



GATEWAY v10

**LEVEL SURVEILLANCE SYSTEM
INSTALLATION INSTRUCTIONS**

Manufacturer:
Optolevel Oy
Puomikatu 3
37150 Nokia, Finland

DECLARATION OF CONFORMITY

We hereby confirm that the electrical apparatus manufactured by us, meets the demands of following directives, in the way that has been defined in this document, EMC-directive 2004/108/EC and ATEX-directive 94/9/EC.

MANUFACTURER	Optolevel Oy
CONTACT INFORMATION	Puomikatu 3, 37150 Nokia, Finland, Tel. +358 400331000, info@optolevel.fi
DESCRIPTION OF THE DEVICE	Surveillance- and control-unit for tank truck loading systems.
PRODUCT NAME, MODEL	Optolevel® GateWay v10
SERIAL NUMBER	Serial number indicates manufacturing order. It can be found inside the device written on the heatsink. Each product has its manufacturing date and patch number stored in our database.

STRUCTURE OF THE APPARATUS OBSERVES FOLLOWING UNIFORMED SAFETY STANDARDS:

EN 60079-10	Electrical Apparatus for Explosive Gas Atmospheres Part 10: Classification of Hazardous Areas. Environment class: II, Device class: 2.
EN/IEC 60079-0:2004	Electrical apparatus for potentially explosive atmospheres. General requirements.
EN/IEC 60079-7:2004	Electrical apparatus for potentially explosive atmospheres. Increased safety "e"
EN/IEC 60079-11:2004	Electrical apparatus for potentially explosive atmospheres. Intrinsic safety "i".
EN/IEC 60079-18:2004	Electrical apparatus for potentially explosive atmospheres. Encapsulation 'm'.
EN 13922:1995	Tanks for transport of dangerous goods. Service equipment for tanks. Overfill prevention systems for liquid fuels.

EMC

EMISSION:

EN/IEC 61000-6-3:1996	General emission standard. Part 1: Residential, commercial and light industrial environments. Class B.
EN/IEC 61000-6-4:1997	General emission standard. Part 2: Industrial environments. Class B.

IMMUNITY:

EN/IEC 61000-6-1:1997	General emission standard. Part 1: Residential, commercial and light industrial environments. Class A.
EN/IEC 61000-6-2:1999	General emission standard. Part 2: Industrial environments. Class A.
ISO 7637-1&-2:2004	Road vehicles -- Electrical disturbances from conduction and coupling.

Quality of our products is guaranteed by our production line, which has certification of the following standards ISO 9001:2000, EN 13980 and ATEX 94/9/EC by DNV Certification OY/AB. Device has been CE-marked on year 2008.



II 2(1)G
Ex emb [ia] IIB T3 Gb
VTT 08 ATEX 035X

At Hämeenkyrö 18th April 2008.

Optolevel Oy.

Table of Contents

Table of Contents	3
Table of figures and drawings.....	4
1. Product description.....	5
1.1. Operational description of GateWay v10 Level Surveillance System.....	6
1.2. The Optic sensors	6
1.3. Overfill protection	6
1.4. Product mixing prevention.....	7
2. Mounting of the GateWay v10	8
2.1. General information.....	8
2.2. Mounting information.....	8
2.3. Mounting instructions	9
2.4. Use, maintenance	9
3. Sensor mounting	10
3.1. Mounting information.....	10
3.2. Mounting instructions for top sensor.....	10
3.3. Mounting instruction for bottom sensor	11
4. Electrical installation of the GateWay v10 Level Surveillance System	12
4.1. General information and the inlets.....	12
4.2. Wiring instructions – Power.....	13
4.3. Wiring instructions – Sensors.....	14
4.4. Wiring instructions – Optic loading rack output.....	16
4.5. Wiring instructions – Thermal loading rack output.....	17
4.6. Wiring instructions – Magnetic valves	18
4.7. Wiring instructions – I-Current.....	19
4.8. Wiring instructions – Interlock, Loading, Acknowledge	20
4.9. Wiring instructions – CAN-bus	21
4.10. Wiring instructions - Unloading OFP	22
4.11. Serial port – instructions.....	23
5. Additions Notes	24
5.1 Warranty	24
6. Troubleshooting and maintenance.....	25
6.1 Maintenance test.....	25
6.2 Troubleshooting	25

Table of figures and drawings

Figure 1. Optolevel® optic sensors Ex-marking	6
Figure 2. Optolevel® Level Surveillance System on tank truck.....	8
Figure 3. Assembly instructions for cable connection *	10
Figure 4. Ex-safe Inlet example *	13
Figure 5. Electrical wiring of the Power *	14
Figure 6. Electrical wiring of the sensors *	15
Figure 7. Electrical wiring of the Optic socket *	16
Figure 8. Electrical wiring of the Thermistor socket *	17
Figure 9. Electrical wiring of the Magnetic valve *.....	18
Figure 11. Electrical wiring of the i-Current *	20
Figure 12. Installation of interlock, acknowledge and loading. *	21

1. Product description

This manual describes the operation, installation and troubleshooting of the GateWay v10 Level surveillance system. Its intended use is to help operators and maintenance men to understand the operation and potential of this system.

Optolevel® GateWay is a tank truck and trailer mounted onboard Level Monitoring System with sensors mounted in the top and on the bottom of each tank compartment. GateWay v10 can be connected to the loading rack control. It monitors the digital data flow from the sensor and detects and informs the status of each sensor. GateWay v10 can be configured to act with desirable way on different scenarios. This document only goes through the most basic functions where GateWay v10 is used for. GateWay v10 can be connected to all used sockets for loading and unloading procedures. It will help make these processes safer, faster and more reliable.

GateWay v10 can be used to create these features:

- Overfill monitor and prevention
- Product mixing monitor and prevention
- Unloading overfill prevention up to three compartments.

And

- For advanced users, GateWay v10 is a tool which can be molded to fit several other customer specified applications.

GateWay v10 has connections for 24 two-wire sensor sockets, which is enough for truck with 8 tank compartments. Each tank can be equipped with 3 sensors. (Note that GateWay v10 can also be made to work with switches)

GateWay v10 controller is able to drive 8 magnetic valves, which can be configured to act the way that is needed on the application.

GateWay v10 controller is designed to be used with Optolevel® optical sensor and is not guaranteed to be compatible with sensors from other manufacturers.

1.1. Operational description of GateWay v10 Level Surveillance System

GateWay uses self checking functions and will indicate faulty sensors with a blinking of a red LED light. This is accomplished with constant digital data exchange between GateWay v10 and Optolevel[®] optic sensors. If the information flow is interrupted or disturbed, it will be indicated with LEDs, which are located at the front panel of the GateWay v10-unit.

1.2. The Optic sensors

The GateWay v.10.2 is designed to operate with two wire optic sensors. Every sensor needs two wires to be connected to GateWay v10-unit. The GND (ground) wire can be shared to save on the total number of the wires.

GateWay v10 communicates several hundred times in a second with each sensor, this guarantees a fast response time for overflow prevention and gives you more safety for the loading and unloading processes.

Both top and bottom sensors operate with the same principle, and they are approved for use in Zone 0 hazardous locations. Refer to www.optolevel.fi for more approval details. The optic sensor has a label as shown in Figure 1.

OPTOLEVEL [®]	
Finland	
Model:	Ui = 14V
Optolevel 2480/2	li = 420 mA
	Ci = 2nF
CE 0575 ⓧ II 1/2 G	Li = 0,01 mH
EEx ia IIC T6	
VTT 04 ATEX 051X	Max. pressure 25 bar.
Serial No. is on top of the prism	Year of production: 200_

Figure 1. Optolevel[®] optic sensors Ex-marking

1.2.1. GateWay v10 Sensor indications

GateWay v.10 controller provides connections for 8 overflow (top) sensors, 8 retain (bottom) sensors and 8 P2 (level 2) sensors for extra safety. The state of each these sensors is indicated with individual red diagnostic LED. The sensor indicates a broken or shorted connection with blinking LED, a wet sensor with solid light and a dry sensor is indicated without a light. This way separate field testers are not required when searching for faulty sensors or connections.

1.3. Overfill protection

OFP (Over Fill Prevention) is a common feature in level monitoring systems and is a very useful safety feature.

Common overfill prevention operation: If any moment the top sensor becomes wet during the loading process, the thermistor and the optic loading rack outputs become immediately non-permissive and the controller will also indicate this by lighting up the corresponding compartments LED.

With the GateWay v10, the user can add extra safety by using additional sensors. The sensors are located slightly lower than the overfill prevention (top) sensors. With GateWay v10 unique configurable* action, the user is able to assign different properties for different situations. For example, the user in here can assign its extra sensor for magnetic valve outputs on the GateWay v10 -unit, and use them to drive bottom valves on tank compartments. This ensures that if the first safety system fails, there is a backup system to prevent the expensive and time-consuming accidents from happening. This is a level of safety that one can only achieve with the GateWay v.10 -Level surveillance system.

(* Help with configuration, refer to configuration instructions manual.)

1.4. Product mixing prevention

PMP (Product Mixing Prevention) is a useful feature, which can save a lot of time when used right. When starting the loading process, the GateWay v10 will inspect if opening the bottom valves have caused the bottom sensor to get wet. If the bottom valve is opened and the sensor gets wet, the corresponding compartment LED is lit, both the thermistor and the optic loading rack outputs will go on non-permissive state until the tank have been checked, and the wet sensor acknowledged. This feature is beneficial when multiple loads are loaded at the same tank. Extra attention has to be given to prevent different products from mixing.*

(* remember that one can also use switches instead of sensors to create similar features more suitable for your application.)

2. Mounting of the GateWay v10

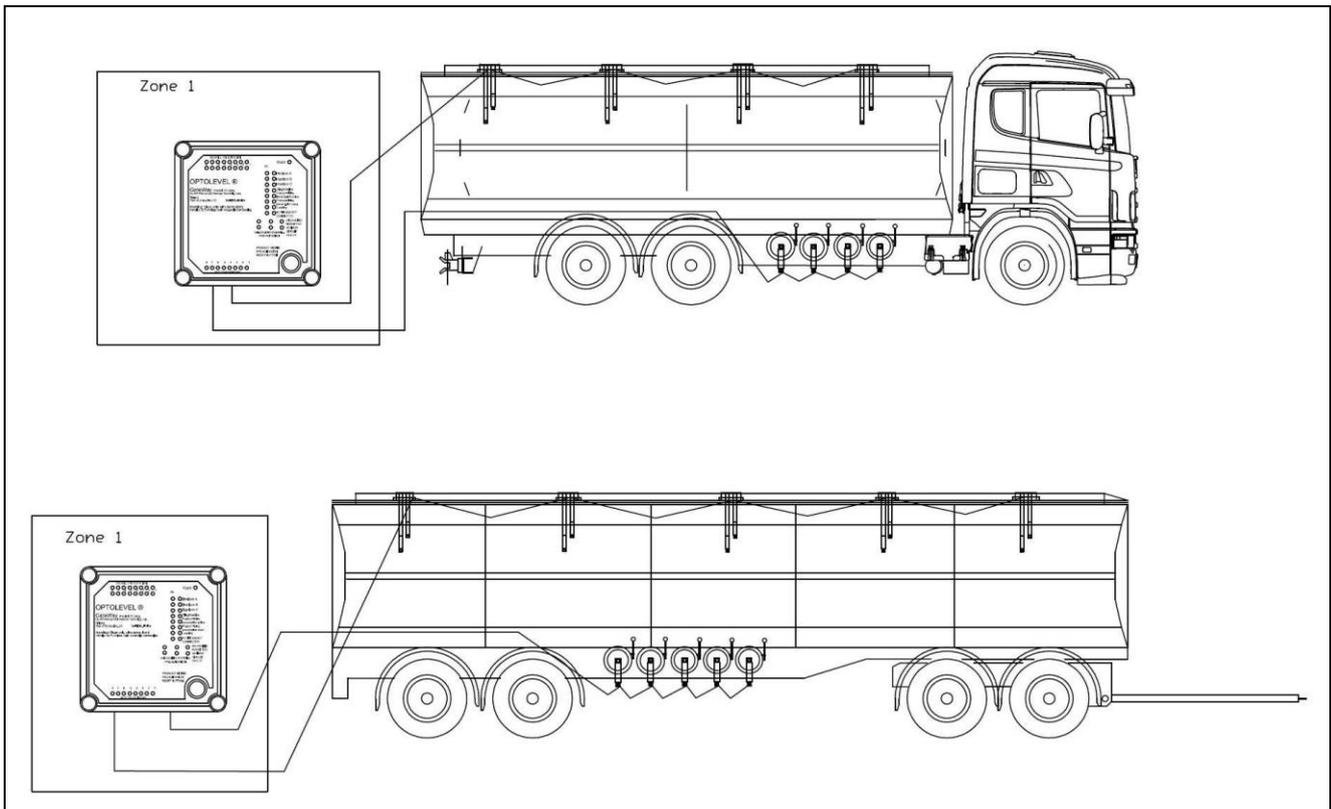


Figure 2. Optolevel® Level Monitoring System on tank truck.

2.1. General information

GateWay v10 is manufactured in reinforced ATEX-certified Fibox cover, which can be installed in potentially explosive atmospheres at Zone 1 (For detailed information of the certification and allowed surroundings, refer to www.optolevel.fi). Although the GateWay v10 is an ATEX certified product, it is still recommended that the user will locate it so that it is protected from impacts. Only competent persons are allowed to carry out installation and maintenance of the device. All official health and safety instructions and regulations must be followed carefully to avoid the risk of accidents, and to protect the environment.

2.2. Mounting information

Ensure that the chosen place for the installation of the device is located on the same zone or zone with lower demands that the device is certified for. When installing the device in potentially explosive atmospheres all regulations and instructions pertaining to the installation are to be followed rigidly. When there is a risk that device may be subjected to heavy sunlight, rain, temperature fluctuations etc., care must to be taken to ensure that the device is adequately protected.

2.3. Mounting instructions

There are no pre-drilled mounting holes on the bottom of the GateWay v10-unit; however, the GateWay v10-unit must be installed through screw places on the bottom of the unit. The GateWay v10-unit should be bolted on the metal base.

IMPORTANT! Installation in accordance to certificate supposes that GateWay v10 is installed in a place where it is not susceptible to impacts.

2.4. Use and maintenance

During the lifetime of the installation, the condition of the unit needs to be maintained. The operational test described in Chapter 6.1 should be done twice a year to ensure flawless operation of this safety equipment. Cleaning of the enclosure must only be carried out with a wet cloth. To ensure the integrity of the enclosure material only neutral washing agents must be used.

WARNING! GateWay MUST be disconnected if any welding is done on tank/truck. If this is not done you may render your unit useless.

3. Sensor mounting

The sensors are a vital part of the Level Monitoring System and they should be installed in the locations presented in the Figure 2.

3.1. Mounting information

The Optolevel® sensor is designed to be mounted with a pearl pipe set such as VSH-24-SUPER-EN1254 which is manufactured by Onninen. You can also use Wennstroms sensor cover 15-3387 and 15-3390 or can be used some other third party mounting equipment.

The sensor has been certified to be used with other compatible mounting equipment if they are Ex-certified for this type of use. The choice of the mounting equipment is not limited to a certain manufacturer.

For detailed information of the physical sensor mounting, refer to the mounting equipments manual or documentation.

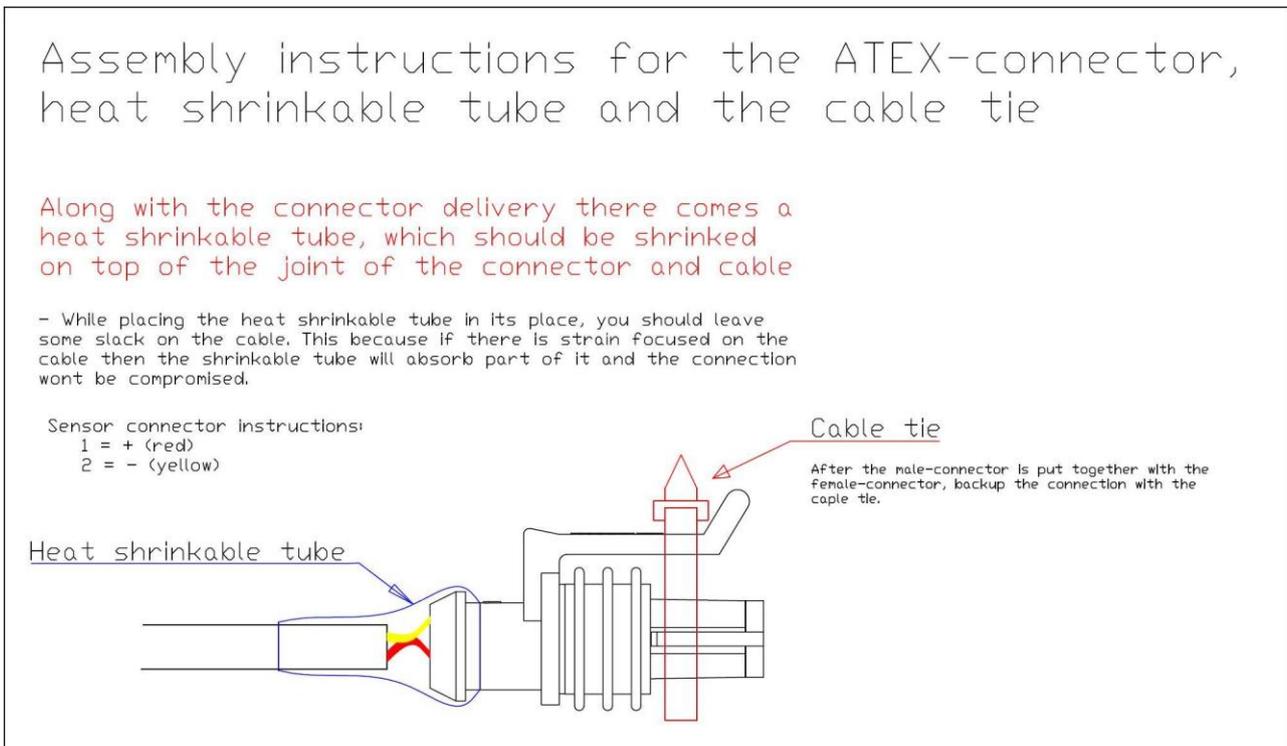


Figure 3. Assembly instructions for cable connection *

(*Picture is a shrunken version of annex 10 which can be located from the end of this document.)

3.2. Mounting instructions for top sensor

The sensor should be mounted the way that is presented in Figure 2. The sensor with the extension pipe (top sensor) should be lowered from the top of the tank compartment to its right

height (this is the height where the OFP should react) and tightened to its place. Left over aluminum pipe should be shortened to a proper length.

IMPORTANT! The connection must be covered and protected from heavy sunlight and rain with a correctly certified protective cover.

IMPORTANT! While mounting the sensor to its place, should be taken into consideration that the sensor and the pipe material is aluminum. So there is a possibility of igniting sparks.

3.3. Mounting instruction for bottom sensor

Mounting of the bottom sensor is almost the same process than with the top sensor, only its location is different. The bottom sensor installation spot is presented in Figure 2. The bottom sensor must also be placed so that its connection is protected from heavy sunlight and rain. While placing the sensor into the pipe, the prism should be facing away from the sunlight, because sunlight might cause false detections.

4. Electrical installation of the GateWay v10 Level Surveillance System

When making the electrical connections, general requirements for installation and maintenance of explosion proof electrical equipment shall be considered. (EN/IEC 60079-14 and EN/IEC 60079-17 in European countries within CENELEC).

4.1. General information and the inlets

There are no pre-made inlets on the GateWay v10-unit. EX-“e” (EN/IEC 60079-7) certified inlets must be used and they need to be installed by ATEX certified manufacturer in ATEX certified facility. Generally, it is suggested that a minimum amount of inlets should be used. This will ensure that the integrity of the enclosure will stay intact. Use weather-tight cable strain reliefs or liquid-tight (IP65 minimum) conduit fittings to keep out the external moisture. The use of weather-tight cable strain reliefs with the sensor and the socket housings as well is also imperative for moisture resistant system. It is required the use of high quality stranded and tinned copper wire with a minimal thickness of 1.0mm² for all electrical connectors to the GateWay v10. Trim approximately 5 mm of the insulation off the end of each wire that will be connected to terminal blocks of the GateWay v10-unit. The orange terminal blocks on the GateWay v10 are the Ex-“e” safety connections and the green terminal blocks are EX-“I” (EN/IEC 60079-11) protected connections.

Usage of orange terminal block: Insert trimmed wire into the desired slot and tighten the screw. Before inserting the wire, make sure that the tightening screw is open.

Exe-e marking of the orange terminal block:

Eex e II II 2 GD 175V 1,5mm
Demko 03 ATEX 134439 U

Usage of the green terminal block: Insert the trimmed wire into the desired slot (nothing else is needed to be done, the connection is self-closing). When detaching connection from the terminal, push gently with the screwdriver (or with some other suitable tool) at the orange lever on top of the terminal and gently pull out the wire. Proper color coding will save time when installing and repairing the system. Remember to make notes of your installation for the maintenance purposes.

IMPORTANT! Due to the vibrations, which occurs on the tank trucks, it is very important ensure that the connections will hold. If unwanted connections are formed, it is possible for dangerous situations to emerge.

In Figure 4 there is one **suggestion** about how to position the inlets to the GateWay v10. Amongst the installers, it has been considered a positive thing if all inlets have been fitted on the bottom side of the GateWay v10-unit.

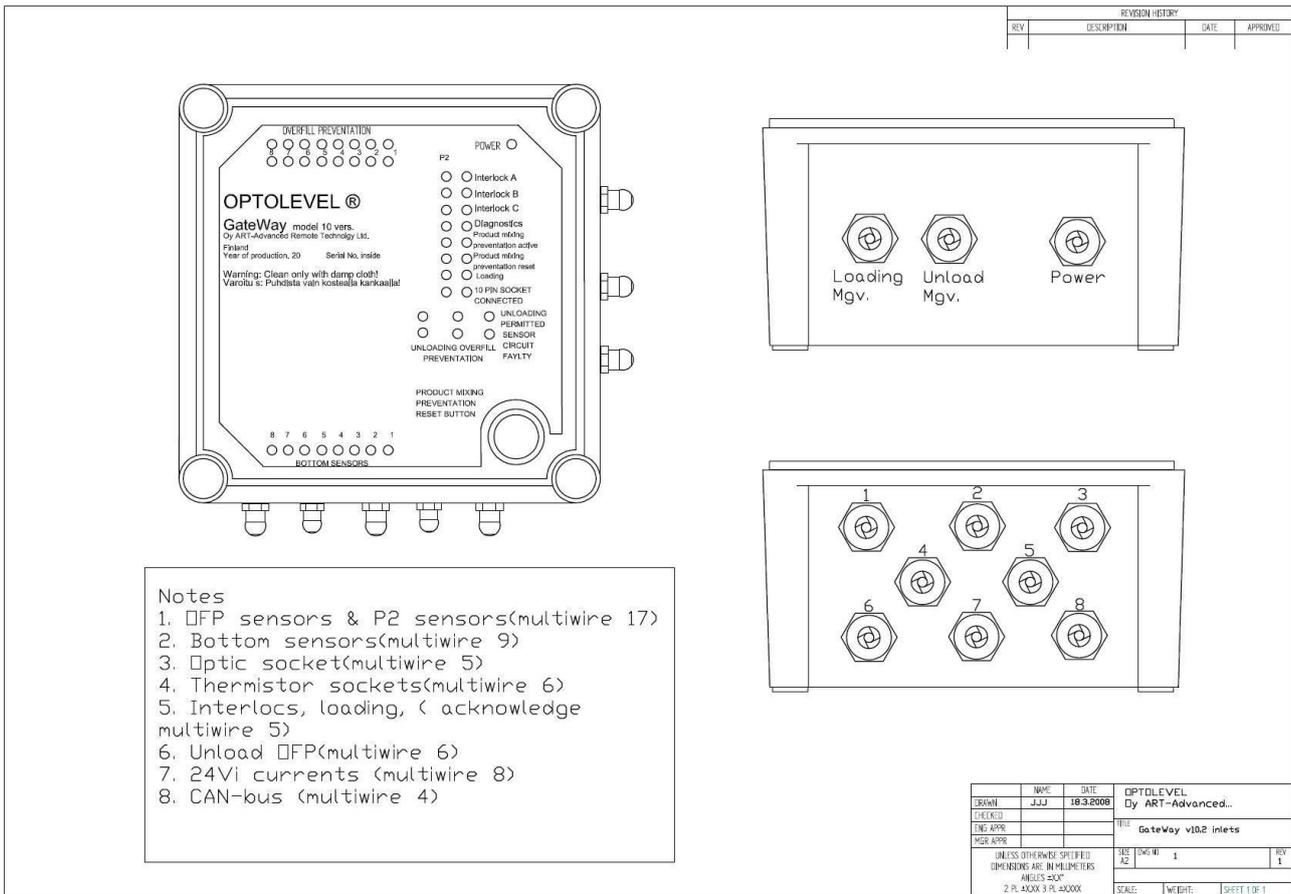


Figure 4. Ex-safe Inlet example *

(*For more instructions and bigger drawings, refer to the last pages of this document to Annex 8.)

4.2. Wiring instructions – Power

IMPORTANT! POWER MUST BE OFF WHEN INSTALLING OR REMOVING POWER LEADS TO THE GATEWAY V10. THE POWER WIRES FOR THE BATTERY MUST BE KEPT SEPARATE FROM THE SENSOR AND SOCKET WIRING! THEY CANNOT BE RUN TOGETHER IN SAME CONDUIT! This is important when maintaining safe current levels in the intrinsically safe sensors, auxiliary switches, and socket wiring.

Do not apply power to the GateWay v10-unit without reading this manual thoroughly and checking all the connections first. The GateWay v10 is designed to operate on truck systems with the nominal power of 24VDC (20VDC min. to 32VDC max.) If the power supply is not within this range contact your retailer before powering up the GateWay v10 system. GateWay v10 has extensive power supply protections; however, by using some pulse supplies or other same kinds of charges, it may end up permanently damaging the GateWay v10-unit.

GateWay v10 has a fuse build inside, but it is not replaceable on site. For this reason the power supply for the GateWay v10 -unit should include fuse of 1 Amps. The fuse should be located at the truck cabin in the fuse box. Because the power cord of the GateWay v10-unit passes through the zone 1, the used cable must be approved cable for said zone. For the power cord, there has to be

an independent housing on the GateWay v10-unit, else it will violate the safety approvals of the GateWay v10 product.

It is suggested to be turned off the GateWay v10-unit when a) it is not in use, and b) the tank truck is in motion.

Previous suggestion is presented because the moving liquid in the tank may cause false detections, especially if “sealed” compartment function is in use. Turning off when not used, can be accomplished with a power switch which is connected to the protecting door or with some similar application.

Attach the (fused) wire from the truck battery to the GateWay v10-units input terminals shown in Figure 5. The connectors are Ex –“e” (EN/IEC 60079-7) class certified.

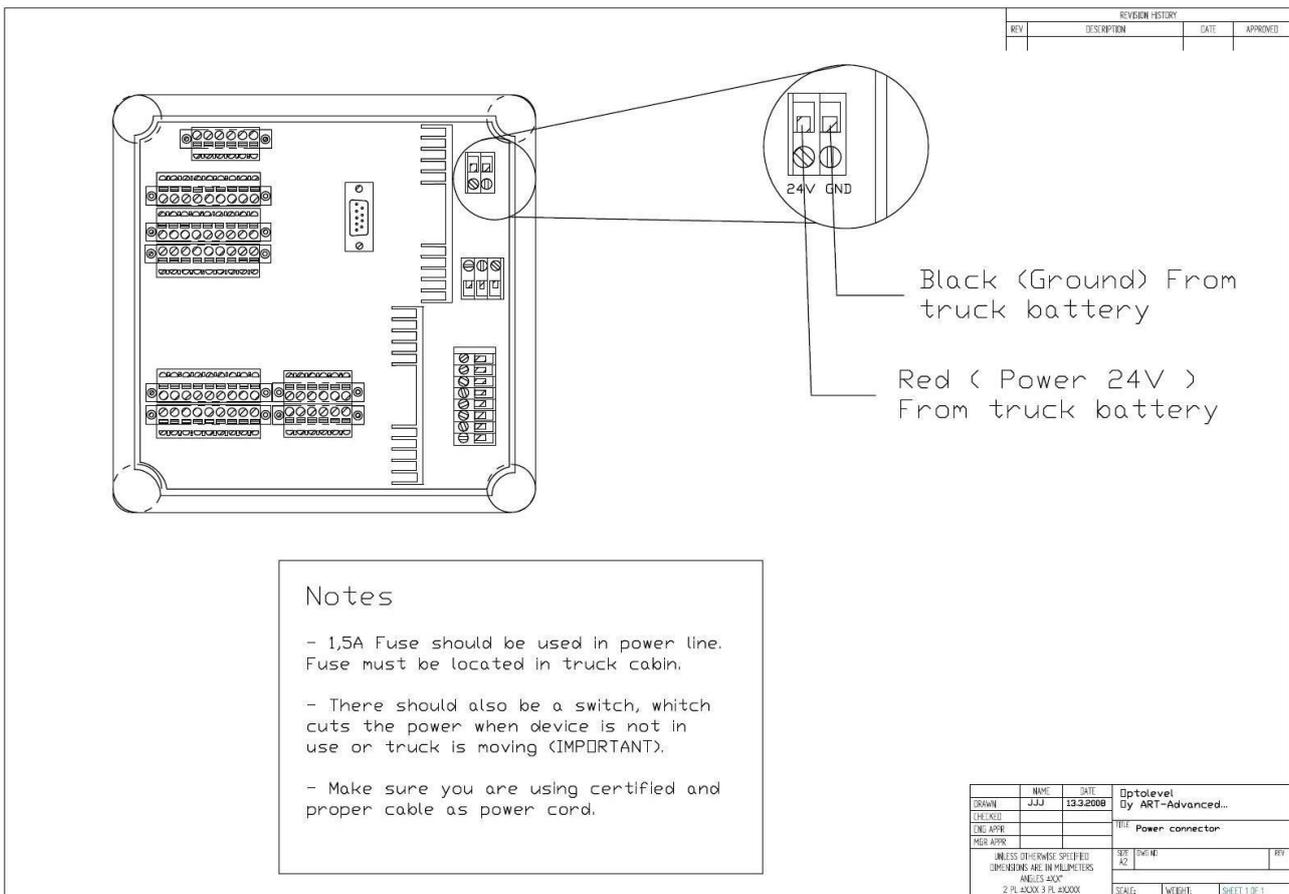


Figure 5. Electrical wiring of the Power *

(*For more instructions and bigger drawings, refer to the last pages of this document to Annex 1)

4.3. Wiring instructions – Sensors

Make all 2-wire wiring connections as defined in Figure 6. Be sure to double check that your wiring connections are correct. It has been found a small amount of non-corrosive sealant or electrical crease in each crimp connection will prevent corrosion and provide very reliable wire connections.

Sensor sockets are intrinsically safe (EN/IEC 60079-11) connections, which have the following properties.

$U_o = 13.6V$
 $I_o = 22mA$
 $C_o = 5.2\mu F$
 $L_o = 0.2H$

The color coding of the used wire is presented in Annex 2. This coding is standardized in EN 13922:2003, Table A.16.

The circuit connected to these terminals should comply with demands for intrinsic safety (EN 60079-11). The circuit must be separated from other not intrinsic safe circuits.

IMPORTANT! Resistance of each wire for 2-wire optic sensor system cannot exceed value of 0,3Ω and resistance of each connection cannot exceed value of 0,5Ω. (EN 13922:2003)

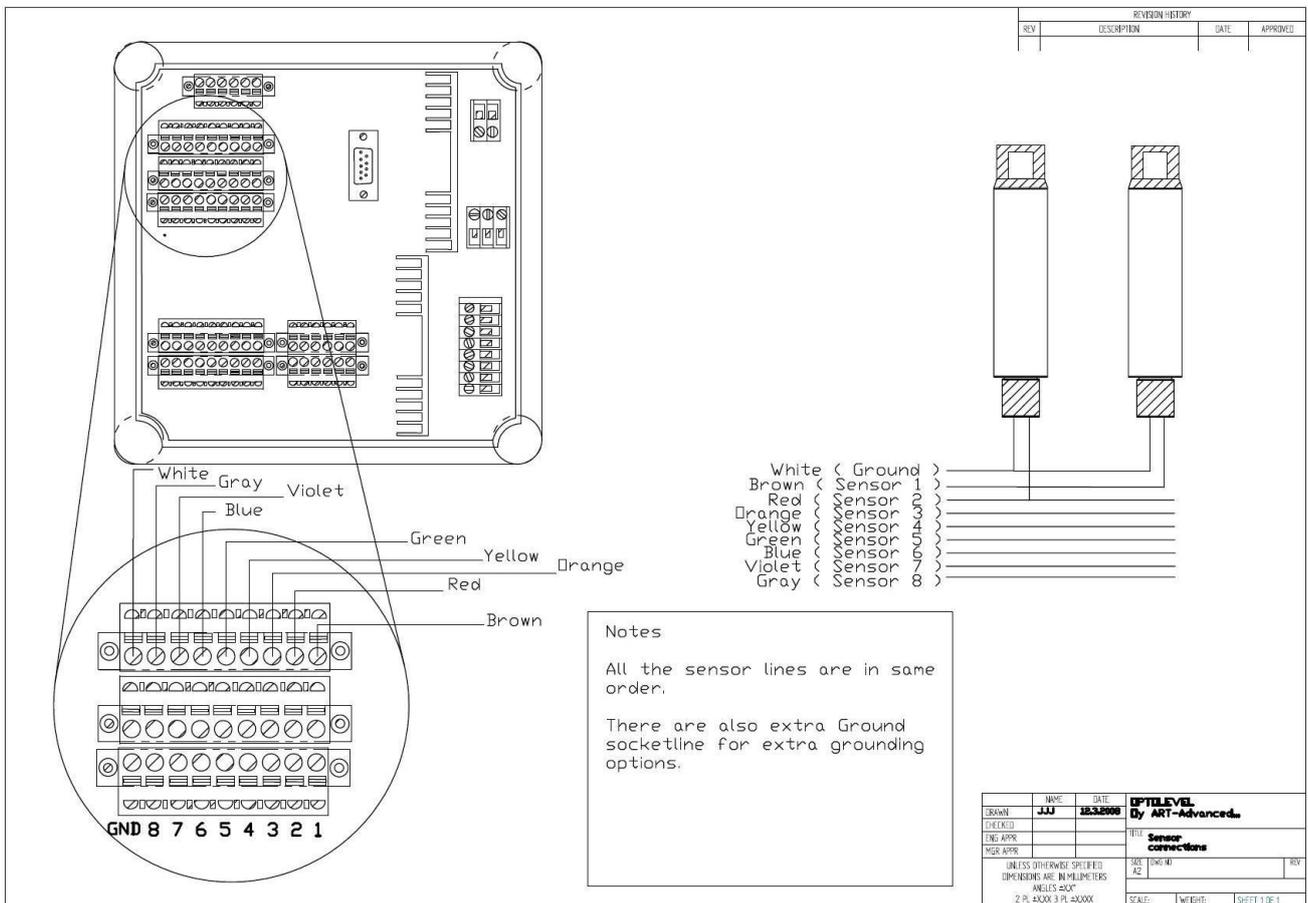


Figure 6. Electrical wiring of the sensors *

(*For more instructions and bigger drawings, refer to the last pages of this document, to Annex 2)

4.4. Wiring instructions – Optic loading rack output

The optic loading rack output should be connected to the optic socket. This socket should be located near the loading pipes because it is needed when the optic socket is used in the loading process. Check installation instructions from Figure 6.

This is intrinsically safe (EN/IEC 60079-11) connection, which has galvanic separation. Connection is compliant with accordance of the standard 13922:2003.

The color coding of the used wire is presented in Annex 3. This coding is standardized in EN 13922:2003, Table A.16.

The circuit connected to these terminals should comply with the demands for intrinsic safety (EN 60079-11). The circuit must be separated from other non-intrinsic safe circuits.

IMPORTANT! The resistance of each wire used for the 5-wire system cannot exceed the value of 5Ω and the resistance of each connection cannot exceed the value of 0,5Ω. (EN 13922:2003)

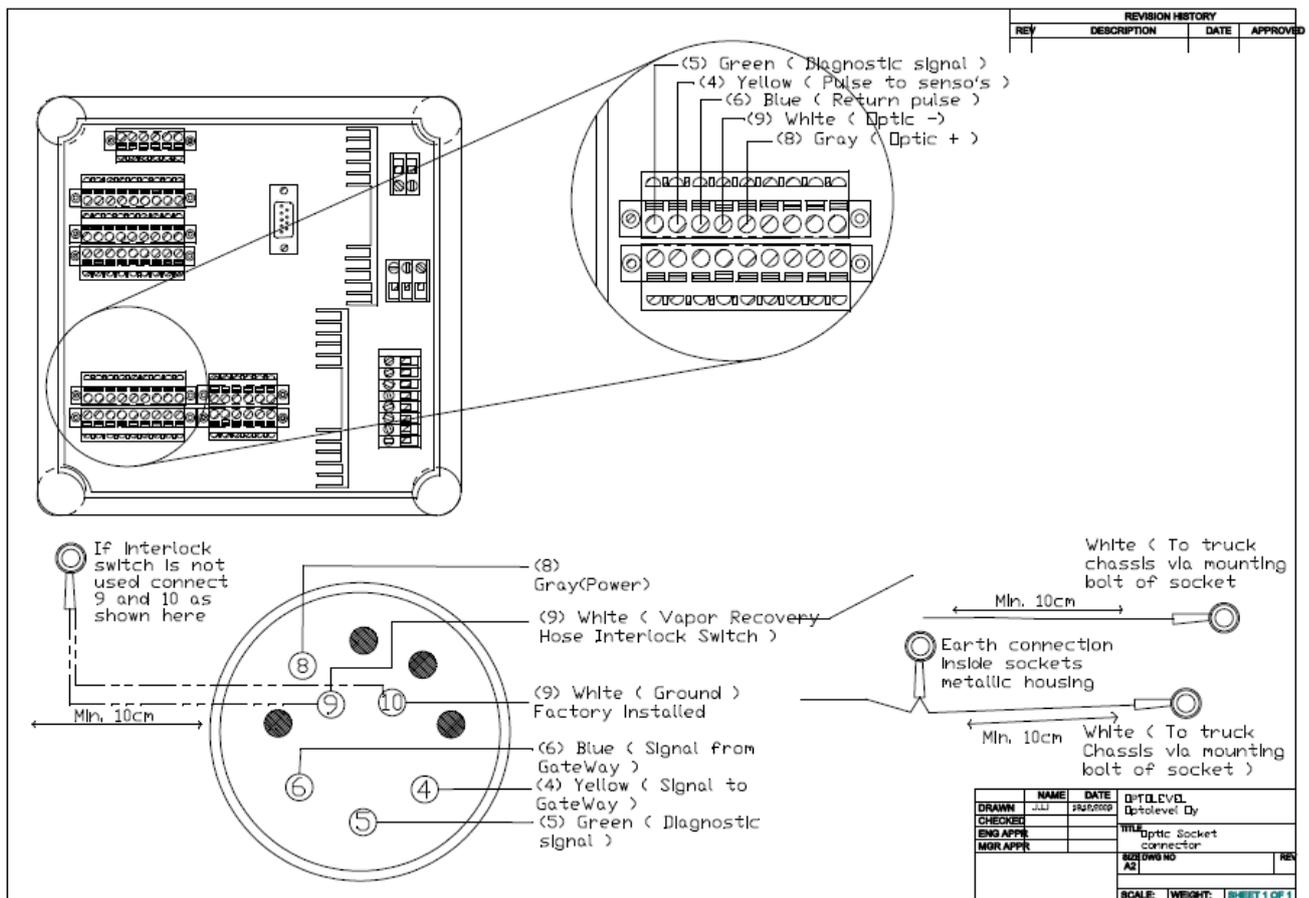


Figure 7. Electrical wiring of the Optic socket *

(*For more instructions and bigger drawings, refer to the last pages of this document, to Annex 3)

4.5. Wiring instructions – Thermal loading rack output

The thermal loading rack output should be connected to the thermal socket which should be located near the loading pipes because it is needed on the loading process. The thermal socket has galvanic separation protection. Check the connection instructions from Figure 7.

This is intrinsically safe (EN/IEC 60079-11) connection, which has galvanic separation protection. Connection values are in accordance to certificate EN 50020.

The circuit connected to these terminals should comply with demands for intrinsic safety (EN 60079-11). The circuit must be separated from other non-intrinsic safe circuits.

$V_i = 20,5V$
 $I_i = 190mA$
 $C_i = 1,33\mu F$
 $L_i = 0,2H$

IMPORTANT! The connection resistance from the thermistor socket and the loading rack must not exceed the value of 10Ω (SFS 5684). So if $2 \times 1\text{mm}^2$ cable is used, then its maximum length is 50m.

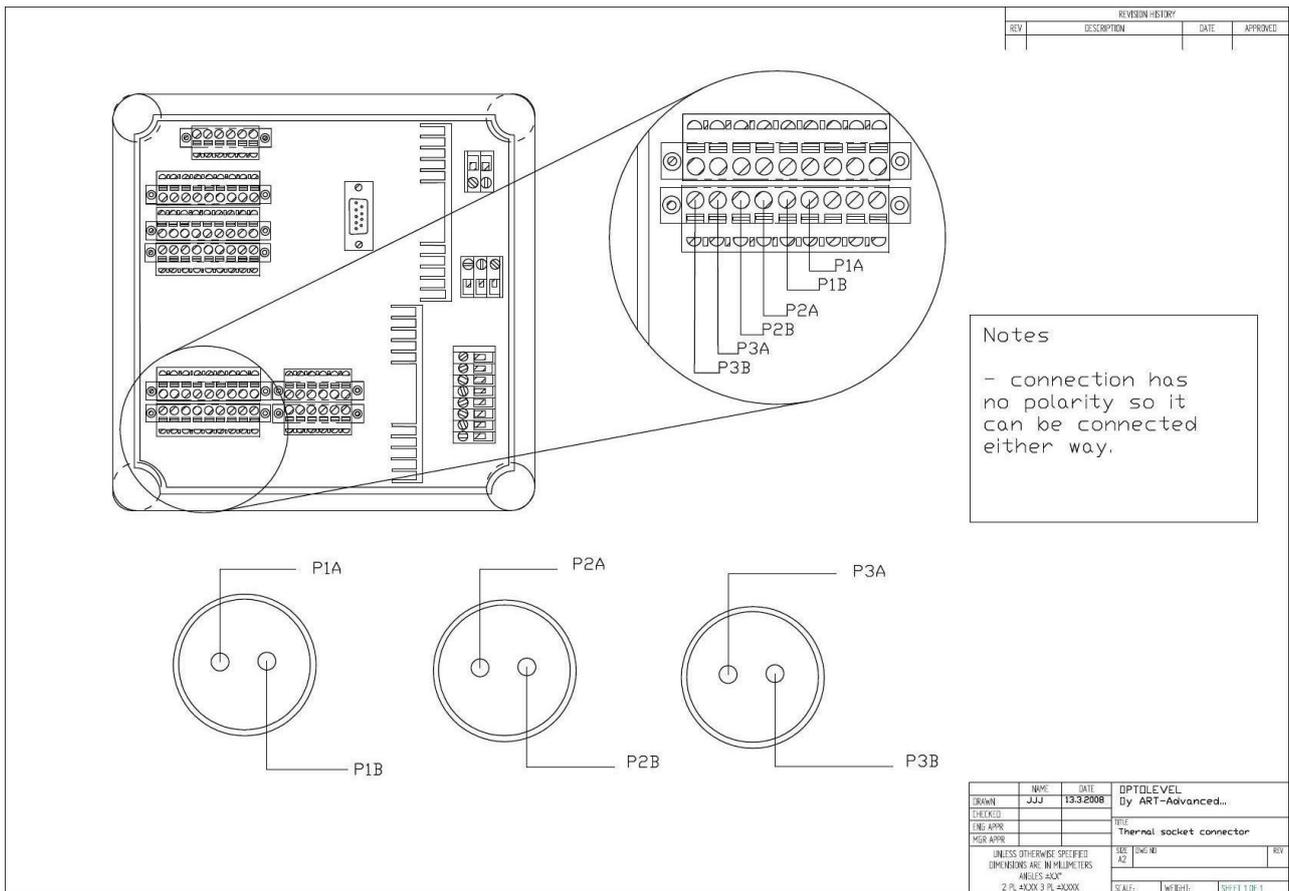


Figure 8. Electrical wiring of the Thermistor socket *

(* For more instructions and bigger drawings, refer to the last pages of this document, to annex 4)

4.6. Wiring instructions – Magnetic valves

There are two different magnetic valve controls, which are associated with different operations. The unloading magnetic valve controls and loading magnetic valve controls.

These connections are inputs, with EX-“e” (EN/IEC 60079-7) sockets.

As the magnetic valve controls are only inputs, it will need a safe power supply to be able to create a working circuit. Check Figure 8 or Annex 5 for more information.

Maximum values for this connection:

Un = 24V nominal
Imax =3A
Pmax =7W

Note that the maximum current and voltage combinations are limited by informed maximum power (7W), which should not be exceeded.

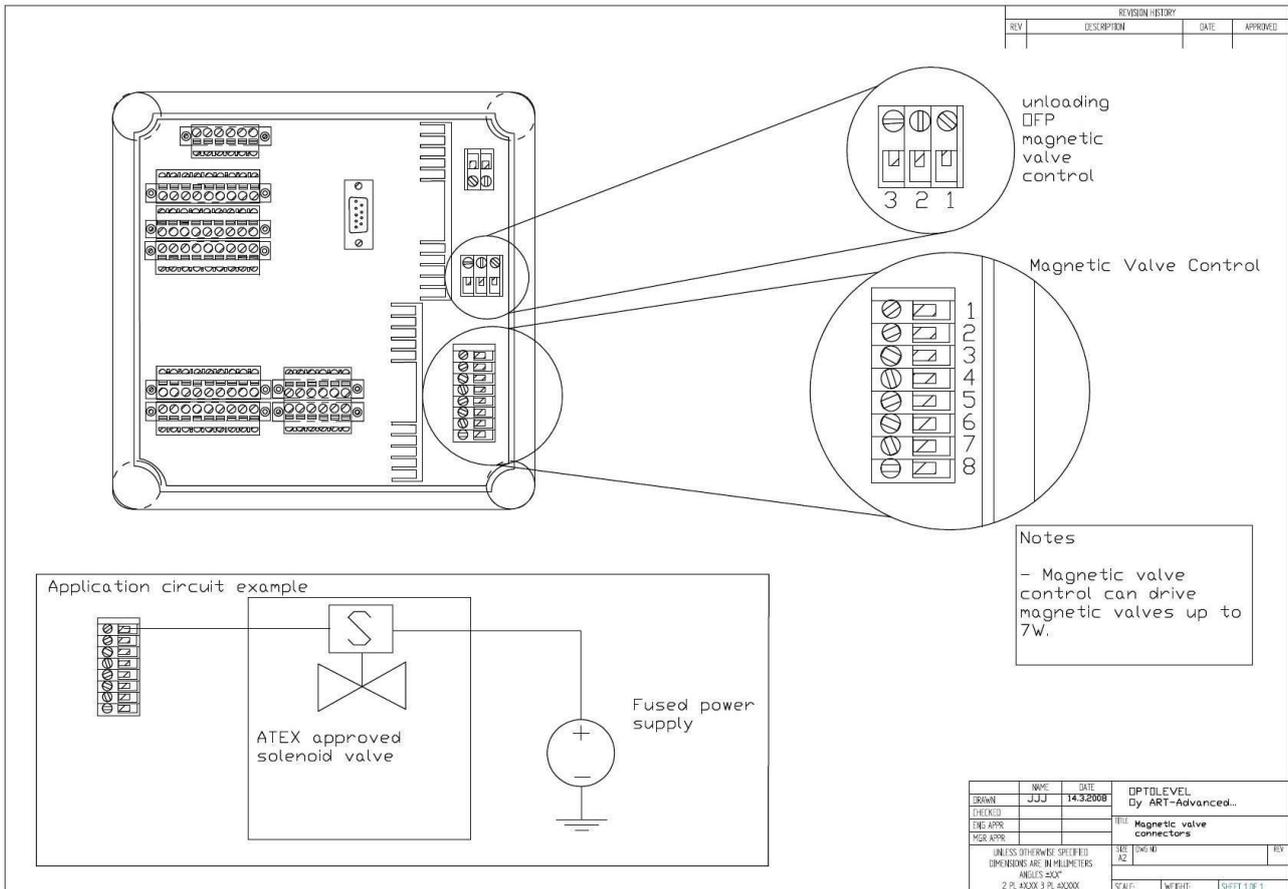


Figure 9. Electrical wiring of the Magnetic valve *

(* For more instructions and bigger drawings, refer to the last pages of this document, to Annex 5)

4.7. Wiring instructions – I-Current

I-Current can provide 24V voltage or 156mA current. The main use for this connection is to offer safe operating voltage for Optolevel® iLED or for future Optolevel® released products.

These are intrinsically safe (EN/IEC 60079-11) connections, which have following properties.

U_o = 25V
I_o = 178mA
C_o = 0,85μF
L_o = 4mH

The circuit connected to these terminals should comply with demands for intrinsic safety (EN60079-11). The circuit must be separated from other non-intrinsic safe circuits.

Voltage response to this connection is almost linear and is presented in Figure 10.

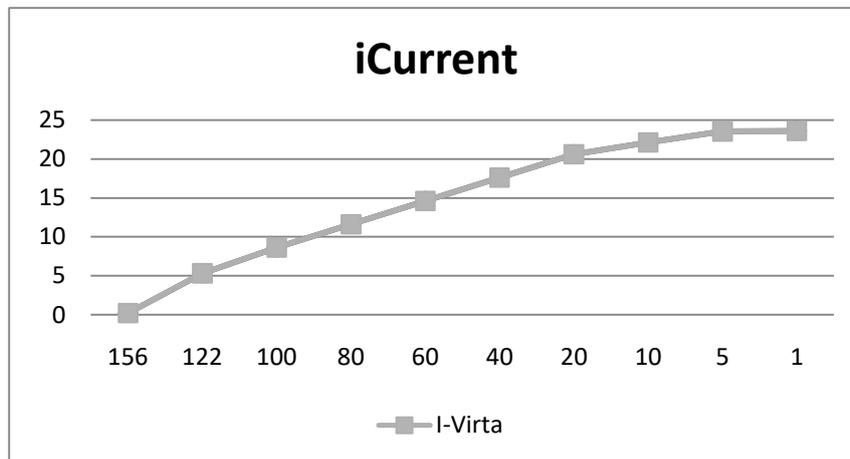


Figure 10. i-Current voltage response

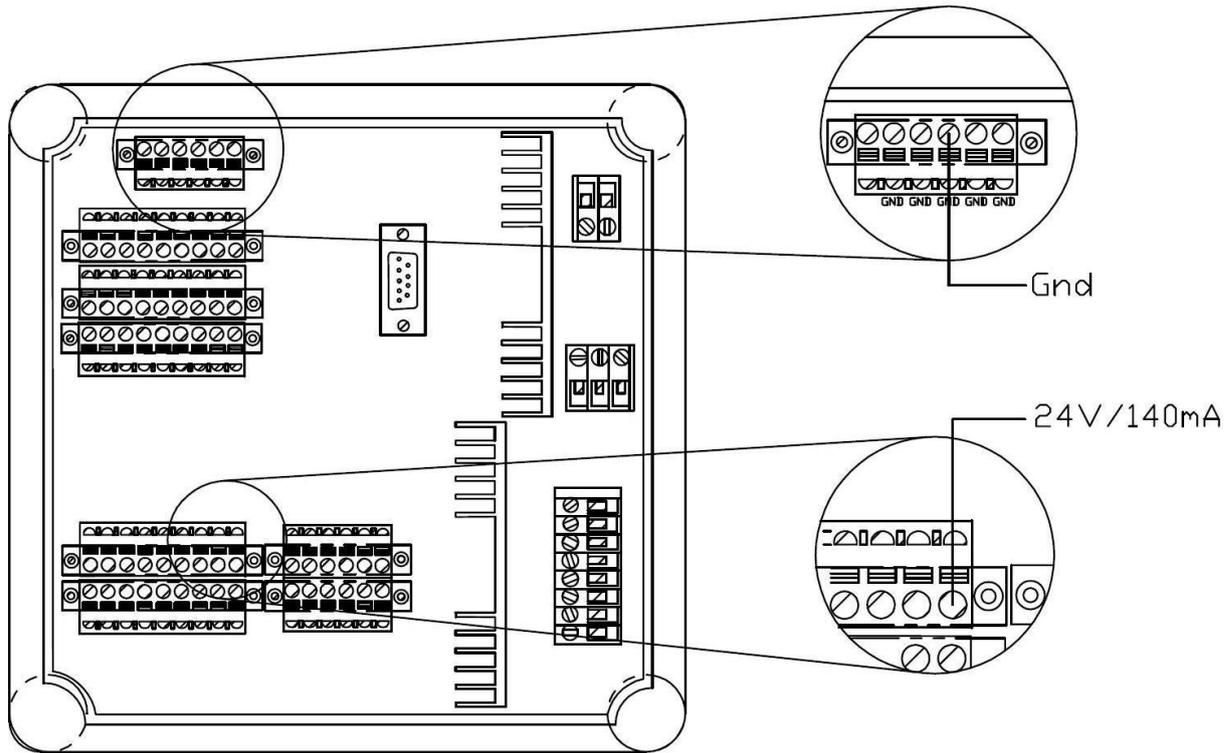


Figure 11. Electrical wiring of the i-Current *

(*For more instructions and bigger drawings, refer to the last pages of this document, to Annex 6)

4.8. Wiring instructions – Interlock, Loading, Acknowledge

Interlock, loading, and acknowledge should be connected as shown in Figure 12. They are protected from the voltage of the wrong polarity

These are intrinsically safe (EN/IEC 60079-11) connections, which have the following properties.

<p>U_o = 6,5V I_o = 6,5mA C_o = 500µF L_o = 1H</p>

The circuit connected to these terminals should comply with demands for intrinsic safety (EN60079-11). The circuit must be separated from other non-intrinsic safe circuits.

4.11. Serial port - instructions

The serial port (RS232) is used for communicating with the computer while configuring the GateWay v10-unit for use.

NOTICE! Although this is an intrinsically safe connection, only it should be connected when configuring the unit. For normal use, it should be left unconnected.

5. Additions Notes

Thermal range of the GateWay v10:

Maximum (constant) ambient temperature is 50°C (122°F) Minimum (constant) ambient temperature is -40°C (-104°F)
--

Where multiple circuits extend from the same piece of intrinsically safe equipment, they must be installed in separate cables, or in one cable having a suitable insulation.

5.1 Warranty

It is guaranteed that each product has been designed, developed, and manufactured with professional competence and in accordance with technical engineering practices and standards observed in the industry and that products contained in deliveries are free from defects of workmanship and materials and that when used in accordance with the specifications as indicated in the related documentation, shall perform substantially as specified.

The term of warranty is 18 months and starts as from the date of delivery from Optolevel.

If during the term of warranty, the product fails to conform to the warranty as specified above and if the distributor is not capable of easily solving the problem, Optolevel, without undue delay after having been informed about malfunction, repair or replace the product.

Optolevel's liabilities are limited to the repair or replacement of the product that fails to conform to the warranty. Optolevel is not liable for any consequential costs.

Optolevel is not liable for any malfunction resulting from modification made without the explicit prior written approval from us.

Warning

Optolevel® products should be used in compliance with applicable federal, state, and local laws and regulations.

6. Troubleshooting and maintenance

6.1 Maintenance test

The test described here should be performed at least two times a year to guarantee the safe operation. The GateWay v10 level monitoring is a safety system, so if everything works like it is supposed to, the system is never needed. This is why it is important to check the basic function of the device time to time.

What is needed:

- two persons
- bucket of water

Description of the very basic test:

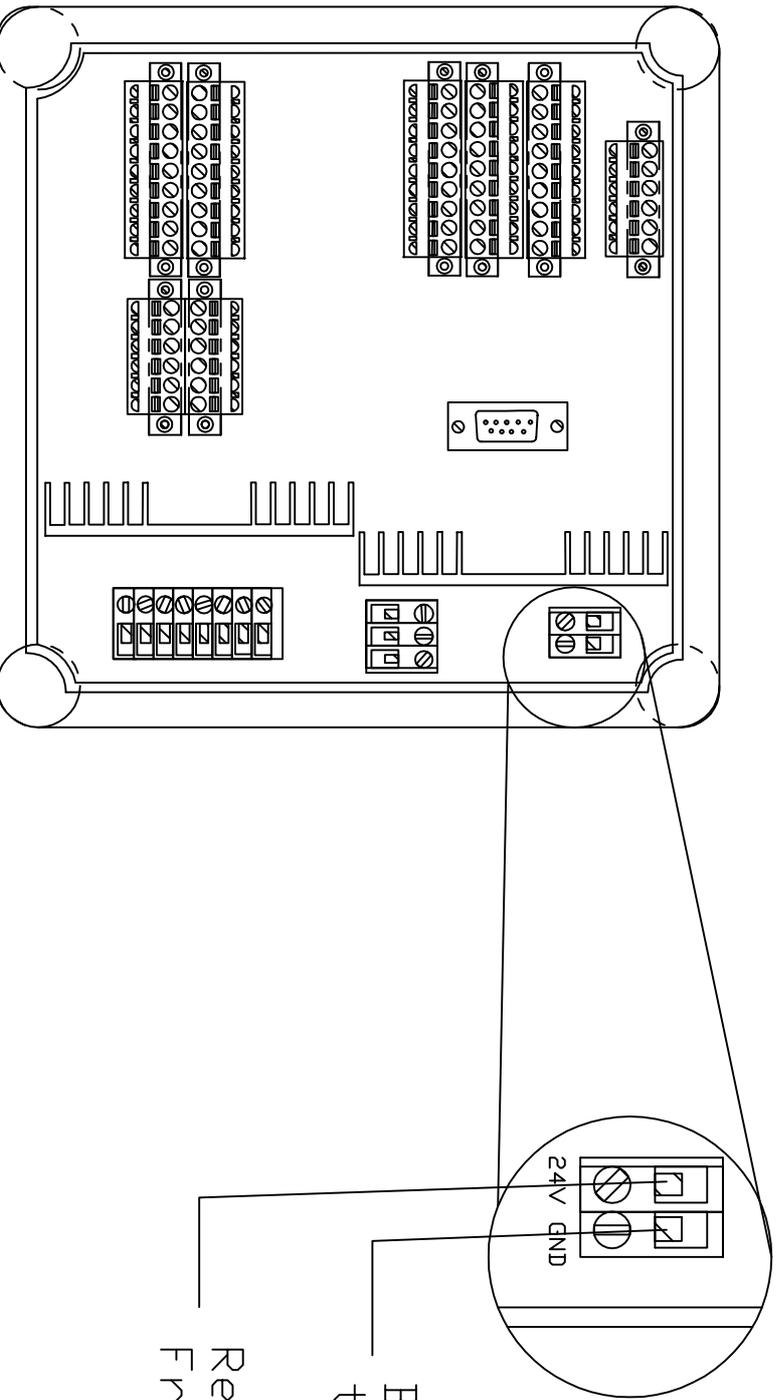
The other test personal will go and wet sensor at the time with the water bucket and the other one will confirm by watching the GateWay v10-units indications that they are correct.

6.2 Troubleshooting

In a need extra help with the installation of the GateWay system, contact your distributor.

Optolevel offers information and technical support on our website, visit www.optolevel.fi in case of having questions. There can be found a contact form and FAQ section for your convenience.

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED



Black (Ground) From truck battery

Red (Power 24V) From truck battery

Notes

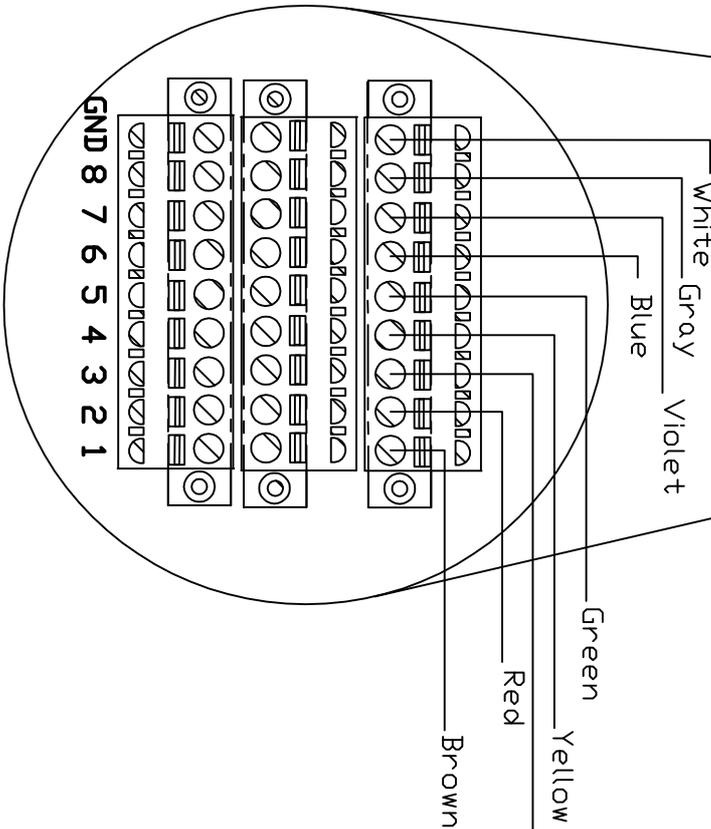
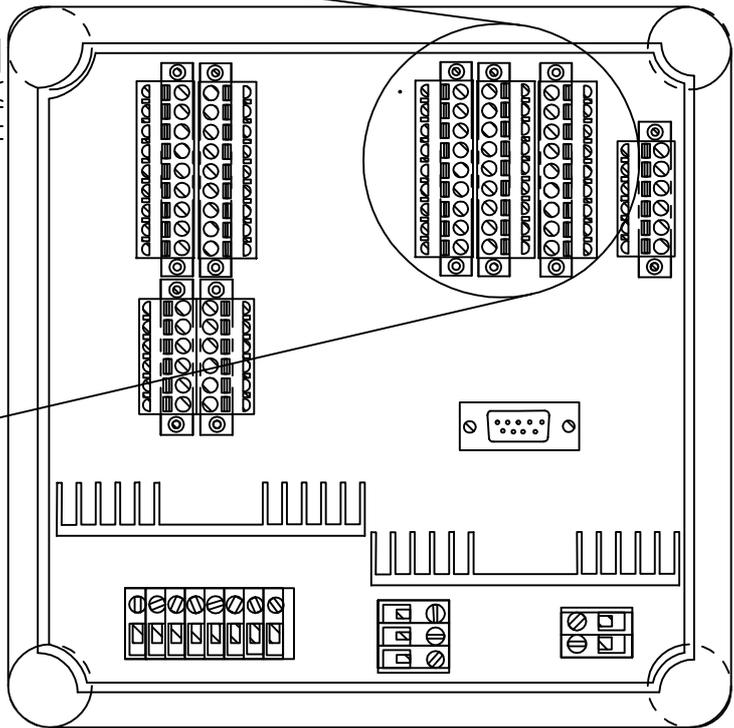
- 1,5A Fuse should be used in power line. Fuse must be located in truck cabin.
- There should also be a switch, which cuts the power when device is not in use or truck is moving (IMPORTANT).
- Because power wiring passes zone 1, make sure you are using certified and proper cable (IMPORTANT).

NAME	DATE	Dpt:level Dy ART-Advanced...	TITLE Power connector	SIZE	DWG NO	REV
DRAWN JJJ	13.3.2008			A2		
CHECKED						
ENG APPR						
MGR APPR						

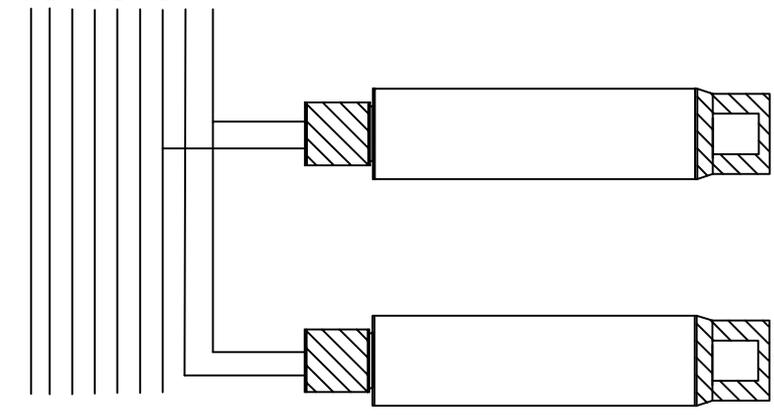
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
ANGLES ±XX°
2 PL ±XXX.3 PL ±XXXX

SCALE: WEIGHT: SHEET 1 OF 1

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED



- White (Ground 1)
- Brown (Sensor 2)
- Red (Sensor 3)
- Orange (Sensor 4)
- Yellow (Sensor 5)
- Green (Sensor 6)
- Blue (Sensor 7)
- Violet (Sensor 8)
- Gray ()



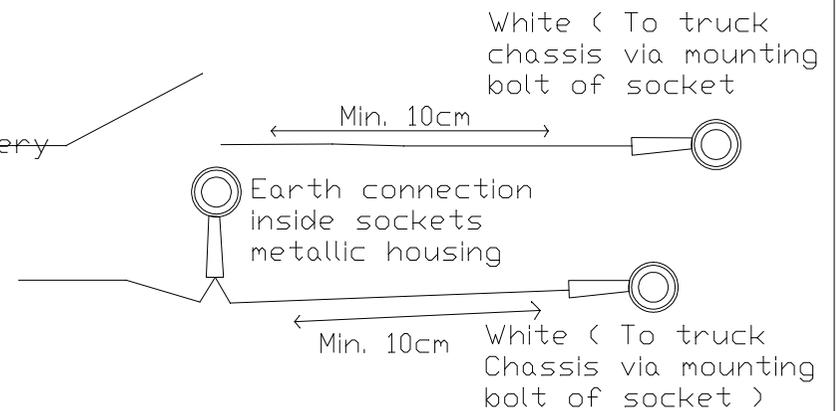
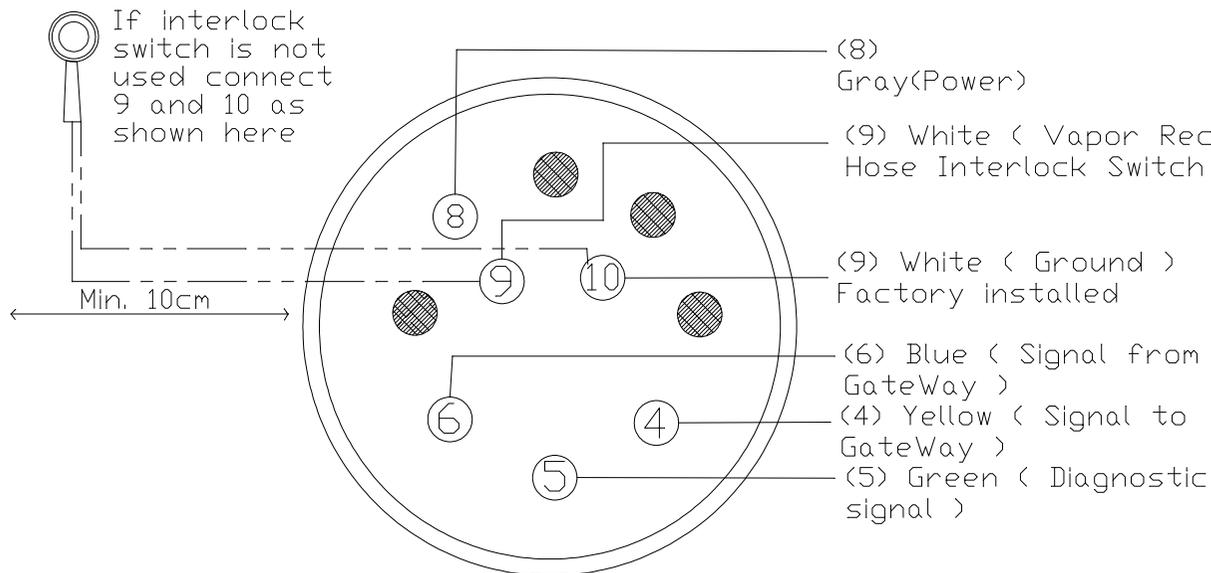
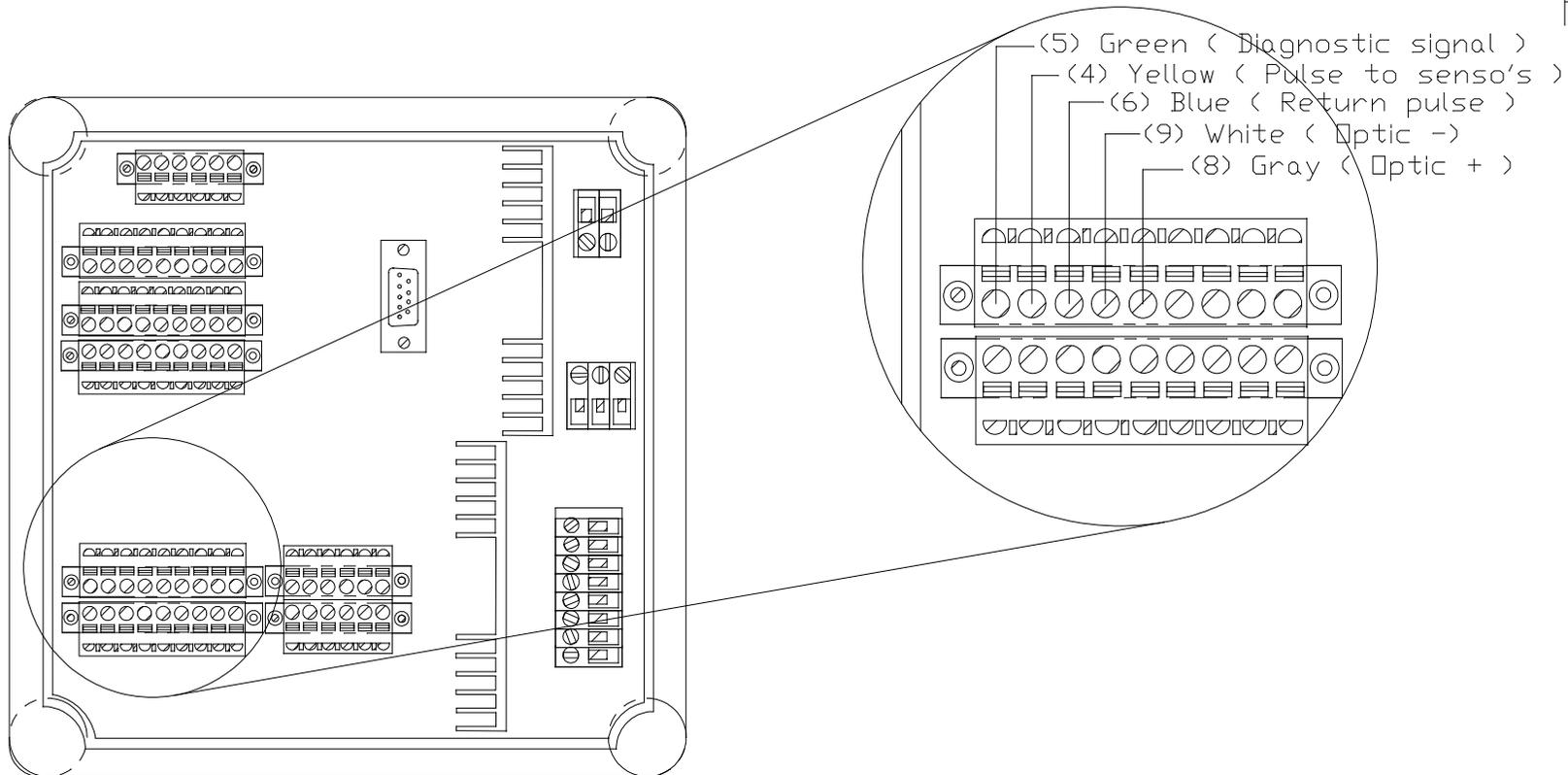
Notes

All the sensor lines are in same order.

There are also extra Ground socketline for extra grounding options.

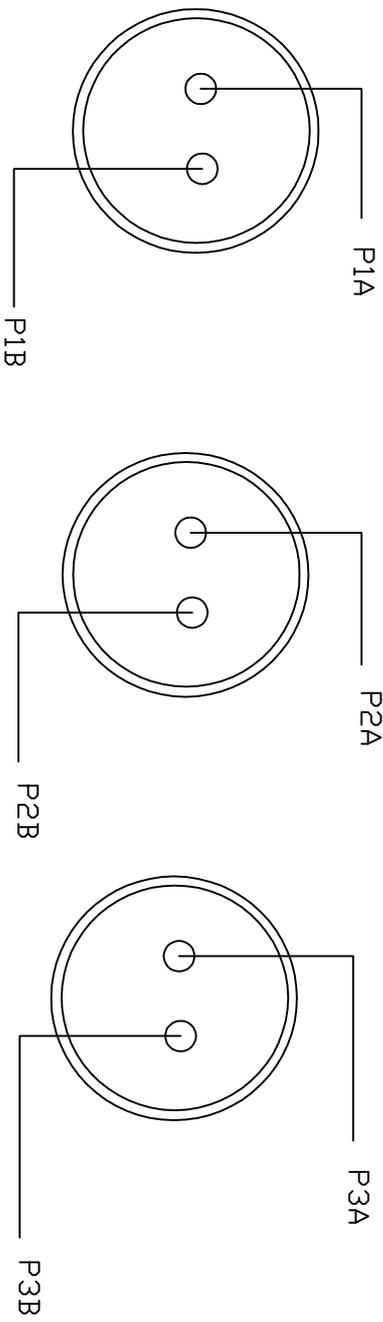
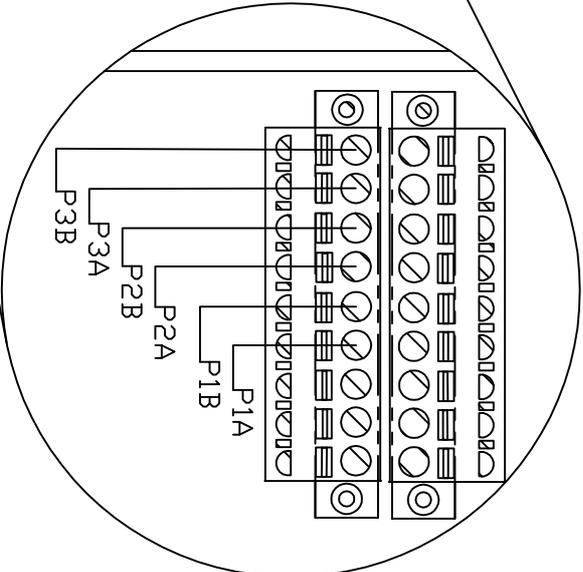
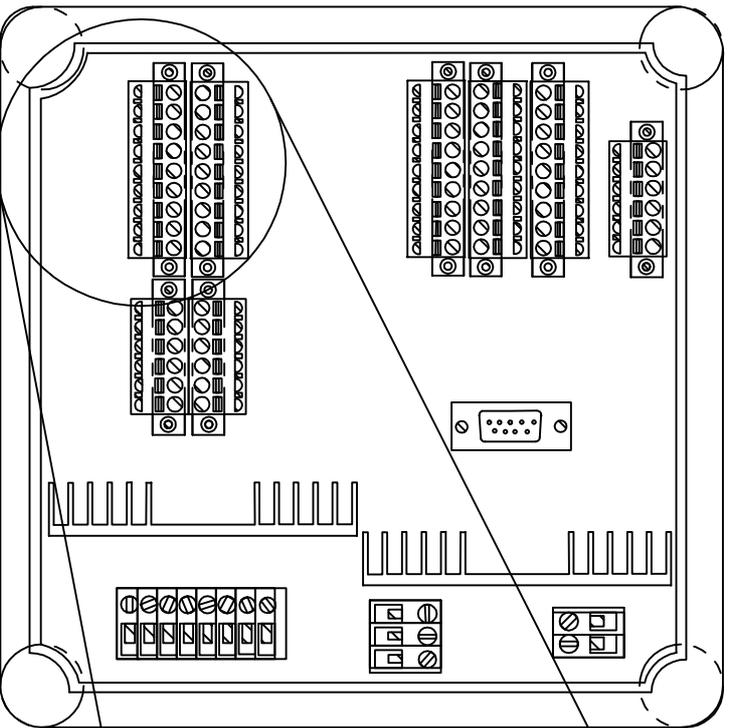
NAME	DATE		
DRAWN JU	12/2008	DPTOLEVEL	By ART-Advanced...
CHECKED			
ENG APPR			
MGR APPR			
UNLESS OTHERWISE SPECIFIED		SIZE	
DIMENSIONS ARE IN MILLIMETERS		A2	
ANGLES #XXX°		TITLE	Sensor corrections
2 PL #XXX 3 PL #XXXX		DWG NO	
SCALE:	WEIGHT:	REV	

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED



	NAME	DATE	OPTOLEVEL
DRAWN	JJJ	18.12.2009	Optolevel Dy
CHECKED			
ENG APPR			TITLE
MGR APPR			Optic Socket connector
	SIZE	DWG NO	REV
	A2		
SCALE:	WEIGHT:	SHEET 1 OF 1	

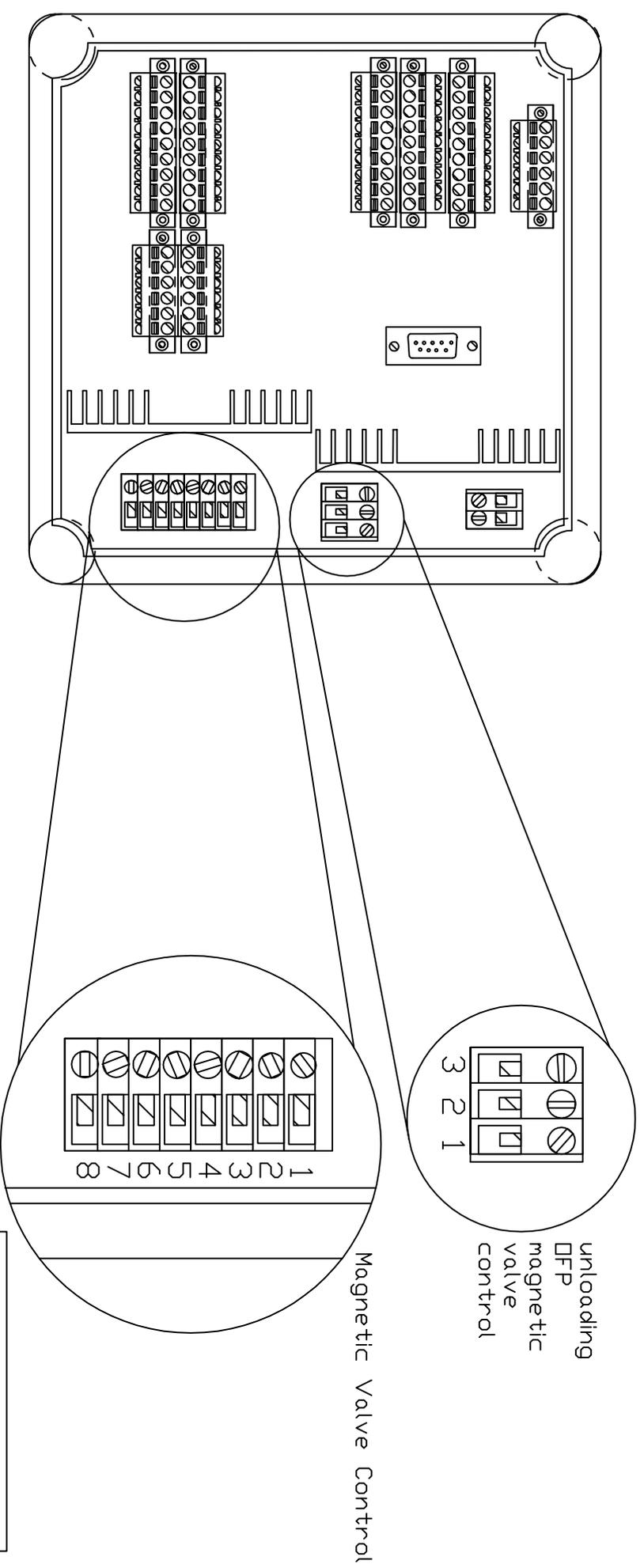
REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED



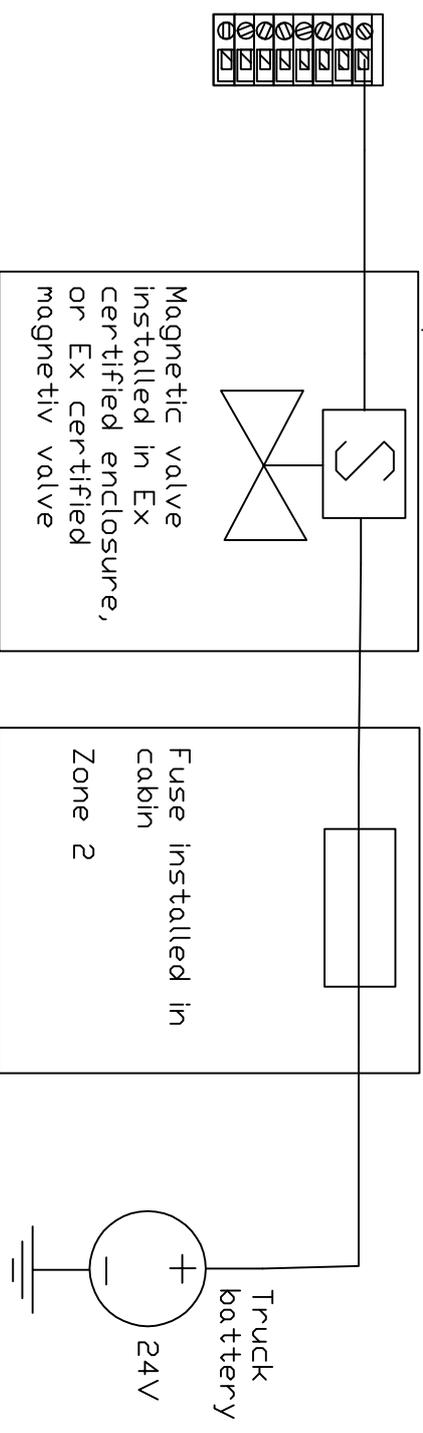
Notes

- connection has no polarity so it can be connected either way.

NAME	DATE	OPTIOL EVEL	
JJJ	13.3.2008	Dy ART - Advanced...	
CHECKED		TITLE	
ENG APPR		Thermal socket connector	
MGR APPR		SIZE	DWG NO
		A2	
UNLESS OTHERWISE SPECIFIED			REV
DIMENSIONS ARE IN MILLIMETERS			
ANGLES #XX°			
2 PL #XXX 3 PL #XXXX		SCALE:	WEIGHT:
			SHEET 1 OF 1



Application circuit example

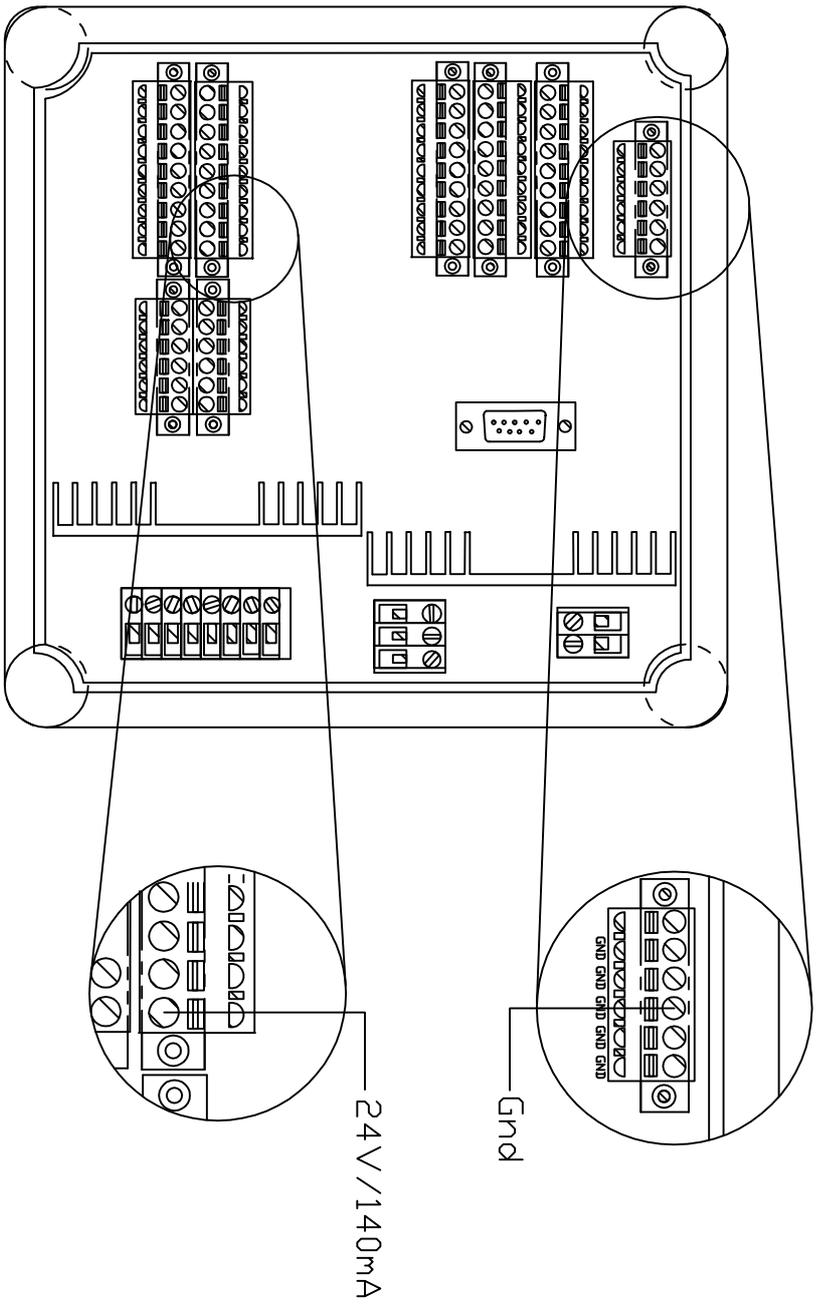


Notes

- Used fuse must be determined on basis of power requirements of the used magnetic valve.
- Magnetic valve control can drive magnetic valves up to 7W.

NAME	DATE	DRAWN	CHECKED
JJJ	14.3.2008	JJJ	JJJ
ENG APPR			
MGR APPR			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS ANGLES °XXX			
TITLE		SIZE	REV
Magnetic valve connectors		A2	
DPTOLEVEL		SCALE	WEIGHT
Dy ART-Advanced...			SHEET 1 OF 1

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED

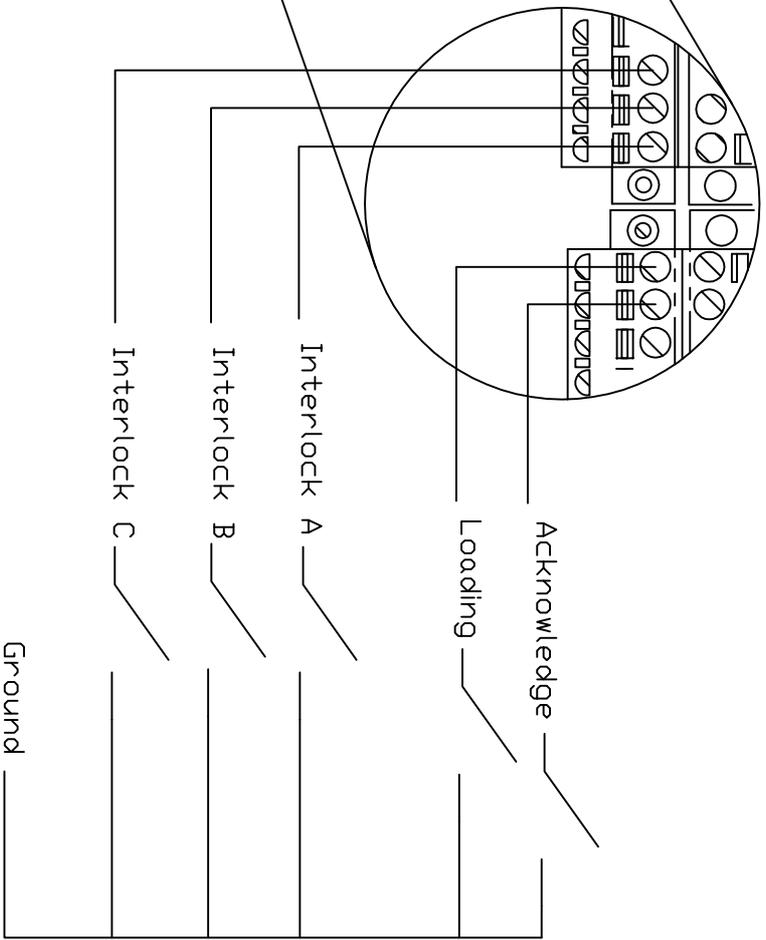
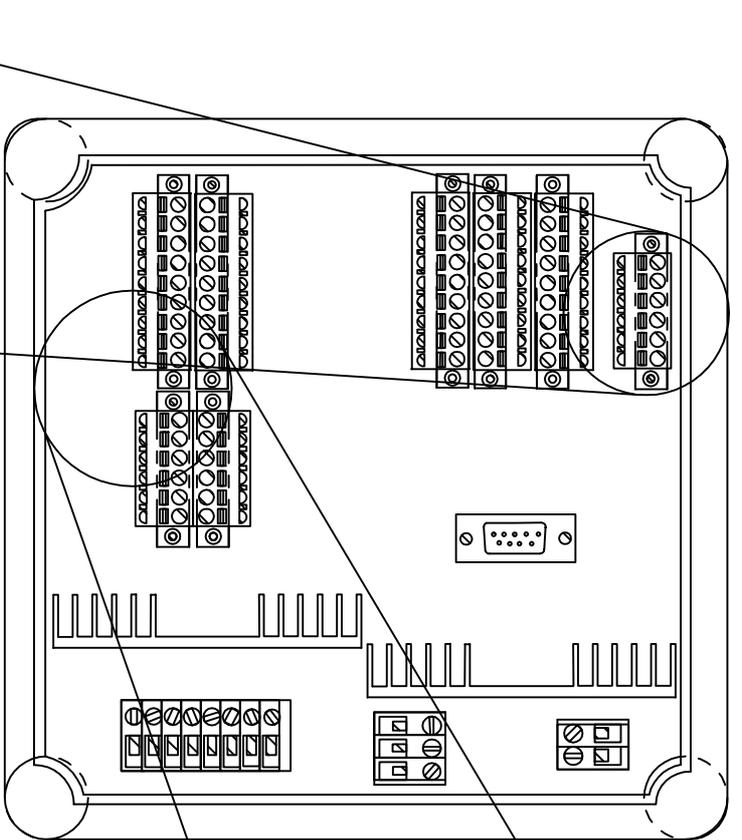


Note

- I-current is mainly designed for Optolevel led and future Optolevel product releases.
- IMPORTANT! Use only Gateways GND. Even if the current is limited this connection is meant to be used with Gateway ground.

NAME	DATE	OPTOLEVEL OY ARTI-Advanced...	SIZE	TDWG NO	REV
DRAWN JJJ	14.3.2008		A2		
CHECKED		TITLE	I-Currents		
ENG APPR		MGR APPR			
<small>UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS ANGLES °XXX</small>					
2 PL. XXX 3 PL. XXXX		SCALE:	WEIGHT:	SHEET 1 OF 1	

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED



Notes

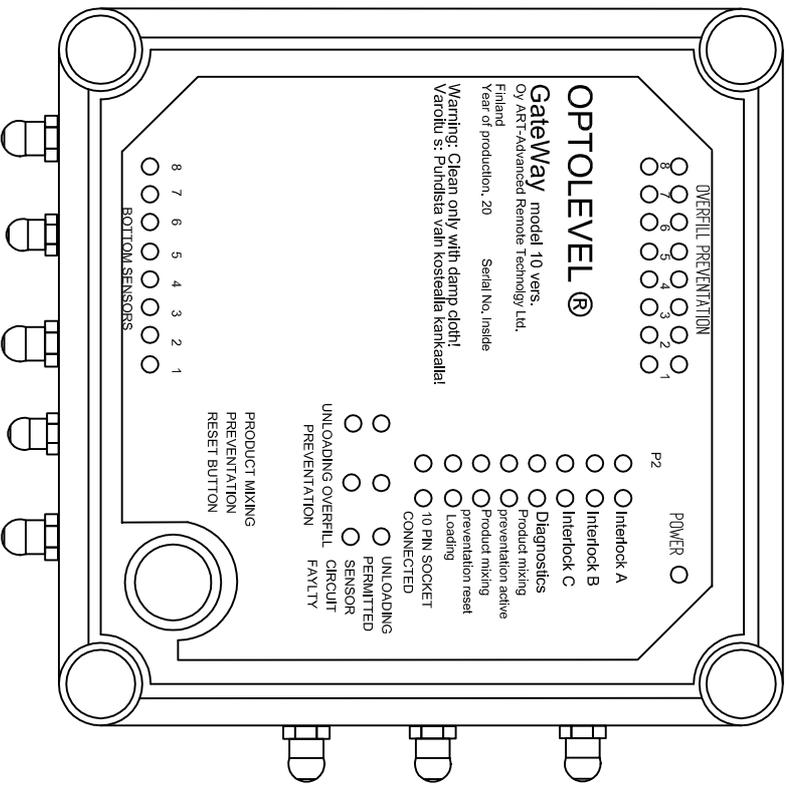
- In which state of the interlock switch is active can be configured with the software. Circuit remains the same.

IMPORTANT

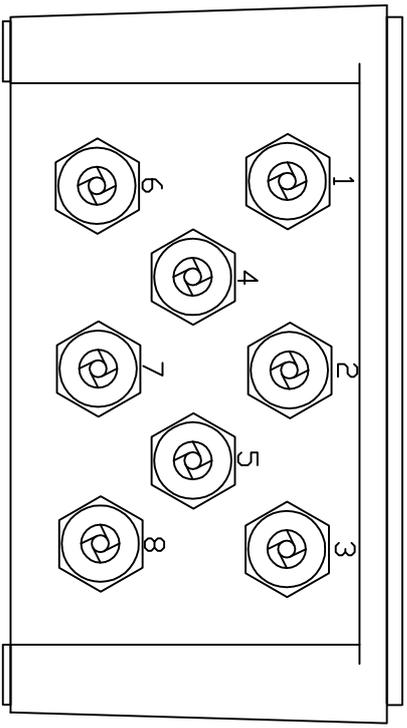
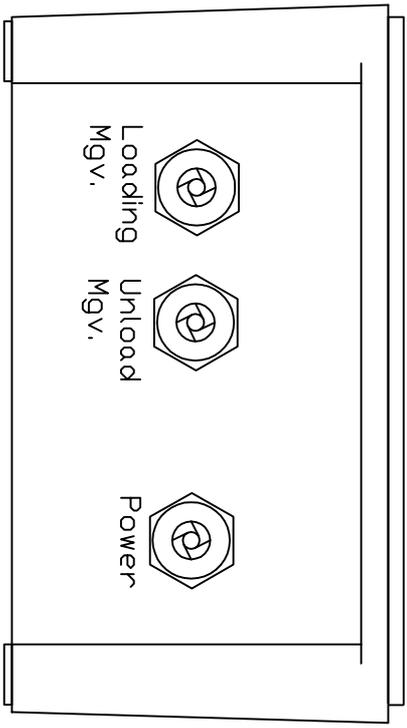
Do not connect grounding to anywhere else than in Gateway grounding sockets.

NAME	DATE	PTOLEVEL	
DRAWN	JJU	1432008	DY ART-Advanced...
CHECKED			
ENG APPR			
MGR APPR			
UNLESS OTHERWISE SPECIFIED		SIZE	
DIMENSIONS ARE IN MILLIMETERS		A2	
ANGLES ±XX°		TWO V.D.	
2 PL ±XXX.3 PL ±XXXX		SCALE	
		WEIGHT	
		SHEET	1 OF 1

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED

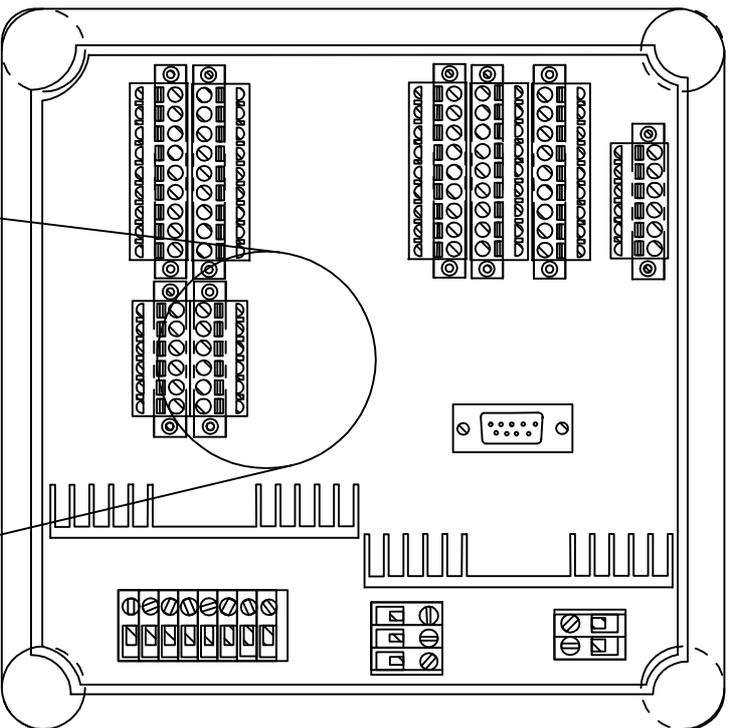


- Notes
1. DFP sensors & P2 sensors(multiwire 17)
 2. Bottom sensors(multiwire 9)
 3. Optic socket(multiwire 5)
 4. Thermistor sockets(multiwire 6)
 5. Interlocs, loading, (acknowledge multiwire 5)
 6. Unload DFP(multiwire 6)
 7. 24Vi currents (multiwire 8)
 8. CAN-bus (multiwire 4)

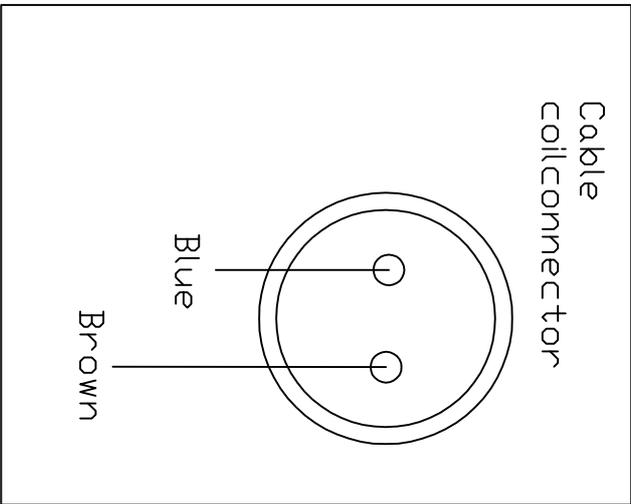
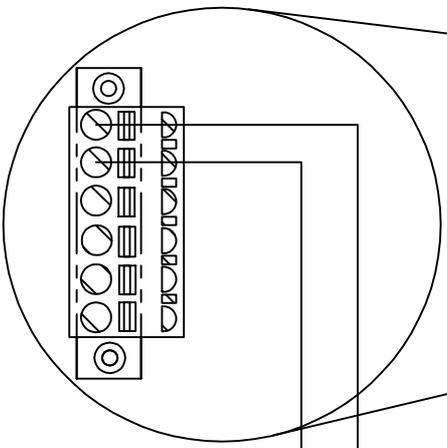


DRAWN	NAME	DATE	OPTOLEVEL	
JJU	JJU	18.3.2008	OJ ART-Advanced...	
ENG APPR			TITLE	
MGR APPR			GateWay v10.2 Inlets	
UNLESS OTHERWISE SPECIFIED			SIZE	DWG NO
DIMENSIONS ARE IN MILLIMETERS			A2	1
ANGLES °XXX°			SCALE:	WEIGHT:
2 PL. XXXX 3 PL. XXXX				SHEET 1 OF 1
				REV
				1

REV	DESCRIPTION	DATE	APPROVED



Blue
Brown



Notes

- This connection has no polarity so it can be connected to the cable coil either way.
- **IMPORTANT!** Use certified or suitable cable coil. Connection resistance can't be over 10 Ohm. Used cable must be flexible, oilproof and tolerate low and high temperatures.

NAME	DATE	DP TITLE	EVEL
JJJ	13.3.2008	Dy ART	Advanced...
CHECKED			
ENG APPR			
MGR APPR			
UNLESS OTHERWISE SPECIFIED			
DIMENSIONS ARE IN MILLIMETERS			
ANGLES °XXX°			
2 PL. XXX 3 PL. XXXX			
SCALE:	WEIGHT:	SHEET 1 OF 1	
SIZE	DWG NO	REV	
A2			
TITLE: Unloading DFP			

Assembly instructions for the ATEX-connector,
heat shrinkable tube and the cable tie

Along with the connector delivery there comes a
heat shrinkable tube, which should be shrinked
on top of the joint of the connector and cable

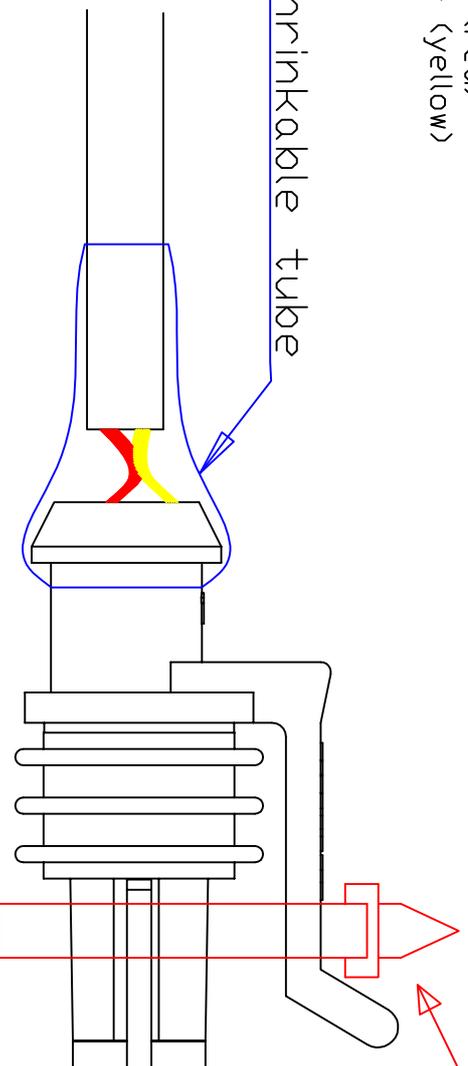
- While placing the heat shrinkable tube in its place, you should leave
some slack on the cable. This because if there is strain focused on the
cable then the shrinkable tube will absorb part of it and the connection
won't be compromised.

Sensor connector instructions:

1 = + (red)

2 = - (yellow)

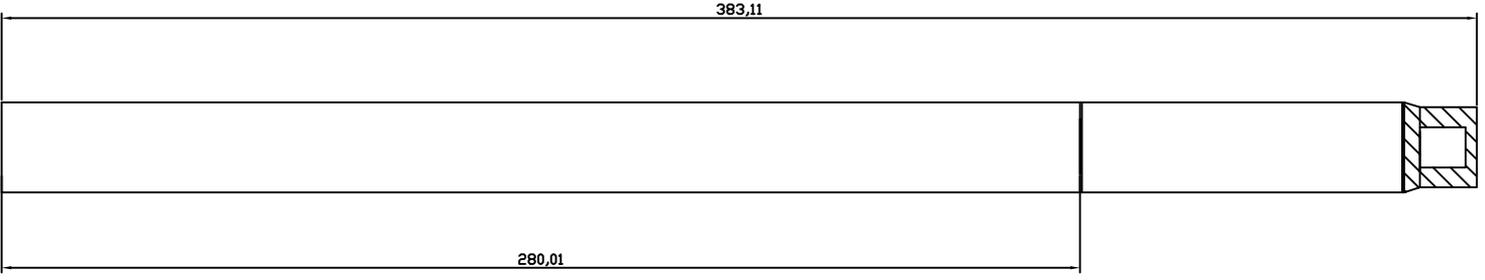
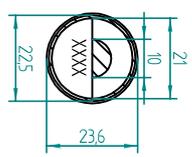
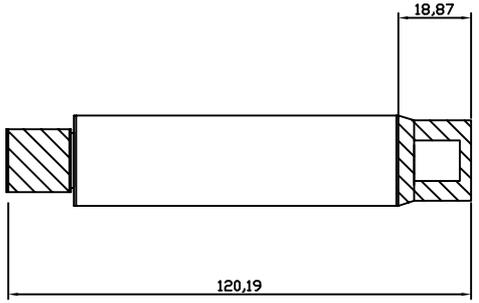
Heat shrinkable tube



Cable tie

After the male-connector is put together with the
female-connector, backup the connection with the
cable tie.

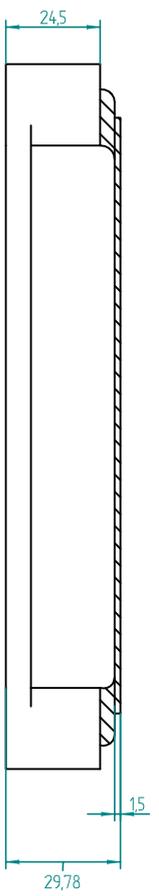
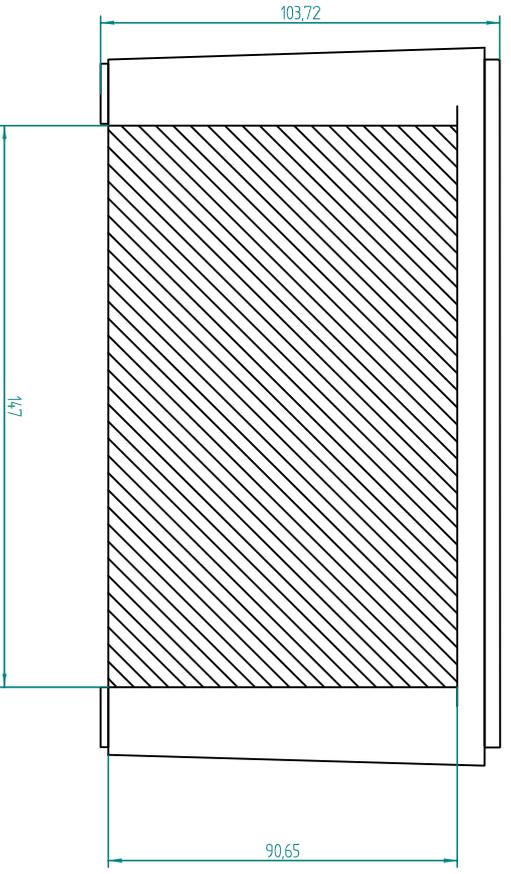
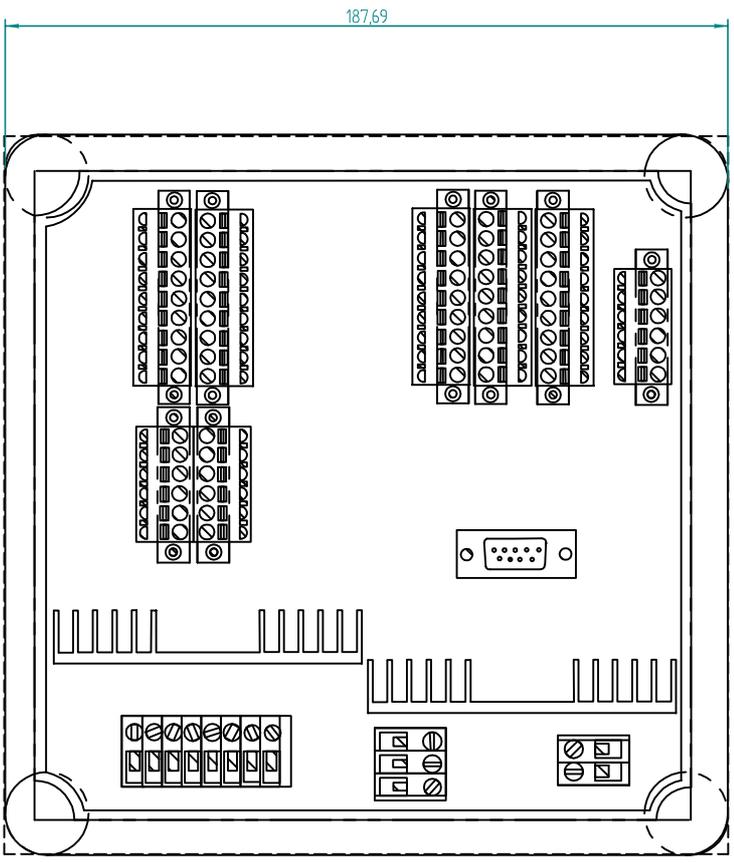
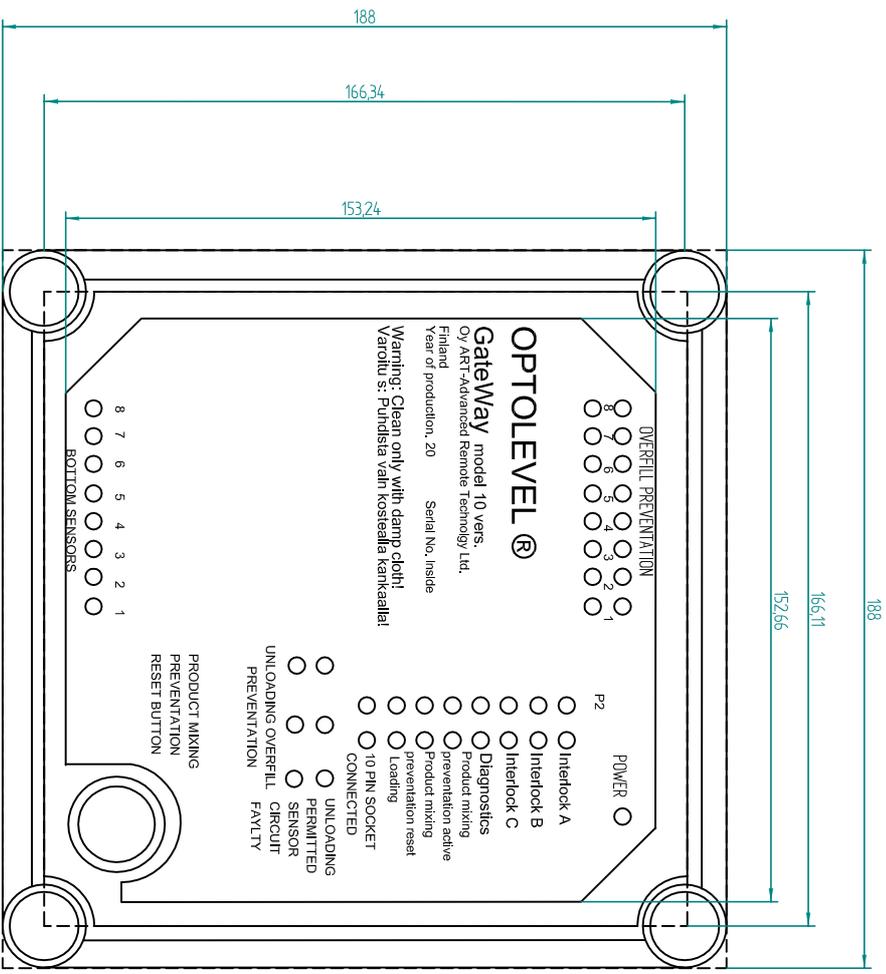
REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS ANGLES ±XX° 2 PL ±XXX.3 PL ±XXXX	SCALE:	WEIGHT:	SHEET 1 OF 1
NAME: JJJ	DATE: 14.3.2008	DRAWN BY: ART-Advanced...	
ENGINEER: MGR APPR		TITLE: Mechanical drawings of Dptolevel Sensor	
		SIZE: A2	REV:

REV	DESCRIPTION	DATE	APPROVED

REVISION HISTORY



NAME	DATE	DRAWN	CHECKED	MGR APPR	TITLE
JJU	11.3.2008				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS ANGLES °XXX°					
SCALE:	WEIGHT:	SHEET 1 OF 1			

NAME	DATE	REV
JJU	11.3.2008	1

TITLE	SIZE	DWG NO	REV
GateWay v10.2 Mechanical drawings	A2	1	1

OPTOLEVEL
Oy ART-Advanced...

GateWay v10.2 Mechanical drawings