

Manual 1.6

# ***OPW Fluid Transfer Group Europe BV***



## ***Retain & Overfill Monitor 3205E***

## Disclaimer

With this document a user manual is presented of the **OPW Retain & Overfill Monitor 3205E** and is designed to use in conjunction with the **OPW /CIVACON** 5-wire and 2-wire overfill sensors and 2-wire retain/bottom sensors, with an interface via 44xx or 41xx socket to a rack monitor

**OPW Fluid Transfer Group Europe BV** guarantees that this product is adequate for the stated use in chapter 0 and is in accordance with the Directive(s) stated in the declaration of conformity in this manual.

**OPW Fluid Transfer Group Europe BV** cannot be held responsible for incorrect use of the 3205E On truck monitor. The ROM 3205E ROM is designed to detect a pending overfill and an empty compartment communicated via the plug socket connection with a Rack mounted monitor.

***In case the 3205E is used in another location than mentioned in the initial quotation or is abused, all guarantees will be declined.***

This user manual is a part of the supplied product and must stored in a known position, when the 3205E ROM is relocated or sold to a third party the manual must be attached at all times. 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**.

© COPYRIGHT 2010. The design, drawings and documentation are the exclusive property of **OPW Fluid Transfer Group Europe BV**. It is submitted on the condition that the designs contained therein are held confidential and is subject to return on demand.

Apart from exceptions provided by the law, nothing from this publication may be duplicated and/or published by means of photography, microfilm, storage in computer files or otherwise, which also applies to full or partial processing, without the written consent of **OPW Fluid Transfer Group Europe BV**.

Although the utmost care has been taken with this publication, errors and omissions cannot be entirely excluded. The **OPW Fluid Transfer Group Europe BV** therefore accepts no liability, not even for direct or indirect damage, occurring due to or in relation with the application of publications issued by **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 Fluid Transfer Group Europe BV

Visiting address:  
Roggestraat 38  
2153 GC Nieuw Vennep  
The Netherlands

Postal address:  
P.O.Box 32  
2150 AA Nieuw Vennep  
The Netherlands

T: +31 (0)252 660 300  
F: +31 (0)252 660 204  
E: [sales@opw-ftg.nl](mailto:sales@opw-ftg.nl)  
W: <http://www.opw-ftg.nl>

Mr. Harry Gilde  
**Managing Director**

## ***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***

See last pages of manual.

## ***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 CIVACON ELECTRONICS TECHNICAL ASSISTANCE LINE:

**In the U.S.A., Call 1-800-5 CIVACON. (800-524-8226)**

For the CUSTOMER SERVICE DEPARTMENT:

**In the U.S.A., Call 1-888-526-5657**

In other countries, call your local agent.

4304 MATTOX RD. \* KANSAS CITY, MO 64150

PH: (816) 741-6600 \* FAX: (816) 741-1061

(888) 526-5657 (888) 634-1433

**The Declaration of Conformity is attached as a separate page.  
Please contact OPW if this separate page is missing**

## Table of Contents

<b>Manual 1.6</b> .....	<b>1</b>
<b>Disclaimer</b> .....	<b>2</b>
<i>Warranty</i> .....	3
<i>Approvals</i> .....	3
<i>Technical assistance in the U.S.A.</i> .....	3
<b>The Declaration of Conformity is attached as a separate page.</b> .....	<b>3</b>
<b>Please contact OPW if this separate page is missing</b> .....	<b>3</b>
<b>Table of Contents</b> .....	<b>4</b>
<b>Specifications ROM</b> .....	<b>6</b>
<i>Specifications external environment</i> .....	6
<i>General Specifications</i> .....	6
<i>Bolts</i> .....	6
<i>Package Dimensions</i> .....	6
<i>General electrical specifications</i> .....	7
<b>Entity parameters</b> .....	<b>7</b>
<b>Input parameters Rack Monitor</b> .....	<b>7</b>
<i>Directive and Standard Compliance</i> .....	8
<b>The Declaration of Conformity is attached as a separate page.</b> .....	<b>8</b>
<b>Please contact OPW if this separate page is missing</b> .....	<b>8</b>
<i>Special conditions for safe use</i> .....	8
<i>3205E Part numbering Guidelines</i> .....	8
<b>Function Key</b> .....	<b>9</b>
<i>Specifications external environment</i> .....	9
<i>General Specifications</i> .....	9
<i>Directive and Standard Compliance</i> .....	9
<b>Initial installation</b> .....	<b>9</b>
<b>Maintenance</b> .....	<b>9</b>
<b>Safe disposal Function Key</b> .....	<b>9</b>
<b>Initial installation</b> .....	<b>10</b>
<i>Safety precautions</i> .....	10
<i>Mounting</i> .....	10

---

<i>Wiring</i> .....	11
<i>Power Wiring</i> .....	12
<i>Socket Wiring</i> .....	12
5-Wire Rack output .....	12
2-Wire Rack output .....	13
<i>Retain (bottom) sensor Wiring</i> .....	14
<i>Overflow sensor Wiring</i> .....	15
<i>Air pressure sensor</i> .....	15
Operational functionality with an activated air sensor .....	15
<i>Multicolour Led indicators</i> .....	16
<i>Explanation of used icons on the Display</i> .....	17
<i>System Programming / setup</i> .....	18
<i>Retain only mode</i> .....	18
<i>Changing pressure indication</i> .....	18
2-wire sensor test .....	20
5-wire sensor test .....	20
<i>Operational use</i> .....	20
<b>Function key</b> .....	<b>21</b>
<b>Trouble shooting</b> .....	<b>21</b>
<b>Maintenance</b> .....	<b>21</b>

## Specifications ROM

### Specifications external environment

Ambient operating Range (T <sub>a</sub> )	: -40°C to +70°C
Storage Temperature (T <sub>s</sub> )	: -20°C to +40°C
Max. Surface Temperature (T <sub>4</sub> )	: ≤135°C
IP Class closed	: IP54 acc. to IEC 60529
Resistant to	: UV Light (within Sun light), Corrosion : Ingress of Gasoline vapours and liquids: Explosive Mixtures : (Diesel) Exhaust fumes, Rain Water, All other weather conditions
External Pressure	: 80 kPa (0.8 bar) to 110 kPa (1.1 bar) (atmospheric pressure)
Air	: Normal oxygen content, typically 21% v/v

### General Specifications

Outline dim. 3205E (W x H x D)	: 230 x 150 x 40 mm (without cable glands)
Material Housing	: Aluminium with <7.5% Mg (acc. to IEC 60079-0 Group II, zone 1) : AL 6061
Max. Capacitance	: 15 pF
Surface Resistance	: < 1GΩ at (23±2)°C and (50±5)% relative humidity
Weight	: 2,1 Kg
View angle display	: >150°
Visibility display	: ~0.5 m
View angle LED's	: 120°
Visibility LED's	: 20 m (no direct sunlight)
Seals	: Silicon VMQ

### Bolts

Yield Stress Limit	: 450 N/mm <sup>2</sup>
Tensile Stress Limit	: 700 N/mm <sup>2</sup>

### Package Dimensions

Package outside dimensions 3205E (L x W x H)	:320 x 230 x 80 mm
Package weight 3205E	:2,2Kg (26 lb)

Keep the ROM 3205E into the initial box and store it into a dry warehouse. Make sure (before installation or storage) to check if the package and the ROM 3205E is free from damages.

Remove yellow carton after installation.

## General electrical specifications

### Power Supply

Nominal input voltage	: 14Vdc ... 45Vdc
Operating input voltage	: 24Vdc
Nominal power consumption	: 1,8 W
Nominal input current at 14Vdc	: 125 mA dc (two 2-W sensors)
24Vdc	: 75 mA dc
Mains current limitation	: Internal fuse: 2AT

### Power Relay driver

Relay voltage	: 45V dc max.
Current limitation	: Internal fuse: 2AT

## Entity parameters

Entity parameter	CN4 pin 1 – 8	CN5 pin 1,2,3,4,5,6,7	CN5 pin 8	CN3 pin 1 – 6
	<b>Retain sensors</b>	<b>Overfill Sensors</b>		<b>CAN &amp; RS485</b> <small>note1</small>
<b>U<sub>o</sub></b>	12.6V	12.6V		12.6V
<b>I<sub>o</sub></b>	20mA	21mA	93mA	176mA
<b>I<sub>o</sub>max return</b>	155mA	270mA		
<b>P<sub>o</sub></b>	61mW	65mW	273mW	550mW
<b>C<sub>o</sub></b>	10 µF	10 µF		10 µF
<b>L<sub>o</sub></b>	80µH	80µH		80µH

## Input parameters Rack Monitor

Entity parameter	CN2 pin 1 – 4 5-W Rack monitor	CN3 pin 1 – 3 2-W Rack monitor <small>Note1</small>
<b>U<sub>i</sub></b>	20V	18V
<b>I<sub>i</sub></b>	250mA	250mA
<b>P<sub>i</sub></b>	0.75W	0.7W
<b>C<sub>i</sub></b>	5.7 µF	Negligible small
<b>L<sub>i</sub></b>	Negligible small	Negligible small

**Note1.** CN3 can have different entity parameters depending on option board.  
Consult part number (**Figure 1**) for details

## Directive and Standard Compliance

To use the 3205E in a hazardous environment the following directives are applicable.

### Directive Compliance:

ATEX : II 2(1) G Ex d e ia [ia] IIA T4 Gb

The 3205E is designed and tested according to the following standards.

### Use of Standards:

EN 60079-0:2012 +A11	11/2013	Electrical apparatus for explosive gas atmospheres – Part 0: General requirement
EN 60079-1	10/2014	Equipment protected by flameproof enclosures “d”
EN 60079-7	02/2007	Equipment protection by increased safety “e”
EN 60079-11	01/2012	Electrical apparatus for explosive gas atmospheres Intrinsic safety “I”
EN 60079-26	04/2007	Equipment mounted across boundary with different protection levels
EN 60529	02/2000	Degrees of protection provided by enclosures (IP Code)
EN 60068-2-14	08/2009	Environmental testing
EN 61000-6-2	10/2005	Generic standards – Immunity standard for industrial environments
EN 61000-6-4	02/2007	Generic standards – Emission standard for industrial environments
EN 13922	09/2011	Tanks for transport of dangerous goods- Service equipment for tanks- Overfill prevention systems for liquid fuels
EN 60068-2-6	03/2008	Sine vibration test
ASTM-D 4169-09		Shock and vibration tests

The Declaration of Conformity is attached as a separate page.  
Please contact OPW if this separate page is missing

## Special conditions for safe use

Only cable glands as well as blanking elements intended to close unused openings with existing, separate EC-type examination certificate are applicable. These components must fulfill at least requirements of the standards EN 60079-0:2012 and EN 60079-7:2007. The blanking elements must be so designed that they can be fitted or removed only by the use of an additional tool.

## 3205E Part numbering Guidelines.

3205E is a versatile system that can be equipped with an option interface.

This option board can have different interfaces to fore fill various applications.

See the build-up of a 3205E part number is shown in **Figure 1**. By default the 3205E is set to Right hand drive (numbering compartments from right to left see also **Figure 2**) with a 2-Wire Rack Interface and Metric cable Glands. Separate documents are available for other option boards. Ask OPW for availability

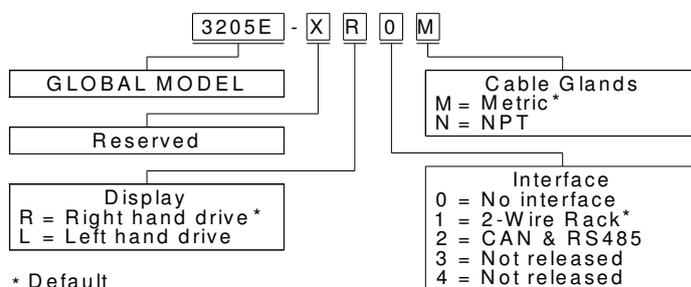


Figure 1

## Function Key

### Specifications external environment

Ambient operating temp. (T <sub>a</sub> )	: -45°C to +40°C
Storage Temperature (T <sub>s</sub> )	: -20°C to +40°C
Max. Surface Temperature (T <sub>4</sub> )	: ≤135°C
IP Class closed	: IP54 acc. to IEC 60529
Resistant to	: UV Light (within Sun light), Corrosion, Ingress of Gasoline vapours and liquids, (Diesel) Exhaust fumes, Rain Water, All other weather condition, Explosive Mixtures
External Pressure	: 80 kPa (0.8 bar) to 110 kPa (1.1 bar) (atmospheric pressure)
Air	: Normal oxygen content, typically 21% v/v

### General Specifications

Outline dim. Function Key	: max. Width = 20 mm X max. Length = 65 mm X max. Height = 15 mm
Material Housing	: Poly carbonate
Max. Capacitance	: 15 pF
Surface Resistance	: < 1GΩ at (23±2)°C and (50±5)% relative humidity
Weight	: 13 gr. (0.45 ounces)
Expected Lifetime battery	: 4 years stand-by

### Directive and Standard Compliance

To use the Function Key in a hazardous environment the following directives are applicable.

#### **Directive Compliance:**

ATEX : II 2 G Ex ia IIC T4

The Function Key is designed according to the following standards.

#### **Use of Standards:**

IEC 60079-0	<i>Electrical apparatus for explosive gas atmospheres – Part 0: General requirements</i>
IEC 60079-11	<i>Electrical apparatus for explosive gas atmospheres Intrinsic safety 'I'</i>
IEC 60529	<i>Degrees of protection provided by enclosures (IP Code)</i>

### Initial installation

No special measures have to be taken to install the Function Key Rack Monitor 8800E/8801E. This Product is ready for use when taken from the box.

### Maintenance

**Caution:**

- To avoid static charge, clean the Function Key only with a damp cloth,
- Make sure never to drop the Function Key onto the floor, because of risk of damaging

### Safe disposal Function Key

This device is marked according the European directive (2002/96/EC) on Waste Electrical and Electronic Equipment WEEE.

***(Disposing of spent batteries/accumulators in the household waste is prohibited!)***



## Initial installation

**Attention:** Installation must be performed by authorized and trained personnel only.

## Safety precautions

**Warning:** Read & Understand this instruction before starting installation.

- Equipment to be used for its designated purpose only.
- Local regulations for installation have to be followed at any time.
- Product flow may result in static electricity, earthing of the equipment is required.
- OPW instructions must be followed for installation of any OPW Product at any time.
- Before installation drain all compartments and degas
- **Make sure to use adequate personal protection at all time during the operation,**
- **Use lower rated fuses for power and output to avoid blowing internal fuses.**  
**Internal fuses cannot be replaced by customer.**

## Mounting

The ROM 3205E should be securely bolted by means of four (4) M6 hexagon slotted bolts and lock washers on bare surface to a grounded metal portion of the trailer that will provide an excellent physical support to the monitor. The supplied drilling pattern at the end of this document can be used to facilitate alignment and drilling. Ensure mounting surface is clean and free of paint. In addition an extra earth wire can be connected between the chassis and the ROM ground stud (bottom right). It is recommended to place the unit visible and easy accessible for wiring and operation. The ROM 3205 must be located outside Zone "0".

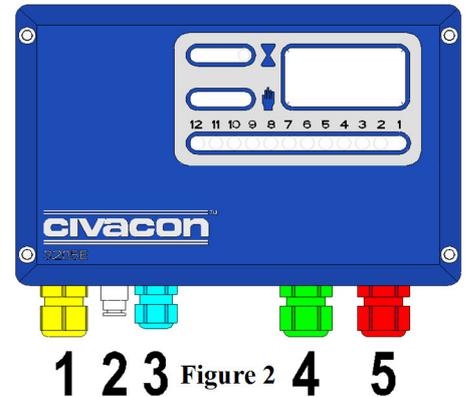
Mounting dimensions are given in millimetres (with inches in parenthesis).

To protect the electronics inside the housing, keep the monitor's cover on the housing until you are ready to wire the monitor. Do not weld when power is applied to the 3205E

## Wiring

The housing provides four (4) M20 x 1.5 mm and one (1) M16 x 1.5 mm threaded holes all located at the bottom of the box. These holes are providing access to the various electrical terminals on the monitor via cable glands or conduit. The cable glands are numbered as shown in Figure 2.

Number 1 must be used for power from the main Truck battery. OPW recommends the use of screened cable with matching cable gland or conduit. (number 2 is used for pressure sensing) The third (3) is an M16x1,5 threaded entry. Via a cable gland or conduit the 5-wire Rack interface can be connected to the socket, see **Figure 4** for details. Entry (4) is designed to feed true the cable for the retain (bottom) sensors. See **Figure 7**. The last and most right located cable entry (5) can be used for the overfill sensors.



A detailed drawing DS00442 is available. ( poster format )

The 3205E can be used with 2 or 5 –Wire overfill sensors. Make sure the correct cable gland is used for the diameter of the cable when cable glands are used. If conduit is used make sure there is a draining hole at the lowest point of the conduit. All wiring entering the housing must enter through the appropriate conduit openings shown in **Figure 2** above. Use weather-tight cable strain reliefs or liquid-tight (IP 65 minimum) conduit fittings to keep out external moisture. The use of weather-tight cable strain reliefs with the sensor and socket housings as well is also imperative for a moisture resistant system. We require the use of a high quality stranded and **tinned** copper wire with a minimum thickness of 1.0 mm<sup>2</sup> (20 gauge AWG) for all electrical connections to the monitor. Trim about 6 mm (¼") of the insulation off the end of each wire that will be connected to the terminal blocks of the monitor. Insert the trimmed wire into its appropriate slot on the terminal block and tighten the screw on top of that slot securely. Ensure that **NO** stray strands of wire have separated from the connection that could cause a potential short with an adjacent terminal.

***It is recommended if possible to use wire ferrules or wire pin connectors on each of the stripped wire ends before inserting the wires into the terminals. These will provide superior connections and prevent the possibility of stray strands of wire causing potential shorts between terminals.***

Due to the vibrations that can occur on a trailer, it is extremely important to double-check all wiring connections for good mechanical integrity. The proper colour code of the wires will save time and money on the installation and on any technical help or troubleshooting which may be required in the future. CIVACON Model 2300 cable is a seven (7) conductor colour coded cable which is highly recommended for use with the installation of CIVACON ROM 3205E™ overfill prevention equipment. This cable is usable for up to a 6-compartment installation. For installations 7 & 8 compartment installations, we recommend CIVACON Model 7215 cable. CIVACON also makes a Model 2100 cable that is a five (5) conductor colour coded cable which may be used for 5-Wire overfill sensor installations, and for installation of the loading rack socket(s). For European EN 13922 compliant wiring installations for 5-Wire top overfill sensor installations, Civacon Model 2100E (5) conductor colour coded cable is available that meets the colour codes of this standard.

**Any holes that are not used should be properly sealed with blind plugs.  
Cut unused wires and remove all remaining stranded wires.  
Do not push wires under printed circuit board.**

**Use 500mA inline fuses to connect 3205E power and external solenoid and or relay**

## Power Wiring

***SAFETY FIRST!! POWER MUST BE OFF WHEN INSTALLING OR REMOVING POWER LEADS TO THE MONITOR. THE WIRES FOR THE POWER FROM THE BATTERY MUST BE KEPT SEPARATE FROM THE SENSOR AND SOCKET WIRING! THEY CANNOT BE RUN TOGETHER IN THE SAME CONDUIT!***  
This is important to maintain safe current levels in the intrinsically safe sensors, auxiliary switches, and socket wiring.

Do not apply power to the monitor without reading this manual and thoroughly checking all connections. Measure the truck / trailer system voltage. The monitor is designed to operate from on truck systems with nominal power of 24 Volts DC (13 VDC min. to 45 VDC max.), negative ground systems, supplied by a battery (or batteries). If your voltage is not within this range, contact CIVACON before installing the monitor. If the power wires pass through a Zone 1 hazardous area, the conduit and wire type must be suitable for this use. The monitor's power supply circuit should contain a switch and an inline fuse with a maximum current rating of **1 Amp**. This fuse should be located in the trailer's nose box or in the truck cab, and an inline switch located in the truck cab so that the overfill system can be turned off when the truck is out of service. This may also be accomplished with an appropriate cabinet door, guard bar or other safety / power interlock switch on the trailer or truck. It is recommended that the power to the monitor be switched off when not in use (i.e.- When servicing the electrical system or when driving the vehicle). The wires from the power source must enter the ROM 3205E housing via the proper conduit opening, which is the left hand opening (1). (refer to Figure 2).

Wire the power into the power input terminal block as shown in **Figure 3**. Be careful to observe the correct polarity. The left most terminal is the negative (-) terminal, and the one just beside it is the positive (+) terminal. Applying the power with the incorrect polarity will not damage the monitor,

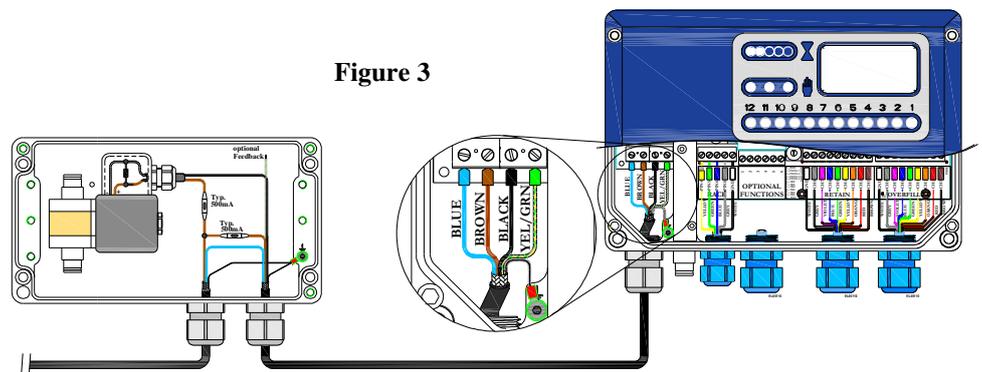


Figure 3

but since the negative (-) terminal is directly connected with the chassis it will blow the external inline fuse. One (1) terminal (black in Figure 3) in this NON-Intrinsically safe compartment is used to energize a solenoid. Solenoid and junction box must be mounted in appropriate location. The last terminal is designated for detecting feedback of the solenoid. Solenoid must be protected by means of an inline fuse ( max. 1Amp ).

## Socket Wiring

### 5-Wire Rack output

The 3205E is standard equipped with a 5-Wire interface to the Rack monitor. The 3205E interface is a transparent interface between the overfill sensors and the rack monitor. It will communicate the pending overfilled compartment to the Rack via the diagnostic output (pin 5) on the socket.

A detailed drawing DS00442 is available..

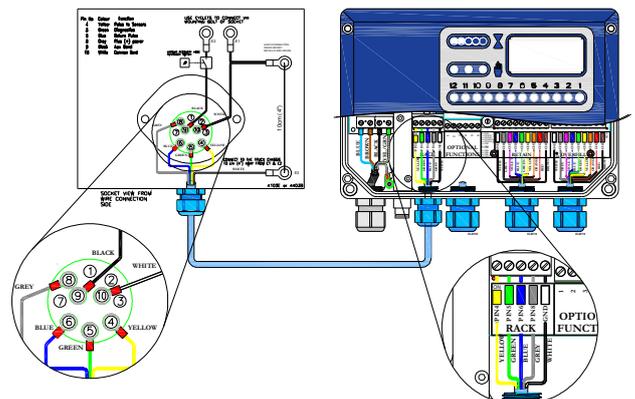


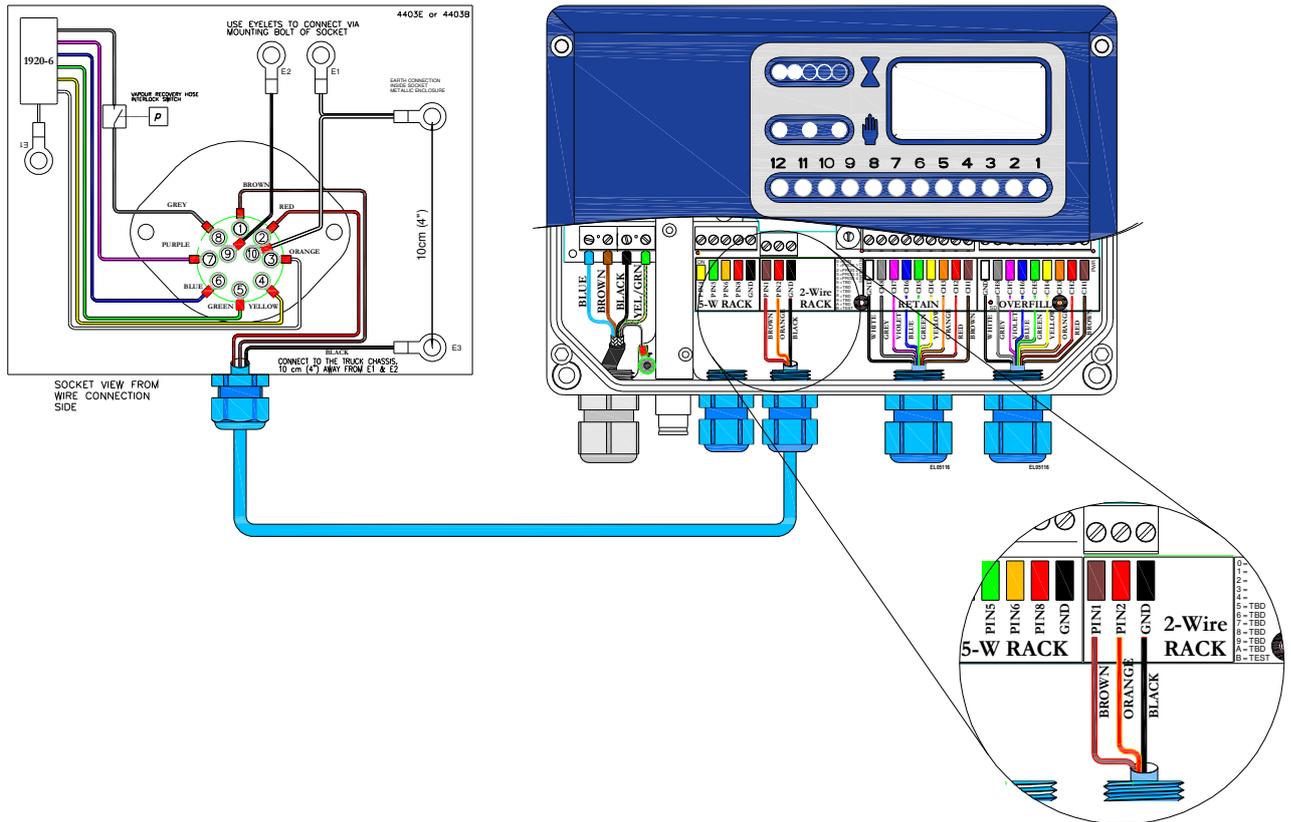
Figure 4

## 2-Wire Rack output

The 3205E can be equipped with an 2-Wire rack interface. ( see Figure 1)

The brown red and black terminals must be connected to the socket for 2-wire interface to The rack monitor.  
 Keep in mind only two wires are connected to the rack monitor and they both switch to non permissive in case of an pending overfill or wet retain sensors (product in compartment) before loading commences.  
 The correct wet overfill sensor will be indicated on the displays.

Below **Figure 5** a typical connection of a 3205E to a 10 pin socket. For 8 channel rack monitors.



**Figure 5**

These connections are based on the European standard where pin 1 is compartment 1. and the amount of compartments is **always 8**. A dummy must be used for trucks with less than 8 compartments.

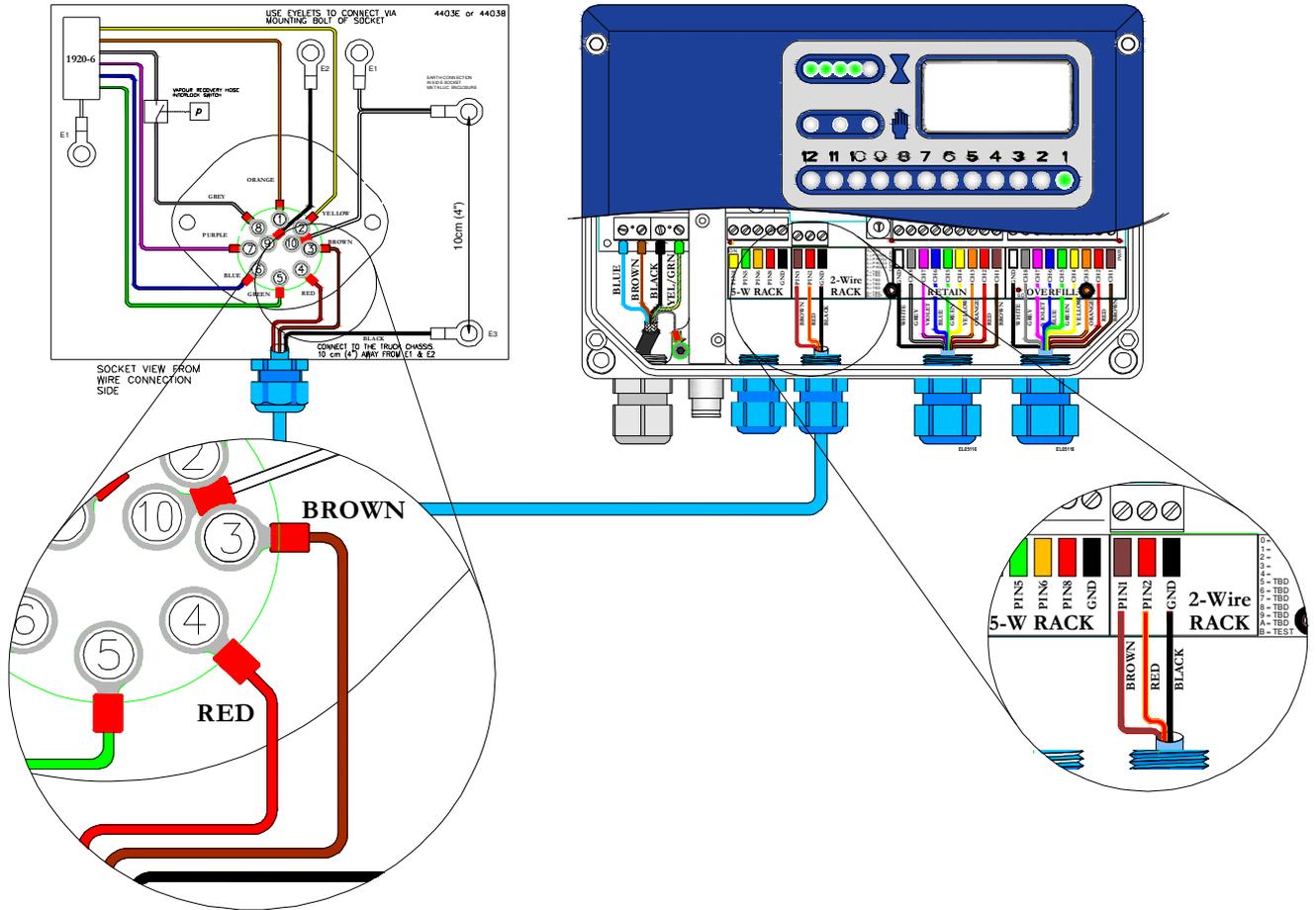
If the 3205E is equipped with a 2 channel 2-wire interface then pin 3 to pin 8 has to be connected to a dummy.

In some countries the maximum compartments is 6. In this case the first compartment is connected to pin 3

In this case the 2 channel 2-wire interface **must** be connected to pin 3 and 4 and a dummy for the remaining 4 channels on pin 5 to 8

If it is unclear how the rack monitor(s) is(are) configured the 2 channel 2-wire interface **must** be connected according the Figure 6 below.

Connect the two wires from the 2 channel 2-wire interface to pin 3 and 4 and the dummy to pin 1,2 and 5 to 8.



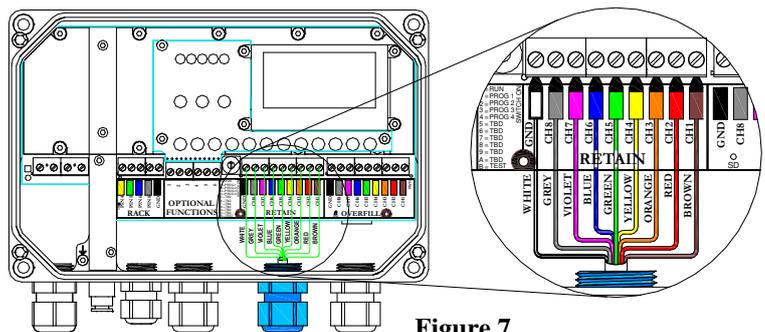
**Figure 6**

Ask OPW for other possible option boards.

### Retain (bottom) sensor Wiring

Sensors mounted at the lowest point in a compartment are needed if retain product detection is required. Retain sensor installation is not an easy task since sensors are barely accessible. Because of repairing or trouble shooting, make sure all wires are neatly tied and have sufficient length. Be aware of rotating parts and avoid the cable to sag beneath the bottom of the trailer as it may catch on something. It is recommended to use the CIVACON premium cable (model 2300 or 7215) because colour coding will help wiring and troubleshooting in later steps. Enter the housing on location number four (4) via matching cable gland shown in **Figure 2**

Information how to mechanical install the retain sensor can be found in the sensor-box. Detailed wiring information can be found in **Figure 7**. The common (white) wire needs to be connected to the first terminal (left) from the retain terminal. The sensors are connected according the colour code mentioned in the NEN-EN13922. The retain sensor located nearest to the front of the truck is compartment one (1). The brown wire should be connected to the corresponding terminal. The common white wire of the sensors to the common white marked terminal.

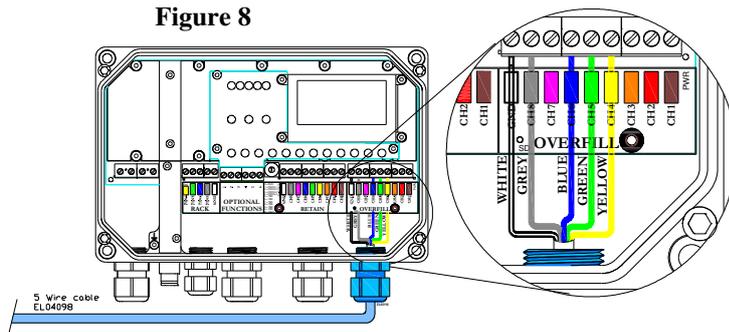


**Figure 7**

Contact OPW Europe if more than 8 compartments are needed.

## Overfill sensor Wiring

The 3205E can be configured for use with eight (8) 2-wire sensors or up to twelve (12) 5-wire sensors. 2-wire overfill sensors are connected in the same way as the retain sensors. Mount and adjust the overfill sensors as described in the datasheet include with the overfill sensor. 5-wire sensors are connected in series and therefore use fewer wires to communicate with the 3205E. On the other hand only the lowest wet sensor can be shown on the display. E.g. if overfill sensor in compartment 3 and 7 are wet only 3 will be indicated.



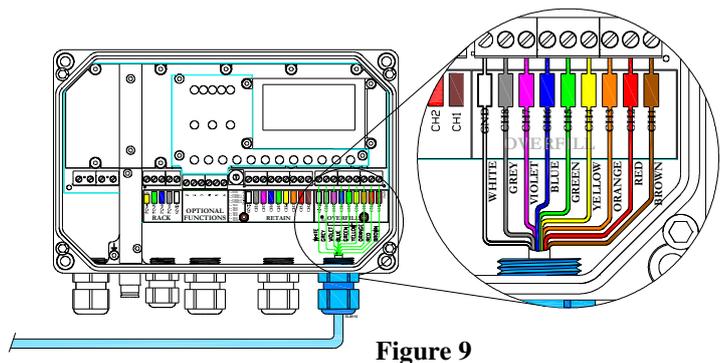
Any wet sensor will be indicated if 2-wire sensors are used. Connect the sensors according and documentation included with the sensor.

The yellow wire from the 3205E fourth (4) terminal from the right is connected to the yellow wire from the sensor located in the compartment close to the cabin.

See **Figure 8** for detailed connection of the 5-Wire cable to the overfill terminals. Terminal 1, 2, 3 and 7 are not connected.

The same terminal (right) strip is used for 2-wire sensors. The common wire (white) has to be connected to pin 9 (counting right to left) as shown in **Figure 9**. The remaining terminals can be left open if less than 8 compartment sensors needs to be installed

No dummies are needed if less than 8 compartment sensors are placed. During setup the right amount of compartments will be corrected. See programming for details.



## Air pressure sensor.

The 3205E ROM monitor can be equipped with an air sensor. This sensor will switch all outputs to non-permissive when the truck air system pressure is too low. By means of an air switch it can also be used to prevent loading when e.g. the guard bar is in front of the API's or the cabinet is closed

If the 3205E is provided with an push-in air pressure fitting then it is located at position 2 in Figure 2.

See setup to activate the air pressure:

## Operational functionality with an activated air sensor.

If the pressure sensor is activated during setup an P icon will be shown on the display.

All outputs will switch to non-permissive if the air pressure is lower than 3,5 Bar. All red compartment indicators will flash and a the P icon will be replaced with R icon.

The actual air pressure will be shown at the bottom line of the display in mbar.

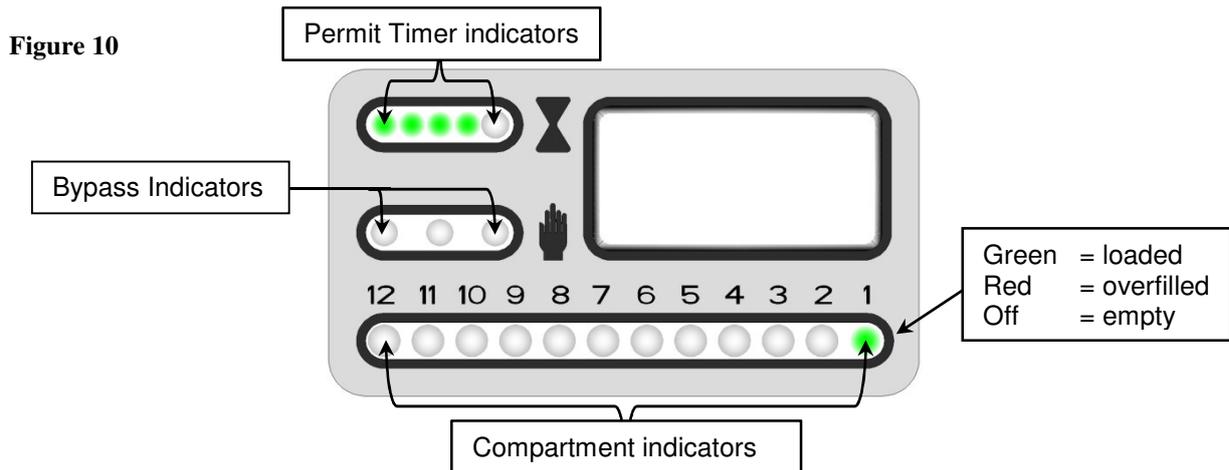
The pressure sensor can also be used to dim the displays.

The displays will go into sleep mode if the air pressure is equal to the ambient pressure e.g. by closing the guard-bar or cabinet and it will wake up as soon as the air pressure is restored.

Although the displays are dimmed the 3205E will continue monitoring all sensors.

## Multicolour Led indicators

On the top left side are 5 green indicators “Permit Timer indicators”. All 5 indicators will lit up when all Retain sensors are dry (*all compartments empty*). As soon as one Retain sensor becomes wet an internal 40 ( or 60 setup “2”) minutes timer will be started. Every 8 (12) minutes one indicator will be turned off. When all green indicators are off the 3205E will turn the rack output and solenoid output off. Below the 5 permit timer indicators are two yellow bypass indicators which will be explained later in chapter **Function key**

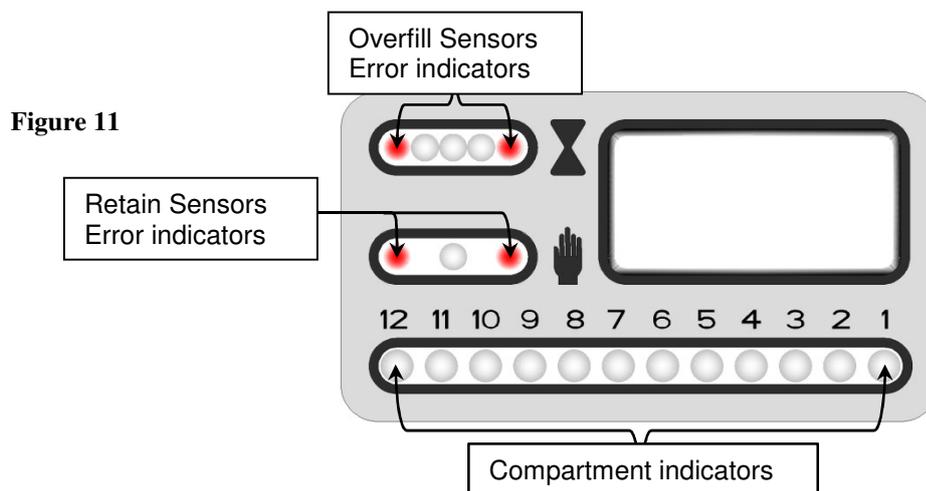


The bottom row indicators can have multiple colours, all with their own functionality. When a compartment is empty the corresponding indicator will be off.

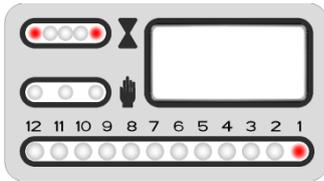
When the retain sensor is wet (product inside the compartment) the indicator will be lit up in green.

The colour of the indicator will change from green to red if during loading the overfill sensor becomes wet. (Simultaneous the output to the rack and to the solenoid will switch to non-permit).

All other colour schemes will be explained later in this document. (Or appendix)

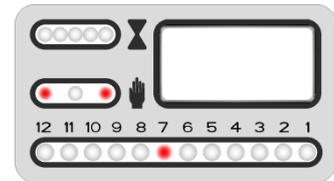


The timer and bypass indicators can also lit up in red to visualize an error. The two red indicators at the top are designated for overfill errors and the middle two red indicators for retain sensors. At the same time a red flashing indicator will be shown at the bottom row to indicate the compartment.



The picture on the left shows an example of a fault with the overflow sensor located in the first compartment.

The picture on the right shows a fault with the retain sensor located in compartment seven (7). The red indicators will flash simultaneously.



Other error light patterns will be explained in detail with the designated functionality.

## Explanation of used icons on the Display

For detailed information a display is added. OPW have chosen to use an organic display to make sure the display is visible when dark, consumes low power and is usable in cold environments. Icons are used to avoid a language's confusion. A list of the used icon is shown in Table 1. In the left /bottom corner a four digit numerically code appears when an error is detected. Since there are more than 1000 possible messages it's impossible to use icons or text on a small display to present clear and unequivocal information. Due to the complexity and amount of possible faults contact OPW or your distributor for assistance when an error number appears.

**Table 1**

	Description	Example e.g.
?	Unknown	3205E is not programmed
	Battery	X Truck battery low
✓	Accepted or valid	
✗	Rejected or not valid	
	Retain sensor	
x	x-wire Retain sensor	2  >> 2-wire Retain sensor
	Overflow sensor	
x	x-wire Overflow sensor	5  >> 5-wire Overflow sensor
	Maintenance	
	Broken or loose wire	
	Shorted sensor wire to ground	
	Shorted sensor wire to wire	
	Unknown Retain Sensor	
	Unknown overflow Sensor	
	antenna	X No GPS satellite's detected
	network	
	Extended timer	Timer extended from 40 min to 60 min.
	Rack monitor connected	
	Air pressure sensor activated	
	Low air pressure	Airs pressure below 3500mB

## System Programming / setup

The 3205E must be configured before it can be functionally used. The 3205E is versatile and need to be setup to for fill different tasks. A rotary switch has to be set to enter the initial setup of the 3205E.

This rotary switch is located at the left side of the retain sensor terminal strip. Although this switch has 16 positions only a few are currently used.

Position "0" : Normal operation position.

Position "1" : Auto detection and verifying of the connected sensors.

Position "2" : Auto detection and verifying of the connected sensors with extend retain timer.

Position "3" : Auto detection and verifying of the connected old\* sensors.

Position "4" : Auto detection and verifying of the connected old\* sensors with extend retain timer.

Position "5" : same as Pos "1" but Display and LEDS are left hand drive orientated  
(standard timer and new diagnostic table) V02.08

Position "6" : Currently no function

Position "7" : Currently no function

Position "8" : Toggle pressure unit setting between mB and Psi or Psi mB (factory setting is in mB)

\* to be compatible with old 5W diagnostic OPW sensors.

### Please follow the following steps to start the initial setup.

Step 1 Disconnect power (if not already done).

Step 2 Make sure all compartments are empty/dry

Step 3 Connect all used sensors as described above.

Step 4 If present, apply air pressure above 3,5 bar.

Step 5 Rotate switch into position "1". (or "2" for extended 60 minutes Permit Timer)

Step 6 Apply voltage between 14 and 32 Volt.

### Initial setup for left orientated display.

Step 1 Disconnect power (if not already done).

Step 2 Make sure all compartments are empty/dry

Step 3 Connect all used sensors as described above.

Step 4 If present, apply air pressure above 3,5 bar.

Step 5 Rotate switch into position "5".

Step 6 Apply voltage between 14 and 32 Volt.

Be sure after programming the switch is set to the "0" position. If not set to "0" the 3205E will stay in the auto detection mode.

## Retain only mode

Retain sensor only Mode has been implemented since version V02.08

No overflow sensors is/are connected in Retain sensor Mode and only the Auxiliary relay is used.

There is no need for extra handling for retain only configuration.

The 3205E is configuring the Retain sensor only mode during setup and disables the rack interface(s).

There should be least 1 retain sensor connected.

After setup the Retain Icon  is shown at the top of the screen to inform the operator that only retain product is monitored.

## Changing pressure indication.

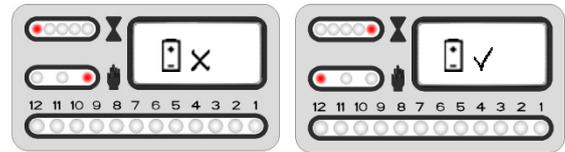
The standard setting of the pressure indication is in mBar,

This can be changed to Psi if needed without affecting initial setup

1. Power off the 3205E.
2. Rotating switch to position "8"
3. Power on.
4. Power off.
5. Rotating switch back to position "0"
6. Power on.

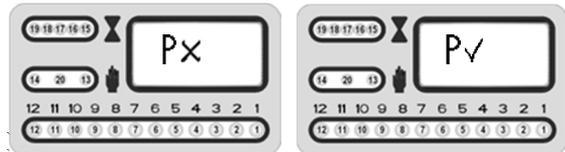
The 3205E will perform the following tests and will show the corresponding light pattern and display

1. An input voltage check :
2. Programming will continue when the input voltage is above the 14 volt dc. If the voltage is too low the programming setup will be stopped and two cross flashing indicators and a battery icon will be shown. (See Figure 12)



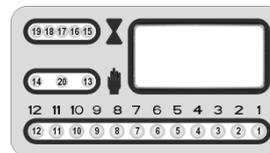
**Figure 12**

3. Air pressure activation:  
 If during setup the air pressure is below the 3,5 Bar. a low pressure icon is shown.  
 If the air pressure is above the 3,5 Bar. the Icon Air pressure good will be displayed. The Air sensor is de-activated if the applied air is equal to the air ambient pressure (See Figure 13)



**Figure 13**

4. Led indicator test:  
 All used indicators will light up in the following sequence:  
 Red 1→15 & 19.  
 blue 1→12 & 20  
 Green 1→19  
 (see Figure 15 for indicator numbers)



**Figure 15**

5. Sensor tests:  
 The 3205E will tests all sensors extensively. If any of the electrical parameters is out tolerance the 3205E will display accordingly. The setup will not continue and the display will show ↓? Unknown retain sensor or ↑? Unknown overflow sensor and indicate the compartment with unknown sensor.

If all tests are successfully ended the indicators will show the sensor configuration by means of flashing lights.

- If only overflow sensors where connected green indicator 15 and 19 and compartment indicators will flash.
- If only retain sensors where connected green indicator 13 and 14 and compartment indicators will flash.
- If retain and overflow sensors where connected indicator 13 & 14 and 15 & 19 and compartment indicators will flash.

At this point there are two possibilities to continue.

- a) A wet test of the overflow sensors.
  - b) Operational mode.
- a) Wet sensor and sequencing test:  
 The compartment indicators will flash at the end of a successfully ended setup. The overflow sensors should be wetted to verify if the connected sensors are located in the correct compartment. This is a simple exercise for overflow sensors but to test the retain sensors a different test will be implemented in the future. There are two different types of sensors with different interfaces.  
 The 2-wire sensors are connected individual to the Rom interface. The 5-wire sensors are connected in series to the Rom interface.  
 Wet test and sequence are different for both types of sensors.

## 2-wire sensor test.

On the display a line of compartment numbers will appear.

The amount of detected sensors are shown as flashing green indicators.

To wet test and check the correct location of the 2-wire sensor the first sensor closet to the cabin must be wetted.

The corresponding flashing green indicator will change to a solid green indicator.

On the display the number of the detected sensor will be shown. Continue the test by wetting the sensor in compartment 2 etc.

If everything is connected correctly the two line with numbers should be the same.

If two sensors are connected incorrect, the numbers will differ and should be corrected by reconnecting and start the setup again.

An example of good connected sensors on a 7 compartment tank truck.

8	7	6	5	4	3	2	1
	7	6	5	4	3	2	1

If two sensors are connected to the wrong terminals it could look like

8	7	6	5	4	3	2	1
	7	5	6	4	3	2	1

In the example above sensor mounted in compartment 5 is connected to the terminal belonging to sensor 6 and vice versa. In this case the fault should be corrected and the setup redone.

## 5-wire sensor test.

The above test is not possible with 5-wire sensors. Another test is done to verify the correct operation of the sensors.

Start the test by wetting the first compartment and continue with the sensor located in compartment 2 etc. The Rom will read the different diagnostic value ( green wire ). Every compartment has his own diagnostic value and should be within the internally stored windows.

If the measured value is outside the predefined windows the display will show

5 ↑ 4 X which means faulty 5-wire overfill sensor in compartment 4.

- b) Turn the rotary switch anticlockwise to “0” and switch power off and on. The 3205E will return in operational mode and ready to use.

## Operational use

There are multiple ways to use the 3205E ROM, **R**etain and **O**verfill **M**onitor.

Most common use is a combination of one (1) overfill and one (1) retain sensors per compartment.

All compartments **MUST** be empty before loading commences. Connect the rack plug to the socket and the 3205E will switch the rack to permissive. As soon as one retain sensor becomes wet an internal timer is started. When the timer reaches 40 minutes (or 60) the 3205E will emulate a wet sensor to the rack. The rack monitor interface will stop the loading process.

At the same time the solenoid output will be de-energized.

In all cases the overfill sensors will switch both outputs to **NON** permit as soon as they become wet.

When a compartment contains product the compartment indicator will lit up in green. If an overfill sensor is wet the compartment indicator will change from green to red.

## Function key

The 3205E is shipped with a green function key. This key can be used to reset the timer to zero when a (minimum of one) compartment contains product to enable loading. The function key fits in the middle slot shown in Figure 16.

The design of the Function Key has been made to fit into your pocket or key ring.



on a

**Figure 16**

## Trouble shooting.

The 3205E is designed to assist in fault finding to reduce down time.

E.g. a broken or loose wire at (TOP sensors) terminal 6 will be indicated on the display as  $\bar{f}$ :6.

The number 6 indicates the sixth (blue marked) wire right located **terminal** and NOT the **compartment** number.

(See Table 1 for addition error related icons)

Also an error code is displayed at the low right corner on the display. In the above mentioned broken or loose wire the displayed error code would be 5904.

Please write down this error code when assistance from a OPW technician is required.

e.g. A broken wire can be appear as an incidental problem therefore the display will freeze the above information.

The display is cleared if the 3205E is powered off and on and the problem is solved. If not it will appear again. Another way of clearing the messages on the display is by placing a finger on the blue flashing indicator.

## Maintenance

There are no serviceable parts but make sure to use clean dry oil-free air when pressure sensors is used.

**For additional features please contact OPW Fluid Transfer Group Europe bv.**