

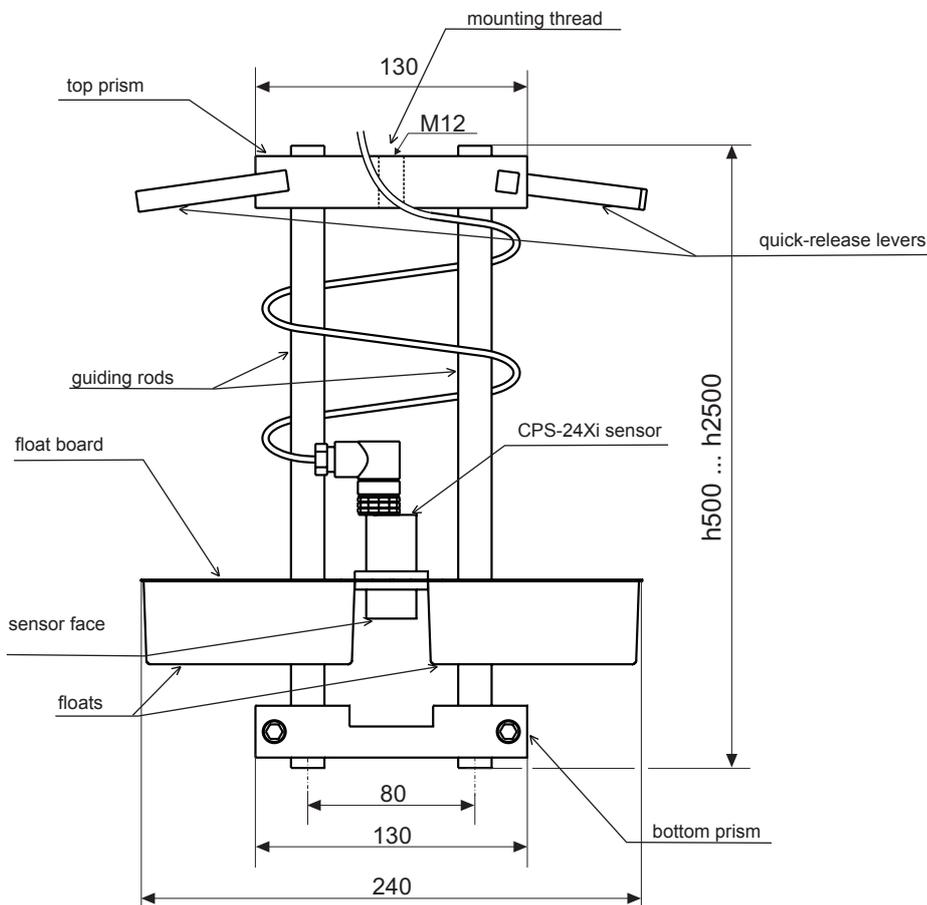
FOR DETECTION OF LEAKAGE OF PETROLEUM AND PETROLEUM PRODUCTS IN BOTH EMPTY AND WATER FILLED TRAP RESERVOIRS

- The unit is intended for an assembly with CPS-24Xi-C-RO capacitive sensor and NSSU-811 SP2 assessment unit with a relay output and power supply voltage of 230 V and 24 V AC/DC
- Float guiding rods of any length (max. 2.5m)



FS-4 Petroleum leakage float system is intended for detection of leakage of petroleum and petroleum products in trap or protection reservoirs. It consists of two guiding rods and a float on which CPS-24Xi-C-RO sensor and NSSU-811 spark resistant assessment unit are installed. The float has been designed so that the sensor face can be submerged under the medium surface. If the sensor face is in contact with water or with the bottom steel prism (when the reservoir is empty), then the sensor is activated. If the sensor face is in contact with petroleum or petroleum products, then the sensor is deactivated, i.e. it is put in an emergency status. The capacitive sensor will be electrically connected to a specially adapted NSSU-811 evaluation unit with a relay output. It is possible to select a unit type with power supply voltage either 230 V AC or 24 V DC.

DIMENSIONAL DRAWING



BASIC TECHNICAL SPECIFICATION

Range of ambient operational temperatures	-20 ... +60°C, the float should be protected against freezing (see Maintenance and operational conditions)
Range of the sensed medium densities	800 ... 950 kg/m ³
Minimum layer thickness of medium for detection - on water level - in empty reservoir	5 mm 25 mm
Cable	PUR 3x0.14 mm ² (brown: + pole, white: - pole, green: not used)
Float weight (board + 4 floats + CPS-24Xi sensor)	600 g
Working area	With spark resistant power supply unit NSSU-811-230V(24V)-R SP2, complete float system zone 1
Other parameters	see manual for CPS-24Xi sensor see manual for NSSU-811 sensor

MATERIALS USED

part of float system	material
Float board	stainless steel no. 1.4301 (AISI 304)
Floats	PP plastic
Guiding tubes	stainless steel no. 1.4301 (AISI 304)
Prism (both bottom and top)	stainless steel no. 1.4301 (AISI 304)

MECHANICAL DESIGN

The float carrying the sensor slides along two guiding rods. These rods are joined with two stainless steel prisms. The bottom prism is used for sensor activation if the reservoir is completely empty. It is necessary to adjust its height so that the sensor face could lean against it if the reservoir is empty. The top prism with a thread can be used for mounting of the complete structure. The sensor power supply cable is wound on the guiding rods.

INSTALLATION INSTRUCTIONS

1. Prepare vertical mounting in the top structure of the reservoir (in lid, in steel fitting, etc.) using a screw with an M12 thread.
2. Loosen the top prism of the float system using quick-release levers in order to achieve free movement along the guiding rods.
3. Insert the float system into the reservoir perpendicularly so that the guiding rods could reach the bottom.
4. Move the top prism in the point where mounting is prepared and attach it to the reservoir top structure using the screw.
5. Check whether the guiding rods are in contact with the reservoir bottom and then fix the top prism by means of the quick-release levers to the guiding rods.

ELECTRIC CONNECTION

The cable wound on the guiding rods begins at the float where it is connected to the sensor connector. The other end of the cable is to be connected to NSSU-811 SP2 spark resistant power supply unit using the following method: the brown wire of the cable connects to the terminal (5) while the white wire connects to the terminal (6). The terminals (9) and (13) are used for connection of power supply voltage (AC/DC) and the terminals (10), (11) and (12) are output relay contacts. A wiring diagram is illustrated below.

CPS-24Xi-C-RO

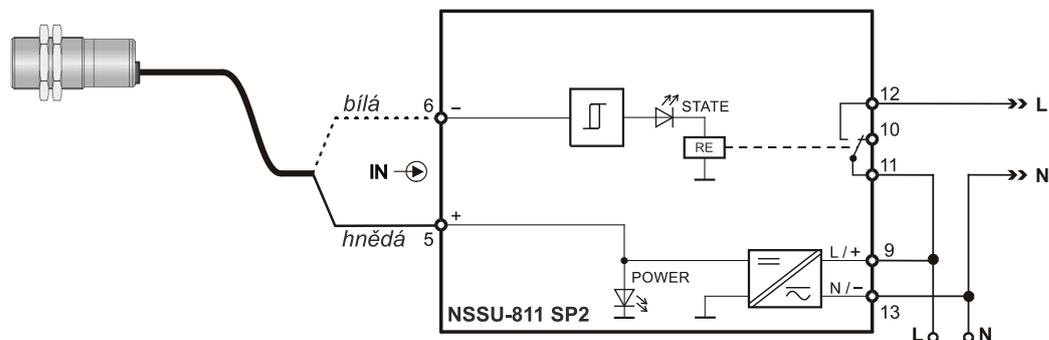


Diagram of float sensor electric connection



Napájecí zdroj
provedení 24 V nebo 230 V



Electric connection may be carried out only if power supply is disconnected!

SENSOR OPERATION

The FS-4 float system can operate in 3 modes (modes 1 and 2 are operational while mode 3 is for testing):

1. Detection of petroleum or petroleum products in a reservoir which contains no water

a) *Reservoir is dry - there is no liquid under the float*

- the float is lowered on the bottom - the sensor face is in contact with the bottom steel prism and the sensor is *activated - closed (LED is on)*.

b) *Reservoir is flooded with petroleum (emergency situation)*

- the float is buoyed with petroleum - the sensor face is submerged under petroleum surface and the sensor is *deactivated - open (LED is on)*.

2. Detection of petroleum or petroleum products in a reservoir which contains water

a) *Reservoir is flooded with water*

- the float is buoyed with water - the sensor face is submerged under water surface and the sensor is *activated - closed (LED is on)*.

b) *Reservoir is flooded with water and petroleum is present on water surface (emergency situation)*

- the float is buoyed with water - the sensor face is submerged under surface It is separated from water with a layer of petroleum on water surface. Sensor is *deactivated - open (LED is on)*.

3. Test of operation

a) *The float rests on the bottom*

- the sensor face is in contact with the bottom steel prism and the sensor is *activated - closed (LED is on)*.

b) *The float is supported by the operator*

- the sensor face is lifted and the sensor is *deactivated - open (LED is on)*.

NSSU-811 SP2 assessment unit is a special variant with output time delay (filtration). The sensor must be closed (or open) for at least 10 seconds in order to allow output switch-over.

In non-emergency situation (cases 1 and 2), the LED on the sensor and the "State" LED on the unit are on. The relay contacts 11 and 12 on the unit are closed. The relay contacts 11 and 10 are open.

In emergency situation (cases 3, 4 and 5 or disconnected or broken cable to the sensor), neither the LED on the sensor nor the "State" LED on the unit is on. The relay contacts 11 and 12 on the unit are open. The relay contacts 11 and 10 are closed.

MAINTENANCE AND OPERATIONAL CONDITIONS

- Proper operation of the float system is guaranteed if the float system can slide freely on the guiding rods. When installing the float, it is necessary to ensure free movement of the float. Potential foreign materials which could block the float must be removed.
- It is necessary to keep the face of the CPS-24Xi sensor clean. It is necessary to check cleanness of the sensor face and clean it if necessary (e.g. with technical petrol) at regular inspections.
- The operator can check operation of NSSU-811 SP2 unit (green LED POWER and possibly orange LED according to the status of the sensor on the input is ON). Maintenance of the unit consists in removal of dust from the surface of the unit and checks of integrity of the housing and terminal blocks. If any visible defects are detected, notify the manufacturer or the distributor of the unit immediately.
- It is forbidden to make any modifications of the unit or interventions without a consent of the manufacturer. Potential repairs should be carried out only by the manufacturer or by an authorized service company. Mounting, installation, operating and maintenance of the unit should be carried out in accordance with these technical conditions and the provisions of the applicable standards for installation of electric equipment should be complied with.



The float should be protected against freezing in ice. There is a risk of damage (breaking) of individual floats or blocking of free movement. In winter months, it is necessary to lift the bottom prism on the guiding rods above the level of water which is usually present in reservoirs (it is also necessary to retain the area for float movement upwards). The sensor face will rest on this lifted prism in such case, however, individual floats will not be submerged in water - there is not a risk of them freezing.

METHOD OF IDENTIFICATION

- **FS-4** h
└─ Length of guiding rods (500 ... 2500 mm)
- **CPS-24Xi-C-RO** cable
- **NSSU-811-****-R SP2**
└─ Type: **230V** – 30...230 V AC/DC
 24V – 10...30 V AC (10...40 V DC)

EXAMPLES OF CORRECT IDENTIFICATION

FS-4 h1500, CPS-24Xi-C-RO cable 15m, NSSU-811-230V-R

(**h1500**) length of guiding rods 1500mm; (**15m**) length of cable wound on guiding rods; (**230V**) power supply voltage for spark resistant unit

NSSU-811 is 30...230 V AC/DC.

PROTECTION, SAFETY, COMPATIBILITY AND EXPLOSION RESISTANCE

CPS-24Xi

The level sensor is provided with a reverse polarity protection or short-term power supply over-voltage and against current overload or short-circuit on the output. Protection against hazardous contact is ensured through safe power supply voltage in accordance with ČSN 33 2000-4-41 standard. Electromagnetic compatibility (EMC) is guaranteed by compliance with ČSN EN 55022/B, ČSN EN 61326-1 and ČSN EN 61000-4-2 through 6 standards.

Explosion-proof design of CPS-24Xi has been verified by FTZÚ - AO210 Ostrava - Radvanice, Report No. FTZÚ 02 ATEX 0233X

NSSU-811 SP2

Connection to the electrical mains can be done only through a fuse or a circuit breaker (max. 16A). Electric equipment with protection class II. Electric safety in accordance with ČSN EN 61010-1 standard. Electromagnetic compatibility is guaranteed by compliance with ČSN EN 55022, ČSN EN 61000-6-2, and ČSN EN 61000-4-2, -3, -4, -5, -6 and -11 standards.

Spark resistance on the input terminals of the unit is in compliance with ČSN EN 60079-0 and ČSN EN 60079-11 standards. Explosion-proof design has been verified by FTZÚ-AO 210 Ostrava-Radvanice, Report No.: FTZÚ 04 ATEX 0136X.