Sika mAV.3 Monofunction Process Calibrator Instruction Manual

Contents

Sika mAV.3 Monofunction Process Calibrator

Specifications

- Product Name: Monofunction Process Calibrator EC mAV.3
- Model: EC mAV.3

Product Information

Safety Instructions

Ensure proper training and qualification before using the product to avoid warranty issues.

Getting Started

Operating Conditions

Ensure the following operating conditions

- Environment: Indoors
- Temperature: Refer to technical specifications
- Humidity: Refer to technical specifications

Battery Installation or Replacement

1. Turn off the calibrator and disconnect measurement leads.
2. Use a slotted screwdriver to turn the battery compartment screw a quarter turn counterclockwise.
3. Remove the battery compartment and insert three AA LR6 batteries.

Product Usage

Output Modes
Ensure correct polarity when connecting for output modes.

Measuring Modes

1. Measure DC Voltage
2. Measure DC Current
3. Measure Current Loops with 24V Supply

FAQ

- **Q: How do I change the output mode?**
  - A: Use the buttons on the calibrator to switch between different functions.
- **Q: What should I do if the display shows an error?**
  - A: Refer to the user manual for troubleshooting steps or contact customer support.

Operating manual

Monofunction Process Calibrator EC mAV.3

About This Operating Manual

- Read carefully before use!
- Keep for future reference!

If you have any problems or questions, please contact your supplier or contact us directly

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- +49 5605 803-555
- **info@sika.n\et**
- **www.sika.net**

Safety Instructions

Read the operating manual carefully. Follow all instructions to avoid personal injury and dam-age to property.

Intended use
The EC mAV.3 monofunction process calibrator may only be used to measure direct current and DC voltage and to generate direct current.

Qualified personnel
The personnel responsible for the operation and maintenance of the device must be appropriately qualified. This can be done through training or instruction.

General safety instructions

- Before use, check that the battery compartment of the calibrator is firmly closed.
- Check the measuring lead for damage or exposed metal and replace if necessary before using the device.
- Do not use the device in the vicinity of explosive gases, vapours or dusts.
- Do not exceed the rated voltage specified on the calibrator between the connections or between a connection and earth.
- Check the calibrator for damage or missing parts before use, especially the casing and insulation of the connections.
- Keep fingers away from the metal contacts of the probe.
- Only switch between different measuring or output functions when the measuring lead is disconnected.
- Do not use the device if it exhibits a malfunction or if the protective devices may be dam-aged.
- Do not open the casing of the device.
- Do not remove or obliterate type plates or other notices on the device, as this will invalid-date the warranty and manufacturer’s liability.

Device Description

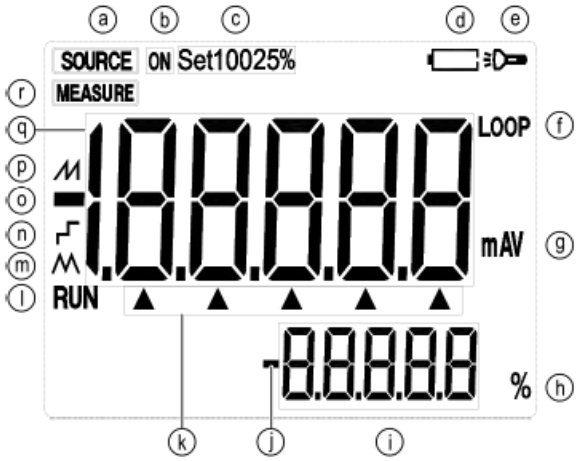
Scope of delivery

- 1x monofunction process calibrator EC mAV.3
- 1x operating manual
- 1 pair of industrial measuring leads (with crocodile clips)
- 4x fuses
- 1x key
- 3x AA batteries

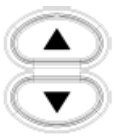
Display

- Output mode
- Active output/measurement
- Increment of the output current
- Low battery
- Flashlight switched on
- Active 24V current loop operation
- Unit of output/measurement
- Current output in per cent
- Current output value in per cent
- Polarity display for measuring range
- Digit of the output value
- Automatic current output
- Automatic triangular wave mode
- Automatic step mode
- Polarity display for measurement/output value

- Automatic sawtooth wave mode
- Main display range for measurement/output values
- Measuring mode



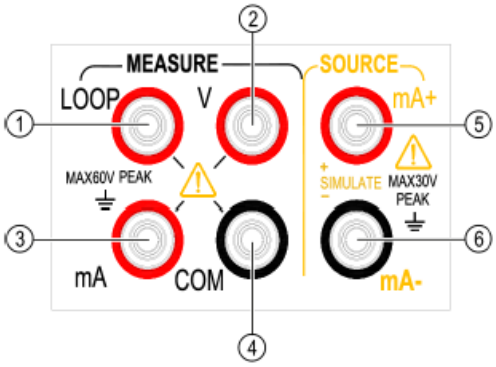
Buttons

Buttons	Description
	Switching the device on and off
	Select output or measurement
	Switch between the functions
	Short press for backlight, long press for torch
	Switch between step mode, sawtooth wave mode or triangular wave mode
	Start/stop automatic power output
	Change parameters in the current operating mode
	Reset the output value to the default value. In maintenance mode, the current settings and parameters are saved by pressing the button.
	Increase or decrease output value
	Move the position of the output value to the left or right

Connections

- **LOOP:** External 24 V power supply connection for current loop operation

- **V**: Input terminal (+) for measurement of DC volt- age
- **mA:** Input terminal (+) for measurement of direct current
- **COM:** Common ground connection (-) for all measurements
- **mA+:** Output terminal (+) for generating direct current
- **mA-:** Output terminal (-) for generating direct current



Commissioning

Operating Conditions

Installation site and operating position

- Use a horizontal surface
- Avoid direct sunlight and heat sources
- Avoid mechanical vibrations
- Avoid sources of interference such as high voltage and motors
- Avoid electromagnetic fields and areas with high electrical power density
- Avoid oil vapours, heat flows, dust and corrosive gases
- Avoid explosive gases

Type	**EC mAV.3**
Ambient conditions	
Ambient temperature	0…50 °C
Humidity (r. h.)	20-80% (non-condensing environment)

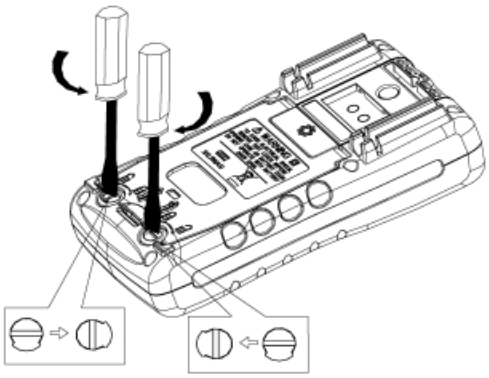
Notices for accurate measurements and output results

- Use the calibrator at 23±5 °C and 20-80% humidity (non-condensing environment). For ambient temperatures of 0-18 °C or 28-50 °C, add the error value of the temperature co-efficient.
- If the air humidity is below 30%, use an antistatic support to avoid static charging.
- Do not use the device immediately after a change in temperature or humidity. Allow the device to acclimatize for at least one hour before using it.

Inserting or Replacing Batteries

WARNING
Risk of electric shock.

- Remove the measuring leads before opening the battery compartment.
- Close the battery compartment tightly before using the calibrator.
- Switch off the calibrator and remove the measur-ing leads.
- Turn the battery compartment screw a quarter turn anti-clockwise using a flat-blade screwdriver.
- Remove the battery compartment.
- Insert 3 AA LR6 type batteries into the battery compartment (observe polarity).
- Close the battery compartment tightly again.



Operation

Switching on and off
Press the power button to switch the calibrator on. Press and hold the power button for 2 seconds to switch it off.

Automatic switch-off
The calibrator switches off automatically after 5 minutes of inactivity. The switch-off time can be adjusted in the factory settings

Backlight
Press the backlight button to switch the backlight on or off. This makes it easier to read the display in dark environments. Please note that the backlight shortens the battery life.

Notice
The backlight switches off automatically after approx. 60 seconds. Press the backlight button again to switch it back on. The backlight duration can be adjusted in the factory settings.

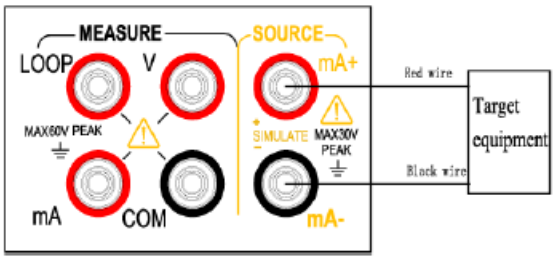
Output Mode

WARNING
Risk of electric shock.

- Do not exceed the rated voltage specified on the calibrator between the connections of the calibrator or between a connection and earth.
- Only use the calibrator if the voltage of any connection to earth does not exceed 30 V peak voltage.

Output Direct Current (Active)

- Connect the cables to the target device.
- Connect the black cable to the mA- socket.
- Connect the red cable to the mA+ socket.
- Connect the other ends of the cables to the signal connections of the target device, ob-serving the correct polarity.



- Press MEASURE/SOURCE to switch to output mode.
- SOURCE, LOOP and mA appear.
- You are now in active direct current mode
- Set manual increment and current range.
- Press CONFIG to call up the direct current parameter setting (MAP.Er).
- Use ▲/▼ to set the desired increment of the output value: 0 = steps of 125 = 25% of the measuring range (0-20 mA: 5 mA; 4-20 mA: 4 mA) 100 = 100% of the measuring range (0-20 mA: 20 mA; 4-20 mA: 16 mA)
- Press ZERO to switch to the range setting (5cALE).
- Use ▲/▼ to set the range 0-20mA or 4-20mA.
- Press ZERO to save the settings
- Press CONFIG to exit the Settings
- Set the output value using the arrow buttons.
- ▲/▼ Change value
- ◄/► Change digit (only possible with increment 0)

Automatic Step Mode

- In output mode, press  until the step symbol  appears.
- Step mode is active.
- Press CONFIG to open the parameters for step mode (5TEP).
- Set the desired step length (1-200 seconds).
- Confirm with ZERO and exit the menu with CONFIG.
- Press START to start the automatic step output of the output current.
- RUN appears.
- Press START to end the automatic step output.
- RUN disappears.

Automatic Sawtooth Wave Mode

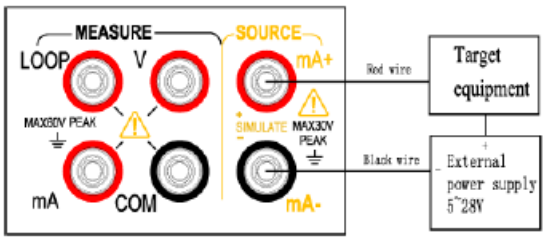
- In output mode, press  until the sawtooth symbol  appears.
- Sawtooth wave mode is active.
- Press CONFIG to open the parameters for sawtooth wave mode.
- START appears.
- Set the initial current and confirm with ZERO.
- STOP appears
- Set the final current and confirm with ZERO.
- CYC appears.
- Set the period duration (5-200 seconds) and confirm with ZERO.
- Exit the Settings with CONFIG.
- Press START to start the automatic sawtooth wave mode.
- RUN appears.
- Press START to exit automatic sawtooth wave mode.
- RUN disappears.

Automatic Triangular Wave Mode

- In output mode, press  until the triangle symbol  appears.
- Triangular wave mode is active.
- Press CONFIG to open the parameters for triangular wave mode.
- START appears.
- Set the initial current and confirm with ZERO.
- STOP appears.
- Set the final current and confirm with ZERO.
- CYC appears.
- Set the period duration (5-200 seconds) and confirm with ZERO.
- Press CONFIG to exit the settings.
- Press START to start the automatic triangular wave mode.
- RUN appears.
- Press START to exit the automatic triangular wave mode.
- RUN disappears.

Output Direct Current (Passive)

- Connect the cables to the target device.
- Connect the black cable to the mA- socket.
- Connect the red cable to the mA+ socket.
- Connect the other ends of the cables to the signal connections of the target device, ob-serving the correct polarity.



- Press MEASURE/SOURCE to switch to output mode.
- SOURCE, LOOP and mA light up.
- You are now in active direct current mode.
- Press FUNC to switch to passive direct current output.
- For further steps, see chapter “Output Direct Current (Active)”.
- **Notice:** A 5-28 V DC power supply is required for passive DC operation.

Use Measuring Mode

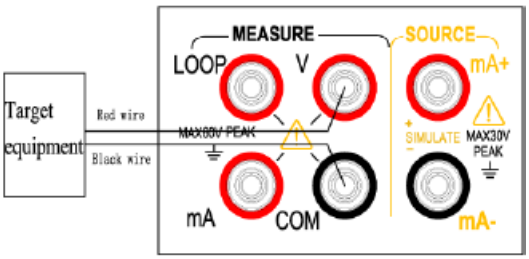
The calibrator can be used to measure DC voltage and direct current.

- Cables must be connected for measurements. The maximum permissible voltage be-tween the connection and earth is 60V peak-to-peak. For safety reasons, no higher volt-ages may be applied in order to avoid an electric shock.
- The power supply to the device to be tested must be disconnected before connecting the calibrator.
- Incorrect connection or incorrect operation during measurement can damage the device or pose a risk of injury to persons.

Notice
If the measured value exceeds the measuring range, “OL” is displayed in the main display.

Measuring DC Voltage

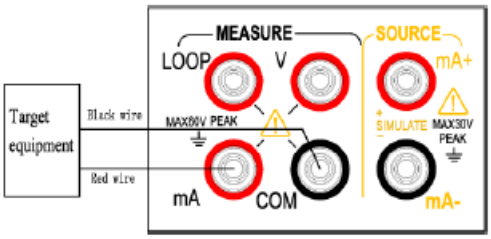
- Disconnect the measuring leads from the test device.
- Press MEASURE/SOURCE to switch to measuring mode (standard).
- MEASURE appears.
- Press FUNC to switch to DC voltage measurement (standard in measuring mode).
- V appears.
- Connect the measuring leads to the signal outputs of the test device.



- The current measured value is displayed on the main display.

Measuring Direct Current

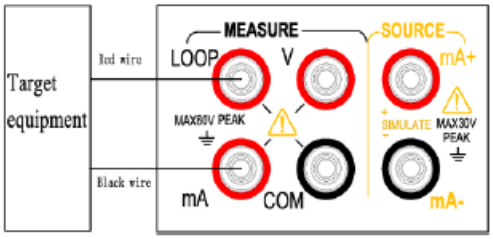
- Disconnect the measuring leads from the test device.
- Press MEASURE/SOURCE to switch to measuring mode (standard).
- MEASURE appears.
- Press FUNC to switch to direct current measurement.
- mA appears.
- Connect the measuring leads to the signal connections of the test device.



- The current measured value is displayed on the main display.

Current Loop Measurement With 24 V Supply

- Disconnect the measuring leads from the test device.
- Press MEASURE/SOURCE to switch to measuring mode.
- MEASURE appears.
- Press FUNC to switch to current loop measurement.
- mA and LOOP appear.
- Connect the measuring leads to the signal connections of the test device.



- The current measured value is displayed on the main display.
- **Notice:** This function supplies the external test circuit with 24 V and measures the current in the loop.

Factory Settings

How to access the factory settings of the calibrator

- Press and hold the backlight button.
- Press the switching on button.
- Release the backlight button as soon as the calibrator displays the factory settings.

Setting Automatic Switch-off

- SPFC APoF appears.
- Use the arrow buttons to set the desired automatic switch-off time in minutes.
- **0 minutes:** Deactivate automatic switch-off
- Any other value: The calibrator is switched off after the set time.
- Press ZERO to save the setting.

- SAVE appears.

Setting the Backlight

- Press MEASURE/SOURCE.
- SPFC bLoF appears.
- Use the arrow buttons to set the desired backlighting time in seconds.
- **0 seconds**: Deactivate automatic switch-off of the backlight.
- **Any other value:** The backlight is switched off after the set time.
- Press ZERO to save the setting.
- SAVE appears.

Setting the Flashlight

- Press MEASURE/SOURCE.
- SPFC LtoF appears.
- Use the arrow buttons to set the desired light duration in minutes.
- **0 seconds:** Deactivate automatic switch-off of the flashlight.
- **Any other value:** The flashlight is switched off after the set time.
- Press ZERO to save the setting.
- SAVE appears.

Resetting to Factory Settings

- Press MEASURE/SOURCE.
- SPFC FACt appears.
- Use the arrow buttons to select the desired function.
- **NO**: Do not reset factory settings.
- **YE5:** Reset all settings to the factory settings.
- Press ZERO to save the setting.
- 5AVE appears.

Replacing Batteries or Fuses

WARNING
Risk of electric shock.

- Remove the measuring leads before normally closed contact with the battery compartment.
- Close the battery compartment tightly before using the calibrator.

Replacing batteries

- Switch off the calibrator and remove the measuring leads.
- Use a flat-blade screwdriver to turn the battery compartment screws a quarter turn anti-clockwise and remove the battery compartment.

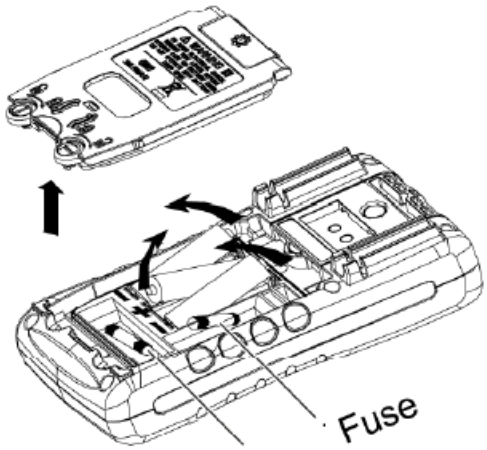
- Insert 3 new AA LR6 type batteries correctly into the battery compartment (observe polarity).

Replacing fuses
Replace blown fuses with equivalent fuses (100 mA/250 V).

Closing the battery compartment
Reinsert the battery compartment and close it tightly.

Notices

- Always use three batteries of the same type.
- Remove the batteries from the calibrator if it will not be used for a long period of time.
- Do not dispose of used batteries in household waste. Take them to a suitable collection point.



Return Shipment and Disposal

Return shipment
Please note the notices on the return procedure on our website (**www.sika.net**).

Disposal
In accordance with Directives 2011/65/EU (RoHS) and 2012/19/EU (WEEE)*, the device must be disposed of separately as electrical and electronic waste.


NO HOUSEHOLD WASTE
The device consists of various materials. It must not be disposed of with house-hold waste.

- Take the device to a local recycling centre or
- Return the device to your supplier or to SIKA.
- WEEE reg. no.: DE 25976360

Technical Data

Measurement
[Valid for one year after calibration, 23°C±5 °C, 20-70% relative humidity, accuracy within ±(% of measured value + constant value)]

Measuring func- tion	Measuring range	Resolution	Accuracy	Remarks
DC voltage (DCV)	-30,000 V to +30,000 V	0,001 V	±0.02% +2 mV	Input resistance: approx. 1 MΩ
Direct current (DCI)	-30,000 mA to +30,000 mA	0.001 mA	±0.02% +4 µA	**Shunt resistance:** approx. 10 Ω **Input resistance:** approx. 20 Ω
Current loop (LOOP)	24 V	–	10%	–

Further properties

- Uncertainty includes standard uncertainty, hysteresis, nonlinearity, reproducibility and typical long-term stability over the specified period (K=2).\
- Refresh rate: 2 to 3 times per second.
- Maximum input voltage: 60 V peak-to-peak.
    - Input protection: 100 mA fuse.
    - Common mode voltage suppression: >80 dB at 50 Hz/60 Hz.
    - Suppression of series signals: >40 dB at 50 Hz/60 Hz
    - Temperature coefficient: 0.1 x base accuracy/°C (temperature range <18 °C or > 28 °C)

Output

[Valid for 1 year after calibration, 23 °C±5 °C, 20-70% relative humidity, accuracy within ±(% of setpoint + constant value)]

Output function	Range	resolution	accuracy	Remarks
Direct current	0,000 mA to	0.001 mA	±0.05% +4µA	At 20 mA maxi-
(DCI)	30,000 mA			mum load 1000 Ω.
				When the transmit-
				ter is simulated,
				the external circuit
				supplies current in
				the range of 5-
				28V.

Further properties

- Uncertainty includes standard uncertainty, hysteresis, nonlinearity, reproducibility and typical long-term stability for the specified period (K=2).
- Maximum output voltage: approx. 30 V peak-to-peak; maximum output current: approx. 25 mA.
- Output protection: 100 mA fuse.
- Temperature coefficient: 0.1 x base accuracy/°C (temperature range <18 °C or >28 °C)

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Documents / Resources

	Sika mAV.3 Monofunction Process Calibrator [pdf] Instruction Manual mAV.3 Monofunction Process Calibrator, mAV.3, Monofunction Process Calibrator, Process Calibrator, Calibrator

References

- SIKA » Clevere Mess- & Kalibriertechnik seit 1901
- User Manual