Operation Manual

OPW Fluid Transfer Group Europe B.V.

Ground Monitor 88xxx

Disclaimer

In this document an operation manual is presented of the **OPW** Grounding Monitor 88xxx. It is important that the end user of the **OPW** Grounding Monitor 88xxx is of adult age, is skilled, reads and understands this manual, otherwise it is not recommended to use the **OPW** Grounding Monitor 88xxx.

OPW Fluid Transfer Group Europe BV guarantees that this product is adequate for the stated use and is in accordance with the Directive(s) stated in the declaration of conformity of this monitor.

OPW Fluid Transfer Group Europe BV can not be held responsible for incorrect use of the Grounding MONITOR 88xxx. The Grounding Monitor 88xxx is for the use of monitoring of a truck ground connection.
In case this OPW Grounding Monitor 88xxx ***is used in another location than mentioned in the initial quotation or is abused, all guarantees will be declined.***

This operation manual is a part of the supplied product and must at all times accompany the Grounding Monitor 88xxx, when it is relocated or sold to a third party. All pages of this manual should be present, in accordance to the table of contents. If not, please contact the **OPW Fluid Transfer Group Europe BV**.

This is an **OPW Fluid Transfer Group Europe BV** product, for technical assistance, information and/or complaints contact:

OPW Engineered Systems

Visiting address:
9393 Princeton Glendale Road
Hamilton, Ohio 45011
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FAX: 513-932-9845 or 800-245-8536
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Mr. Edwin Smit
Managing Director

Preface

This manual describes the operation, and troubleshooting of the Civacon 88xxx Grounding Monitoring System.
Read separate installation manual for wiring the grounding monitor
It is intended to help operators, maintenance persons, and equipment specifiers understand the operation and standard features of the 88xxx Grounding monitor
It is recommended reading this manual before installation of the equipment.
The 88xxx grounding monitor is a ground monitoring system designed to offer reliable and safe assistance when loading a tank truck.

Warranty

All parts and products are thoroughly inspected and tested from the time raw material is received at
our plant, until the product is completed. We guarantee that all products are free from defects in
materials and workmanship for a period of one year from the date of shipment. Any product that may
prove defective within said one year period will, at our option, be promptly repaired, or replaced, or
credit given for future orders. This warranty shall not apply to any product which has been altered in
anyway, which has been repaired by any party other than an authorized service representative, or
when such a failure is due to misuse or conditions of use. We shall have no liability for labour costs,
freight costs, or any other cost or charges in excess of the amount of invoice for the products.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND SPECIFICALLY THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Approvals

The 88xxx CIVACON Loading Grounding Monitor is suitable for
Equipment group II, category 2(1)
Class I, Division 1, Groups C & D
hazardous locations with intrinsically safe outputs, and housed in an Explosion Proof Enclosure. All monitors are ATEX / QPS approved. Please consult the factory for the availability of
special models.

Technical assistance in the U.S.A.

If at any time during the installation a question arises that is not covered in this Installation Instruction, or with any other applicable documents referenced, feel free to call the

OPW-ENGINEERED SYSTEMS – ELECTRONICS TECHNICAL ASSISTANCE LINE:

In the U.S.A., Call: 513-932-9114 or 800-547-9393

OPW-ENGINEERED SYSTEMS – CUSTOMER SERVICE DEPARTMENT:

In the U.S.A., Call 513-932-9114 or 800-547-9393

IN ALL OTHER COUNTRIES: Contact your local **OP**W-ENGINEERED SYSTEMS agent.

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Table of Contents

Specifications

The Grounding Monitor 88xxx is a ground monitoring system for validating ground connections. The grounding monitor does this with a DC impedance measurement.
The maximum allowed impedance is 2500 Ω. Ground bolts are also detected as a valid ground connection. In these cases the maximum forward voltage drop may not exceed 1 volt. Reverse bolts are detected and rejected as a valid grounding connection.
The user can specify with a dipswitch if the monitor needs to give a permissive signal on either a ground loop, ground bolt or both.
Another setting available to the user is to require a ground disconnect after 45, 60 or 90 minutes of operation. Continues ground measuring is also an option.

Electrical Specifications

Mains:

Nominal min. input voltage	: 90 Vac.
Nominal max. input voltage	: 250 Vac.
Nominal input current	: 50 mA_{RMS} @ 230 Vac
Frequency	: 50 / 60 Hz
Nominal power consumption	: 15 VA.
Mains current limitation internal fuses	: 1 AT

Inputs.

Terminal J5 Pin 9 & 10	: Verification according EN13922 : Positive and negative sensing
Secondary input	: J7 an intrinsically safe normally closed input. With different functions. Ask OPW for details

Outputs.

Permit Relay output

Voltage	: 250 V ac/dc
Current limitations	: 2 AT Internal Fuses
Functional specs	: Form-A, Normally open safety relay contacts Closed when grounding is valid

Auxiliary 1 Relay output

Voltage	: 250V ac/dc
Current limitations	: 2 AT Internal Fuses
Functional specs	: Form-A, Normally open relay contacts Closed when grounding is valid

Auxiliary 2 Relay output, not used

Voltage	: 250 V ac/dc
Current limitations	: 2 AT Internal Fuses
Functional specs	: Form-C (SPCO) Auxiliary relay

***Miscellaneous*.**

Optional sockets	: expansion slots for additional functionality.
SD Ram socket	: Bootloader for firmware upgrades : Event logging

External environment reminder (see installation manual for details)

Operating Temperature Range (T_a)	: -45°C (-43°F)to +70°C (158°F)
Storage Temperature (T_s)	: -45°C (-43°F)to +70°C (158°F)

View angle display	: ~25°
Visibility display	: ~0.5m
View angle LED's	: 120°
Visibility LED's	: 20m (no direct sunlight)

Main Seal : Certified Silicon gasket. Use only OPW part H72542 as replacement.

- The gasket is attached or secured to bottom part to prevent loss, damage or incorrect assembly. The gasket material shall not itself adhere to the other joint face and has to be slightly greased.

System operation.

The purpose of the Civacon 88xxx grounding monitor is to detect a ground connection between a tank truck and the gantry. The system provides a relay contact to signal the permissive status. The permissive status is the combination between the detection of a ground connection, the system settings and system errors.
The system has 2 lightbars. lightbar 1 on the top and lightbar 2 on the bottom as seen in Figure 1.

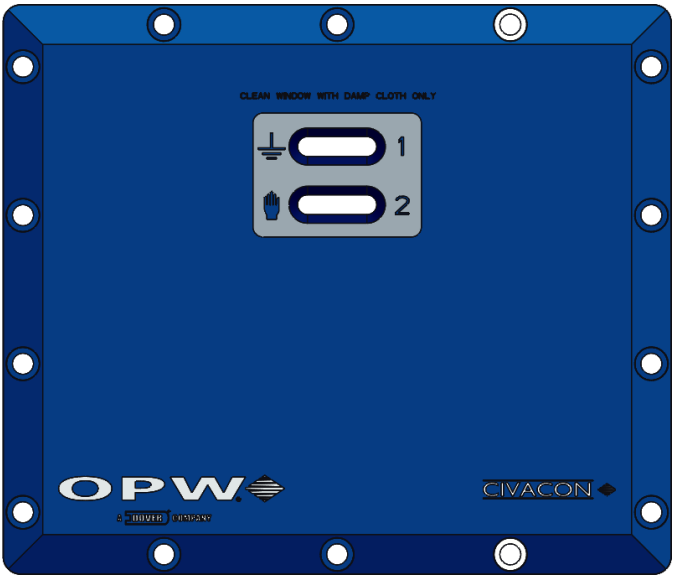

Figure 1 Grounding monitor front

Power-up.

On system startup both lightbars blink in the pattern red->green->blue after which normal operation is resumed. On startup the grounding monitor check for a ground connection. If a ground connection is detected the monitor goes into an error state. The grounding must be disconnected on system startup.

Normal operation.

In normal operation the 88xxx grounding monitor await a ground connection. All relays are open in this state.
When a valid ground connection is detected the monitor switches to permissive. The permissive relays will close in this state. The light bars are used to visualize the monitor state. See Table 1 for the meaning of the table. Table 2 shows the maximum permissible impedance or forward voltage on a ground loop or ground bolt respectively.

Lightbar 1	Lightbar 2	Relays	Meaning
Off	Low intensity red	Open	Monitor is in sleep mode
Red blinking	Off	Open	No ground connection detected
Off	Green	Closed	Valid ground connection detected
Red blinking	Green	Closed	A ground connection is detected, but the monitor is non permissive. See the chapter “Dipswitch Settings” for details
Red blinking	Red blinking	Closed	System error.

Table 1 Lightbar truth table

Ground type	Maximum value	Unit
Loop	2500	Impedance (Ω)
Bolt	1.00	Forward voltage (V)

Table 2 Ground connection validation

Dipswitch settings

The grounding monitor has various settings. Please refer to Figure 2 for all settings. By default all switches are set to the “Off” position.

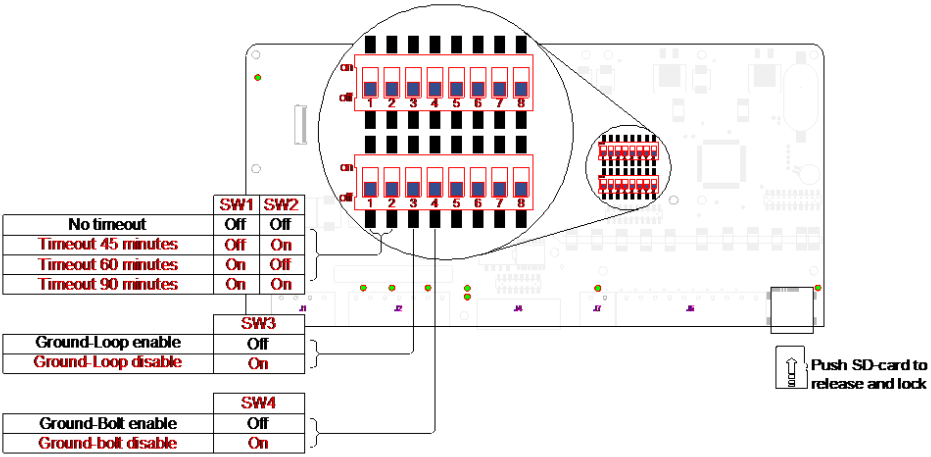

Figure 2 Dipswitch settings

Timeout:
The grounding monitor offers a timeout mode to avoid a permanent permissive. When a timeout occurs disconnect the grounding clamp and re-connect it to resume operation.

Ground loop disable:
To enforce that only ground bolts result in a permissive from the grounding monitor disable the ground loop.

Ground bolt disable;
To enforce that only ground loops result in a permissive from the grounding monitor disable the ground bolt.

Firmware upgrade.

The firmware of the 88xxx grounding monitor can be upgraded with an microSD card. This microSD card will be provided by your vendor.
In order to perform the upgrade de-energize the monitor, remove the lid, remove the microSD card currently in the monitor and place the provided microSD card. Please refer to the installation manual for details on how to perform these steps.
Place the lid back and power the monitor on. The firmware procedure will now start. During the upgrade lightbar 1 will blink blue at first and green after. On a successful firmware upgrade normal operation with the new firmware will ensue. On failure both lightbars are red, reboot the grounding monitor when this happens. Contact Civacon if the firmware upgrade fails after a second attempt.

Maintenance.

When servicing the grounding Monitor 88xxx the following needs attention:

- Before maintenance the full installation must be shut down before proceeding.
- Maintenance must be performed by authorized personnel only.
- All fasteners must be inspected periodically.
- After maintenance is performed, the grounding monitor 88xxx must be tested before the next use.
- Periodical inspection (every 6 months) for leakages (especially with heavy rainfall or wind).
- Periodically maintenance is not required, but we recommend to check the internals at least once a year, by tucking all the cables and inspect for any corrosion.
- Depending upon the condition of the inside the enclosure after inspection, it may be necessary to apply a coating of corrosion inhibiting spray to the interior components.
- During servicing loading and unloading of tank trucks is not allowed.
- During maintenance (partial) disassembling could be necessary, the same risks and procedures apply as during installation.

Check Points.

During maintenance the following items should be checked:

- All earth cables should rigidly connected and free from corrosion,
- If there is no moisture inside of the enclosure,
- If the main seal is still intact and still soft and smooth,
- If there is no corrosion on any part inside the enclosure,
- Visual inspect all electronic components, with special attention for the voltage suppressors (also see trouble shooting in Troubleshooting.)

Caution: When replacing the fuses, always make sure that you replace the fuse with original ones with an equal stated value.

When maintenance has been performed, the following should be done before closing the grounding monitor 88xxx

- Replace the corrosion protector (should be done every 6 months),
- Put grease on the main seal,
- Make sure that all earth cables are connected,
- Apply coating (if necessary) to the interior components,

Caution: - Make sure, before closing the enclosure, that the cables do not get stuck between the door and the bottom side of the enclosure.
- When tightening the bolts, apply the torque mentioned in the installation manual.

Troubleshooting.

The following troubleshooting guide will give you first aid hands-on in solving most of the problems you can encounter. There are two types of issues.

1. Operational issues.
2. Hardware issues.

The risk of faulty hardware will increase if the 88xxx grounding monitor is NOT serviced on a regular base. The main issue to look out for is corrosion, both internally when the corrosion protector is never replaced and on the grounding clamp.

Issue	Possible cause	Solution
The grounding monitor 88xxx doesn't turn ON	The mains isn't connected	Connect the mains.
		Check if the main wiring is connected according to the installation instruction.
		Check if there is any power available at the terminal of the grounding Monitor 88xxx.
	The fuses are broken	Replace the fuses for new ones. Note: the fuses might have been blown due to the high inrush current of the power-supply. Always use same rated fuses.

Table 3 Installation issues

For operational issues please refer to the lightbar pattern description of Table 4.

Lightbar 1	Lightbar 2	Meaning
Off	Low intensity RED	Monitor in sleep mode, no ground detected.
Red blinking	Off	No ground detected.
Red blinking	Green	- Ground bolt detected & ground bolt disabled - Ground loop detected & ground loop disabled - Ground detected, but timeout occurred. - TODO:
Red blinking fast	Red blinking slow & fast	Grounding monitor system error. Check if the dead man switch is closed.
Off	Green	Monitor permissive, but undetected issue with the output relay

Table 4 Operational issues

For all other possible inflictions/damages to the grounding Monitor 88xxx, contact **OPW Fluid Transfer Group Europe BV** and ask for assistance to obtain a safe and right use.

Annex A – Additional Electrical Drawings

Ask OPW for different connection diagrams e.g. dual socket or junction box

Annex B - Recommended Spare Parts

With the purchase of the grounding Monitor the **OPW Fluid Transfer Group Europe BV** recommends some spare parts to be purchased. Although this grounding Monitor 88xxx is designed with solid state lamps and a minimum maintenance spare parts are available. When parts are replaced, it is recommended to replace them with the original parts.

When using the grounding Monitor 88xxx for its intended use and the normal environments these spare parts will be useful at the end of the lifecycle of the given parts, but they have been known to be necessary to resume working swiftly after replacing these parts.

The recommended spare parts are:

Part number	Description	Quantity
H71197	Main Seal	1
H71307	Corrosion Protector VCI-101/ACF-50	1
EL04141	Mains power input Fuse 2 AT	1

The following parts are also available:

Part number	Description	Quantity
EL00203-CRK	Internally used connector kit	1
8800-BRK-14	Fastener kit 14x Door Bolts	1
H71342	Installation manual	1

Annex C – Certificates

- NEN-EN-ISO 9001:2000 Certificate.
- Quality certificate.
- ATEX certificate.
- IECEx certificate
- QPS certificate

Contact OPW fluid transfer if insert is missing in Operation or Installation manual.