

SPARKVIEW HIGH VOLTAGE INDICATOR

OPERATING MANUAL



SparkView 
MOTORTECH HIGH VOLTAGE INDICATOR

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1 GENERAL INFORMATION

Read through this Operating Manual carefully before use and become familiar with the machine. Installation and start-up should not be carried out before reading and understanding this document. Keep this manual readily available so that you can reference it as needed.

1.1 What is the Purpose of this Operating Manual?

This Manual serves as an aid for the installation and operation of the product and supports the technical staff with all operating and maintenance tasks to be performed. Furthermore, this Manual is aimed at preventing dangers to life and health of the user and third parties.

1.2 Who is this Operating Manual Targeted To?

The operating manual provides a code of conduct for personnel tasked with the set-up, operation, maintenance, and repair of gas engines. A certain level of technical knowledge with respect to the operation of gas engines and basic knowledge of electronic ignition systems are necessary. Persons who are only authorized to operate the gas engine shall be trained by the operating company and shall be expressly instructed concerning potential hazards.

1.3 Which Symbols are Used in the Operating Manual?

The following symbols are used in this Manual and must be observed:



Example

This symbol indicates examples, which point out necessary handling steps and techniques. In addition, you receive additional information from the examples, which will increase your knowledge.



Notice

This symbol indicates important notices for the user. Follow these. In addition, the symbol for overviews is used to give you a summary of the necessary work steps.



Warning

This symbol indicates warnings for possible risks of property damage or risks to health. Read these warning notices carefully and take the mentioned precautionary measures.

1 GENERAL INFORMATION



Danger

This symbol indicates warnings for danger to life, especially due to high voltage. Read these warning notices carefully and take the mentioned precautionary measures.

2 SAFETY INSTRUCTIONS

2.1 General Safety Instructions

The following safety instructions must be followed in the area in which the device is operated.



High voltage! Danger to life!

While the engine is running, the area around the ignition system especially holds the risk of danger due to high voltage. The following parts should therefore not be touched or removed unless explicitly stated otherwise:

- Ignition coils and caps
- Wires of the high voltage circuit
- Connectors of the input / output wiring
- Pickups and their wiring



Danger to persons with pacemakers!

Electromagnetic impulses in the wiring of the ignition system may exceed the permissible limits of pacemakers. Persons with pacemakers must therefore not be present in the vicinity of the ignition system being operated. Mark the operating location of the ignition system with the corresponding standardized warning symbol.

MOTORTECH equipment is manufactured as state of the art and therefore safe and reliable to operate. Nevertheless the equipment can cause risks or damages can occur, if the following instructions are not complied with:

- The gas engine must only be operated by trained and authorized personnel.
- Operate the equipment only within the parameters specified in the technical data.
- Use the equipment correctly and for its intended use only.
- Never apply force.
- For all work, such as installation, conversion, adaptation, maintenance, and repair, all equipment must be disconnected from the power supply and secured against unintentional restarting.
- Perform only such maintenance and repair work as is described in this operating manual, and follow the instructions described while working. For maintenance of the equipment, only use spare parts supplied by MOTORTECH. Further work must only be performed by personnel authorized by MOTORTECH. Non-compliance with the instructions will void any warranties for the proper function of the equipment as well as the responsibility for the validity of the certifications.
- Safety devices must not be dismantled or disabled.
- Avoid all activities that can impair the function of the equipment.

2 SAFETY INSTRUCTIONS

- Operate the equipment only while it is in proper condition.
- Investigate all changes detected while operating the gas engine or ignition system.
- Ensure compliance with all laws, directives and regulations applicable to the operation of your system, including such not expressly stated herein.
- Always ensure adequate ventilation of the engine compartment.
- Ensure a safe position at the gas engine.

2.2 Electrostatic Discharge Hazards

Electronic equipment is sensitive to static electricity. To protect these components from damage caused by static electricity, special precautions must be taken to minimize or prevent electrostatic discharge.

Observe these safety precautions while you work with the equipment or in its vicinity.

- Before performing maintenance or repair work, ensure that the static electricity inherent to your body is discharged.
- Do not wear clothing made from synthetic materials to prevent static electricity from building up. Your clothing should therefore be made of cotton or cotton mix materials.
- Keep plastics such as vinyl and Styrofoam materials as far away from the control system, the modules, and the work environment as possible.
- Do not remove the circuit boards from the housing of the device.

2.3 Special Safety Instructions for the Device



High voltage! Danger to life!

While the engine is running, the area around the ignition system especially holds the risk of danger due to high voltage. The high tension lead must not be touched when attaching the SparkScan1 high voltage clamp if the engine is running. You can safely touch the grounded high voltage clamp, even when the engine is running.



High voltage! Danger to life!

Without proper grounding, high voltages of up to 40,000 V can occur. Ensure that the high voltage clamp is always correctly grounded. Use the green and yellow cable with the grounding terminal for that purpose.



Risk of destruction resulting from excessive heat

The engine or parts of the engine become very hot. Avoid any lasting contact between the BNC cable or the grounding cable and any hot points.



Risk of damage and erroneous measurements

If the product shows any visible signs of damage (in particular to cables and plugs), safe operation is no longer guaranteed. The product must then not be used any longer.



Risk of destruction resulting from excessive voltage

Excess voltage may damage or destroy the SparkView high voltage indicator. You should therefore stop the measurement if the measured voltage is approx. 40 kV or more for any length of time.



Risk of damage

When the battery compartment is open, moisture and dirt may get into the device. You should therefore only use the device with the battery compartment lid firmly screwed shut.

2 SAFETY INSTRUCTIONS



Risk of destruction resulting from excessive heat

The engine or parts of the engine become very hot. Keep the high voltage indicator away from any hot places.



Risk of damage

The device is designed to operate with the SparkScan1 high voltage clamp from MOTORTECH and with high-quality BNC cables from MOTORTECH and ignition coils with a measuring output from MOTORTECH. In order to prevent damage and incorrect measuring results, the high voltage indicator must only be used with specific MOTORTECH products.

2.4 Proper Disposal

After the expiration of its service life, MOTORTECH equipment can be disposed of with other commercial waste, or it may be returned to MOTORTECH. We will ensure its environmentally friendly disposal.

3 INTENDED USE

3.1 Functional Description

With the SparkView portable high voltage indicator, the high voltage requirements of spark plugs can be measured on a running engine. You can draw conclusions about the condition of the ignition system and of the spark plugs from the measured values. The measurements can be carried out in two ways:

- with the SparkScan1 inductive high voltage clamp from MOTORTECH on the high tension lead
- with a special BNC cable from MOTORTECH on the diagnostic output of specific ignition coils from MOTORTECH

Using the measured voltage it is possible to draw conclusions about the condition of the ignition system and of the spark plugs. Regular measurements can thus also contribute to reducing maintenance costs.

3.2 Application Range

With the SparkView portable high voltage indicator, the high voltage requirements of spark plugs can be measured when the engine is running. The measurements can be carried out in two ways:

- with the SparkScan1 high voltage clamp from MOTORTECH on the high tension lead
- with a special BNC cable from MOTORTECH on the diagnostic output of specific ignition coils from MOTORTECH

The measuring range goes up to a maximum of 40 kV.

Any use other than the one described in the operating manual shall be considered improper use and will result in the voiding of all warranties.

4 PRODUCT DESCRIPTION

4.1 Certifications

The SparkView high voltage indicator is certified in compliance with the following Directives:

- EMC Directive 2004/108/EC
- RoHS Directive 2011/65/EC

The following standards are complied with:

- DIN EN 61000-6-4:2011
- DIN EN 61000-6-2:2006
- EMC ISM DIN EN 55011:2011

CE - DECLARATION OF CONFORMITY

The company: **MOTORTECH GmbH**
Hogrevestrasse 21-23
29223 Celle

declares that the product: **SparkView high voltage indicator**

purpose: **Application on engines**

complies with the provisions of the following EC-Directives:

EMC Directive 2004/108/EC
RoHS Directive 2011/65/EC

under consideration of the following standards:

DIN EN 61000-6-4:2011
DIN EN 61000-6-2:2006
EMC ISM DIN EN 55011:2011

The marking of the product is:

P/N 06.90.099

This declaration is delivered by:

Name: Florian Virchow

Position within the company: Managing Director

Celle, dated 07.11.2012

City, date



Legally binding signature

4 PRODUCT DESCRIPTION

4.2 Technical Data

4.2.1 Mechanical Data

The SparkView high voltage indicator has the following mechanical characteristics:

Feature	Value
LED-scale	Three-color, two brightness levels
Housing material	Plastic, shock-protected
Connections	BNC connector
Working temperature	-20 °C – + 50 °C (-4 °F – 122 °F)
Transport and storage temperature	-20 °C – + 70 °C (-4 °F – 158 °F)
Dimensions	17,5 cm (6.9 "), 8,4 cm (3.3 "), 4,1 cm (1.6 ")
Weight	290 g (0.64 lb)

4.2.2 Product Identification – Labeling on the Device

Printed details	Meaning
<hr/> P/N 06.90.099 <hr/>	Product number
!WARNING!	Warning with regard to operational safety:
DO NOT OPERATE WITH BATTERY DOOR OPEN	Operate only with the battery compartment closed
USE ONLY SPECIFIED LEADS AND TOOLS	Use only with specific, approved accessories from MOTORTECH
	WEEE mark
	CE mark

4.2.3 Electrical Data

The SparkView high voltage indicator has the following electrical characteristics:

Feature	Value
Measuring range	0 kV up to 40 kV
Resolution	1 kV
Accuracy of the display	+/- 2 kV
Batteries	3x AA
Maximum pulse frequency	15 Hz (corresponding to 1,800 rpm with a four-stroke engine) Higher frequencies may lead to a faulty display.

4.3 Unpacking

Unpack the high voltage indicator, taking care not to damage it, and ensure that the operating manual is always near to the device and is easily accessible. Check the contents for completeness and verify that the equipment meets your application requirements.

4 PRODUCT DESCRIPTION

4.4 Overview

Plan view



Item No.	Designation
I	Voltage display
II	Adjustment buttons for the bottom value of the red range
III	Adjustment buttons for the bottom value of the yellow range
IV	TEST
V	I/O (On/Off)
VI	Status indicator
VII	BNC connector

Front view



Item No.	Designation
VII	BNC connector
VIII	Switch for selecting the measuring range a = measuring range from 0 kV to 40 kV b = measuring range from 0 kV to 20 kV (halve displayed value)

5 OPERATION

5.1 Startup

Insert three AA batteries. Make sure the polarity is correct! (See also section *Changing the Battery* on page 25.)

- ▶ The device is ready for operation.

5.2 Shutdown

Remove the batteries, in case you do not use the device for some time. (See also section *Changing the Battery* on page 25.)

5.3 Adjustments

Adjust the SparkView high voltage indicator as follows:

Switching on and off

Switch the SparkView high voltage indicator on or off by pressing the I/O (V) button once.

Testing the scale

Press and hold the TEST (IV) button in order to display the adjustment of the voltage display.

Setting the yellow and red ranges

Press and hold the TEST (IV) button and use the adjustment buttons (II and III) to adjust the bottom values for both the yellow and red ranges. These settings are saved and are retained even after the device is restarted; they have no effect on measuring sensitivity. The optimum voltage range of your ignition system can be found in the documentation for your ignition system.

Setting maximum value indicator

The maximum value indicator is switched on or off by pressing the TEST (IV) button twice. If the maximum value indicator is switched on, the maximum voltage is displayed for slightly longer than it is actually measured, making it easier to read.

Setting the brightness of the scale

Press and hold down the TEST (IV) button and change the brightness of the voltage display by pressing the I/O (V) button once.

Setting the measuring range

If very low measurement values are displayed, the switch for selecting the measuring range (VIII) can be moved to position *b* with a screwdriver. This doubles the resolution of the LED scale, i. e. 10 kV on the display actually corresponds to 5 kV and 40 kV actually corresponds to 20 kV.

5.4 Status display signals

The status display (VI) lights up as soon as the device is switched on and it goes out when switched off.

Status display	Meaning
green light	The batteries are fully charged.
yellow light	The batteries have a medium charge level.
red light	The batteries are weak.
flashes red	The batteries are almost flat and should be replaced (see <i>Changing the Battery</i> on page 25 section).
flashes red once and goes out	The device has been switched off manually.
flashes red three times and goes out	The device has switched off automatically after 5 minutes idle
flashes red five times and goes out	The batteries are dead and must be replaced (see section <i>Changing the Battery</i> on page 25).
flashes red more than five times	There is a fault.

5.5 Measuring the high voltage

You have two options for measuring the voltage with the high voltage indicator with the engine running:

- Measuring with the SparkScan1 high voltage clamp from MOTORTECH on the ignition lead (see section *Measuring with the SparkScan1 high voltage clamp* on page 20)
- Measuring with a special BNC cable from MOTORTECH on the diagnostic output of specific ignition coils from MOTORTECH (see section *Measuring on an ignition coil with a diagnostic output* on page 22)



Risk of destruction resulting from excessive voltage

Excess voltage may damage or destroy the SparkView high voltage indicator. You should therefore stop the measurement if the measured voltage is approx. 40 kV or more for any length of time.



Using MOTORTECH measuring equipment

To ensure that the measuring results are correct, only MOTORTECH measuring equipment may be used.

5 OPERATION



Follow the operating manual of the high voltage clamp or ignition coil with BNC diagnostic output

Follow the instructions in the operating manual of the high voltage clamp or the ignition coil with BNC diagnostic output in order to guarantee the safe operation of the SparkView high voltage indicator.

5.5.1 Measuring with the SparkScan1 high voltage clamp

Measure the high voltage with the SparkScan1 high voltage clamp as follows:



High voltage! Danger to life!

While the engine is running, the area around the ignition system especially holds the risk of danger due to high voltage. The high tension lead must not be touched when attaching the SparkScan1 high voltage clamp if the engine is running. You can safely touch the grounded high voltage clamp, even when the engine is running.

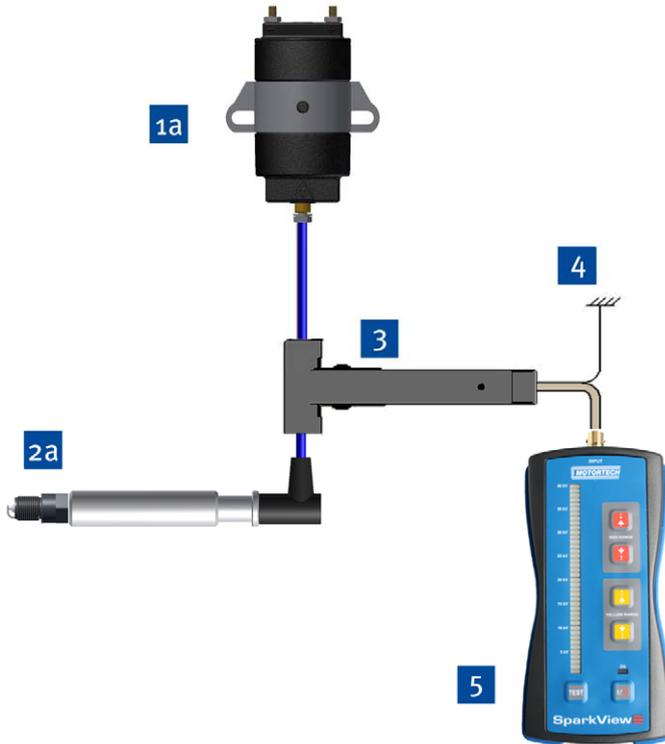
1. Switch on the SparkView high voltage indicator by means of the I/O button ().
2. Press and hold the TEST () button and adjust the red and yellow ranges by means of the adjustment buttons.
 - ▶ The setting is saved and is retained even when the device is restarted.
3. Connect the device to an ignition lead with a maximum diameter of 7 mm (0.27 ") by means of a previously grounded high voltage clamp.



High voltage! Danger to life!

Without proper grounding, high voltages of up to 40,000 V can occur. Before each measurement, ensure that the measuring clamp is properly grounded. Use the green-yellow cable with the alligator clip for this purpose.

- ▶ The test set-up looks like this:



Item No.	Column 2
1a	Ignition coil
2a	Spark plug
3	High voltage clamp
4	Ground
5	SparkView

- ▶ The voltage display of the SparkView high voltage indicator shows the measured ignition voltage.

5 OPERATION



Maximum measuring time is 10 minutes

The SparkScan1 high voltage clamp is designed for short-term measuring (max. 10 minutes) under full load and must not remain on the high tension lead permanently.

5.5.2 Measuring on an ignition coil with a diagnostic output

Measure the high voltage at a diagnostic output as follows:

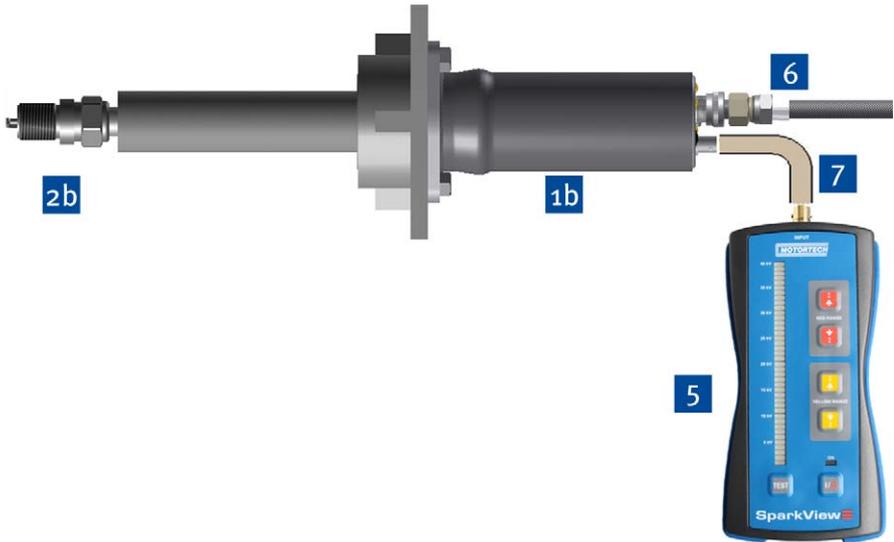
1. Switch on the SparkView high voltage indicator by means of the I/O button ().
2. Press and hold the TEST () button and adjust the red and yellow ranges by means of the adjustment buttons.
 - ▶ The setting is saved and is retained even when the device is restarted.
3. Connect the device to a MOTORTECH ignition coil with BNC diagnostic output using a BNC cable from MOTORTECH.



Risk of destruction resulting from excessive heat

The engine or parts of the engine become very hot. Avoid any lasting contact between the BNC cable or the grounding cable and any hot points.

- ▶ The test set-up looks like this:



Item No.	Column 2
1b	Ignition coil with diagnostic output
2b	Spark plug
5	SparkView
6	Primary cable
7	BNC cable

- ▶ The voltage display of the SparkView high voltage indicator shows the measured ignition voltage.

5.6 Evaluation of measuring results

If the voltage is too low or too high, this implies a faulty ignition system or a faulty spark plug. The voltage range which is correct for your ignition system can be found in the documentation for your ignition system. It is advisable to carry out a reference measurement immediately after installing the ignition system, in order to be able to compare subsequent measurements.

6 LOCATING AND CORRECTING MALFUNCTIONS

Nature of the malfunction	Possible cause	Fault correction
The device cannot be switched on.	The batteries are flat.	Replace the batteries (see section <i>Changing the Battery</i> on page 25).
The values displayed are much too high.	The switch for the selection of the measuring range is not correctly set.	Set the switch for the selection of the measuring range to <i>a</i> (see section <i>Overview</i> on page 15).
	Your ignition system is defective.	Carry out further tests on your ignition system.
Incorrect values are displayed.	The SparkScan1 high voltage clamp is not correctly mounted around the high tension lead.	Attach the inductive high voltage clamp onto a high tension lead in such a way that it completely surrounds the high tension lead. The high tension lead must not exceed 7 mm (0.27 ") in diameter.
	There is an error in your ignition system.	Carry out further tests on your ignition system.

7 MAINTENANCE

7.1 Changing the Battery

Change the batteries of the SparkView high voltage indicator as follows:

1. Switch off the device.
2. Disconnect the device from the BNC cable or from the SparkScan1 high voltage clamp.
3. Open the battery compartment on the rear of the SparkView with a screwdriver.
4. Remove the flat batteries.
5. Insert three new AA batteries. Make sure the polarity is correct!
6. Close the battery compartment with a screwdriver.
 - ▶ The device is ready for operation.

7.2 Customer Service Information

You can reach our customer service during business hours at the following phone and fax number, or by e-mail:

North and South America:

Tel. +1 504 355 4212

Fax +1 504 355 4217

E-mail service@motortech.de

All other countries:

Tel. +49 5141 9399 0

Fax +49 5141 9399 99

E-mail service@motortech.de

7 MAINTENANCE

7.3 Returning Equipment for Repair / Inspection

Enclose the following information when returning the equipment for repair and inspection:

- Name of company
- Name and location at which the equipment is installed
- Name and phone number of a contact person
- Engine type
- Part and serial numbers of the device
- Description of the defect/error
- Instructions concerning the desired type of repair/inspection

Providing this information will ensure the speedy and smooth processing of your repair order.

Send the equipment to one of the two addresses below or to the nearest MOTORTECH representative:

MOTORTECH GmbH

Hogrevestrasse 21-23
29223 Celle

Germany

Tel. +49 51 41 - 93 99 0

Fax +49 51 41 - 93 99 98

www.motortech.de

motortech@motortech.de

MOTORTECH Americas, LLC

1400 Dealers Avenue, Suite A
New Orleans, LA 70123

USA

Tel. +1 504 355 4212

Fax +1 504 355 4217

www.motortechamericas.com

info@motortechamericas.com

7.4 Instructions for Packaging the Equipment

For return shipment, equipment should be packaged as follows:

- Use packaging material that does not damage the equipment surfaces
- Wrap the equipment with sturdy materials and stabilize it inside the packaging.
- Use sturdy adhesive film to seal the packaging

7.5 Spare Parts and Accessories

For spare parts and accessories, please refer to our current Product Guide, which is available for you to download on the Internet at www.motortech.de.

WE UPGRADE GAS ENGINES

Original MOTORTECH Accessories for Stationary Gas Engines

As a supplier, MOTORTECH develops, produces and distributes accessories as well as spare and wearing parts for nearly all kinds of stationary gas engines worldwide: Ignition control and monitoring, industrial

spark plugs and high tension leads, wiring systems and gas regulation– from detonation to speed control and complete gas engine management. On-site support and special training courses complete our service.



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