
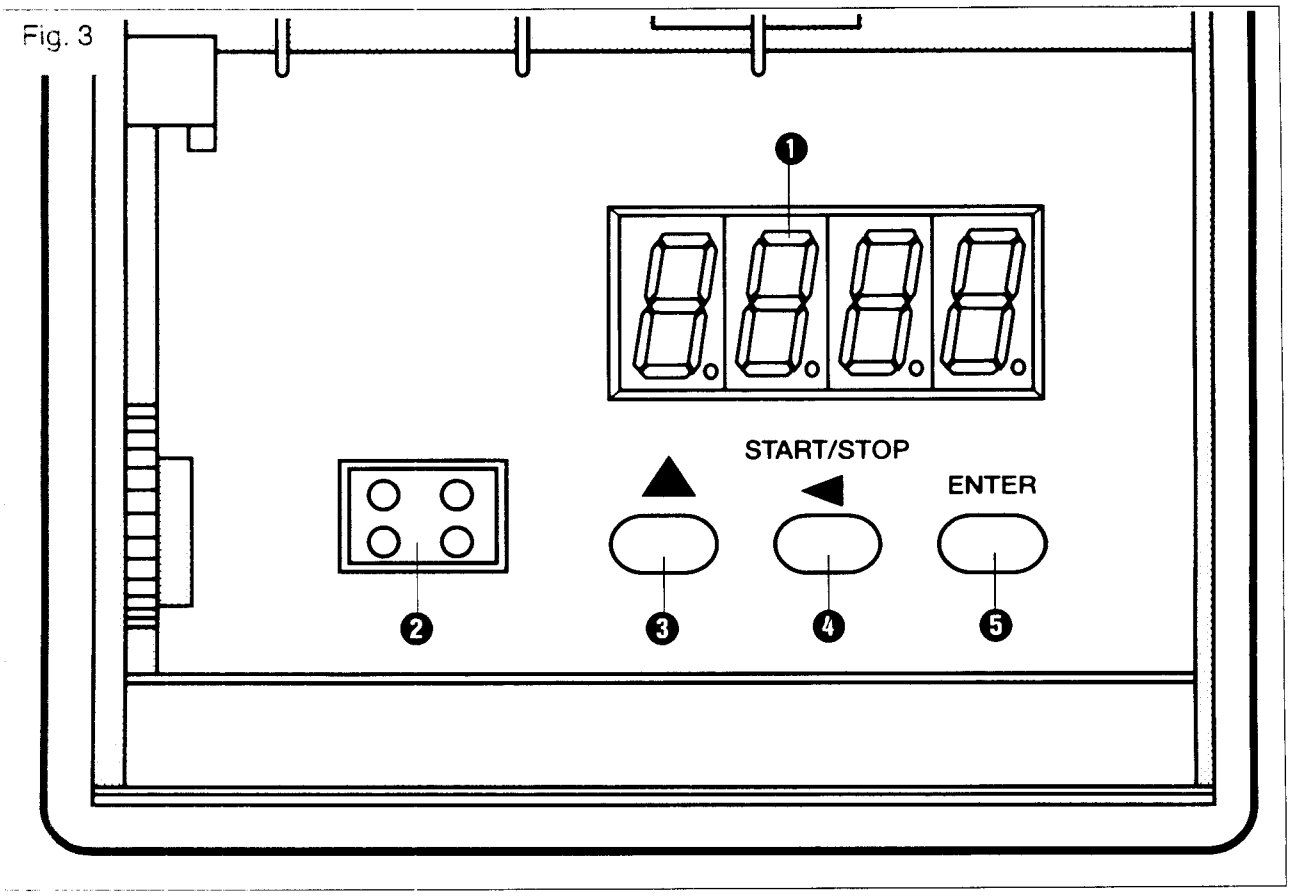


Fig. 2



❶ 4-digit 7-segment display
❷ 4-pin connector for setup interface
❸ operating key
❹ operating key
❺ operating key

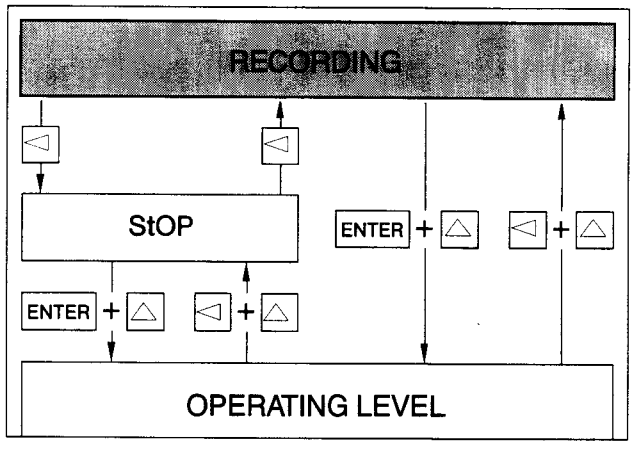
Fig. 3



6.2 Recording

This is the basic status of the pen recorder including signal acquisition and processing. The LED display is switched off.

After the chart cassette has been removed, recording can be stopped by pressing the key ◁. The LED display shows "StOP". Pressing the ◁ key again re-starts recording; the LED display goes out. From the recording or stop status, simultaneously pressing the keys ENTER and △ gives access to the **operating level**.



The relays are operated by the limit comparators even when the recorder is in the stop status.

Events can not be shown simultaneously; the sequence has therefore been prioritised. This means that in the simultaneous presence of several events the event with the highest priority has precedence.

The following priorities apply to the different chart speeds (1 = highest priority; 3 = lowest priority):

1. chart speed on limit recording (C801)
2. chart speed on external control (C802)
3. normal chart speed (FEEd)

All pens move from their position to 0%, draw a line up to 100% and return to their current position, on the following events:

- supply switch-on
- return from stop status to recording
- change of chart speed

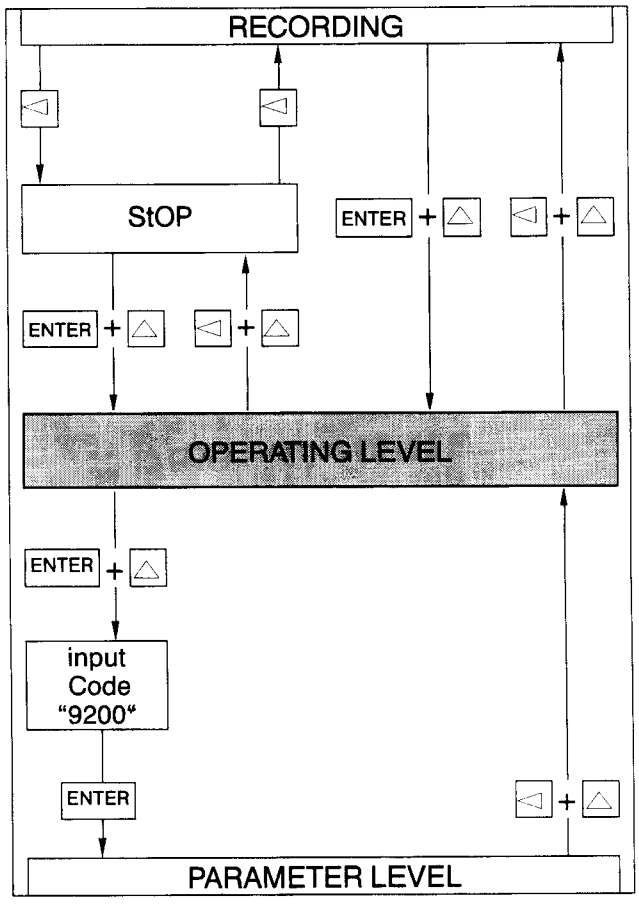
6.3 Operating level

Starting from "Recording" or "Stop Status" the operating level is reached by simultaneously pressing the keys ENTER and △.

The operating level can be used to set the general parameter "chart speed" as well as the plot status for channels 1, 2 and 3. In addition it is possible to select whether a print test should be performed.

When you have reached the operating level the LED display shows the first parameter "FEEd".

The relays continue to be operated by the limit comparators.



Display	to edit	Selection/Input	with keys	Enter	continue with
FEEd		see 6.3.1			

6.3.1 Chart speed (FEEd)

Setting the chart speed for recorder traces during normal operation (not on limit recording or external control). It can be selected in the usual JUMO steps or freely programmed in steps of 1 mm/h.

The recorder is set at the factory for the usual JUMO steps. For programming in mm/h steps the recorder must be switched over at configuration level 2 to "Chart speed – continuous programming" (⟹ 6.6.1 Chart speed – continuous programming).

Display	to edit	Selection/Input	with keys	Enter	continue with
FEEd	ENTER	0, 5, 10, 20, 60, 120, 240, 300, 360, 600, 720, 1800, 3600 mm/h	△	ENTER	△
or:					
FEEd	ENTER	0000 └ input required chart speed	△ ◁	ENTER	△

6.3.2 Plot status (PLOt)

Status ON or OFF is set separately for each channel.

ON: the signals are recorded.

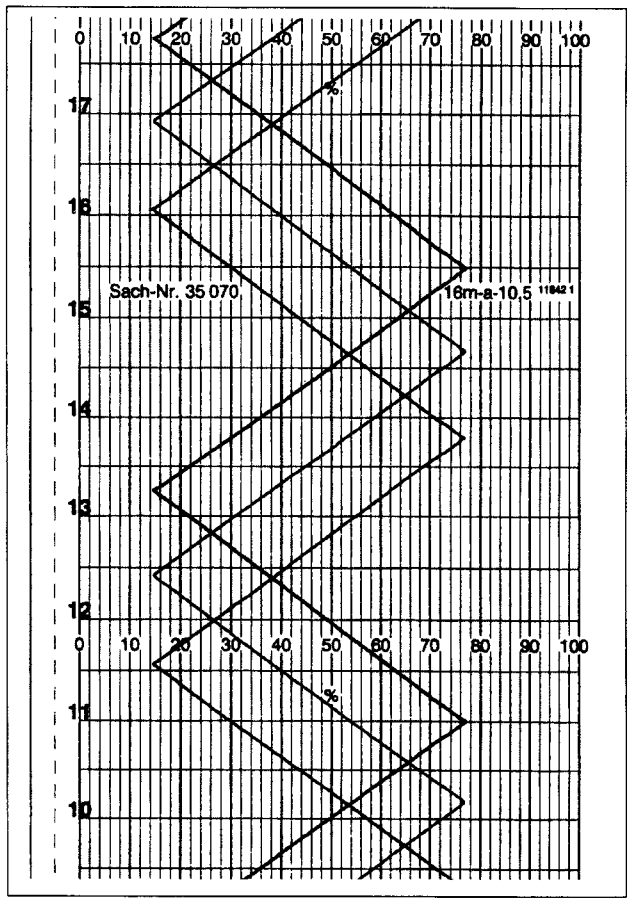
OFF: the signals are not recorded but the limit value monitoring remains activated. The relays continue to be operated by the limit comparators.

Display	to edit	Selection/Input	with keys	Enter	continue with
PLO	ENTER	CH1, CH2, CH3 select required channel	△	ENTER	→ 2
	→ 2	ON, OFF select status	△	ENTER	△

6.3.3 Print test (tESt)

Set whether there is to be an immediate test of the fibre pens ("ON") or not ("OFF").

After the chart cassette has been replaced in position the pattern shown alongside is recorded.



Display	to edit	Selection/Input	with keys	Enter	continue with
tESt	ENTER	ON. OFF	△	ENTER	△

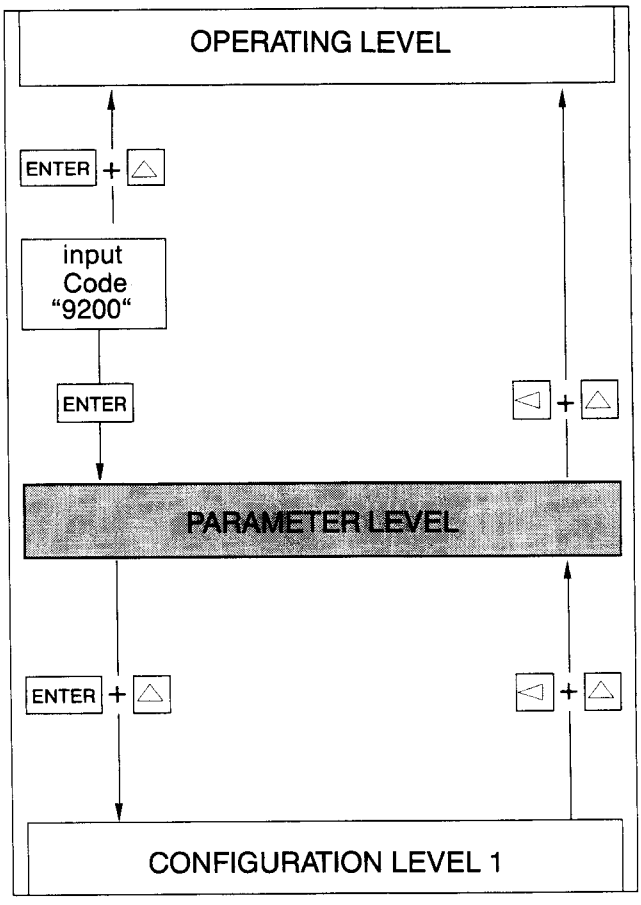
6.4 Parameter level

To reach the parameter level from the operating level you simultaneously press the keys [ENTER] and [△], input the JUMO code number "9200" and press the [ENTER] key.

To reach the parameter level from configuration level 1 you simultaneously press the keys [◁] and [△].

When you have reached the parameter level the LED display shows the first parameter "P1".

When code 9200 is input the parameters at the parameter level and at the two configuration levels can be altered. Relay operation is interrupted. If a wrong code number is input the parameters can be viewed but not altered.



Display	to edit	Selection/Input	with keys	Enter	continue with
COdE	[ENTER]	0000 input "9200"	[△] [◁]	[ENTER]	→ 2
	→ 2	see 6.4.1			

6.4.1 Filter constant (P1)

The filter constant affects the response time of the pen. By increasing the filter constant setting it is possible to dampen the recording of heavily fluctuating values, e.g. the signal from a float.

The response time corresponds roughly to ten times the selected filter constant in seconds, for a step change of the input signal from 0 to 100% (programmable from 1.3 to 1000 sec).

Adjustment range 0.0 – 100.0
If a value outside this range is input the display shows "Err".
On pressing the [ENTER] key the display shows again the old value of the filter constant.

Display	to edit	Selection/Input	with keys	Enter	continue with
P 1	[ENTER]	P110 (channel 1) P120 (channel 2) P130 (channel 3) select required channel	[△]	[ENTER]	→ 2
	→ 2	000.0 └ input value (setting range 0.0 – 100.0)	[△] [◁]	[ENTER]	[△]

6.4.2 Limit comparator setting (P2)

Here you enter the setting for the relay output selected. The setting is input as a percentage of the measuring range. In order to avoid excessively frequent switching a dead band of 0.5% is placed about the switching point.

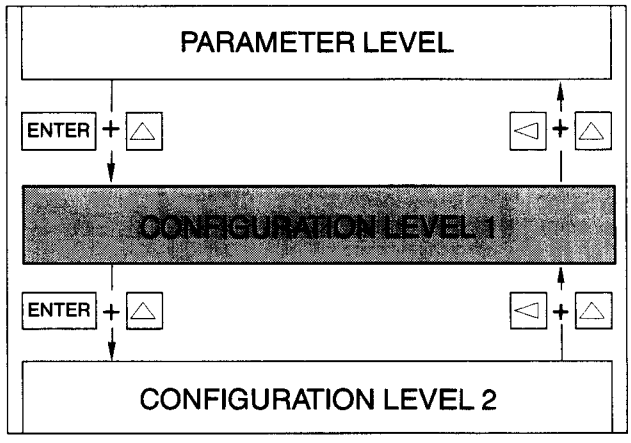
The 0.5% dead band always refers to the total range of 0 – 100%, irrespective of the limit setting.

Display	to edit	Selection/Input	with keys	Enter	continue with
P 2	ENTER	P210 (relay 1) P220 (relay 2) P230 (relay 3) P240 (relay 4) P250 (relay 5) P260 (relay 6) select required relay	△	ENTER	→ 2
	→ 2	000.0 └ input value (setting range 0.0 – 100.0)	△ ◁	ENTER	△

6.5 Configuration level 1

To reach configuration level 1 from the parameter level you press simultaneously the keys [ENTER] and [△].

To reach configuration level 1 from configuration level 2 you press simultaneously the keys [◁] and [△]



Configuration level 1 is used to set parameters specific for individual channels, such as range, plot area, offset, limit speed, and recalibration to user specification; in addition the relay outputs are configured.

When you have reached configuration level 1 the LED display shows the first parameter "C1".

Display	to edit	Selection/Input	with keys	Enter	continue with
C 1		**see 6.5.1**			

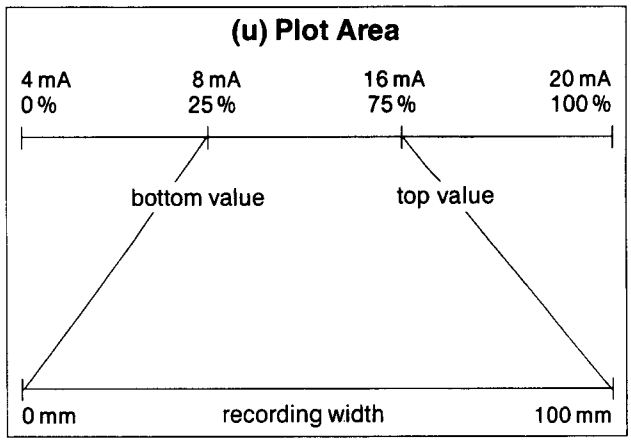
6.5.1 Range (C1)

Selection of the range for each channel:
0 – 1 V
1 – 10 V
0 – 20 mA
4 – 20 mA
The sampling time for each channel is 150 msec.

Display	to edit	Selection/Input	with keys	Enter	continue with
C 1	ENTER	C110 (channel 1) C120 (channel 2) C130 (channel 3) select channel required	△	ENTER	→ 2
	→ 2	0 – 1, 0 – 10, 0 – 20, 4 – 20 select range required	△	ENTER	△

6.5.2 Plot area (C2)

This function can be used to spread part of the range over the full recording width. Set separately for each channel. The input is made in %. The **bottom value** indicates the point in the range where you want the new zero to be. The **top value** indicates the new top end of the recording.



Example:

Range: 4 – 20 mA
You want to record a range of 8 – 16 mA.

The bottom value is given by:

$$\frac{\text{new range start} - \text{original range start}}{\text{original range end} - \text{original range start}} \cdot 100\%$$

$$= \frac{8\ \text{mA} - 4\ \text{mA}}{20\ \text{mA} - 4\ \text{mA}} \cdot 100\% = 25\%$$

The top value is given by:

$$\frac{\text{new range end} - \text{original range start}}{\text{original range end} - \text{original range start}} \cdot 100\%$$

$$= \frac{16\ \text{mA} - 4\ \text{mA}}{20\ \text{mA} - 4\ \text{mA}} \cdot 100\% = 75\%$$

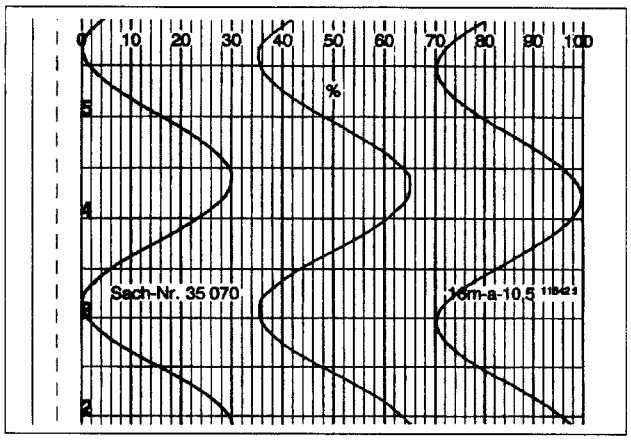
The difference between the bottom value and the top value must be at least 10%.

When using plot area, note that you also require the appropriate scale.

Display		to edit	Selection/Input	with keys	Enter	continue with
	C 2	ENTER	C210 (channel 1) C220 (channel 2) C230 (channel 3) select channel required	△	ENTER	→ 2 → 4 or → 6
→ 2	C 210	ENTER	0000 └ input bottom value (range 0 – 100%)	△ ◁	ENTER	→ 3
→ 3	C 211	ENTER	0000 └ input top value (range 0 – 100%)	△ ◁	ENTER	△
→ 4	C 220	ENTER	0000 └ input bottom value (range 0 – 100%)	△ ◁	ENTER	→ 5
→ 5	C 221	ENTER	0000 └ input top value (range 0 – 100%)	△ ◁	ENTER	△
→ 6	C 230	ENTER	0000 └ input bottom value (range 0 – 100%)	△ ◁	ENTER	→ 7
→ 7	C 231	ENTER	0000 └ input top value (range 0 – 100%)	△ ◁	ENTER	△

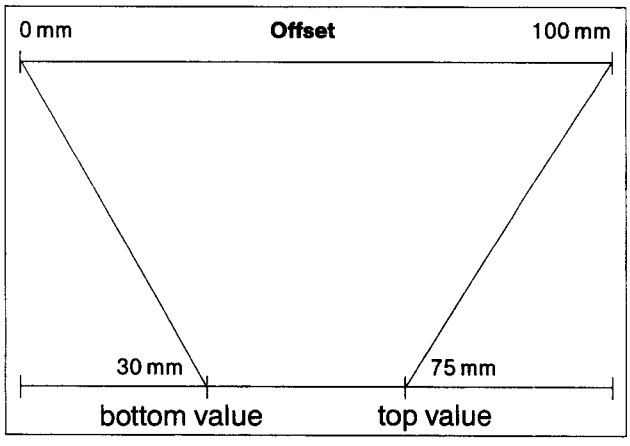
6.5.3 Offset (C3)

When the recording traces run into each other and therefore become unclear it is possible to separate them by forming strips (offsets). These are set separately for each channel. The input is in mm. The **bottom value** indicates the point on the chart where the zero of the recording will be reproduced. The **top value** determines the top end of the recording.



Example:

The signal should be recorded on the chart in the range from 30 to 75 mm. The **bottom value** is therefore 30 mm; the **top value** is 75 mm (see Ill. on the right).



When using offset, note that you also require the appropriate scale.

Display		to edit	Selection/Input	with keys	Enter	continue with
	C 3	ENTER	C310 (channel 1) C320 (channel 2) C330 (channel 3) select channel required	△	ENTER	→ 2 → 4 or → 6
→ 2	C 310	ENTER	0000 └ input bottom value (range 0 – 100%)	△ ◁	ENTER	→ 3
→ 3	C 311	ENTER	0000 └ input top value (range 0 – 100%)	△ ◁	ENTER	△
→ 4	C 320	ENTER	0000 └ input bottom value (range 0 – 100%)	△ ◁	ENTER	→ 5
→ 5	C 321	ENTER	0000 └ input top value (range 0 – 100%)	△ ◁	ENTER	△
→ 6	C 330	ENTER	0000 └ input bottom value (range 0 – 100%)	△ ◁	ENTER	→ 7
→ 7	C 331	ENTER	0000 └ input top value (range 0 – 100%)	△ ◁	ENTER	△

6.5.4 Limit recording (C4)

If the signal goes above or below the limits which are input here (referred to the range) the recording is continued at the chart speed set under "limit value recording" (⇒ 6.6.2).
This is set separately for each channel.
The input is in %.
In order to avoid excessively frequent switching a dead band of 0.5% is placed about the switching point.

Example:

set range: 4 – 20 mA
required bottom for limit recording: 12 mA
required top for limit recording: 14 mA

The 0.5% dead band always refers to the total range of 0 – 100%, irrespective of the limit value setting.

bottom value:

$$\frac{\text{limit recording} - \text{range start}}{\text{range end} - \text{range start}} \cdot 100\%$$

$$= \frac{12\ \text{mA} - 4\ \text{mA}}{20\ \text{mA} - 4\ \text{mA}} \cdot 100\% = 50\%$$

top value:

$$\frac{\text{limit recording} - \text{range start}}{\text{range end} - \text{range start}} \cdot 100\%$$

$$= \frac{14\ \text{mA} - 4\ \text{mA}}{20\ \text{mA} - 4\ \text{mA}} \cdot 100\% = 62.5\%$$

Display		to edit	Selection/Input	with keys	Enter	continue with
	C 4	ENTER	C410 (channel 1) C420 (channel 2) C430 (channel 3) select channel required	△	ENTER	→ 2 → 4 or → 6
→ 2	C 410	ENTER	000.0 └ input bottom value (range 0 – 100%)	△ ◁	ENTER	→ 3
→ 3	C 411	ENTER	000.0 └ input top value (range 0 – 100%)	△ ◁	ENTER	△
→ 4	C 420	ENTER	000.0 └ input bottom value (range 0 – 100%)	△ ◁	ENTER	→ 5
→ 5	C 421	ENTER	000.0 └ input top value (range 0 – 100%)	△ ◁	ENTER	△
→ 6	C 430	ENTER	000.0 └ input bottom value (range 0 – 100%)	△ ◁	ENTER	→ 7
→ 7	C 431	ENTER	000.0 └ input top value (range 0 – 100%)	△ ◁	ENTER	△

6.5.5 Recalibration to user specification (C5)

For correcting the indicated value.
It can be used e.g. to compensate for systematic errors due to unfavourable probe location. The input is made in % referred to the range. 1% corresponds to a shift of 1 mm on the chart since the recording width is 100 mm.
An input of e.g. −1% means a pen shift of 1 mm to the left.
It is set separately for each channel.

Example:

A temperature probe produces a signal of 4 – 20 mA over the temperature range 200 – 400°C. It has an unfavourable location in a tunnel oven so that it always reads 10°C lower than the charge in the furnace.
The characteristic must therefore be shifted to the right by 10°C, i.e. 5% of the range. In this way a probe temperature of e.g. 200°C (signal 4 mA) produces on the chart the correct charge temperature of 210°C.

The negative sign for negative inputs must always be input at the first digit. It is reached between "9" and "0" when scrolling through the numbers.

Display	to edit	Selection/Input	with keys	Enter	continue with
C 5	ENTER	C510 (channel 1) C520 (channel 2) C530 (channel 3) select channel required	△	ENTER	→ 2 → 4 or → 6
→ 2 C 510	ENTER	000.0 └ input value (range −99.9 to +100%)	△ ◁	ENTER	△
→ 3 C 520	ENTER	000.0 └ input value (range −99.9 to +100%)	△ ◁	ENTER	△
→ 4 C 530	ENTER	000.0 └ input value (range −99.9 to +100%)	△ ◁	ENTER	△

6.5.6 Relay status (C60)

Selection whether the output is operated by the limit comparator or not.
This is set separately for each relay.

ON: limit monitoring for the selected relay is switched off.

OFF: limit monitoring for the selected relay is switched on.

Display	to edit	Selection/Input	with keys	Enter	continue with
C 60	ENTER	C610 (relay 1) C620 (relay 2) C630 (relay 3) C640 (relay 4) C650 (relay 5) C660 (relay 6) select relay required	△	ENTER	→ 2
→ 2 C 610 C 620 C 630 C 640 C 650 C 660 (as selected)	ENTER	ON, OFF select status	△	ENTER	△

6.5.7 Reference channel (C61)

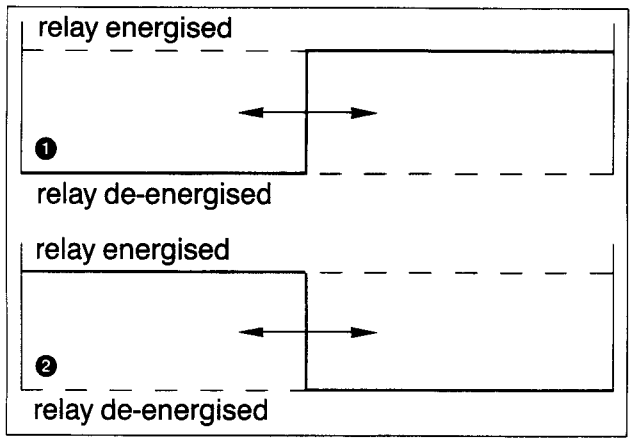
Selection of the channel to which the selected relay is to be assigned.

Each relay can be assigned to any channel. It is possible e.g. to assign all 6 relays to channel 1; this permits programming of warning and main alarm.

Display	to edit	Selection/Input	with keys	Enter	continue with
C 61	ENTER	C611 (relay 1) C621 (relay 2) C631 (relay 3) C641 (relay 4) C651 (relay 5) C661 (relay 6) select relay required	△	ENTER	→ 2
→ 2 C 611 C 621 C 631 C 641 C 651 C 661 (as selected)	ENTER	CH1, CH2, CH3 select channel	△	ENTER	△

6.5.8 Limit comparator type (C62)

Selecting function Ik7, Ik8 for the relays 1 – 6
(⇒ 6.5.6, 6.5.7)



❶ Ik7

Adjustable over the entire range.
Function: relay is energised when the signal **exceeds** the limit value.

㉕ Ik8
as Ik7 but relay action reversed.

Display	to edit	Selection/Input	with keys	Enter	continue with
C 62	ENTER	C612 (relay 1) C622 (relay 2) C632 (relay 3) C642 (relay 4) C652 (relay 5) C662 (relay 6) select relay required	△	ENTER	→ 2
→ 2 C 612 C 622 C 632 C 642 C 652 C 662 (as selected)	ENTER	Ik7, Ik8 select function	△	ENTER	△

6.5.9 Relay action on overrange/underrange (C63)

With this function you can set whether on overrange or underrange the relay of the selected channel is energised ("ON") or de-energised ("OFF").

This is set separately for each channel.

Display	to edit	Selection/Input	with keys	Enter	continue with
C 63	ENTER	C613 (relay 1) C623 (relay 2) C633 (relay 3) C643 (relay 4) C653 (relay 5) C663 (relay 6) select relay required	△	ENTER	→ 2
→ 2 C 613 C 623 C 633 C 643 C 653 C 663 (as selected)	ENTER	ON, OFF select status	△	ENTER	△

6.5.10 Copy channel parameters (C7)

Using this function you can copy the parameters from one channel to another channel.

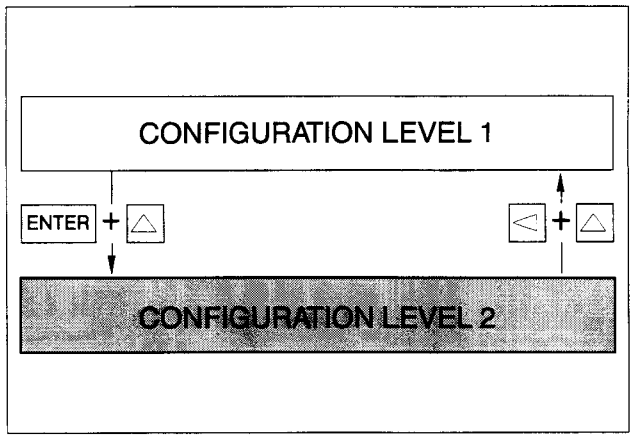
The first number indicates the channel whose parameters are to be copied; the second number designates the target channel.

The following parameters are copied: plot status, filter constant, range, plot area, offset, limit recording, recalibration to user specification.

Display		to edit	Selection/Input	with keys	Enter	continue with
	C 7	ENTER	–	–	–	→ 2
→ 2	C 700	ENTER	OFF, 1 – 2, 1 – 3, 2 – 1, 2 – 3, 3 – 1, 3 – 2	△	ENTER	△

6.6 Configuration level 2

From configuration level 1 you reach configuration level 2 by simultaneously pressing the keys ENTER and △.



Configuration level 2 is used to set the chart speed programmes (continuous or in the usual JUMO steps), the chart speed on limit operation and on external control, also the pen offset compensation. In addition a function test and preset can be performed and the version No. can be indicated.

When you have reached the configuration level 2 the LED display shows the first parameter "C800".

Display	to edit	Selection/Input	with keys	Enter	continue with
C 800		see 6.6.1			

6.6.1 Chart speed – continuous programming (C800)

Select whether the chart speeds (⇒ 6.3.1 Chart speed (FEEd), 6.6.2 Chart speed on limit recording, 6.6.3 Chart speed on external control) are adjusted in the usual JUMO steps ("OFF") or continuously on mm/h steps ("ON").

Display	to edit	Selection/Input	with keys	Enter	continue with
C 800	ENTER	ON, OFF select status	△	ENTER	△

6.6.2 Chart speed on limit recording (C801)

When the input signal goes above or below the limits input under ⇒ 6.5.4 the recording continues at the chart speed selected here.

Display	to edit	Selection/Input	with keys	Enter	continue with
C 801	ENTER	0, 5, 10, 20, 60, 120, 240, 300, 360, 600, 720, 1800, 3600 mm/h	△	ENTER	△
Or:					
C 801	ENTER	0000 └ input required chart speed (mm/h)	△ ◁	ENTER	△

6.6.3 Chart speed on external control (C802)

Chart speed for recording when an external control signal is applied (contacts 81 and 82 are linked).

Display	to edit	Selection/Input	with keys	Enter	continue with
C 802	ENTER	0, 5, 10, 20, 60, 120, 240, 300, 360, 600, 720, 1800, 3600 mm/h	△	ENTER	△
Or:					
C 802	ENTER	0000 └ input required chart speed (mm/h)	△ ◁	ENTER	△

6.6.4 Pen offset compensation (C803)

There is a pen offset of 2 mm from the pen of channel 1 to that of channel 2, and from the pen of channel 2 to that of channel 3. This pen offset can be compensated ("ON"). This function is performed by a temporary storage of the measurements.

Example:

At a chart speed of 20 mm/h this offset represents a time difference of 6 minutes from channel to channel.

If pen offset compensation is switched on the values of the second channel are stored temporarily for 6 minutes, and those of the third channel for 12 minutes, until they are output on the chart.

If compensation of pen offset is switched on ("ON") there is real time recording referred to the chart time grid.

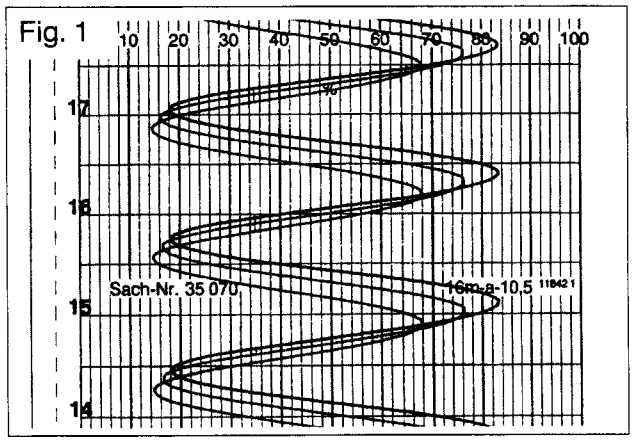


Fig. 1
without pen offset compensation

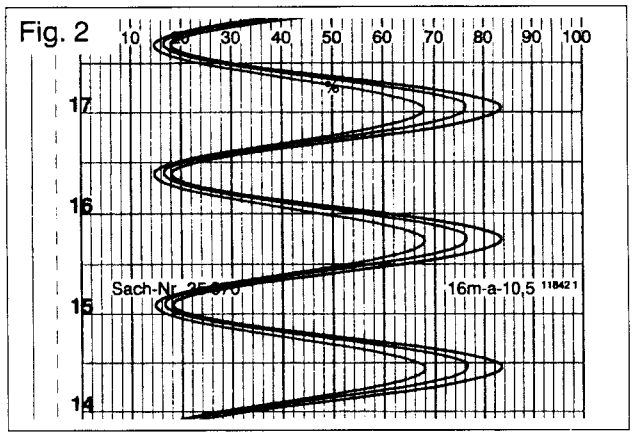


Fig. 2
with pen offset compensation

Display	to edit	Selection/Input	with keys	Enter	continue with
C 803	ENTER	ON, OFF	△	ENTER	△

6.6.5 Function test (C804)

Basic setting of the recorder. These values are used by the factory for a functional test before shipping the instrument.

6.6.6 Preset (C805)

Factory-set basic setting of the instrument. Using this function the basic parameters of the recorder can be restored.

Display	to edit	Selection/Input	with keys	Enter	continue with
C 805	ENTER	ON, OFF	△	ENTER	△

6.6.7 Version number (C806)

Under this parameter you can read the version number of the recorder.

Display	to edit	Selection/Input	with keys	Enter	continue with
C 806	ENTER	0101 └ Version No. (read only)	–	ENTER	△

7 CONSUMABLES

7.1 Consumables summary

Roll chart

marked JUMO, % graduation, linear
overall length: 16 m
overall width: 120 mm
chart speed: 20 mm/h
Ref. No.: 35 070

no name, % graduation, linear
overall length: 16 m
overall width: 120 mm
chart speed: 20 mm/h
Ref. No.: 35 069

no name, % graduation, linear
overall length: 32 m
overall width: 120 mm
chart speed: 20 mm/h
Ref. No.: 49 857

no name, special calibration
(marking as ordered)

Fanfold chart

marked JUMO, % graduation, linear
overall length: 16 m
overall width: 120 mm
chart speed: 20 mm/h
Ref. No.: 49 603

no name, % graduation, linear
overall length: 16 m
overall width: 120 mm
chart speed: 20 mm/h
Ref. No.: 49 604

no name, special calibration
(marking as ordered)

Disposable fibre pens

blue. Ref.No. 48 075
red. Ref.No. 48 076
green. Ref.No. 48 077

Refillable fibre pens

blue. Ref.No. 53 708
red. Ref.No. 53 709
green. Ref.No. 53 710

Bottle of ink

size 10 ml
blue. Ref.No. 53 711
red. Ref.No. 53 712
green. Ref.No. 53 713

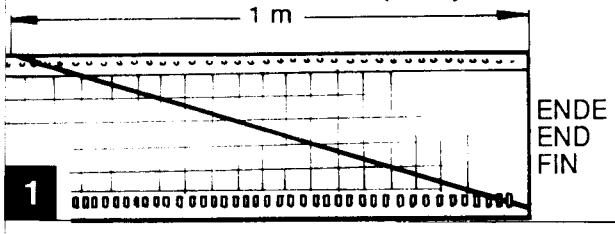
Filler pipette

blue. Ref.No. 53 714
red. Ref.No. 53 715
green. Ref.No. 53 716

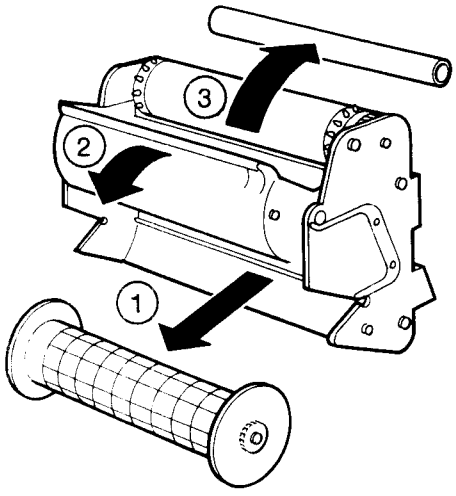
Fibre tip set

incl. fitting clip
contents: 10 tips
Ref.No. 53 717

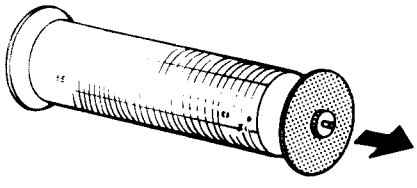
7.2 Changing the roll chart (16 m)



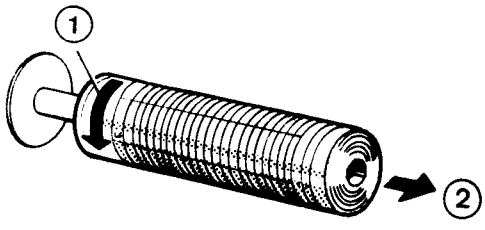
1



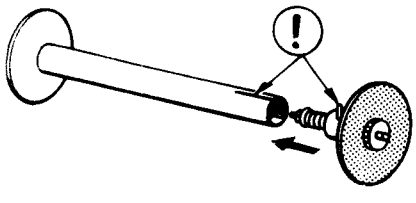
2



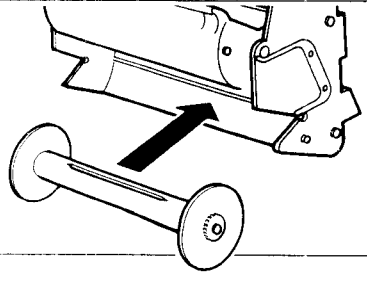
3



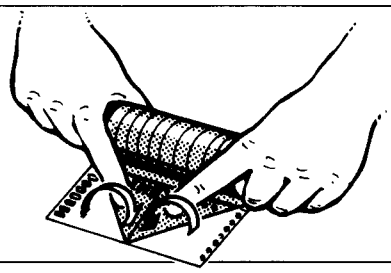
4



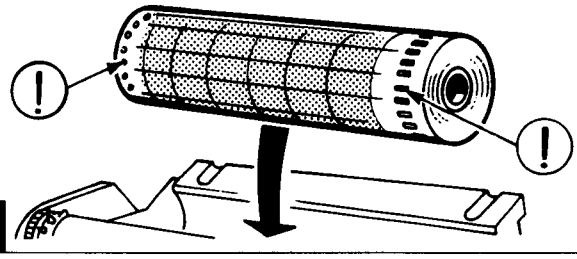
5



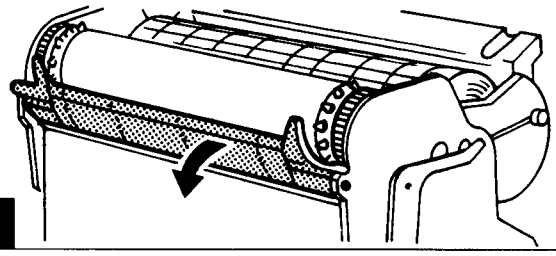
6



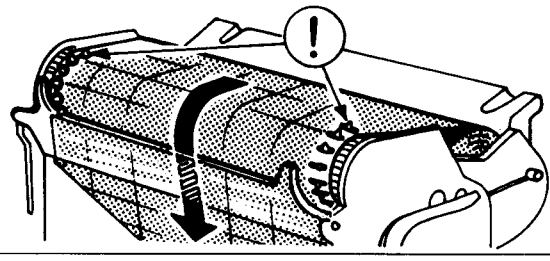
7



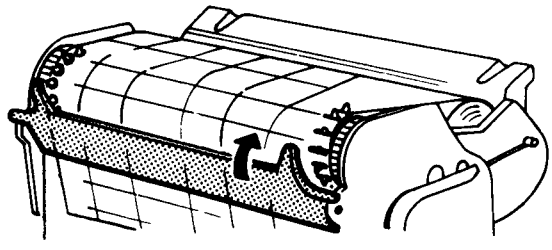
8



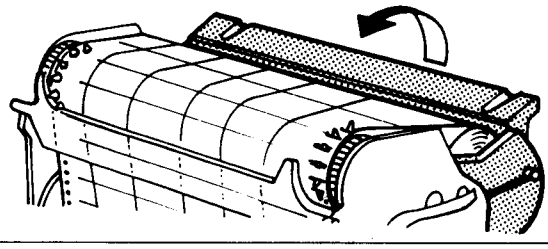
9



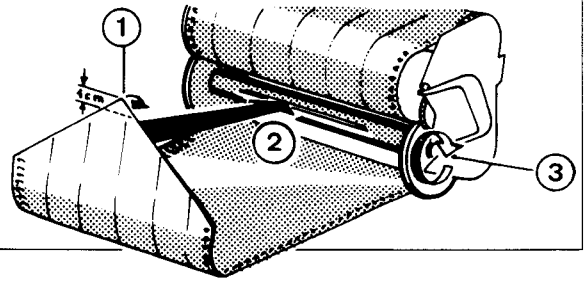
10



11

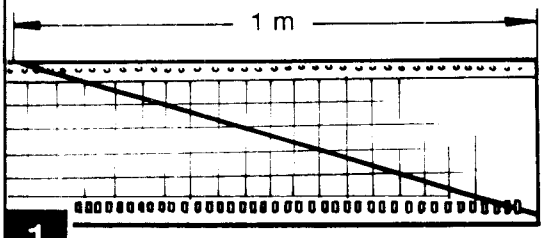


12

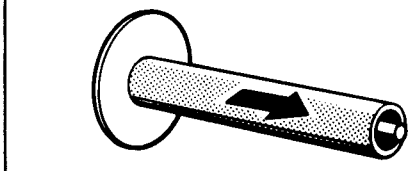


13

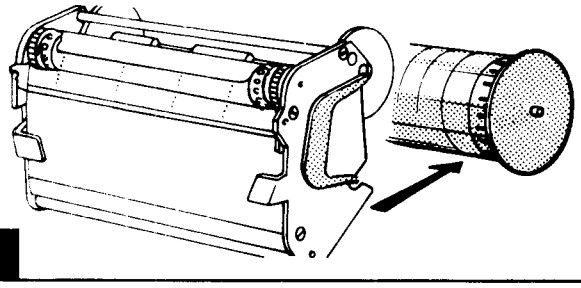
7.3 Changing the roll chart (32 m)



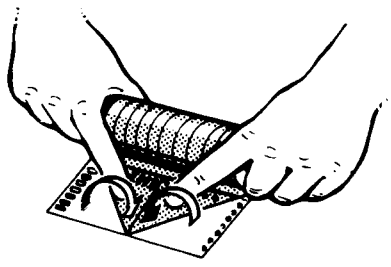
1



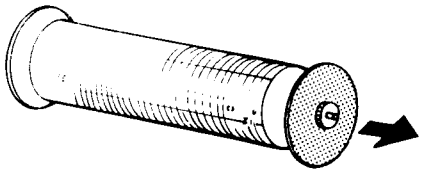
7



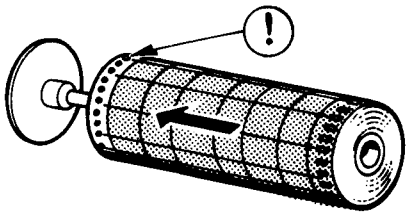
2



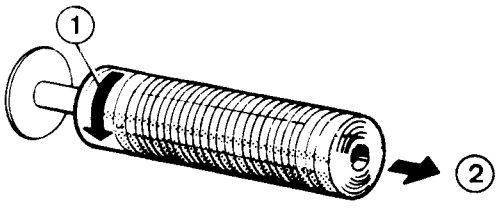
8



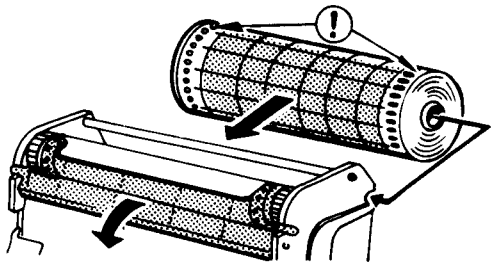
3



9



4



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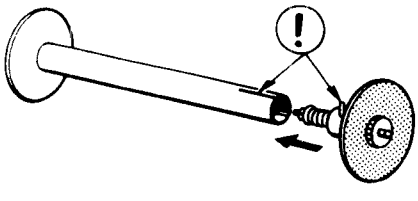

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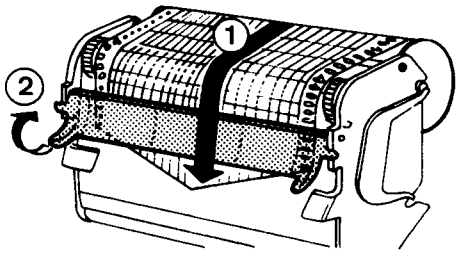

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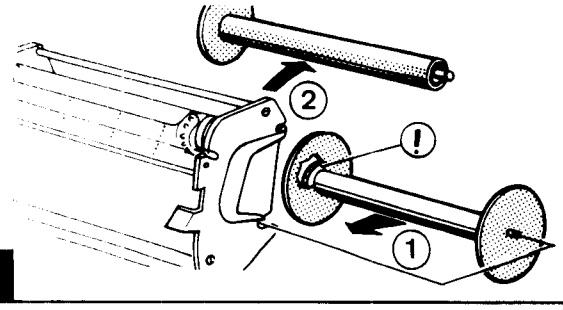

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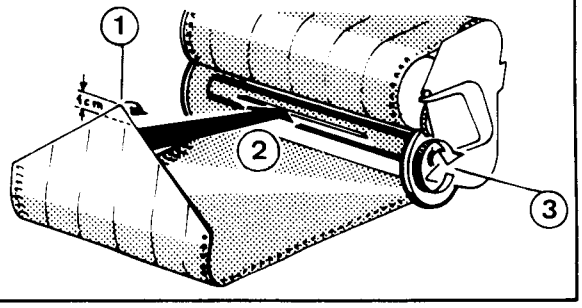
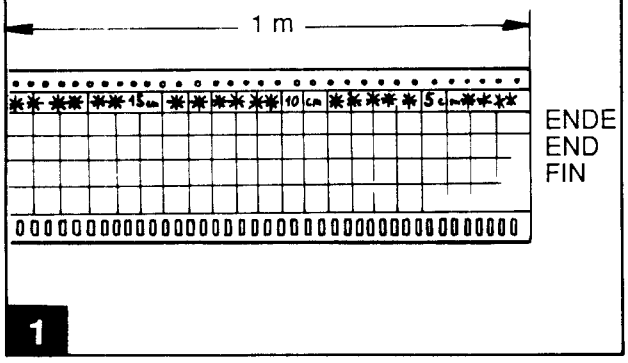


12

7.4 Changing the fanfold chart



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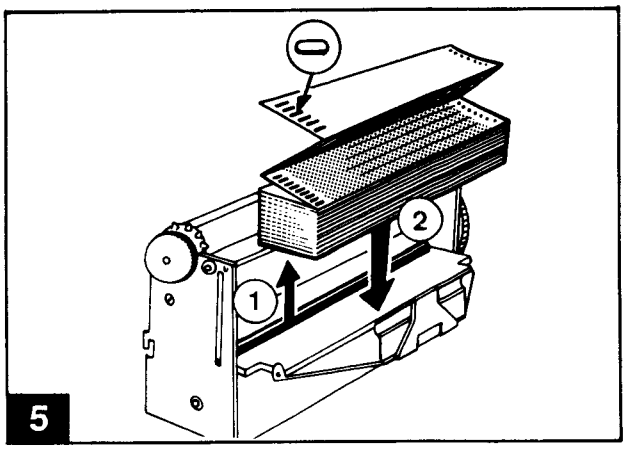

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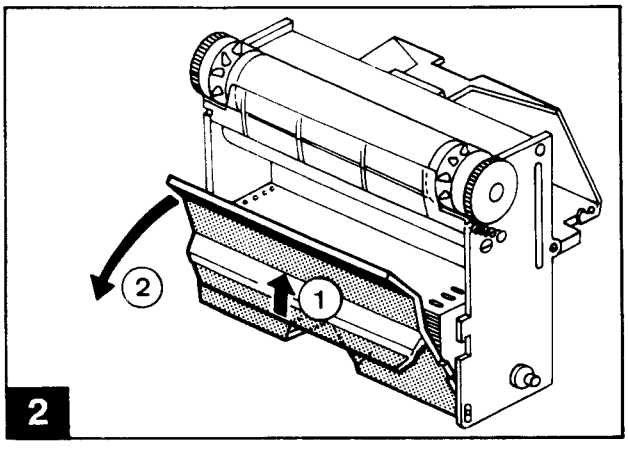

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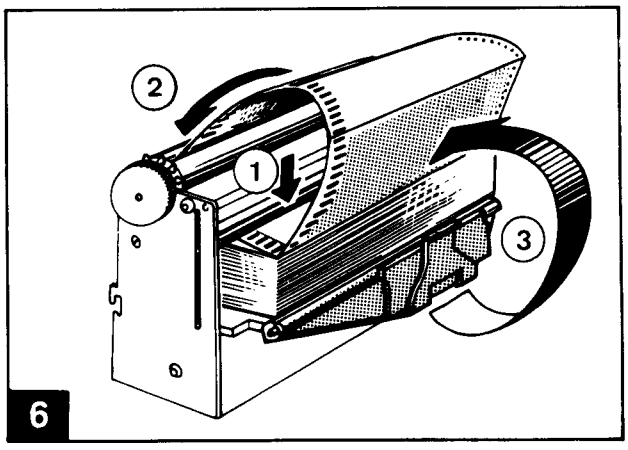

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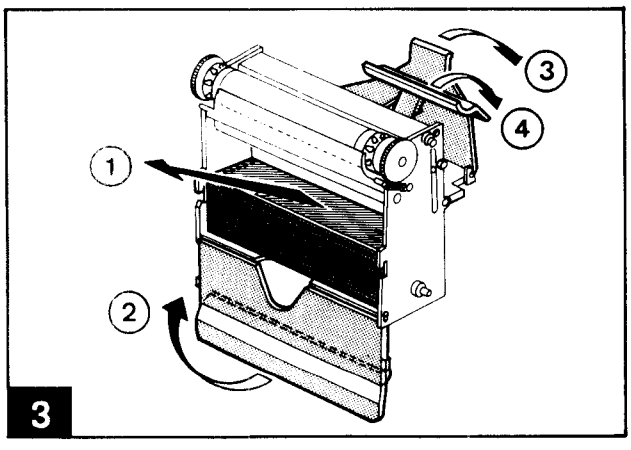

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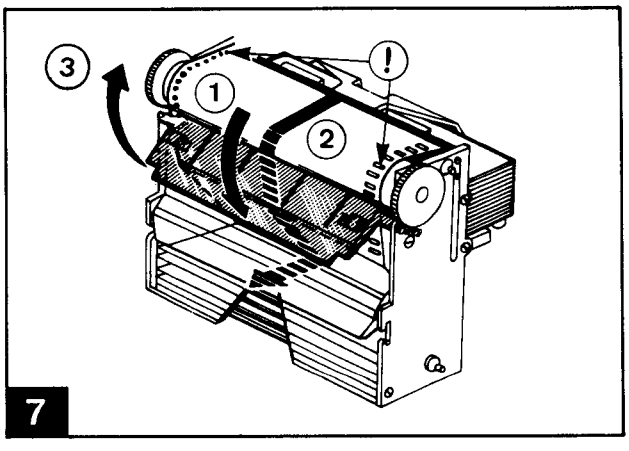

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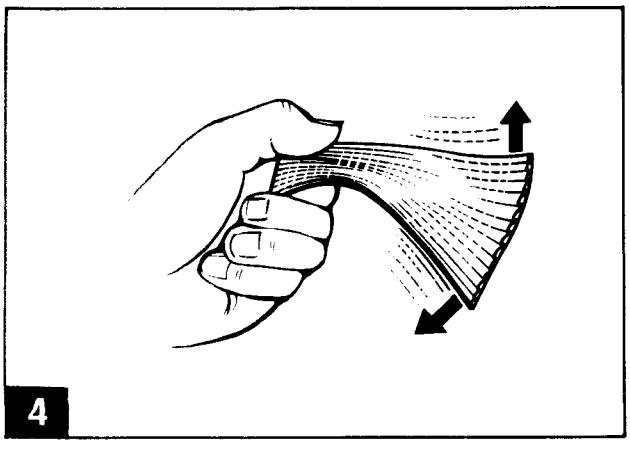

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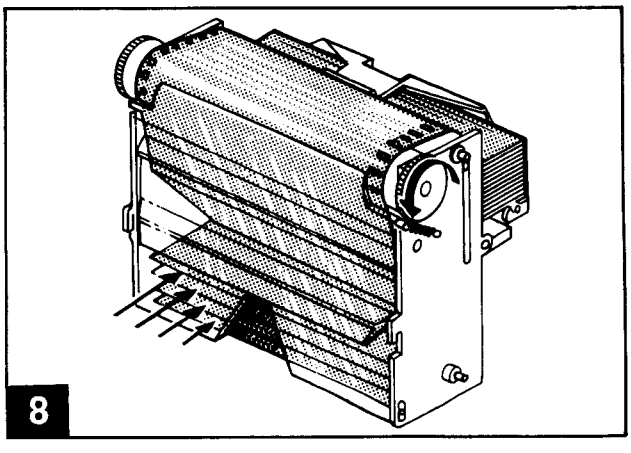
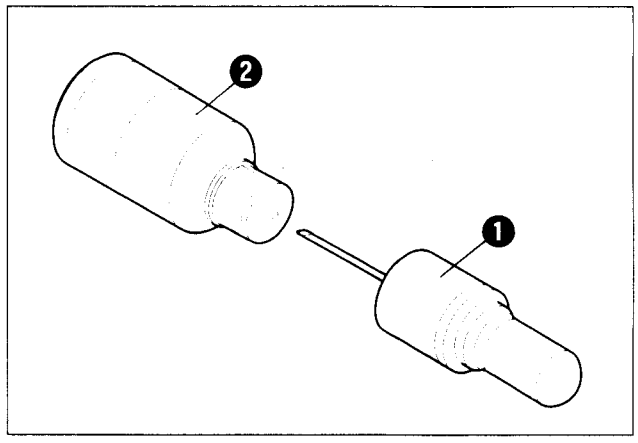


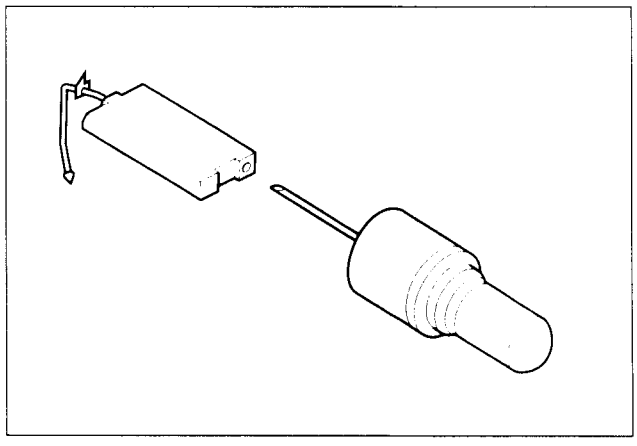
8

7.5 Refilling the fibre pens (Code nfs)

Open the housing door and pull out the fibre pen forward. Take the filler pipette ❶ and the ink bottle ❷ (note correct colour) from the accessories. Remove the rubber protection cap from the injection needle and insert the needle tip into the opening of the closing cap.
Fill the pipette filler and pull it out of the ink bottle.



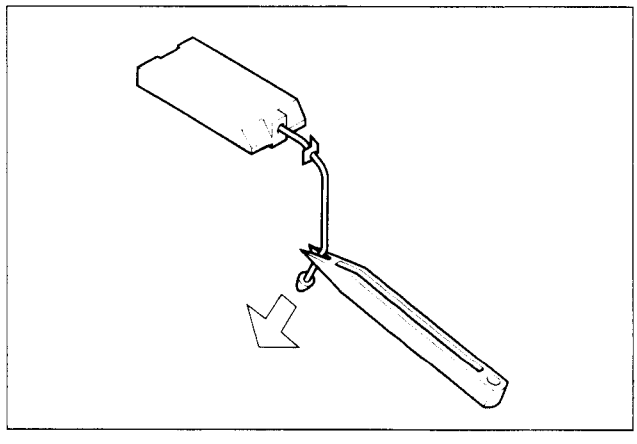
Insert the needle of the filled pipette filler about 15 mm into the ink reservoir of the fibre pen and empty the filler.



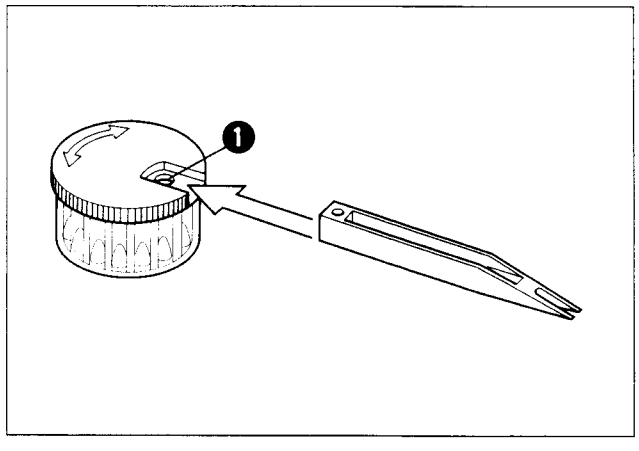
Do not overfill the ink reservoir to prevent drops forming at the pen tip.

The pen tip should be changed each time the pen is refilled in order to ensure reliable writing action.

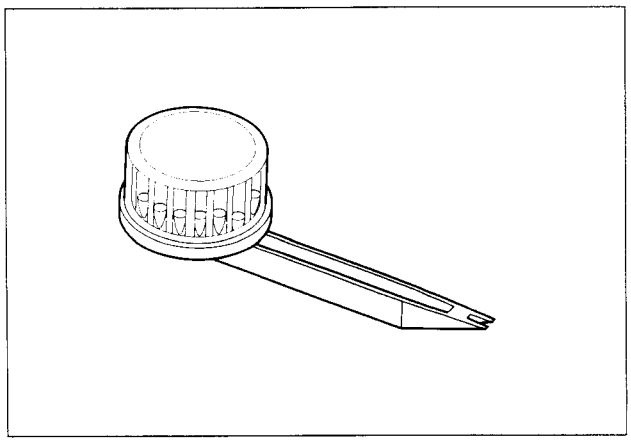
Remove the old pen tip using the fork of the mounting clip.



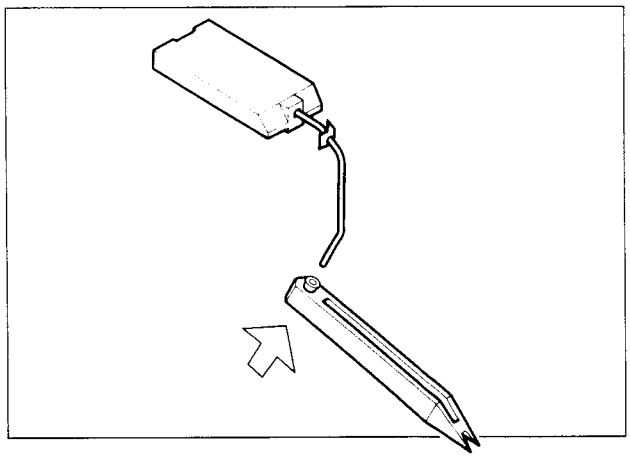
Rotate the red cover of the carrier so that the opening ❶ is located above one of the tips. Slide the fitting clip into the cover cut-out.



Rotate everything through 180° so that the tip drops into the fitting clip (see ill.).



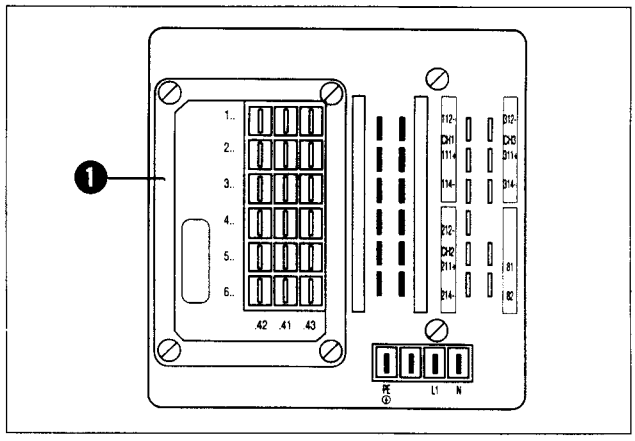
Push the tip on to the ink capillary (see ill.).

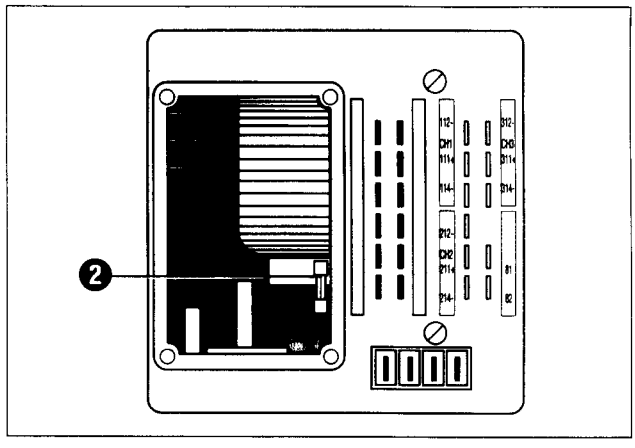


It is advisable to wet the tip with ink so that it becomes usable more quickly.

8.1 Check the supply fuse, replace if necessary

Switch off the recorder. Unscrew the cover ❶ on the back panel of the instrument.
Check the fuse ❷ for continuity, replace it if faulty (G fuse insert M 0.63 AC 250V DIN 41571/2).
Screw the cover back into position. Connect the recorder to the supply.





8.2 No recording

Check the following points:

- Has the key ◁ been pressed?
  (LED shows "StOP")
- Has the chart cassette been fitted correctly?
- Is the chart finished?
- Is the chart speed = 0?
  (⇒ 6.3.1 Chart speed (FEEd)
  6.6.2 Chart speed at limit operation
  6.6.3 Chart speed on external control)
- Is the plot status "OFF"? (⇒ 6.3.2 "PLOt")

8.3 Pen does not write

- Pen not pushed in correctly (clicked home)?
- Ink exhausted?

Carry out print test (⇒ 6.3.3).

8.4 Chart not moving

- Chart cassette not pushed in fully
- Does the transport roller engage with the perforations?

8.5 No indication of current input

- Check that connection terminals are tightened properly!
- Check the supply!
- Check transducer and its wiring, test with a meter. Take care in case of current/voltage transformer connection!

8.6 Relays do not switch when limit value is exceeded

- Have the signal inputs been connected up according to the connection diagram?
- Are the input signals outside the range for standard signals?
- Has the limit value dead band been taken into account?
- Are you checking the correct signal for limit value monitoring?

8.7 Programming not possible

■ The parameters at parameter level, configuration levels 1 and 2 can not be altered.
You have entered a wrong code number.
Repeat the input with the correct code number.

9 INDEX

J

K

L

M

N

O

P

R

S

T

U

V

W

Z

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