



Q3 *ENERGIE*

GmbH & Co. KG



Q3 ENERGIE GmbH & Co. KG

Installation and Operation Manual



QFire - Fire Brigade Switch Generator Cut-Off according to IEC60947-3



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1 SAFETY INSTRUCTIONS


1.1 ICONS AND THEIR MEANING


Read all safety instructions very carefully!


The observance of all instructions, the proper use and the application according to the instructions is binding for product liability and product guarantee. Be sure to pass this information on to other people who use this device!


 **DANGER**
 identifies dangerous situations that will result in **serious injury** or **death**, if ignored.


 **VOLTAGE**
 identifies dangerous voltage situations that will result in **serious injury** or **death**, if ignored

 **FIRE**
 identifies dangerous situations that will result in **fire**, if ignored.

 **ATTENTION**
 identifies important information that will result in **material damages** or **injury**, if ignored.

 **HINT**
 indicates important information and useful hints.

 **SUPPORT**
 In case of any questions, please contact our Q3 Energie Support.

 **INFO**
 The marked passages refer to further or supplementary information, such as documents or Internet links.


1.2 DEVICE INFORMATION


The technology and equipment of the product described here are state-of-the-art in terms of functionality and safety. Further developments and improvements are taken into account on an ongoing basis.


As a result, the illustrations, dimensions, technical data, and general content listed below may change as a result of adaptation to new knowledge.


This manual is intended to help you to optimally and safely operate our product, which has been developed and manufactured according to the latest technology, with its versatile possibilities. Please read these instructions carefully before start-up and always keep the manual close to the device for quick access, if needed.

- In principle, the device may only be opened or repaired by authorized personnel. Never open the device or make any repairs to the device yourself.
- Avoid constant high humidity and condensation. Protect the QFire enclosure from splashes, floods and chemicals.

 *In case of any questions, please contact our personnel, see chapter 6.3 TECHNICAL SUPPORT, page 23.*

 **The safe operation of the device is generally guaranteed if the instructions in this manual and on the device are observed.**

 Safe operation of the device is no more possible, in the case of:

- 
 - smoke coming out of the device.
 - defective connecting cables.
 - it is no more working properly.
 - the housing is damaged.

1.3 GUARANTEE

We guarantee that the goods delivered by us have the specified properties. The duration of guarantee is 24 months, unless otherwise agreed in writing, and is calculated from the registration of the QFire system at Q3 Energie GmbH & Co. KG from the authorized specialist company that carried out the installation and connection of the QFire system.

As the manufacturer of the QFire - Fire Brigade Switch, we confirm that:

- by turning the main switch S1 to position „0“ (= off), the PV system (string lines) from the QFire control box to the inverter is set power-free.

As the manufacturer of the QFire - Fire Brigade Switch, we certify that:

- the QFire - Fire Brigade Switch complies to the valid norm IEC60947-3.

1.4 DISCLAIMER OF LIABILITY

We explicitly state that all product liability and guarantee claims are null and void:

1. if the QFire system has not been installed, connected and approved by a specialist company (start-up protocol).
2. if the QFire system is operated on a photovoltaic plant, which was not erected according to norm VDE-AR-N 4105.
3. if the QFire system is operated on a photovoltaic plant, which has no lightning overvoltage protection (earthing).
4. if the QFire system is not installed/operated in accordance with the instructions described in this manual.
5. if the QFire system is operated outside of its intended use, see chapter 1.5 INTENDED USE, page 5 and chapter 1.6 NON INTENDED USE, page 5.
6. if the QFire system is operated outside of its specification.
7. if a defect that has occurred is not immediately asserted in writing.
8. when opening and operating the QFire system in a faulty condition.
9. if own repair attempts have been made which have not been approved in writing by the manufacturer Q3 Energie GmbH & Co. KG.
10. when using/installing non-original spare parts and accessories.
11. for overvoltage damage due to lightning.
12. for damage caused by liquids (e.g. flooding, burst pipes, fire extinguishing).
13. for mechanical damage and its consequential damage after successful installation (start-up protocol).
14. for damage caused by overuse (frequent switching of switch S1 not in accordance with the application) or exposure to foreign bodies.
15. for normal wear and tear.
16. in case of optical defects.
17. for damages due to force majeure, natural disaster or war.

1.5 INTENDED USE

- The product is to be used only for the purpose described in chapter 2 SYSTEM DESCRIPTION, page 6. Under no circumstances may it be used for any other purpose and may not be operated outside the technical limits!
- Also, make sure that the connected components are in a safe condition and suitable for operation with the product.

1.6 NON INTENDED USE

- Usage of the device outside the intended use according to chapter 1.5 INTENDED USE, page 5.
- Non intended use is any type of use not described in this document.
- Usage/installation of parts and accessories others than the manufacturer's original's.
- Usage of the printer in non-compliance to this manual.
- Changes/modifications not approved by Q3 Energie GmbH & Co. KG will void the user's authority to operate the equipment.
- Not complying to the safety instructions.



In the event of an application that does not meet the specification, there is a risk of personal injury, electric shock, fire and damage to the product and the connected components!



2 SYSTEM DESCRIPTION


The QFire Brigade Switch is intended exclusively for operation on a photovoltaic system. High voltages (up to 1,500 VDC) as well as strong electrical currents can flow!

 **Improper operation and incorrect handling can result in danger to life and limb!**

QFire is a PV generator shutdown device for automated galvanic isolation of PV strings according to DIN EN 60947-3:2020.

It serves the purpose of:

- galvanically disconnecting the PV generator up from the installation point of the QFire product, if necessary (e.g. in case of fire).
- visually displaying the status of the PV system in operation, cable breakage of the control line, PV system "switched off".
- fending-off dangers from people, animals, buildings and objects!

 *When used as intended and installed properly and professionally, the QFire system will perform the function reliably according to the system description! Please take the time to read this document carefully.*

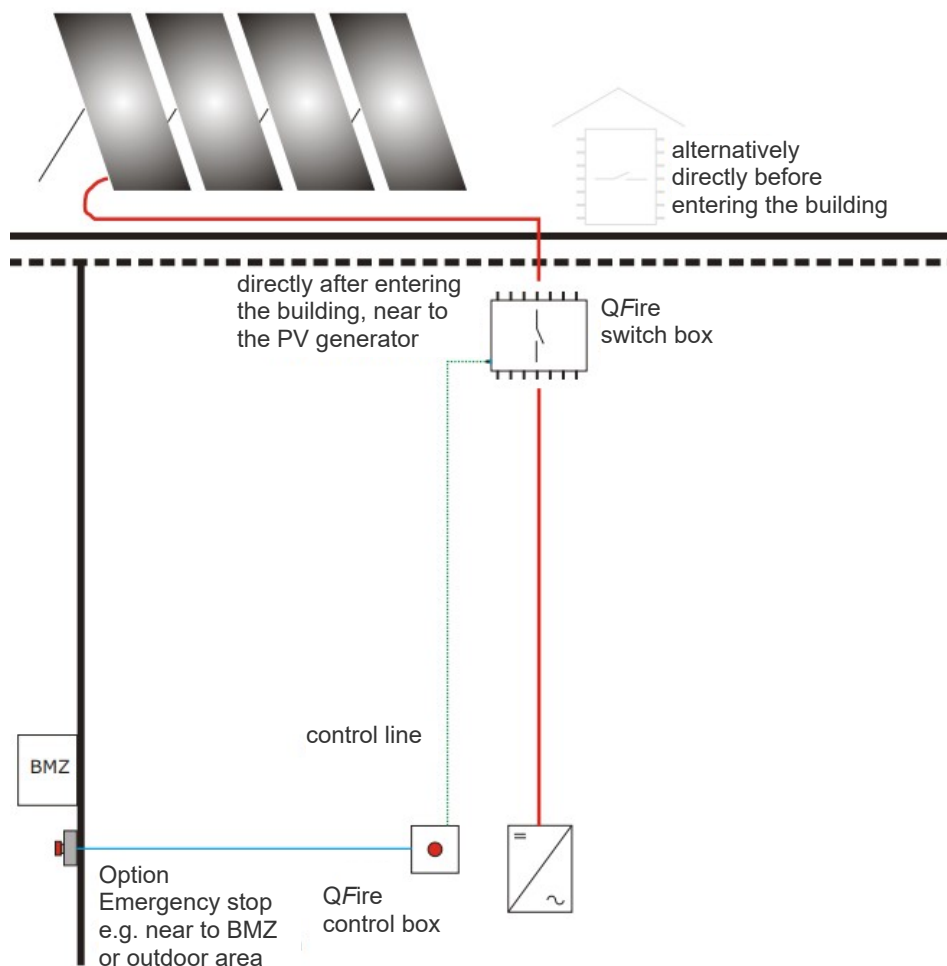


Figure 1: Overview mounting position

2.1 QFire - LAYOUT

The QFire system consists of a control box and one or more switch box(es). The last switch box has to be finished with the dongle. (The dongle is included in the delivery content of the control box.)
 The control box is used to switch-off and -on the switch boxes centrally, as well as to display the status of the system. Optionally SPDs surge protective devices are installed in the switch boxes. The status of the SPDs is displayed on each switch box as well as in its entirety on the control box LED (SPD), see chapter 2.4.1 LED STATUS INDICATION.

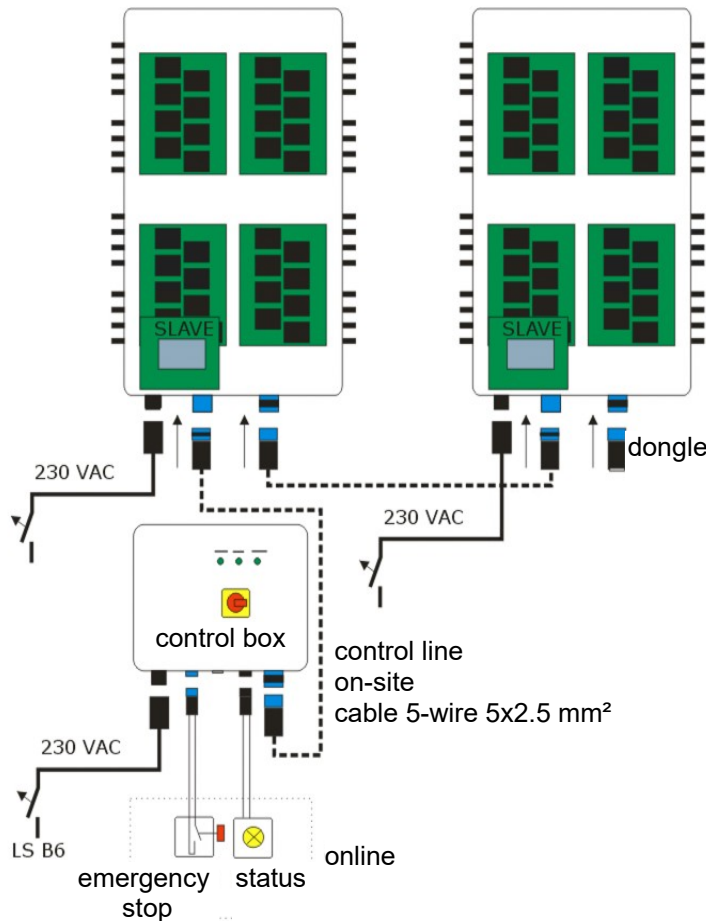


Figure 2: Overview interconnection and control lines

Delivery content according to figure 2:

- Shown connection plugs are included. (The dongle is included in the delivery content of the control box.)
- All cables have to be provided on-site.
- Emergency stop and status display (potential-free switch) are **optionally** available from Q3 Energie GmbH & Co KG.

Delivery content overview, see chapter 3 DELIVERY CONTENT, page 16.

2.1.1 CABEL SPECIFICATION

from – to	Description	Cable diameter	Plug
Control box – Switch box 1	Control line, 5-wire, color or number coded	2.5 mm ² without core end sleeve 1.5 mm ² with core end sleeve	Wieland 46.052.4553.9
Switch box – Switch box	Control line, 5-wire, color or number coded	2.5 mm ² ohne Aderendhülsen 1.5 mm ² mit Aderendhülsen	Wieland 46.052.4553.9 und Wieland 46.051.4553.9
Control box – emergency stop switch	2-wire	0.5 mm ²	Wieland 4L.022.3043.9
Control box – key switch	2-wire	0.5 mm ²	Wieland 4L.022.3043.9
Control box – BMZ	3-wire	0.5 mm ²	Wieland 4L.032.3053.1
Control box – 230 VAC	3-wire with protective conductor	2.5 mm ²	Wieland 46.031.4453.1

2.1.2 CONNECTING OPTIONAL EMERGENCY STOP

Without connection of the optional emergency stop, the bridge inside the connector **MUST** be set (see figures 2 and 7). Otherwise the system QFire will not get in operation.

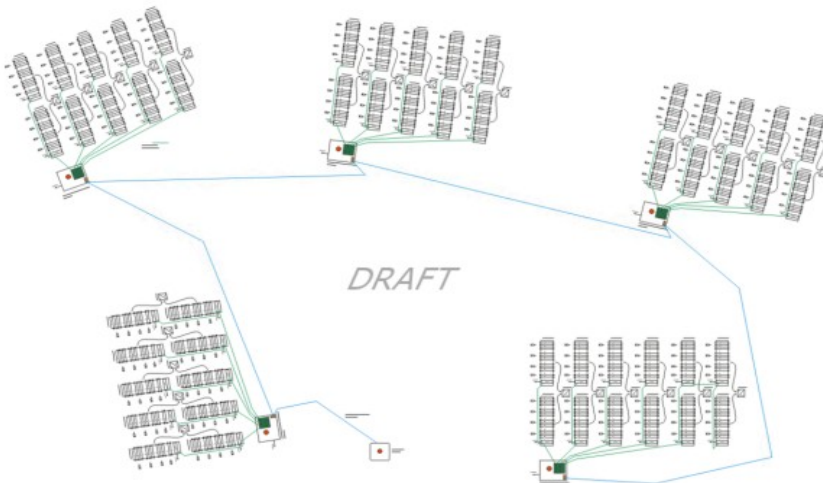
With connection of the optional emergency stop, the bridge (see figure 7) will be removed and cables mounted.

Also see chapter 7 TROUBLESHOOTING AND REMEDY, page 24.

2.2 QFire EXTENSIONS

2.2.1 QFire CLUSTER CONTROL BOX

The QFire system can not only switch off several switch boxes by means of 1 control box, but can also communicate intelligently in conjunction with other control boxes, which in turn manage several switch boxes. A cluster can be switched off centrally via 1 emergency stop. Ideal for factory sites with several buildings.



INFO

Detailed information about QFire Cluster can be downloaded from our website: www.q3-energie.de.

Figure 3: Overview interconnection of cluster control boxes

2.2.2 QFire.LIVE

The QFire system status can also be called up mobil in the internet via QFire.LIVE web monitoring:



INFO

Detailed information about QFire.LIVE can be downloaded from our website: www.q3-energie.de.

Figure 4: QFire.LIVE status overview

2.3 QFire - COMPONENTS

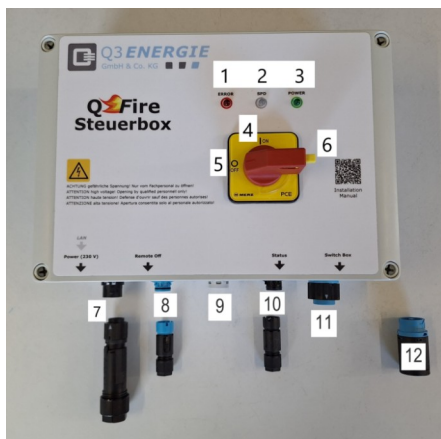
2.3.1 CONTROL BOX

The control box must be installed in an accessible place.

Main switch (4) is used to switch-on and /-off the QFire system / PV generator according to chapter 2.4 QFire FUNCTIONS, page 13.

To prevent accidental restarting, the main switch can be locked in the „0“ position (5) using the small yellow lever (6), which additionally can be blocked by a padlock.

Its LEDs are indicating the QFire system status, see chapter 2.4.1 LED STATUS INDICATION, page 13. Optionally, an external status indicator (10) or an emergency stop remote OFF (8) can be connected.



No.	Description
1	LED Error (red)
2	LED SPD surge protective device (red/green)
3	LED Power (green)
4	Main switch S1 position „on“ „I“
5	Main switch S1 position „off“ „0“
6	Locking lever position „off“ „0“
7	Power supply 230 VAC
8	Connection Emergency stop optional
9	Ventilation opening (condensate)
10	Connection Status (potential-free switch) optional
11	Connection control line (Wielandstecker)
12	Dongle for last switch box (within the delivery content of control box)

Figure 5: Control box

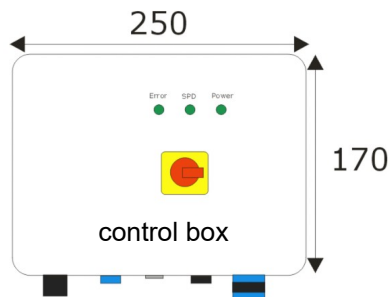


Figure 6: Dimensions control box in mm



Figure 7: Bridge set in connector (8) emergency stop



Figure 8: Wieland plug for connecting to switch box(es)

2.3.2 SWITCH BOX

The switch box is installed immediately after the PV string cables have entered the roof. It contains the switching device for galvanic isolation of the PV strings. It is controlled by the control box connected via control line (5).

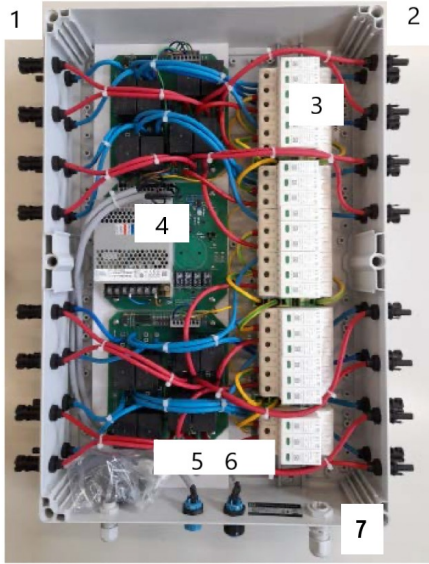


Figure 9: Example switch box for 8 strings with integrated SPD (option)

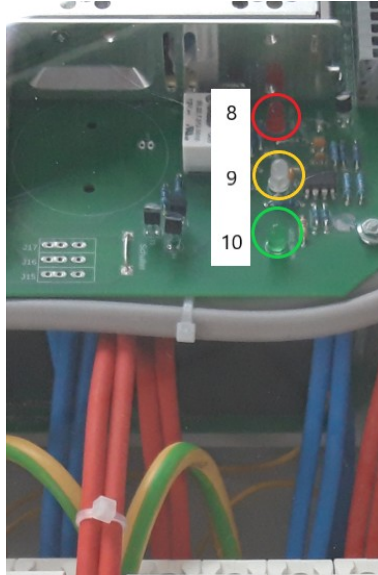


Figure 10: LEDs

No.	Description
1	8 strings +/- from PV generator
2	8 strings +/- to PV inverter
3	Overvoltage contactors SPD (Surge Protection Device)
4	Slave power supply
5	Connector for control lines to the control box or preceding switch box(es)
6	Connector for control lines to further switch box(es) or for termination dongle *
7	Insert for PE
8	LED Error (red)
9	LED SPD surge protective device (red/green)
10	LED Power (green)

* dongle included in control box delivery content

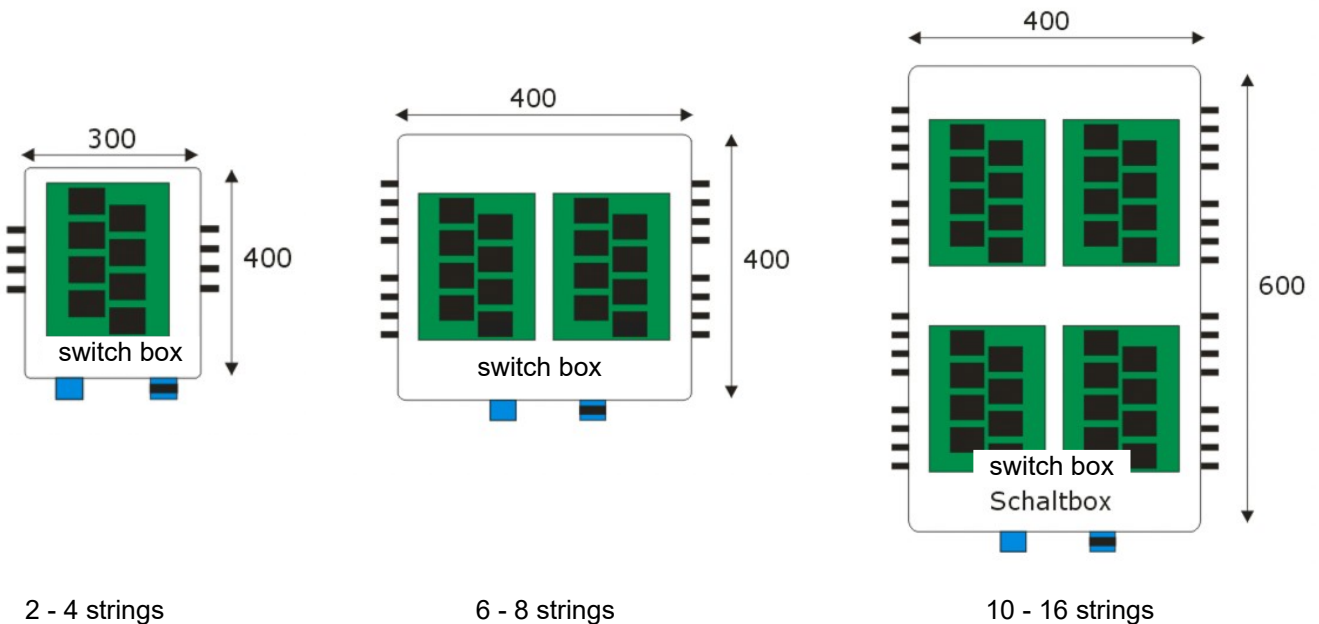


Figure 11: Dimensions of switch box housing sizes in mm



Depending on the configuration of the options, suitable housing sizes are used specifically for the customer. Please inquire the dimensions for your application.

2.3.3 TYPE PLATES

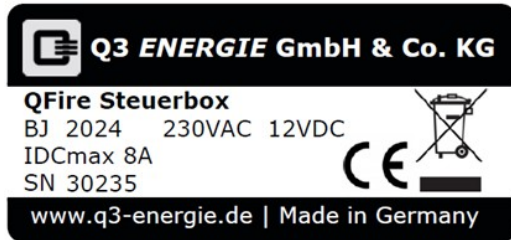


Figure 12: Type plate control box

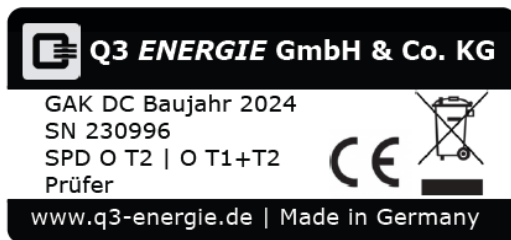


Figure 13: Type plate switch box

2.4 QFire FUNCTIONS

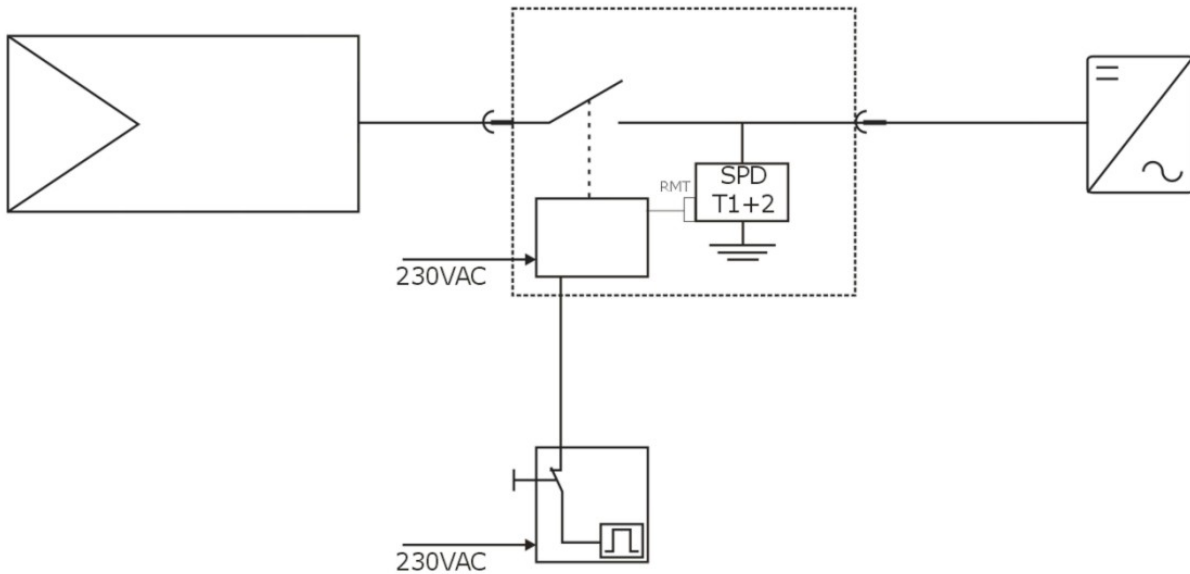


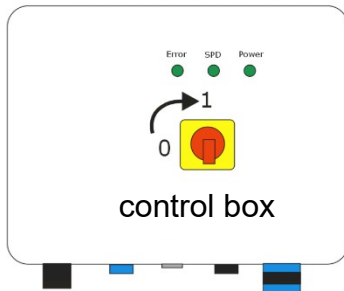
Figure 14: Schematic

2.4.1 LED STATUS INDICATION

Error	SPD	Power	System
off	green	green	QFire system ON – in operation
off	red	green	SPD defectiv - QFire system in operation
red	red	off	Control lines interrupted or under voltage at the control lines - QFire system (partly) not operating
off	off	off	QFire system OFF – not operating



2.4.2 TURNING-ON MANUALLY



Turn-on the connection PV generator – PV inverter:

If the main switch S1 is turned on (position „1“) at the control box, a signal is transmitted to the switch box via the control line.

As a result, the relays in the switch box are tightened which connects the PV string lines with the inverter on plus and minus sides.

The status LED "Power" at the QFire control box lights up green.



DANGER

Dangerous electrical voltage is applied after turning-on the control box!

2.4.2.1 OPTIONAL MONITORING OF OVERVOLTAGE SPD

A surge protection device (3/ Fig. 9, page 11) is installed in each MPP tracker in the switch box. These can optionally be monitored.

If none of the SPD modules has a defect due to an overvoltage, the status LED SPD lights up green on the control box. A defect due to overvoltage is signaled in red.

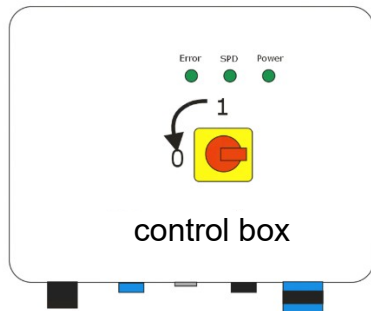


Defective SPD modules must be exchanged immediately in order to ensure device protection in the event of an overvoltage!



2.4.3 TURNING-OFF MANUALLY

Turn-off the connection PV generator – PV inverter:



If the main switch S1 is turned off (position „0“), the control box transmits via the control line a signal to the switch boxes for **simultaneous shutdown**.

Optionally a delay circuit for **time-shifted shutdown** is available.

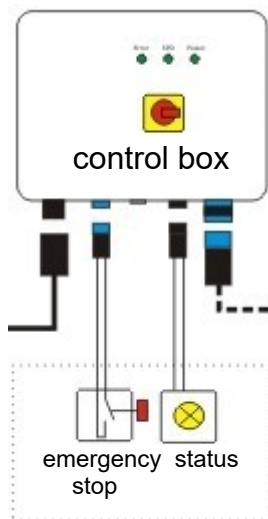


Please inquire.

As a result, the relays in the switch box are disconnecting the PV string lines from the inverter on plus and minus sides.

Up from the switch box, the cables in the direction to the inverter no longer carry voltage. All status LEDs are off!

2.4.3.1 BY EXTERNAL SWITCH (Remote OFF)



Optionally, a status indicator/potential-free contact (10/ Fig. 5) or an emergency stop remote OFF(8/ Fig. 5) can be connected externally.

In this way, the switch-off process can also be triggered externally for all switch boxes connected to the control box.

QFire system in operation: status contact closed
QFire system OFF: status contact opened

Also see chapter 2.1.2 CONNECTING OPTIONAL EMERGENCY STOP, page 8.

2.4.3.2 OPTIONAL SHUTDOWN DELAY

For the shutdown process of larger systems, e.g. 2 MW, we recommend an optional delay circuit. Please specify when planning and ordering, see chapter 3.2 PARTS LIST, page 17.

2.4.4 TURNING-OFF AUTOMATICALLY

2.4.4.1 CAUSED BY POWER GRID FAILURE

If the AC power is switched off, all relay voltages automatically drop and the relays open/interrupt the circuit.

The PV generator output is switched off. If the AC grid is turned back on, the QFire system automatically switches the PV system back into operation.

2.4.4.2 CAUSED BY UNDERVOLTAGE

If there is a cable break within the control lines or if the control voltage drops below 9 VDC (e.g. in the case of strong fluctuations in the AC network), this is detected as an undervoltage and the PV-system is completely switched off. The LED ERROR on the QFire control box lights up red.

Once the error has been resolved, the correct status display and the functioning of the system can be restored by turning the S1 switch off and on again from 0 to 1.

3 DELIVERY CONTENT

3.1 UNPACKING



When unpacking, check that all supplied parts are complete and undamaged. Be sure to remove all parts from the packaging. Claims for damages caused during transport can only be asserted if the delivery service is notified immediately. Please prepare a damage report with appropriate photos and send it back to Q3 Energie GmbH & Co. KG immediately with the defective part, see chapter 6.3 TECHNICAL SUPPORT, page 23.

The product is manufactured (customer specific), tested and packaged according to our strict quality standards. Each assembly has a serial number and is recorded in our QM system. Assemblies that are connected to high voltages have been specially checked and a test report is enclosed. If there is any reason for complaint, please have the serial number and test report available.



***Damaged products must not be installed and put into operation under any circumstances!
There is a risk of malfunction, electric shock and fire!***

3.2 PARTS LIST

Article number	Article description
QFire Control Box	
500566	QFire Generator shut-down control box . With integrated evaluation of surge protection modules via LED. Control of QFire switch box in endless connection with slave boxes.
QFire Switch Box HV/HC	
503122	QFire Generator shut-down switch box HV/HC for switching of 2 strings 1000VDC/15ADC oder 1200VDC/11A, extension by 2 strings
503101	QFire Generator shut-down switch box HV/HC for switching of 4 strings 1000VDC/15ADC or 1200VDC/11A, extension by 4 strings
503106	QFire Generator shut-down switch box HV/HC for switching of 6 strings 1000VDC/15ADC or 1200VDC/11A. Module connectors MC4. Housing polycarbonate 300 x 400. Membrane for pressure balance.
503108	QFire Generator shut-down switch box HV/HC for switching of 8 strings 1000VDC/15ADC or 1200VDC/11A. Module connectors MC4. Housing polycarbonate 300 x 400 mm. Membrane for pressure balance.
510610	QFire Generator shut-down switch box HV for switching of 10 strings (1:1 with or without slave may be listed as a separate position) Remote-controlled switching unit "QFire" for separating 10 PV strings (10 x plus & 10 x minus). Output (10 outputs - 10 x plus & 10 x minus) IP64 polycarbonate enclosure for outdoor installation in weatherproof environments, 600 x 400 mm. String connection input and output via MC4 plug. Connection of the control cable in the box. Maximum string voltage 1500VDC at max. 11 A or 1200 VDC at up to 15A per string. 6 pieces of mounting ears pre-assembled. Connection of the 5-wire control cable via Wieland connector.
510612	QFire Generator shut-down switch box HV for switching of 12 strings (1:1 with or without slave may be listed as a separate position) Remote-controlled switching unit "QFire" for separating 10 PV strings (10 x plus & 10 x minus). Output (10 outputs - 10 x plus & 10 x minus) IP64 polycarbonate enclosure for outdoor installation in weatherproof environments, 600 x 400 mm. String connection input and output via MC4 plug. Connection of the control cable in the box. Maximum string voltage 1500VDC at max. 11 A or 1200 VDC at up to 15A per string. 6 pieces of mounting ears pre-assembled. Connection of the 5-wire control cable via Wieland connector.
510614	QFire Generator shut-down switch box HV for switching of 12 strings (1:1 with or without slave may be listed as a separate position) Remote-controlled switching unit "QFire" for separating 10 PV strings (10 x plus & 10 x minus). Output (10 outputs - 10 x plus & 10 x minus) IP64 polycarbonate enclosure for outdoor installation in weatherproof environments, 600 x 400 mm. String connection input and output via MC4 plug. Connection of the control cable in the box. Maximum string voltage 1500VDC at max. 11 A or 1200 VDC at up to 15A per string. 6 pieces of mounting ears pre-assembled. Connection of the 5-wire control cable via Wieland connector.
510616	QFire Generator shut-down switch box HV for switching of 16 strings (1:1 with or without slave may be listed as a separate position) Remote-controlled switching unit "QFire" for separating 10 PV strings (10 x plus & 10 x minus). Output (10 outputs - 10 x plus & 10 x minus) IP64 polycarbonate enclosure for outdoor installation in weatherproof environments, 600 x 400 mm. String connection input and output via MC4 plug. Connection of the control cable in the box. Maximum string voltage 1500VDC at max. 11 A or 1200 VDC at up to 15A per string. 6 pieces of mounting ears pre-assembled. Connection of the 5-wire control cable via Wieland connector.
Accessories	
500001	QFire Power Off - red central EMERGENCY OFF, potential-free switch in series. Connection for 2.5 mm ²
500003	QFire key switch
500005	QFire Emergency Off in Housing Behind Glass, GMC-120-DKM-G-Y, Manual Fire Detector Yellow
500005-S	Key for QFire emergency stop switch in the housing behind glass (Art. No. 500005)
500666	Online monitoring: QFire Power Patcher for connection to a control box, data transfer to Q3 Cloud via TCP/IP to the customer's router. Message: Status, Status (On/Off)
X502102	Slave control box assembly without housing for integration into Big Box and cable lengths > 25 meters
991010	Delay circuit for QFire. Shutdown delay 1 second per switch box in series. Assembled and pre-tested PCB with connection tabs.
595012	Surge protection T1/2 combi operator with telecommunication contact for integration into a QFire switch box.

4 INSTALLATION



***In the event of improper or non-professional installation, there is a risk of electric shock, of a fire as well as damage to the product and the connected components!
Observe the safety regulations according to chapter 1 SAFETY INSTRUCTIONS, page 3.***

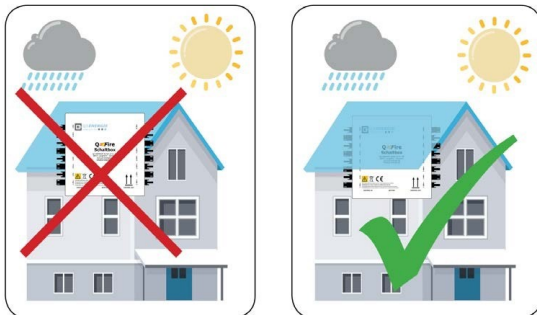
4.1 INSTALLATION POINT

Install the switch box(es) and control box in a load-bearing location (rack/wall). The installation location should be chosen in such a way that the boxes are not directly exposed to the weather and are shaded as much as possible.

Operating temperature range of -15°C to +60°C must be maintained.

Direct sunlight, as well as additional heating by e.g. machines, should be avoided.

The switch boxes can be attached to the substructure/frame under the PV modules, for example.



4.2 ATTACHING

The control box/switch box(es) are attached with the appropriate mounting ears (included).



When tightening the screws, keep in mind, that the housing (standard version) is made of plastic material – polycarbonate. Only use suitable tools.



Before start-up, check the complete system for hazards!



4.3 CONNECTING THE CONTROL LINES

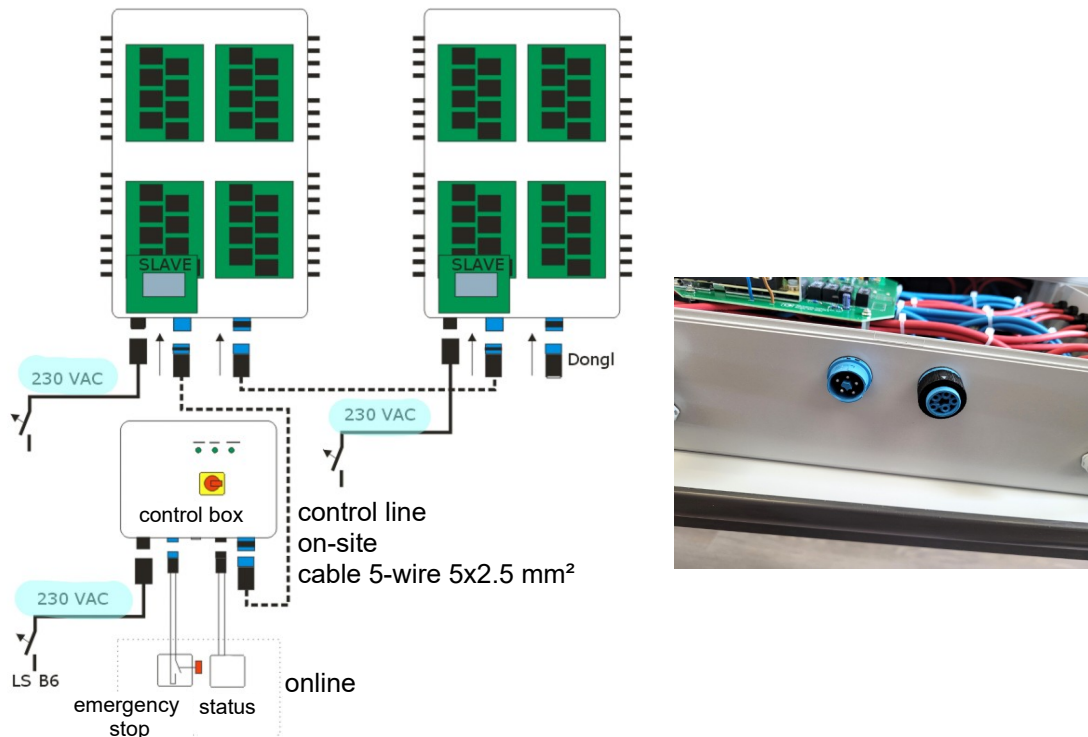


Figure 15: Control lines at switch box(es)

The QFire system is delivered with "plug and play" connectors for the control lines. This innovation is designed to make the installation of the fire brigade switch as easy and efficient as possible. The heart of this innovation are the customer-specific pre-wired connections for the control lines. The control line from the control box to the switch box(es) are no longer mounted on terminals in the housing. The installer only has to mount the supplied mating plugs onto his control line and plug into the control box and the switch box(es).

Proceed as follows:

1. Interconnect the control box with the 1. switch box and further switch boxes with a control line cable 5 x 2.5 mm² (on site) 1:1.
2. Both, control box as well as switch box -slaves (with power supply) must be connected to 230V AC.
 - ➔ With option surge protection device an appropriate grounding has to be installed.
3. Check the system function as follows:
 - ➔ Turn on the control box main switch → all LEDs light up green.
 - ➔ Measure the transmission at the MC4 plugs.
4. Turn off the control box main switch.
5. Connect the string lines to the switch box(es).
6. Perform a functional test with PV and inverter(s) according chapter 5 START-UP, page 22.

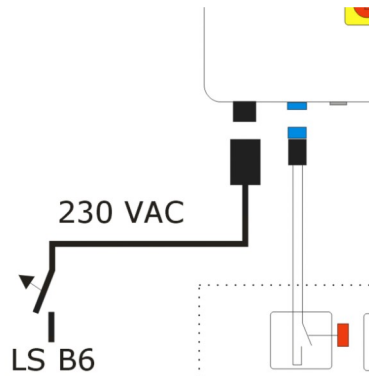



INFO

A mounting instruction of the Wieland plugs can be downloaded from our website:
[QFire PV Feuerwehrscharter Modul String Abschaltung \(q3-energie.de\)](http://q3-energie.de)

4.4 CONNECTING THE POWER SUPPLY

4.4.1 CONTROL BOX



 For power supply connection, use the supplied plug to connect to 230 VAC and secure the supply line with a B6 line protector.

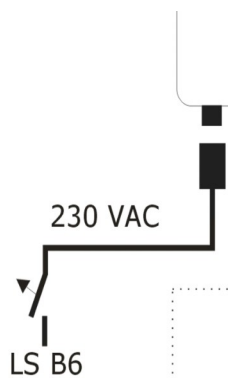
Within the delivery content:
1 each Wieland plug RST08 (incl. allen key for lockable plug)



INFO

A mounting instruction of the Wieland plugs can be downloaded from our website:
[QFire PV Feuerwehrscharter Modul String Abschaltung \(q3-energie.de\)](https://www.q3-energie.de/QFire_PV_Feuerwehrscharter_Modul_String_Abschaltung)

4.4.2 SWITCH BOX



For power supply connection, use the supplied plug to connect to 230 VAC and secure the supply line with a B6 line protector.

Within the delivery content:
1 each Wieland plug RST08 (incl. allen key for lockable plug)



INFO

A mounting instruction of the Wieland plugs can be downloaded from our website:
[QFire PV Feuerwehrscharter Modul String Abschaltung \(q3-energie.de\)](https://www.q3-energie.de/QFire_PV_Feuerwehrscharter_Modul_String_Abschaltung)



Control lines must under no circumstances be installed together with other cables or near to potential sources of interference (powerful electric motors, etc.)!

4.5 CONNECTION OF PE



On site a separate PE ground conductor 16 mm² must be installed into each switch box. Place on the provided clamp.

4.6 CONNECTION OF THE PV STRING LINES

Proceed as follows:

1. Turn off the control box main switch OFF „0“.
2. Connect PV strings to the MC4 plugs of the switch box(es), see figure 16:
 - left – connection PV strings coming from PV modules
 - right – connection to the inverter



DON'T REVERSE POLARITY! String lines must maintain their assignment input to output!

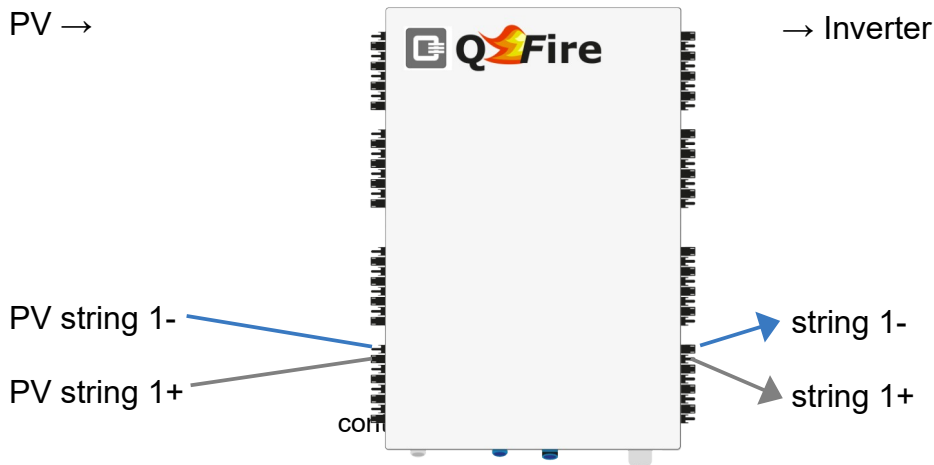


Figure 16: Connections switch box

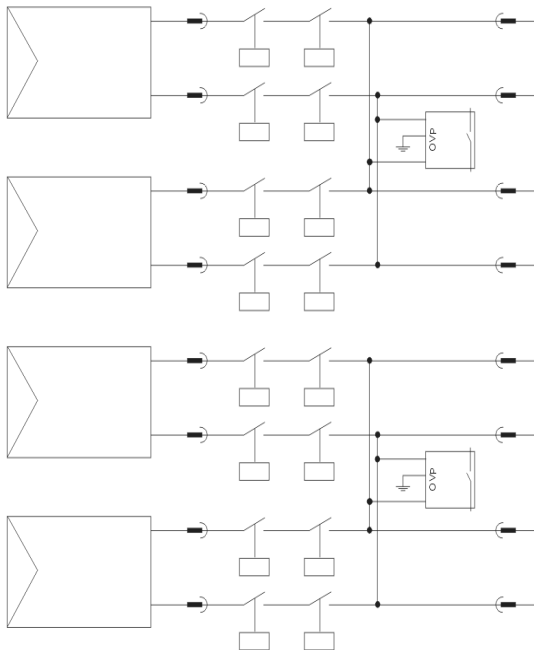


Figure 17: Interconnection PV strings and surge protection device SPD

5 START-UP

1. Connect all control lines on control box and switch box(es), see chapter 4.3 CONNECTING THE CONTROL LINES, page 19.
2. Turn on the QFire system via control box main switch S1 „on“ = „1“.
→ The switch box relays get in contact. This relay switching noise is audible.
3. If everything is wired correctly and all connected switch boxes have contacted through, the green POWER LED lights up after a maximum of 1 second.
4. Now the PV generator voltage is applied to the inverter(s) and they should start working after their self-test and grid-test (if the sun is shining).
5. With the Surge Protection Device option installed, the SPD LED at the control box must light up green. (If no surge protection is installed, SPD LED is not present.)
6. After about 5 minutes, shut down the system again by turning off the control box main switch to "off" = "0".
→ All connected switch boxes must turning off at the same time. (Time-shifted shutdown with delay switching option.)
7. Now check the voltage on the inverters.
→ All strings up from the switch box right side (see figure 16, page 21) must be voltage-free.
8. Repeat this procedure from **point 2. - 7.**
9. After installation and start-up all housings of control and switch box(es) must be closed.
→ It must be ensured that these cannot be opened by unauthorized persons (key switch option)!
10. The installer specialist company issues a installation protocol for the customer's signature.
11. The installer specialist company registers the QFire system at the manufacturer Q3 Energie as the basis for the guarantee service of the QFire system and provides a copy of the signed installation protocol.



People who work or stay in near the QFire product, are to be informed about the possible dangers of PV system components.

6 MAINTENANCE/SERVICE



The operator is responsible for complying with and commissioning the prescribed maintenance and service intervals.

6.1 MAINTENANCE INTERVAL



Service and maintenance work may only be carried out by a specialist company.



Regular visual inspections of the components by the customer are recommended, especially in case of abnormalities, see chapter 7 TROUBLESHOOTING AND REMEDY, page 24.

The operation of the product in intended use does not require any special supervision. The QFire system does not contain any component inside the housings which need to be serviced or repaired.

In case of a malfunction, the system must be switched off and put out of operation by a qualified electrician. The installer company must be notified.

Interval	Service check
yearly	Functional test

6.1.1 FUNCTIONAL TEST

A complete functional test must be carried out and documented annually. At this the QFire system is switched off and all strings from the distance between the QFire switch box(es) and inverter(s) must be voltage-free tested and confirmed. See chapter 5 START-UP, page 22.



The functional test must be carried out by a qualified electrician.



If you have any questions, please contact our Technical Support by having your serial number ready, see chapter 6.3 TECHNICAL SUPPORT, page 23.

6.2 DOCUMENTS



Further documentation is available from our website: www.q3-energie.de

6.3 TECHNICAL SUPPORT

In a service case please contact us:
Q3 Energie GmbH & Co. KG



phone: +49 (0)8341/9080 334
email: info@q3-energie.de

Under www.q3-energie.de you will also find the direct contact to your personal advisor for any kind of questions.

7 TROUBLESHOOTING AND REMEDY



Contact our service to troubleshoot faults and errors, see chapter 6.3 TECHNICAL SUPPORT, page 23.

SYMPTOM	POSSIBLE CAUSE	REMEDY (contact service)
QFire system can not be turned-on with the control box main switch „on“ = „1“ LED Power : off LED SPD : off LED Error : off LED Power : off LED SPD : red LED Error : red	Emergency stop: <ul style="list-style-type: none"> connector was not plugged in connector was not bridged (in case option not available) wrongly installed as opener instead of closer <ul style="list-style-type: none"> Control line broken Undervoltage on control lines (system partly off) 	<ul style="list-style-type: none"> Plug-in emergency stop connector Bridge the connector Correct installation Check control lines and replace, if needed Installed control lines to long or less diameter – Replace control lines with cables of right length and diameter
QFire system can not be turned-off with the control box main switch „off“ „0“ LED Power : green	QFire control box defective	<ul style="list-style-type: none"> Deinstall control box Bridge the PV strings (for continuing operation of the PV generator) Replace control box
LED Power : green LED SPD : red LED Error : off	SPD tripped due to overvoltage No connection on remote output SPD component in switch box defective	Shut-down PV generator: <ul style="list-style-type: none"> Turn control box main switch to „off“ „0“. Check all PV strings. Check wiring of SPD block – measurement must show low impedance Check switch boxes SPD components for red LED indication. Pull out and replace defective SPD block.
Emergency stop does not work	Plug contact still bridged	<ul style="list-style-type: none"> Remove bridge contact.



8 CERTIFICATES

8.1 EU CONFORMITY



EU-Konformitätserklärung/EU

Hiermit erklären wir die Übereinstimmung der aufgeführten Geräte mit den hier folgenden Normen.

Hersteller

Q3 ENERGIE GmbH & Co. KG
Innovapark 20
87600 Kaufbeuren
Germany

Produkt/Product

QFire HV Schaltbox
QFire Steuerbox

Beschreibung

Das Produkt schaltet PV Strings galvanisch getrennt durch das Betätigen eines Schalters, oder durch Wegfall der Versorgungsspannung (netzabhängig) auf der Ausgangsseite der Schaltbox spannungsfrei. Die maximale Systemspannung beträgt 1.500 VDC, der maximale Schaltstrom beträgt 15A bei 1.200 VDC.

Normen/Standards

Niederspannungsrichtlinie 2014/35/EU
IEC 60947-3:2020 in conjunction with IEC 60947-1:2020
EMC Directive 2014/30/EU

Kaufbeuren, 24.01.2023

Thomas Neumann
Geschäftsführer Q3 ENERGIE GmbH & Co. KG

Rechtsform: Kommanditgesellschaft GmbH & Co
Sitz der Gesellschaft: Kaufbeuren
Handelsregister: HRA 10466, Amtsgericht Kempten
Komplementärin: Q3 Vermögensverwaltung GmbH
HRB: 14116
Vertreten durch den Geschäftsführer:
Thomas Neumann IM Elektrotechnik

Hausanschrift: Innovapark 20, 87600 Kaufbeuren
www.q3-energie.de
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VAT: DE298067511
Bankverbindung: VR Bank Kaufbeuren-Ostallgäu eG
IBAN: DE98 7346 0046 0001 7561 33
BIC: GENODEF1KFB



8.2 CERTIFICATE OF COMPLIANCE



Certificate of compliance

Applicant: Q3 Energie GmbH & Co. KG
Innovapark 20
87600 Kaufbeuren
Germany

Product: Switch Disconnecter

Model: Q3 QFirePV-HV Standard
Q3 QFirePV-HV BIG

Ratings: DC voltage range [V] up to 1500
DC current [A] 15

Use in accordance with regulations:
The switch disconnectors are tested according to the IEC 60947-3:2020 in conjunction with IEC 60947-1:2020.

Applied rules and standards:
IEC 60947-3:2020
Low-voltage switchgear and controlgear – Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units
* environmental tests were excluded – see test report for further details

At the time of issue of this certificate, the representative product listed above corresponds to the stated rules and standards.

Report number: 22TH0526-IEC60947-3_0 **Certification program:** NSOP-0032-DEU-ZE-V01
Certificate number: U23-0184 **Date of issue:** 2023-03-07

Certification body

Georg Lenz



Certification body of Bureau Veritas Consumer Products Services Germany GmbH Accredited according to DIN EN ISO/IEC 17065
Testing laboratory accredited according to DIN EN ISO/IEC 17025
A partial representation of the certificate requires the written permission of Bureau Veritas Consumer Products Services Germany GmbH

BUREAU VERITAS Consumer Products Services Germany GmbH OehLeckerring 4/0, 22419 Hamburg, Germany cps-hamburg@de.bureauveritas.com
Tel: +49 40 74041-0 www.bureauveritas.de/cps



9 TECHNICAL DATA

	Control box	Switch box
Switching methode	galvanic isolation	
Connections	MC4 (4-6 mm ²)	
Number of strings	System modular extendable with 1-99 switch boxes of max. 16 strings each	
Norms	CE, IEC 60947-3:2010-02	
Housing		
Material:	polycarbonate	
IP class (EN60529):	IP 66/67	
mechanical resilience:	IK08 (+35°C/-25°C)	
Certification:	EN 62208:2011:2011	
Mounting location:	protected outdoor area	
Diameter L x W x D	250 x 170 x 100 mm	for 2 - 4 strings: 300 x 400 x 132 mm for 6 - 8 strings: 400 x 400 x 132 mm for 10 - 16 strings: 400 x 600 x 132 mm (plastic) for 10 - 16 strings: 400 x 600 x 150 mm (metal)
Weight:	approx. 1.1 kg	approx. 11 kg (plastic) / 15 kg (metal)
Spannung		
Operation voltage:	230 VAC	
Sicherung:	B6 line protection	
Power consumption:	approx. 40 mA at 230 VAC	< 3 W / string connected
Rated voltage isolation.	1,500 VDC	
System voltage max.	--	1,500 VDC
Switch voltage max. at 15 A	--	1,200 VDC
Control voltage:	12 VDC	12 VDC
Switch current max. per string:	--	15 A
Surge protection		
Category:	--	DC T1+2
Telecommunication contact:	--	ja
Integrated slave:	--	230 VAC for cascade circuit and control lines > 30 m
Compliance	--	IEC 61634-31:2018, EN 50539-111:2012+A1:2014
Communication	optical LED status message or LAN/ethernet optional	optical LED status message
Operation temperature	- 15°C to +60°C	
Humidity	0 – 99% relative humidity (no condensation)	
Options	external key switch or emergency stop, potential-free status contact	

10 DISPOSAL



The symbol of the "crossed-out garbage can" means that you are legally obliged to collect these devices separately from unsorted municipal waste.

Information on the disposal of electrical and electronic equipment in the European Community: Electrically operated equipment is disposed of in accordance with national rules based on the EU Directive 2002/96/EC on waste electrical and electronic equipment (WEEE). According to this, all devices delivered after 13.08.2005 may no longer be disposed of in municipal or household waste, but via special collection and return systems.

Options for returning old equipment:

Owners of old appliances from private households can hand them in free of charge at the collection points of the public waste management authorities or at the take-back points set up by manufacturers or distributors within the meaning of the Electrical and Electronic Equipment Act. On the website of the foundation "elektro-altgeräte register" (www.ear-system.de) you will find a list of collection and take-back points.

Q3-Energie is registered as a manufacturer of electrical and/or electronic equipment under the WEEE registration number DE 26170472 with the stiftung elektro-altgeräte register, Nordostpark 72, 90411 Nuremberg, Germany.



Further information about disposal according to ElektroG is available on our website, see link:
<https://q3-energie.de/ueber-die-q3/informationspflicht-nach-elektrog-novelliert/>

In our business with our suppliers and customers, our terms and conditions apply

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