53430


EUROLUBE
OK
ALARM
STOP
TANK 1
TANK 2
TANK 3
TANK 4
LAMP TEST
LUBE-Master
Eurolube Equipment AB
www.eurolube.com

1. Introduction

The LUBE-Master TSM module, (**T**ank **S**urveillance **M**odule), is used to control pumps through discrete level sensors. A TSM can be used both for fresh and waste oil tanks, stand-alone and in an LUBE-Master Monitoring system.

The TSM (53430) is based on an LUBE-Master TCM (53408) with a TSM lid (2030311).

NOTE! To use it in an LUBE-Master monitoring system check the Installation manual, TCM Manual and WinTools manual.

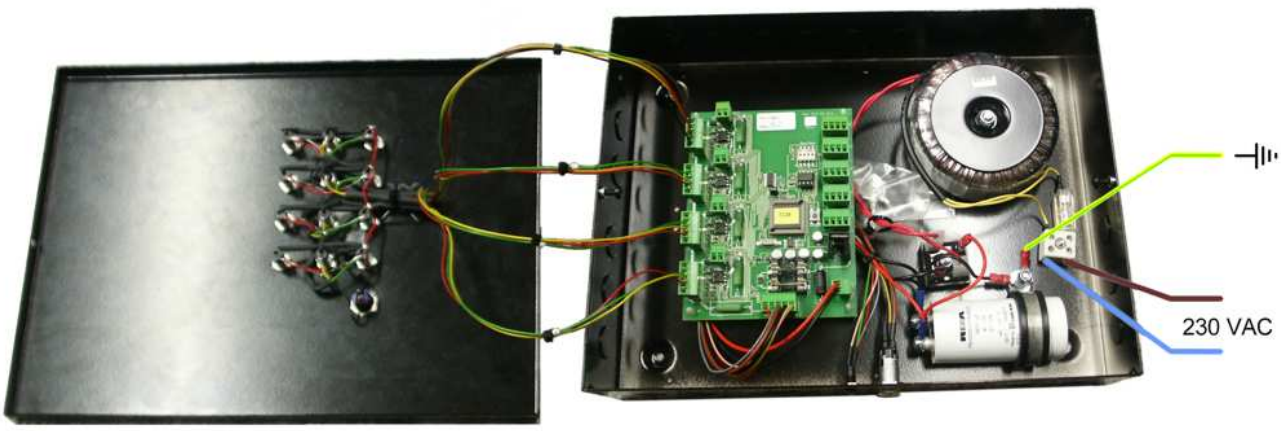
2. Mechanical installation

The TSM is delivered mounted in a metal box with power supply. On the lid there are control lamps and a lamp test button.

The TSM is mounted on a wall or other suitable place using the four-ø5 mm holes in the bottom corners of the box. Preferred orientation is key-switch downwards.

3. Mains Electric installation

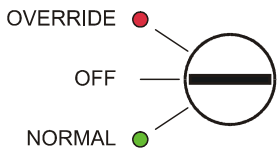
The power supply should be connected to mains 230VAC in a proper way following valid rules.



Eurolube Equipment AB recommends that the connection be done through a 2-pole working switch.

4. Key switch

The TSM has a key switch that has three positions.



"OVERRIDE" position activates all four control outputs. This can be used to prime the system or in case of some failure.

"OFF" position deactivates all four control outputs. This is used to shut the system down during nights or holidays to reduce the risk of leakage.

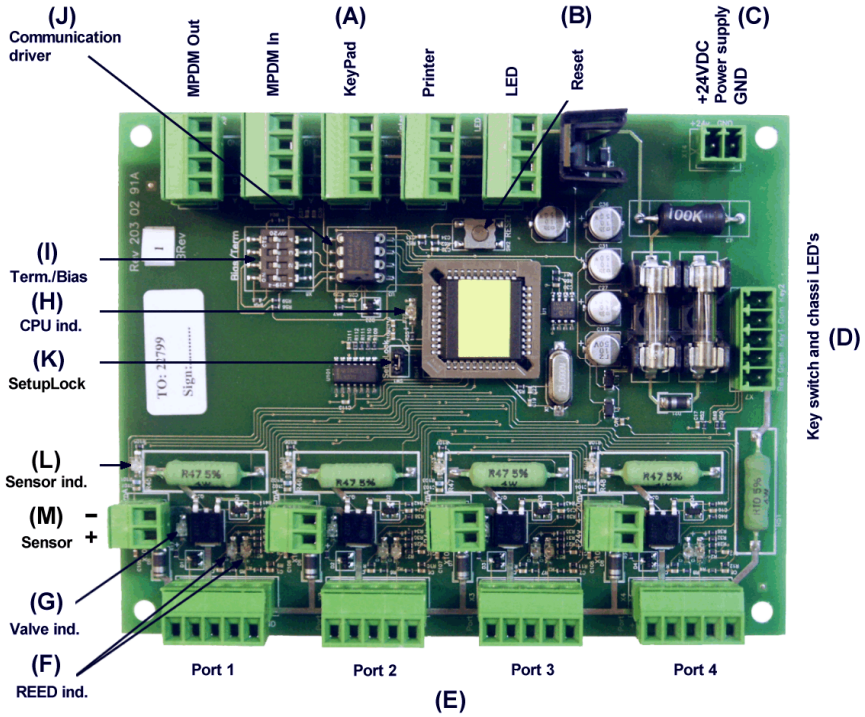
"NORMAL" position should be used to let the input signals activate their respective control output. This position is used during work hours.

The key can be removed or inserted in all three positions.

The connector **(D)** on the TSM card is used for the key switch and chassis key position diodes.

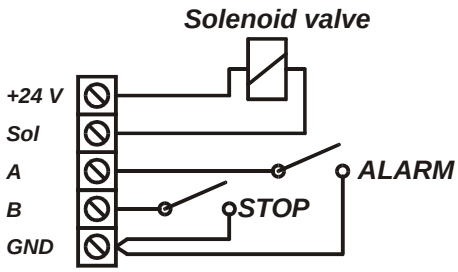
5. Card connectors

The TSM card has a number of connectors with different purposes.



5.1. Tank control connectors (Ports)

There are four connectors **(E)** market +24 V, OC, A, B and GND, one for each pump/tank. Solenoid valves and level sensors are connected to these connectors.



"A" of a TSM port is connected to "order oil/emptying" of the level sensor.

"B" of a TSM port is connected to "Stop level" of the level sensor.

"GND" of a TSM port is connected to common of the level sensor.

"+24V" of a TSM port is connected to one of the terminals of a solenoid valve and "Sol" is connected to the other.

TIP! **If a TSM is used for a tank containing flammable liquid it could be necessary to use an EX protection.**

There are two diodes **(F)** for every port. These indicate the status of entry points A and B, the level in the tank.

One diode **(G)** on each port indicates if the solenoid valve is open or not.

5.2. LUBE-Master communication connectors.

It has five connectors **(A)** for the LUBE-Master communication. More information about these connectors can be found in the LUBE-Master TCM manual

5.3. Miscellaneous

The RESET-button **(B)** can be used to reset the module or reset the module address. Power supply is connected to the connector **(C)**.

NOTE! **Check polarity, GND is closest to the hole!**

If the diode **(H)** is flashing the module is operational and working properly. A steady light or completely off indicates a problem.

DIL switches for termination and BIAS are located at **(I).** For a stand-alone TSM all four should be in **ON** position.

(J) Shows the position of the replaceable communication driver. The **SetupLock** jumper at position **(K)** has no function for a TSM.

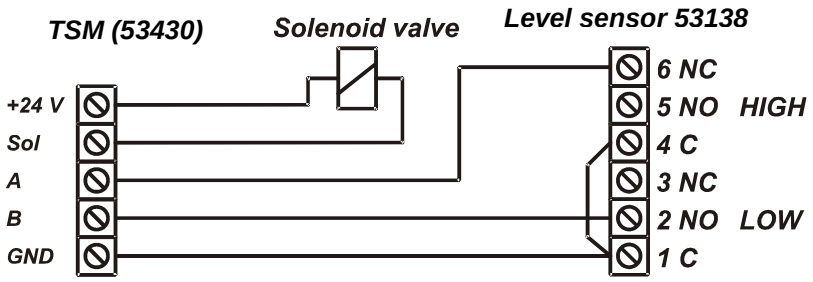
A LED **(L)** shows if an analogue sensor is detected or not, lit if detected. The analogue sensors are connected to the 2-pole connectors marked **(M)**. The polarity is marked on the PCB.

6. To connect discrete level sensors 53132/138/171 and solenoid valves

The examples in this chapter are primarily intended for 53430 in stand-alone use so no configuration of the TSM is needed. If the TSM is used together with an LUBE-Master system see also TCM (53408) manual.

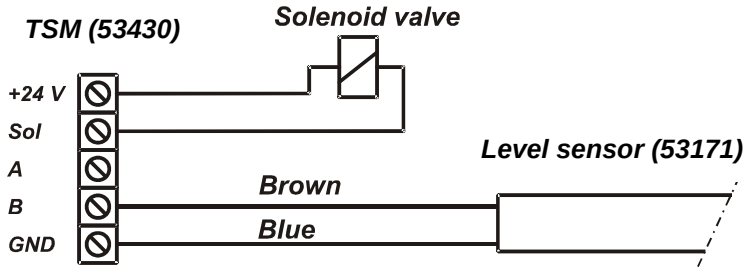
6.1. Fresh oil tank, 53138 (2-Levels)

To achieve a proper function, that is the pump is on only if there is enough oil in the tank, the following connection should be made. Sensor must be active closed.



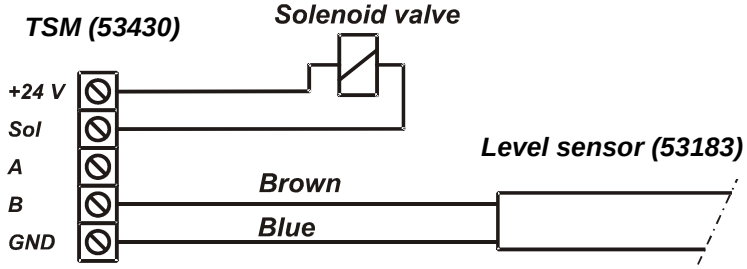
6.2. Fresh oil tank, 53171 (1-Level)

To achieve a proper function, that is the pump is on only if there is enough oil in the tank, the following connection should be made. Sensor must be active closed. To achieve this remove the lower clip on the sensor and turn the floater upside-down and put the clip back. Verify the function and trim it by moving the clips if necessary. The floater is a little tapered and the small diameter should then be down.



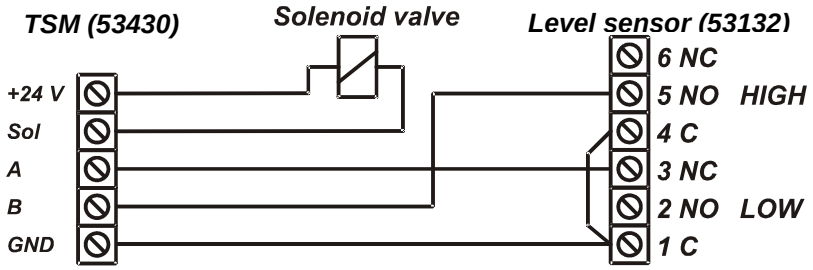
6.3. Fresh fluid, 53183 (1-Level)

To achieve a proper function, that is the pump is on only if there is enough fluid in the tank, the following connection should be made. Sensor must be active closed. To achieve this remove the lower clip on the sensor and turn the floater upside-down and put the clip back. Verify the function. The floater is a little conic and the small diameter should then be up.



6.4. Waste oil tank, 53132 (2-Levels)

To achieve a proper function, that is the pump stops if the physical tank is full or if the sensor is disconnected, the following connection should be made. Sensor must be active closed.



6.5. One TSM port controls a number of pumps

It is possible to control several pumps with only one TSM control port that is all pumps starts if the level sensor says that it should. To do this the current sum of all solenoids has to be calculated. If it is below 1A one TSM port can be used. If it is over 1A 2 or more ports must be used or a relay has to be used.

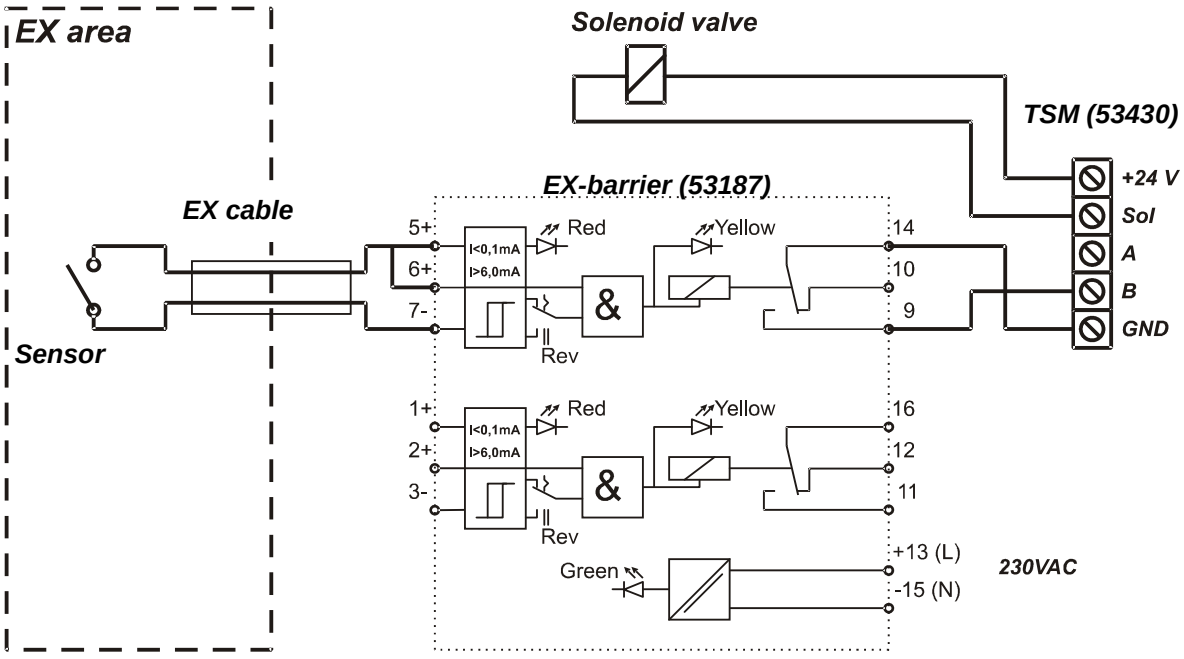
7. EX-barrier 53187

In some countries an EX-barrier is needed between the level sensor and the tank module if the liquid is classed as flammable. For this purpose the EX-barrier 53178 and a special EX approved cable can be used.

The EX-barrier, the solenoid valve that controls the air to the pump and the tank module should be placed outside the EX-classed area. The EX approved cable should be used to connect the level sensor on the tank inside the EX-classed area with the EX-barrier outside the EX-classed area.

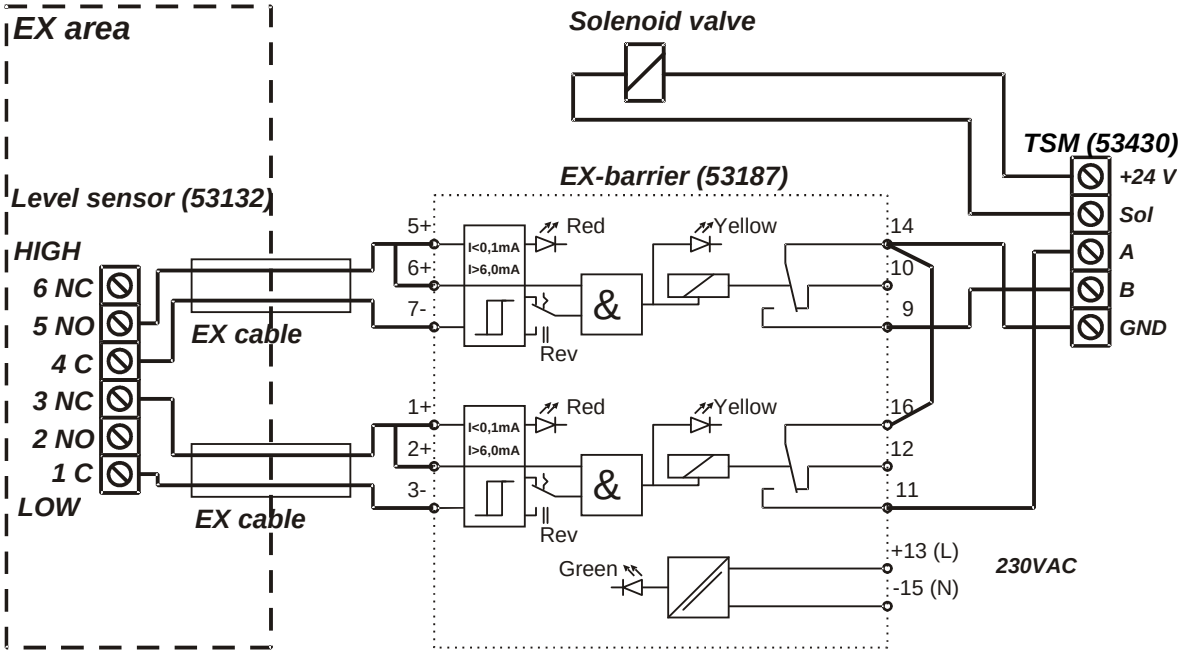
7.1. Connecting a fresh oil tank 53171/53183 (1-Level).

To achieve a proper function, that is the pump starts only if there are enough oil in the tank, a dispense point is open and the sensor works properly, the following connection should be made.



7.2. Connecting a waste oil tank 53132 (2-Levels)

To achieve a proper function, that is the pump stops if the physical tank is full or if the sensor is disconnected, the following connection should be made. The EX function switches should be set in position I.

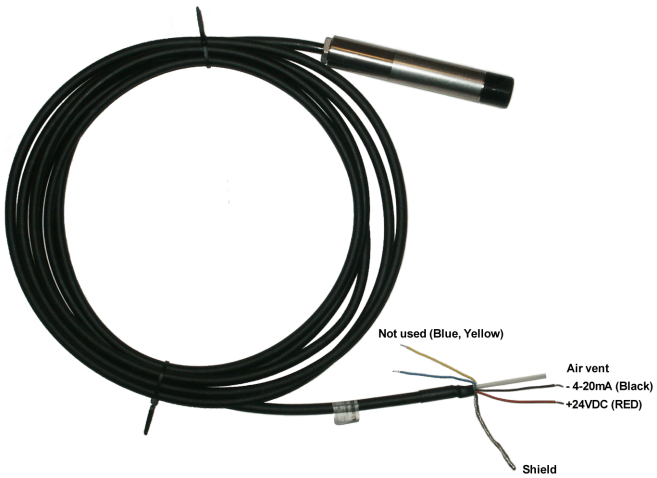


8. To connect analogue level sensor 53417

To be able to use an analogue level sensor with a TSM in stand-alone use a Keypad (53401) or a LED (53404) must be used to show tank level and a PC must be used to configure the port. The PC is not needed after configuration is done.

The four analogue inputs on the TSM supports any standard industrial 2-lead / 4-20mA / 24VDC sensors. To connect sensors a 2-pole connector is used.

The submergeable pressure based level sensor 53417 is a robust sensor that can be used with good accuracy for tanks with a height of 1 – 5 meters. Max height depends on density of fluid. The measuring resolution for a TSM with a 53417 sensor is 4 mm for water and about 4.5 mm for mineral oil.



Connect the red wire to +24VDC and the black wire to Sense. +24VDC and Sense are printed on the PCB.

If the sensor cable (6.5 m) is to short to reach the TSM it can be lengthen using a standard 2-lead wire

with copper area of 0.5 mm2 for each lead. For this purpose use the by-packed connection box.

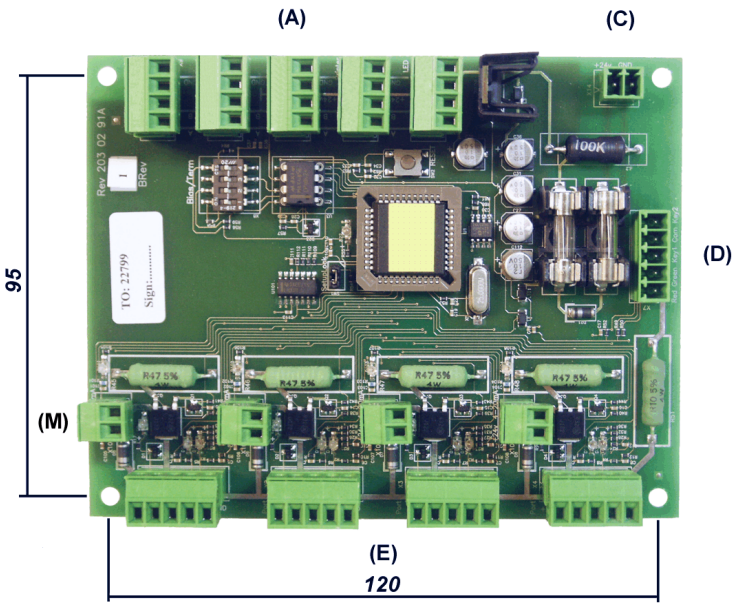
It is not necessary to use the shield to obtain a good signal because the signal is current based. The shield can be used for protection grounding purposes if needed.

Observe! – It is important that the transparent tube is not blocked and that the humidity protection filter is used.
A blocked tube will cause measuring failure.
Not using the humidity protection could cause sensor malfunction due to corrosion caused by condensed water.

Observe! To use analogue sensors an LUBE-Master keypad (53401) or LED (53404) is needed to show the tank volume.

9. Technical specification

Net ports:	5 LUBE-Master ports **(A)** for data communication, 2 without +24VDC.
Discrete level inputs:	4 **(E),** for one or two levels. Switch or active signal max 50 V. Supports reorder and stop set-up for both fresh and waste oil.
Analogue level inputs:	4 **(M)** 4 - 20mA, 24VDC with 10-bit A/D-converters.
Control outputs:	4 **(E)** for solenoid valve 24 VDC max 1,25 A. Closes after about 30 s when short circuited, this is logged in the database.



Other:	RISC-based microprocessor EEPROM, 64 KB. Connector **(D)** for 3-pos key switch. Connector **(C)** for 24 VDC 5A power supply. SetupLock jumper **(F)**, not used.
Power supply:	Primary 230 VAC 500mA Secondary 24 VDC 5 A
Max current:	500 mA + 4x1.25 A for solenoid valves
Casing:	Strong black powder painted steel box
Outer measures:	303 x 228 x 65 mm.
Fitting:	4 x ø5mm CC = 250 x 175 mm
Weight:	3,9 kg