

Arucomp EK, EK-Ex Multipoint recorder

Manual

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1 Important Instructions

They must absolutely be read and obeyed

Perfect and safe operation of the Arucomp EK and Arucomp EK-Ex multipoint recorders presupposes that they are correctly transported and stored, installed and commissioned by experts and carefully operated and maintained.

Only those persons conversant with the installation, commissioning, operation and maintenance of similar equipment and who possess the necessary qualifications may work on the apparatus. They must observe the contents of this Operating Manual, the safety instructions imprinted on the apparatus as well as the relevant safety regulations for installation and operation of electrical apparatus.

These multipoint recorders have been designed and tested in accordance with DIN VDE 0411, Part 1, "Safety Requirements for Electronic Measuring Equipment", and have been supplied in a safe condition. To retain the apparatus in safe condition, the safety instructions with the title "Caution" in this Operating Manual must be observed. Failure to comply with these safety instructions and information can result in death, severe bodily injuries and considerable damage to the apparatus themselves or to other equipment.

Should the information given in the Operating Manual prove to be inadequate at any time, please consult the Technical Branch Office, subsidiary or representative of ABB in your area.

The industrial standards and regulations (DIN, VDI, VDE, etc.) as well as the directives and regulations governing explosion protection (ElexV, EX-Ri, VDE, DIN EN) referred to in this Operating Manual are applicable in Germany. When using these devices outside the German Federal jurisdiction, the relevant specifications, standards and regulations applicable in the country where the devices are used must be observed.

2 Applications

The Arucomp EK and Arucomp EK-Ex multipoint recorders are designed for quasi-continuous measured value recording applications. The measured variables may be processed in the form of direct current, DC voltage, thermoelectric voltage or resistance.

3 Installation and connection

3.1 Basic equipment for the Arucomp EK and Arucomp EK-Ex

(see Fig. 3-1)

Carefully remove the Arucomp EK or Arucomp EK-Ex from its packaging. Ensure that the separate components supplied with the basic unit are not accidentally left in the packaging material. The components of the basic unit are provided for installation and first start-up of the Arucomp EK and Arucomp EK-Ex.

The following accessories are supplied with the basic unit:

- 1 Operating manual
- 2 Mounting elements
- 1 Package containing either a roll or fan-folded chart paper with linear increments from 0 to 100 for a fedrate of 20 mm/h
- 1 Ink holder

3.2 Installation site

Service position	Immune to inclinations up to 45 °C
Ambient temperature	0 ... 50 °C
Relative humidity	≤ 75% annual average, max. 80 %
Avoid condensation	

The Arucomp EK-Ex is approved for type of protection EEx m [ib] e d 11131 T4. It can be installed in a zone 1 hazardous area up to an ambient temperature of 50 °C.

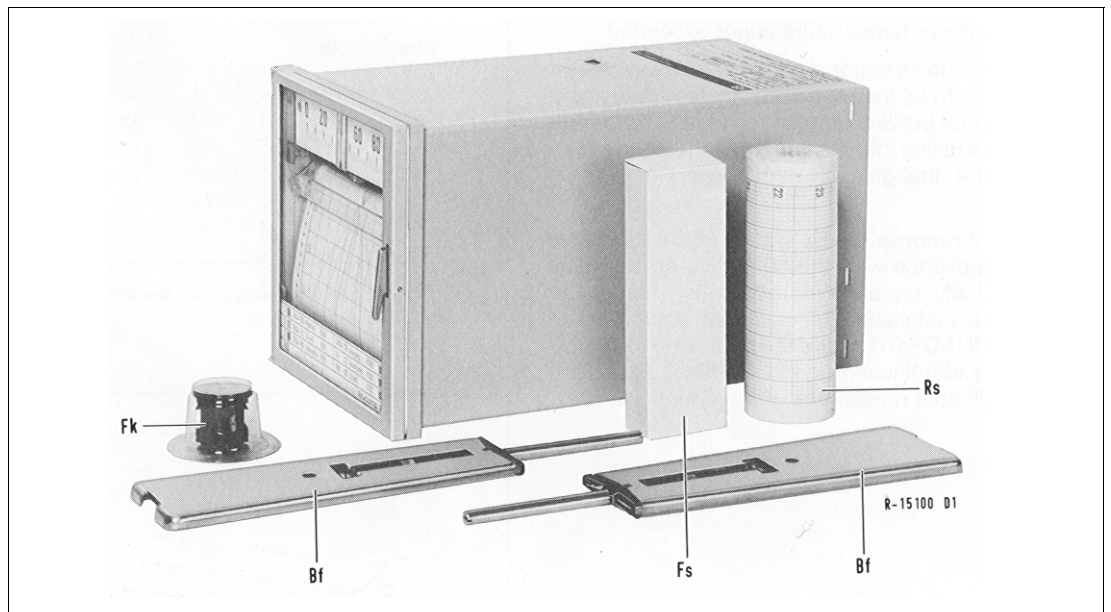


Fig. 3-1 Arucomp EK. with basic accessories (included in the standard scope of supply)

- Bf Mounting elements
- Fk Ink holder
- Fs Fan-folded chart paper or
- Rs Chart paper roll (depending on order specification)

3.3 Installation

(see Fig. 3-2 and Fig. 3-3)

The Arucomp EK and Arucomp EK-Ex are suitable for both panel and rack mounting.

3.3.1 Panel installation

1. Insert unit into panel from the front.
2. Attach mounting elements in the openings on the case. Where several units are arranged in a tight side-by-side configuration in the horizontal direction, insert the mounting elements in the top and bottom openings.
3. Following vertical alignment, evenly tighten the mounting elements.

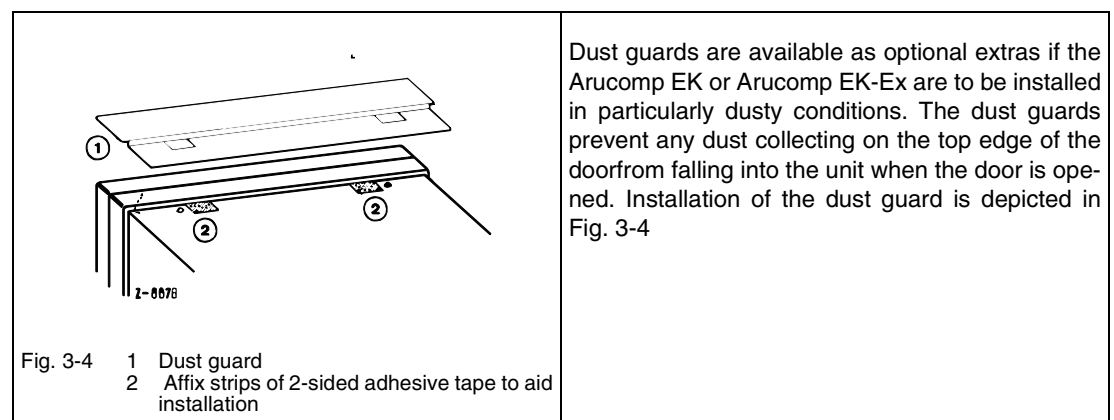
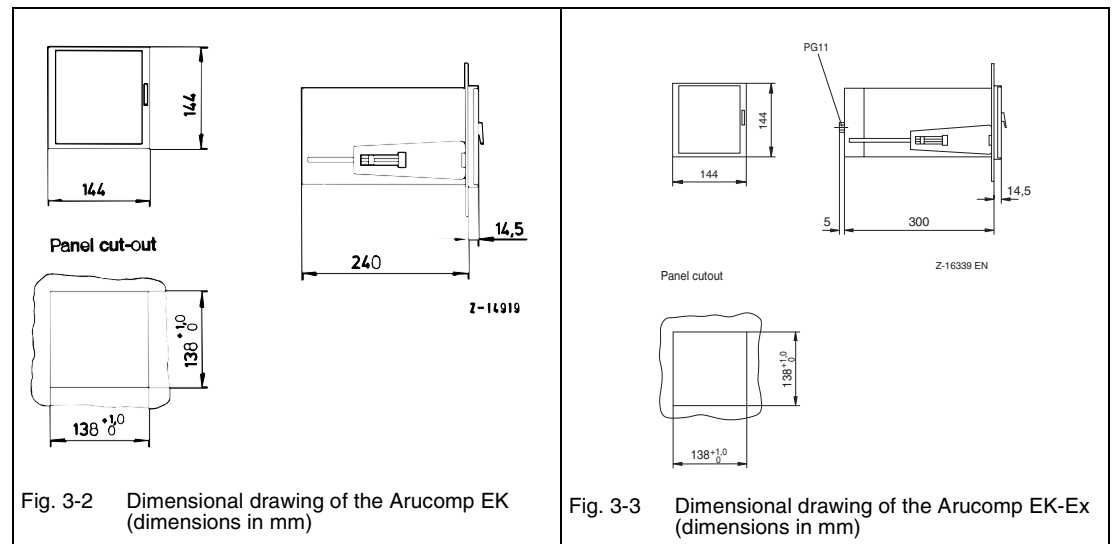
3.3.2 Rack installation

1. Fix 4-off centering brackets (Catalog No. 92204-4-0457301) to the rack.
2. Insert the mounting elements in the openings on the case.
3. Following vertical alignment, evenly tighten the mounting elements.

Note

If the units are densely packed together, ensure that the maximum permissible ambient temperature is not exceeded.

When installing the Arucomp EK-Ex and its intrinsically safe circuits, ensure compliance with the "Directive on electrical equipment in potentially explosive atmospheres" (Elex\o, the "Regulations for the installation of electrical equipment in hazardous areas" (DIN VDE 0165) and the certificate of conformity (Manufacturer's Identification code 49/40-23 EX) or the relevant locally applicable regulations of the country of use..



3.4 Connection



Warning

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

If the grounding conductor should be interrupted either inside or outside the unit, or the grounding conductor connection become loose, the unit may become dangerous. Deliberate interruption is dangerous and not permitted.

When installing and selecting the cabling material for the power supply, ensure compliance with the appropriate regulations for the installation of power systems and equipment with voltage ratings up to 1000 V (DIN VDE 0100).

3.4.1 Connection diagrams for the Arucomp EK 10, Arucomp EK 30 and EK-Ex

(see Fig. 3-5 and Fig. 3-6)

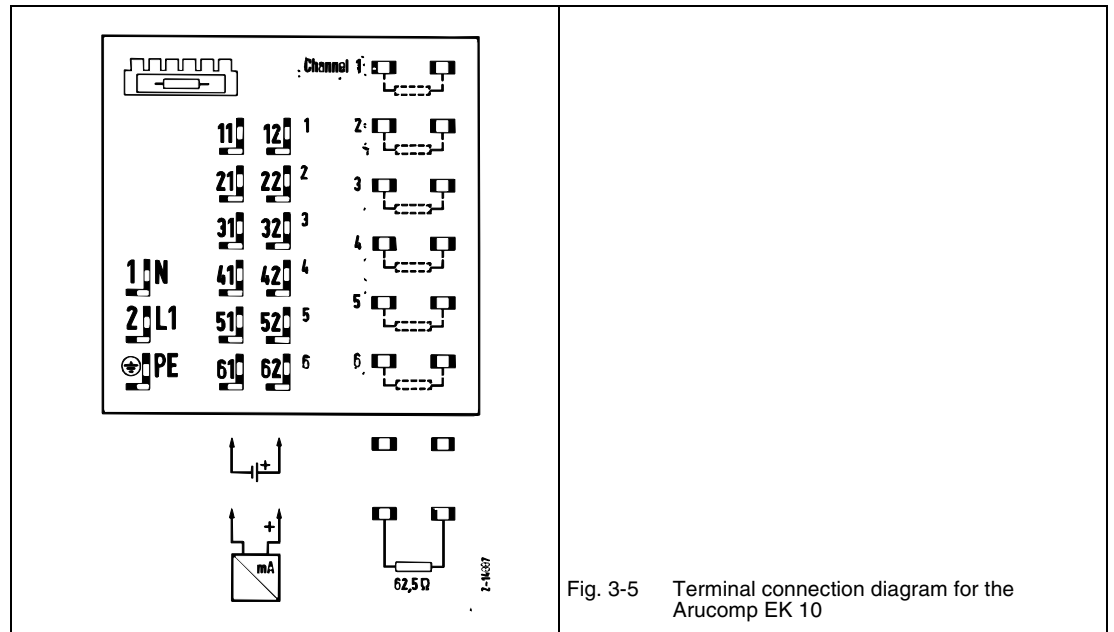


Fig. 3-5 Terminal connection diagram for the Arucomp EK 10

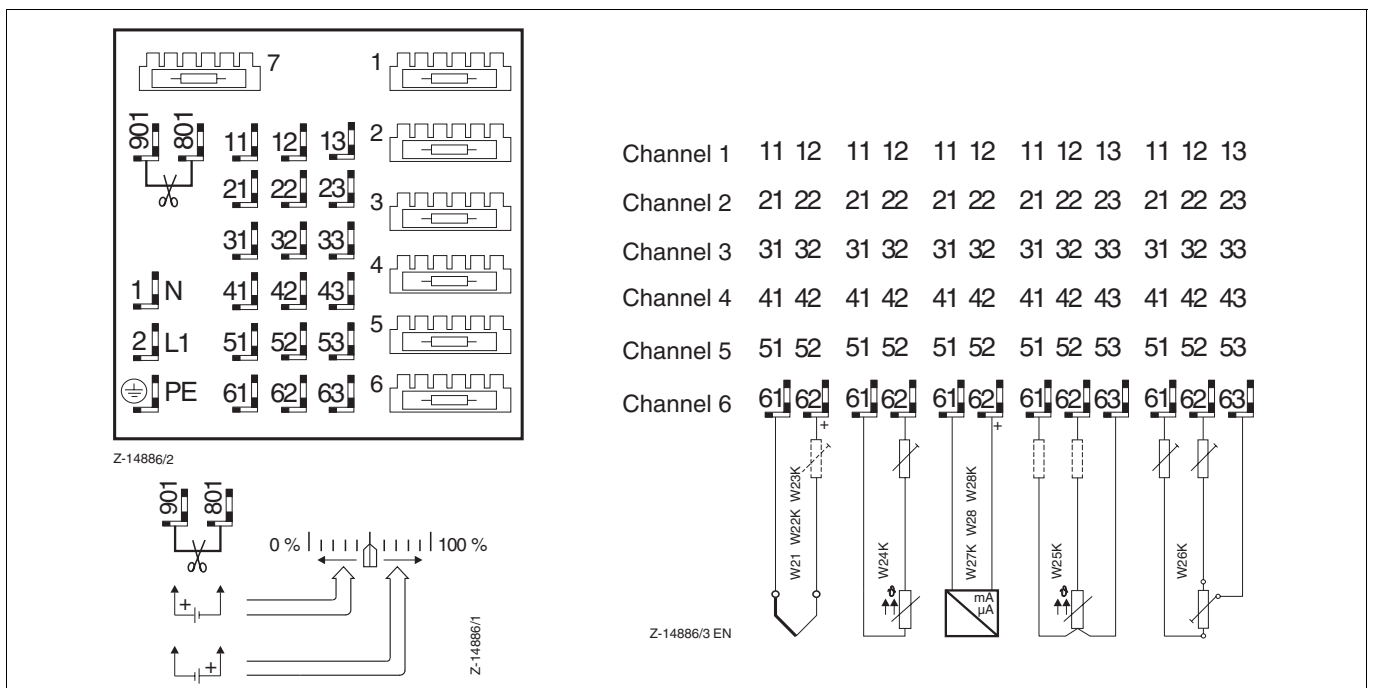


Fig. 3-6 Terminal connection diagram for the Arucomp EK 30 and EK-Ex (with the Arucomp EK-Ex, the power supply is connected at screw terminals (see Fig. 3-8))

3.4.2 Connecting the power supply

Arucomp EK

- Connect the power supply using female tab connectors and insulating sleeves type A 6.3 x 0.8 (see Fig. 3-7).

Note

Pass the leads through the rectangular openings in the transparent cover (degree of protection IP 20).

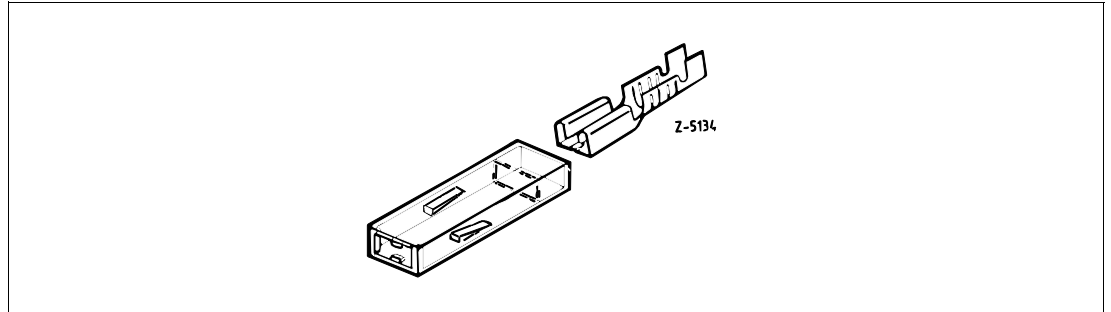


Fig. 3-7 Connection with female tab connector and insulating sleeve

Arucomp EK-Ex

- Connect the power supply using the screw terminals (1, 2 and (D)).
- Place the transparent cover (degree of protection IP 54) over the screw terminals (see Fig. 3-8).

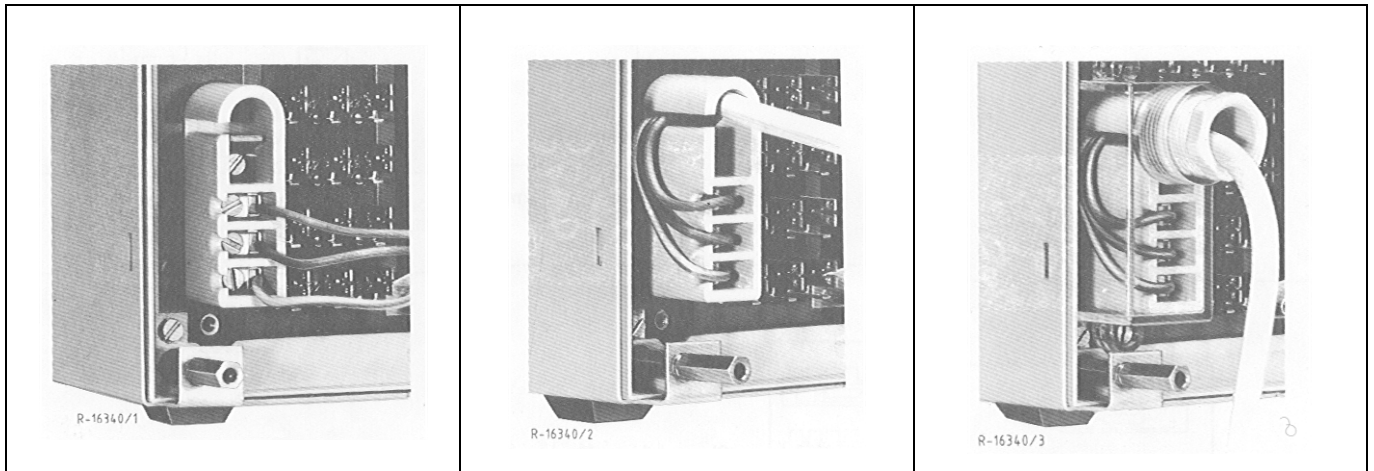


Fig. 3-8 Power supply for the Arucomp EK-Ex (the seal for the transparent cover (degree of protection IP 54) is not depicted here)

3.4.3 Connecting the measuring circuits

Arucomp EK

- Connect measuring circuits at screw terminals (see Fig. 3-9)
- or with tab connectors 6.3 mm x 0.8 mm
- or with tab connectors 2.8 mm x 0.8 mm
- or with Maxi-Termi-Point in accordance with DIN 41 611 Part 4.
- Lay compensating leads up to the terminals of the Arucomp EK (where thermocouples are being used as sensors).

Note

The reference junction is installed in the range box KXV.

- Connect the compensation leads of the sensors to the corresponding terminals (see Fig. 3-10).

*2 (for plus sensor)

*1 (for minus sensor)

*3 (for supply to inactive sensors)

Note

Pass the leads through the rectangular openings of the transparent cover (degree of protection IP 20) of the signal inputs.

Arucomp EK-Ex

- Connect measuring circuits to screw terminals (see Fig. 3-9
- or using female tab connectors and insulating sleeves, 6.3 mm x 0.8 mm (see Fig. 7).

Note

- Place the transparent cover (degree of protection IP 20) over the measuring circuit connections).
- or connect using a compact connector.

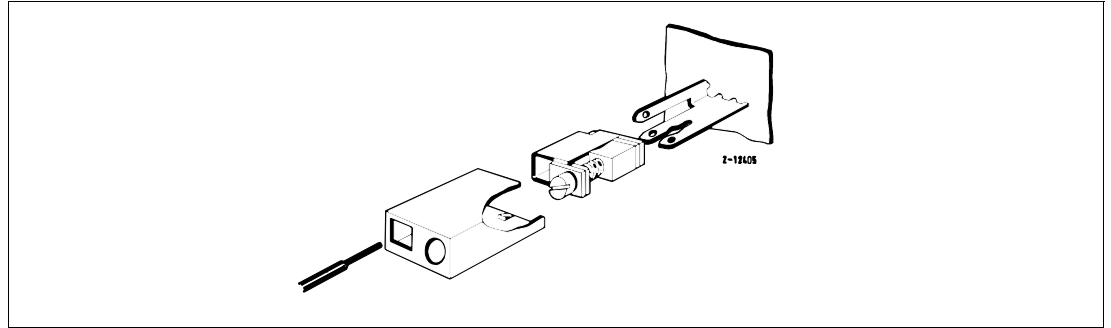


Fig. 3-9 Fitting a screw terminal

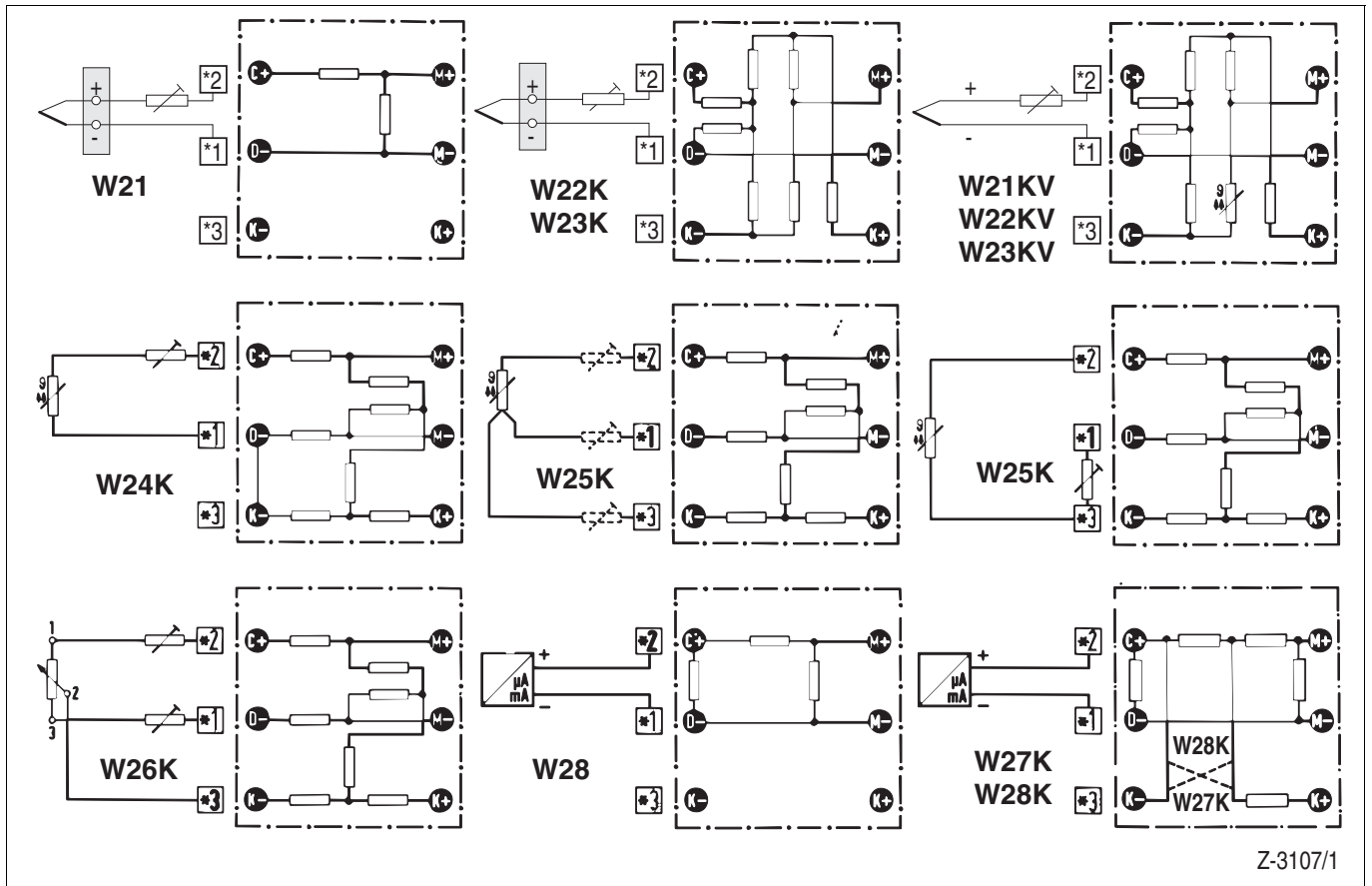
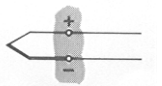


Fig. 3-10 Terminal diagram of the sensors with corresponding range boxes (* = 1... 6 measuring ranges depending on measuring point)



The sensors can be operated with a common compensation box if the reference junctions indicated are in the same temperature zone as the compensation box.

3.4.4 Functional diagrams of the Arucomp EK 10, EK 30 and Arucomp EK-Ex
(see Fig. 3-11 and Fig. 3-12)

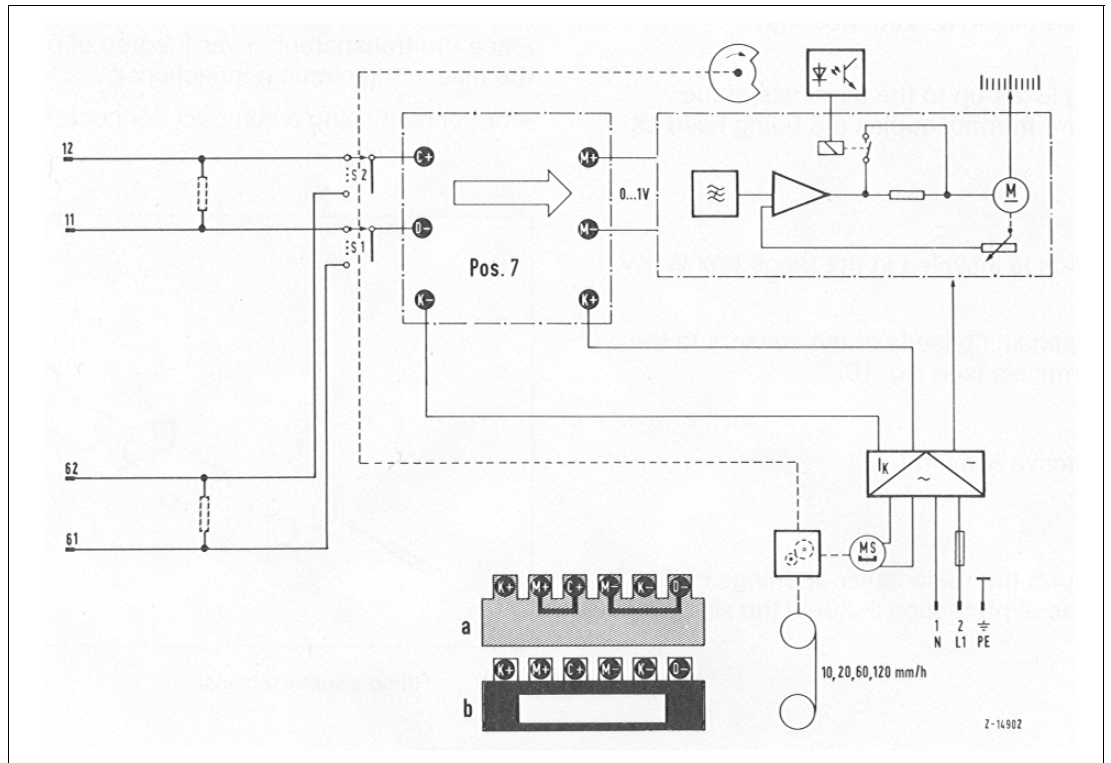


Fig. 3-11 Arucomp EK 10 functional diagram

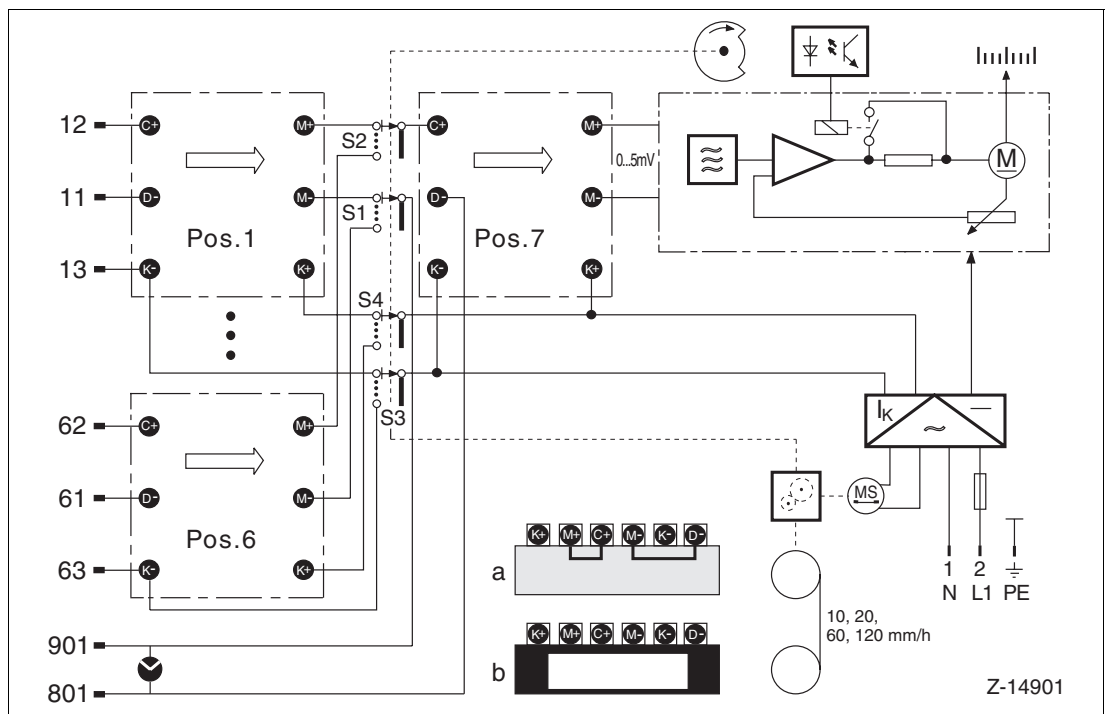


Fig. 3-12 Arucomp EK 30 and Arucomp EK-Ex functional diagram

4 Commissioning

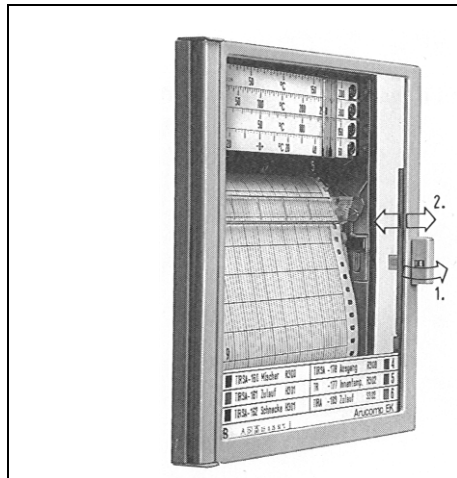


Fig. 4-1 Opening the case door

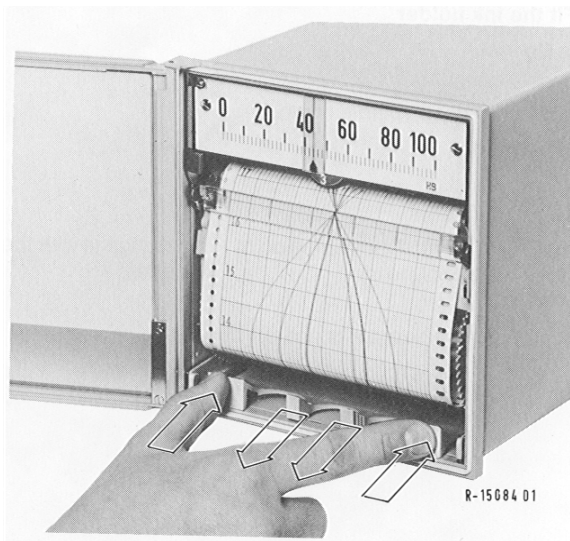


Fig. 4-2 Unlocking the chart unit

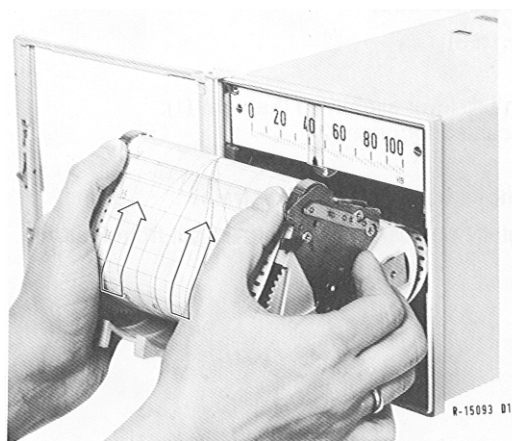


Fig. 4-3 Removing the chart unit

4.1 Open case door

(see Fig. 4-1)

- Push tab lever slightly to the right (1).
- Pull case door open (2).

4.2 Remove transportation restraint

- Carefully pull cardboard restraint out from the front

4.3 Unlock the chart unit

(see Fig. 4-2)

Designs with roll-type and fan-fold chart paper

- Unlock the chart unit by pressing down on the two tabs at the bottom (left and right).

Note

When unlocked, the chart unit slides forward approx. 20 mm.

Pull the chart unit forward to its mechanical stop.

4.4 Pull the chart unit forward

4.5 Remove the chart unit

(see Fig. 4-3)

Tilt the chart unit upwards and remove from its guide.

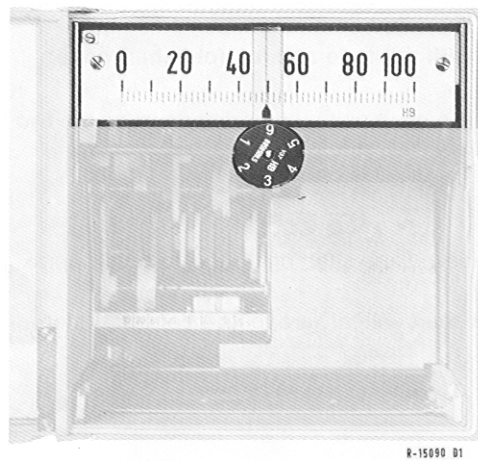


Fig. 4-4 Inserting the ink holder

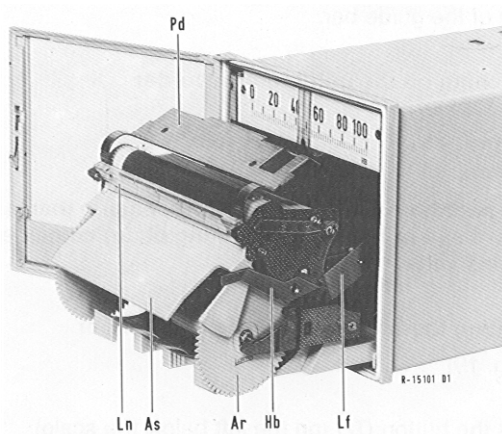


Fig. 4-5 Chart unit for paper rolls
 As Delivery plate
 Pd Pressure plate
 Ar Take-up spool
 Lf Spring-loaded roll holder
 Hb Lever for unlocking the take-up spool and delivery plate
 Ln Guide bar

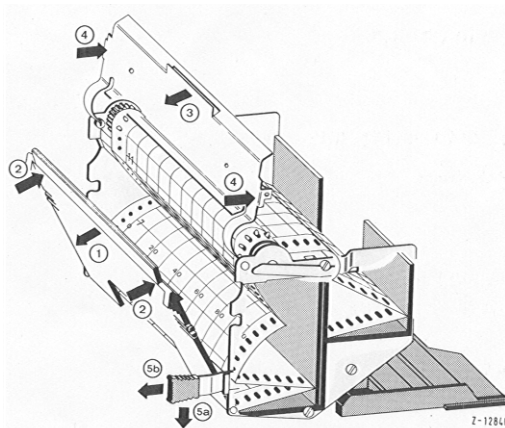


Fig. 4-6 Chart unit for fan-fold paper

4.6 Fit the ink holder

(see Fig. 4-4)

- Press print head spindle down.
- Fit ink holder.

Note

The wide pin (behind measuring point 1) must engage with the groove in the print head.

- Raise the ink holder to its upright position.

4.7 Insert the chart paper

(see Fig. 4-5 and Fig. 4-6)

Chart unit for paper rolls

- Insert the paper roll by spreading apart the springloaded holder (Lf).
- Pull forward the pressure plate (Pd)
- Insert the start of the paper between the tractor roller and the guide bar (Ln).
- Place the perforations of the chart Paper over the tractor roller pins.

Shut down the pressure plate (Pd) ensuring that it has properly latched on the right and left.

Chart unit for fan-fold paper

- Unlock the chart unit (see 5a).
- Pull chart unit forward (see 5b).
- Open transparent flap (see 1).
- Raise pressure plate (see 3).
- Close transparent flap (see 2).
- Push down pressure plate (see 4).

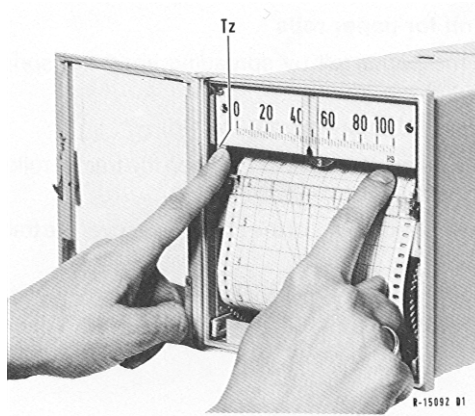


Fig. 4-7 Time value adjustment of the chart paper

4.8 Re-install the chart unit

- Tilt the chart unit and locate it in its guide.
- Push the chart unit to the rear and upwards against the flutes of the guide bar.

4.9 Switching on the multipoint recorder

Warning

Before switching on the power supply ensure that the operating voltage of the unit (see rating plate) coincides with the mains voltage.

4.10 Setting the time value of the chart paper

(see Fig. 4-7)

- Press the button (rz) (on the left below the scale) while at the same time turning the tractor roller.

Note

The tractor roller can be rotated in both directions while the button (Tz) is depressed.

- Release the button (Tz) again once the required time line is located below the printing needles.

5 Operation

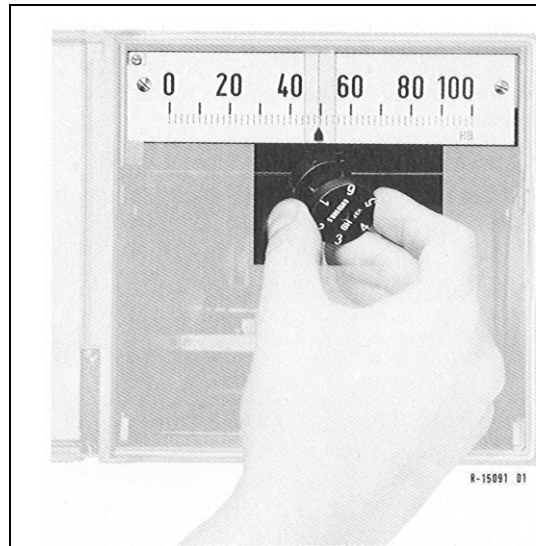


Fig. 5-1 Removing the ink holder

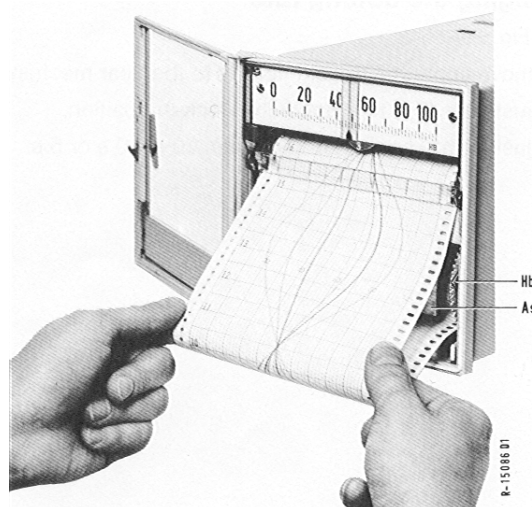


Fig. 5-2 Chart retrieval
As Delivery plate
Hb Lever for unlocking the take-up spool and delivery plate

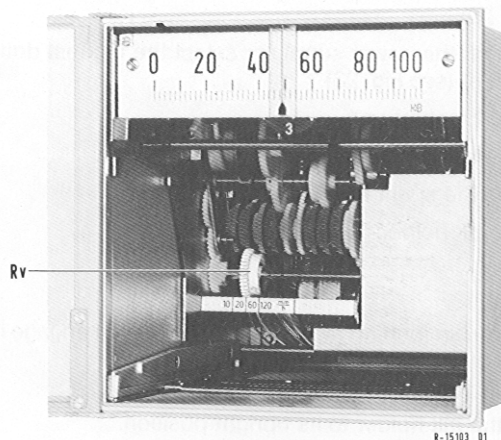


Fig. 5-3 Changing the feedrate

5.1 Changing the ink holder

(see Fig. 5-1)

- Switch off the power supply or select the highest dotting rate (20 s) (see Fig. 5-4).
- Unlock the chart unit. Remove the chart unit.
- Remove the spent ink holder from the front.
- Fit new ink holder.

Note

The wide pin (behind measuring point 1) must engage in the groove of the print head.

- Raise the ink holder to its upright position.
- Re-install the chart unit.
- Switch on the power supply or select the required dotting rate.

5.2 Chart retrieval

(see Fig. 5-2)

Push down the lever (Hb) on the right of the chart unit.

Note

This interrupts the drive to the take-up spool (Ar).

- Turn back the take-up spool at the left flange approx. 1/4 turn.
- Pull out the chart paper to the required position. (The chart paper can be parted at the required hour line).
- Turn the take-up spool at the left flange to rewind the chart paper so that it is taut.
- Check the time setting.
- Push the lever (Hb) up again.
- Press and latch the delivery plate (As) in position.

5.3 Changing the paper feedrate

- Remove the chart unit to gain access to the gear mechanism.
- Adjust gear (Rv) to the required lock-in position.

Adjust to the required feedrate: 10 mm/h, 20 mm/h, 60 mm/h or 120 mm/h.

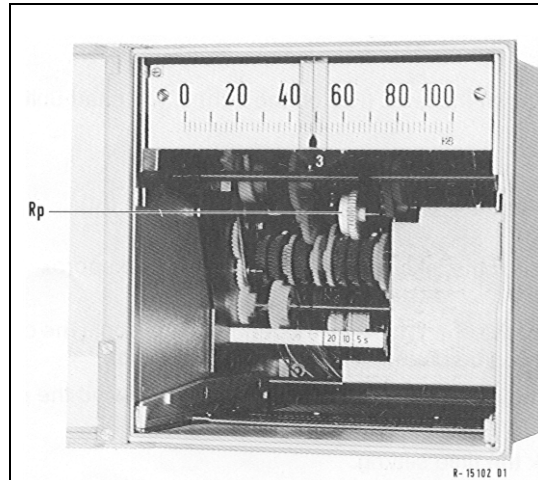


Fig. 5-4 Changing the dotting rate

5.4 Changing the dotting rate

(see Fig. 5-4)

- Remove chart unit to gain access to the gear mechanism.
- Adjust gear (Rp) to the required lock-in position.
- Adjust to the required dotting rate: 20 s, 10 s or 5 s.

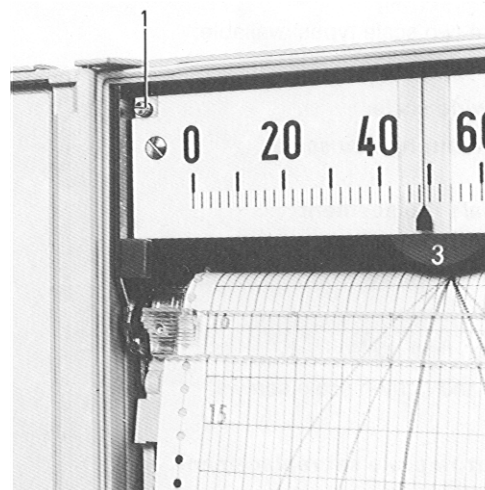


Fig. 5-5 Mode selector Selector position 1 - horizontal

5.5 Changing the mode of operation

(see Fig. 5-5 and Fig. 5-6)

- Set mode selector to required value.

Note

Use a screwdriver (3 mm blade width) to move the mode selector.

- There are two possible mode selector settings:
 - Mode 1:**
All the measuring points are recorded. (Selector slot is horizontal and the spindle moves forward).
 - Mode 2:**
Only one measuring point is recorded. (Selector slot is vertical and the spindle remains in its rear position).

Note

Push the mode selector to the rear and turn the slot to the vertical direction to locate.

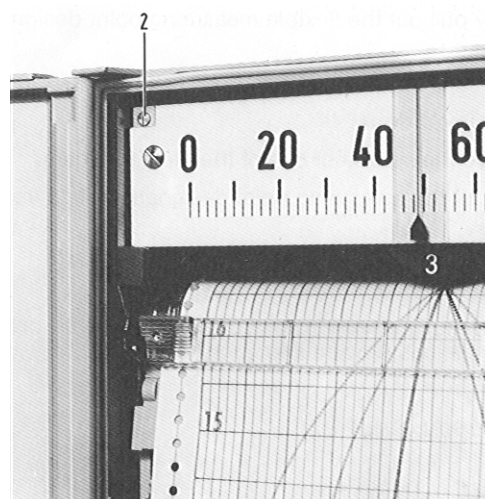


Fig. 5-6 Selector position 2 - vertical

5.6 Replacing the scales

There are two scale types available:

1. **One wide scale**
2. **Set of four narrow scales**

Wide scale replacement

1. Remove scale screws.
2. Remove scale.
3. Position new scale.
4. Insert and tighten scale screws.

Four narrow scale set replacement

1. Slacken scale screws on the left.
2. Unscrew scale screws on the right.
3. Slide scales out from the right.
4. Install new scales in reverse sequence.
5. Adjust measuring system to zero point (measuring signal at 0)
6. Align scale start line to the pointer tip.

5.7 Replacing the measuring point designation plate

Moulded plastic door

- Simply pull out the flexible measuring point designation plate.

Metal framed door

- Remove the screws of one of the plate retainers.
- Slide out the measuring point designation plate from the side.

Note

To shorten the measuring point designation plates, break off at the indentations provided (see Fig. 5-7).

5.8 Fuse replacement

Warning

Ensure that only fuses of the specified type and the specified amperage are employed. Never use repaired fuses or short-circuit the fuse holder.

Arucomp EK fuse

Fuse in accordance with DIN 41 571)

The plug-in fuse holder is located on the inside of the rear wall of the unit (bottom centre).

Note

Remove the equipment module from the case.

Warning

When opening covers or removing components other than when this is possible by hand, live parts may become exposed. Connections may also be live.

Fuse data:

for 24 V, (Order No. 94382-0804205) 0.5 A (slow-blow)

for 115 V, (Order No. 94382-0804204) 0.1 A (slow-blow)

for 230 V, (Order No. 94382-0865948) 0.05 A (slow-blow)



Arucomp EK-Ex fuse

The fuse is located on an encapsulated PCB.

**Warning**

Replacement of the encapsulated fuse must be performed by authorised personnel of the manufacturer or the work must be inspected and certified by an accredited inspector for installations in hazardous areas.

Fuse data:

for 24 V, (Order No. 41004-0742331) 0.63 A (slow-blow)

for 115 V, (Order No. 41004-0742330) 0.25 A (slow-blow)

for 230 V, (Order No. 41004-0742329) 0.16 A (slow-blow)

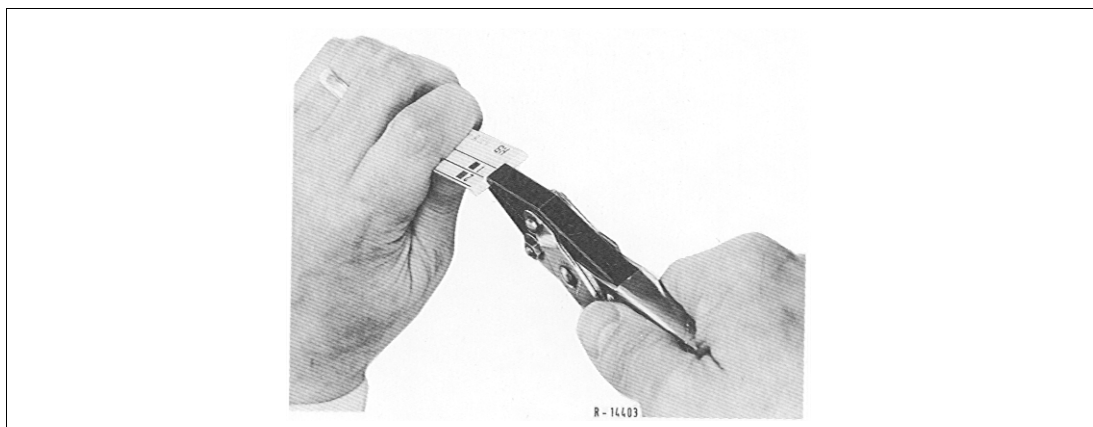


Fig. 5-7 Shortening the measuring point designation plate

6 Appendix

6.1 Description

The measuring system operates according to the compensation principle. A virtually non-wearing encapsulated potentiometer of conductive plastic serves as the position detector. The actuator (for the pointer, print head and potentiometer) takes the form of a DC motor with a hard-gold-plated commutator for long service life and maximum setting reliability. The paper feed, measuring point selector, ink selector and print head are operated by a common synchronous motor.

There are three models available:
Arucomp EK 10, Arucomp EK 30 and Arucomp EK-Ex.

6.1.1 Arucomp EK 10

Recording of measuring ranges 0/4 ... 20 mA (standard analog signals)

The measuring ranges are defined in a range box (color coded white).
To select the measuring ranges 0 ... 20 mA or 4 ... 20 mA, jumper points A or B in the range box as appropriate (see Fig. 6-1).

Note

For DC measurement, there are six shunt resistors of 62.5 Ω each arranged at the rear wall of the unit.

Recording of measuring ranges 0/1 10 V or 0 50 V (standard analog signals)

The measuring ranges are defined in a range box.

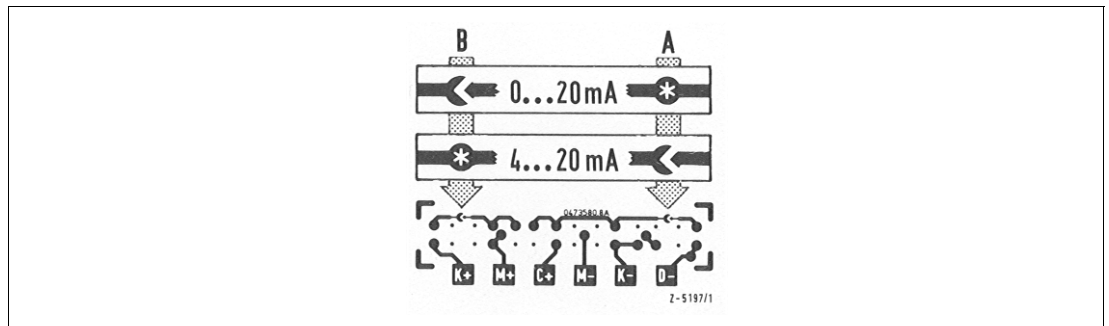


Fig. 6-1 Measuring range selection 0/4...20 mA

6.1.2 Arucomp EK 30

The measuring ranges are defined in an Arucomp 4900 range box (color coded orange).

The range boxes are easy to replace. They standardise the various input signals to 0 ... 5 mV.

Versions available:

- One measuring range for six measuring points
- Six measuring ranges for six measuring points

One measuring range for six measuring points

In this version, the following are employed:

- One range box and six patch modules (dedicated circuit SW)

In the SW dedicated circuit, a range box governing all the measuring points is arranged between the measuring point selector and the input amplifier.

The measuring circuits in this case are interrupted during measuring point change-over.

Six measuring ranges for six measuring points

In this version, the following are employed:

- Six range boxes and one patch module (dedicated circuit MW)

In the MW dedicated circuit, one range box is arranged between the measuring point selector and the signal input of each measuring point.

In the case of DC measurement operations, all the measuring circuits remain closed even during measuring point changeover.

The features of the various measuring circuits are detailed in the following descriptions.

Measuring circuits W 21, W 22 K and W 23 K

- Temperature measurement with thermocouples (with external reference junction)

Note

Connect compensating leads between the thermocouple and the reference junction.

Ensure correct polarity of the compensating lead!

Measuring circuits 21 KV, W 22 KV and W 23 KV

- Temperature measurement with thermocouples (with internal reference junction)

Note

Connect compensating leads to terminals *2 and *1.

Temperature differences between the range boxes and terminals impair the measurement accuracy.

Lead balancing for measuring circuits: W 21, W 21 KV, W 22 K, W 22 KV, W 23 K and W 23 KV

If the resistance of the thermocouple and extension lead lies within the specified range, no lead balancing is necessary in the case of range boxes carrying the inscription

"El. + Lead = 0...40 Ω" or similar.

Measuring circuit W 24 K

- Temperature measurement with two-wire resistance thermometers

Lead balancing

Lead balancing is necessary in the case of range boxes carrying the inscription "Lead = 10 Ω".

Lead unbalance results in measurement distortions

Measuring circuit W 25 K

- Temperature measurement with three-wire resistance thermometers

Lead balancing

If the resistance of the individual leads lies between 0 ... 10 Ω and if leads * 2 and * 1 are symmetrical, no lead balancing is necessary in the case of range boxes carrying the inscription

"Lead = 3 x 0 ... 10 Ω" or similar.

Lead symmetries

1. Connect test resistor in place of the resistance thermometer.
2. Ensure that the value of the test resistor corresponds to a measurement value at approximately the centre of the scale. When the measuring circuit is patched through, the pointer of the meter mechanism should show the value of the test resistor. If the pointer is closer to the start of the scale, increase the resistance of lead *2.
If the pointer is further towards the end of the scale, increase the resistance of lead * 1.
3. Remove the test resistor and re-connect the resistance thermometer
If the extent of the span is < 8 Ω, lead balancing is necessary in the case of range boxes carrying an inscription such as „Leud = 3 x 10 Ω".

Measuring circuit W 26 K

- Resistance teletransmitter

Lead balancing

Lead balancing is necessary in the case of range boxes carrying the inscription "Lead = 2 x 10 0". Lead unbalance results in measurement distortions.

Measuring circuits W 27 K, W 28 K and W 28 K

– DC measurement

Note

Where current is being measured, the lead resistances normally have no influence on the measurement result.

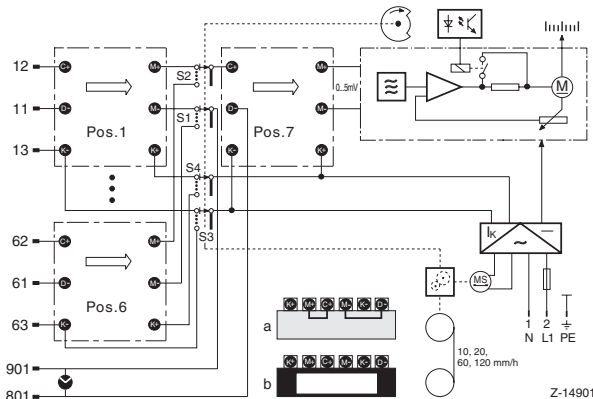
6.1.3 Arucomp EK-Ex

The Arucomp EK-Ex is essentially similar in description terms to the Arucomp EK 30.

The replaceable range boxes must carry the inscription Arucomp 4900/EK-Ex on their rear panel.

7 Technical data

Functional diagram



Measuring section

Error limit
Accuracy class 0.5 according to DIN 43782 / IEC 484 for basic unit 0...5 mV

Measuring ranges

Via range box type Arucomp 4900 / EK-Ex at rear of unit

Incremental error
without zero shift 0.2 % of span
with zero shift 0.3 % of span
zero shift ≥ 1 mA 0.5 % of span
incl. temperature effect 0.2 % / 10 K
 $R_e = 20$ k Ω / V at least 20 k Ω
Thermometer current $I_{th} \leq 1$ mA
Lead balancing for mV in range 0...40 Ω unnecessary
For Ω in 3-wire circuit necessary
For Ω in 2-wire circuit of 10 Ω ; 0.1 % external

Reference junction
Optionally external or built into range box.
Caution!
Note temperature difference between terminals and range box

Measuring range limit data
Current measurement $I_{e\ max} \pm 50$ mA; $I_{e\ min} \pm 0.1$ mA
Span min. 0.1 mA; max. 100 mA
 $R_e \leq \frac{7}{I(mA)}$ [Ω]
Voltage measurement - 25 V DC...+ 25 V DC
Span min. 5 mV DC; max. 25 V DC
 R_e 20 k Ω / V; but min. 20 k Ω
Zero shift with constant current source ± 600 % of selected span (max. 6/7 of upper-range value)
Resistance measurement
Scale span min. 8 Ω ; max. 500 Ω

Circuit designation
Direct voltage and thermocouples with external reference junction
without zero shift circuit measuring circuit W 21
with zero elavation W 22 K
with zero suppression W 23 K

Resistance measurement
Resistance thermometer in 2-wire circuit W 24 K
in 3-wire circuit W 25 K
Resistance teletransmitter in 3-wire circuit W 26 K
Current measurement
without zero shift W 28
with zero elavation W 27 K
with zero suppression W 28 K
Continuous overload capacity of signal inputs ± 25 V; electr. motor current switched off at -0.5 % and 100.5 %

Recording section

Scale
interchangeable for all measuring ranges with either 1...6 graduated scales or single scale strips with one graduated scale each

Scale type

No. of graduated scales	1	2	3	4	5	6	single scale
Digit size (mm)	6	5	3	2.5	2	2	3
Size of main graduations	8	6	4	3	2.5	1.8	3

Colour sequence

Violet, red, black, green, blue, brown (DIN 43838)
Last point visible from front
Ink supply for 5×10^5 dots per colour

Drive

Common synchronous motor for chart drive, measuring point selector switch and print head

Dotting rate

5 / 10 / 20 s selectable

Chart drive

10 / 20 / 60 / 120 mm/h selectable

Recording width

100 mm (chart width 120 mm) to DIN 16230

Chart length

Roll chart 32 m (approx. 66 days at 20 mm/h)
Fanfold chart 16 m (approx. 33 days at 20 mm/h)

Chart feed-in

Automatic (roll chart)

Power supply

24 V or 115 V or 230 V; 50 Hz or 60 Hz
Tolerated temperature deviation +10 %, -15 %
Typical power consumption approx. 8 VA

General and safety data

Environmental capabilities

Ambient temperature 0...25...50 $^{\circ}$ C
Transport and storage temperature -25...+70 $^{\circ}$ C
Climatic category KWE to DIN 40040

Relative humidity
 $\leq 75\%$ annual average; avoid condensation; max. relative humidity $\leq 80\%$ in operation; pay attention to influence of humidity on chart paper to DIN 16234

Electrical safety tested to DIN VDE 0411 Part 1/IEC 348

Class of protection
 Measuring circuits; functional extra-low voltage with safe isolation to VDE 0110 Part 410

Test voltage
 1.5 kV power supply to case
 4 kV measuring circuit to power supply
 0.5 kV measuring circuits to case
 0.5 kV measuring circuits to measuring circuits
 Overvoltage category II
 Degree of contamination II

Electromagnetic compatibility

The safety requirements stated in the EMC directive 89/336/EWG, May 1989 shall be fulfilled with respect to immunity to electromagnetic interference to drafted EN 50082.2

Radio interference suppression
 Suppression class N to VDE 0875 or EN 55014

Connection, case and mounting

Electrical connections
 Type of protection IP 20
 Tab connector A 6.3 x 0.8 or A 2.8 x 0.8 or
 MTP 2.4 x 0.8 or as accessory
 Screw terminal for 2 x 1.5 mm² wire

Power supply
 Type of protection IP 54
 Screw terminals for 1.5 mm² wire

Case
 Sheet metal for panel or mosaic panel field mounting
 Color RAL 7032, protection IP 54, door made of polycarbonate

Operating orientation: vertical $\pm 45^\circ$

Mounting distance
 horizontal or vertical 0 mm; case door must be open at 100°

Weight: approx. 5.5 kg

Labelling facilities

On the measuring point designation plate in the door,
 31 characters per measuring point

Parts supplied with the first unit

1 Operating Manual
 2 Fastening elements to DIN 43834
 2 Roll or fanfold charts
 1 Ink holder (print star)

Explosion protection

Manufacturer's code
 49/40-23 Ex
 Certificate of conformity
 PTB No. Ex-92.C.2082

Type of protection
 EEx m (ib) e d IIB T4

Mounting
 within the hazardous zone 1

Measuring circuits
 (Terminals 11, 12, 13; 21, 22, 23; 31, 32, 33;
 41, 42, 43; 51, 52, 53; 61, 62, 63; 801, 901)
 in type of protection intrinsically safe EEx ib IIB or EEx ib IIC

1. Measuring circuits for current, voltage and resistance
 with range box Arucomp 4900/EK-Ex
 -Ex W21, -Ex W21KV, -Ex W22KV, -Ex W22K, -Ex W23 KV,
 -Ex W23K, -Ex W24K, -Ex W24K2, -Ex W25K, -Ex W25K2,
 -Ex W26K, -Ex W27K, -Ex W28, -Ex W28K

Max. values per measuring circuit:

$U = 10\text{ V}$
 $I_K = 65\text{ mA}$
 $P = 400\text{ mW}$

The effective internal inductance is negligibly low.

The effective internal capacitance is 12 nF

Max. permitted values of the connected intrinsically safe circuits:

1.1 Connection to **passive** intrinsically safe circuits

	Group IIC	Group IIB
Max. ext. inductance L_a	5 mH	20 mH
Max. ext. capacitance C_a	4 μF	30 μF

1.2 Connection to certified **active** intrinsically safe circuits

Max. values per circuit

$U = 25\text{ V}$
 $P = 600\text{ mW}$

The maximum internal inductance L_a and capacitance C_a depending on the respective max. values of the connected intrinsically safe circuit can be taken from tables 1, 2 and 3 of the certificate of conformity

2. Measuring circuits for current

with range box Arucomp 4900/EK-Ex
 -Ex W28, -Ex W27K, -Ex W28K, with input resistance
 $R_e \leq 7\ \Omega$

Max. values per circuit

$U = 0.5\text{ V}$
 $I_K = 65\text{ mA}$
 $P = 8\text{ mW}$

The effective internal inductance is negligibly low.

The effective internal capacitance is 12 nF

Max. permitted values of the connected intrinsically safe circuits:

Max. values per circuit

$U = 20\text{ V}$
 $I = 170\text{ mA}$

The maximum internal inductance L_a and capacitance C_a depending on the respective max. values of the connected intrinsically safe circuit can be taken from tables 4 and 5 of the certificate of conformity.

The six measuring circuits are electrically isolated. The respective measuring circuit in operation and the circuit for the external reference junction are electrically coupled.

Note:

The values mentioned above do not apply to a plug connection. Those values can be taken from the annex to the certificate of conformity

8 Packing

Packing If the original packing is no longer available, the units must be wrapped in insulating airfoil or corrugated board and packed in a sufficiently large crate lined with shock absorbing material (foamed material or similar). The thickness of cushioning should be in accordance with the weight of the unit and the method of shipment. 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 should be in accordance with the packing volume and the envisaged transportation duration (at least 3 months). Furthermore, the crate should be lined with a double layer of bitumen paper.

Subject to technical changes.

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