ISO 9001
ISO 14001

Specification Sheet

TOA DKK

Oil on Water Monitor (S)ODL-12

Introduction

This instrument detects oil films formed on a water surface using laser technology. It is installed between 0.3- 2m above the water surface and detects oil presence using a reflected laser beam. This monitor provides a low maintenance, non-contact solution to oil on water detection and can detect oil at below visible traces. The Model SODL-12 is a certified explosion-protected version, suitable for hazardous locations. The Model ODL-12 is suitable for non-hazardous locations.

Features

- Non-contact monitor using laser technology.
- Can detect all types of film-forming oil with excellent sensitivity and fast response.
- Small floor area requirement. Installation in manholes is possible.
- Does not suffer from interference caused by substances floating on or suspended in the water.
- Field-proven — more than 500 units installed worldwide.
- Low maintenance requirements provide excellent cost of ownership advantages.

Sensor Specifications

Product Name:	Oil on water alarm.
Model:	SODL-12 (Explosion protected). ODL-12 (Non-explosion protected).
Measurement Object:	Floating oil film on water.
Measurement Method:	Reflectance of visible light.
Light Source:	He-Ne laser, light output 1mW.
Explosion Protection:	Model SODL-12: Flameproof explosion protected construction, certification No. 39379 (JIS d2G4). Meets with NEC Class 1, Group D, Division 1.

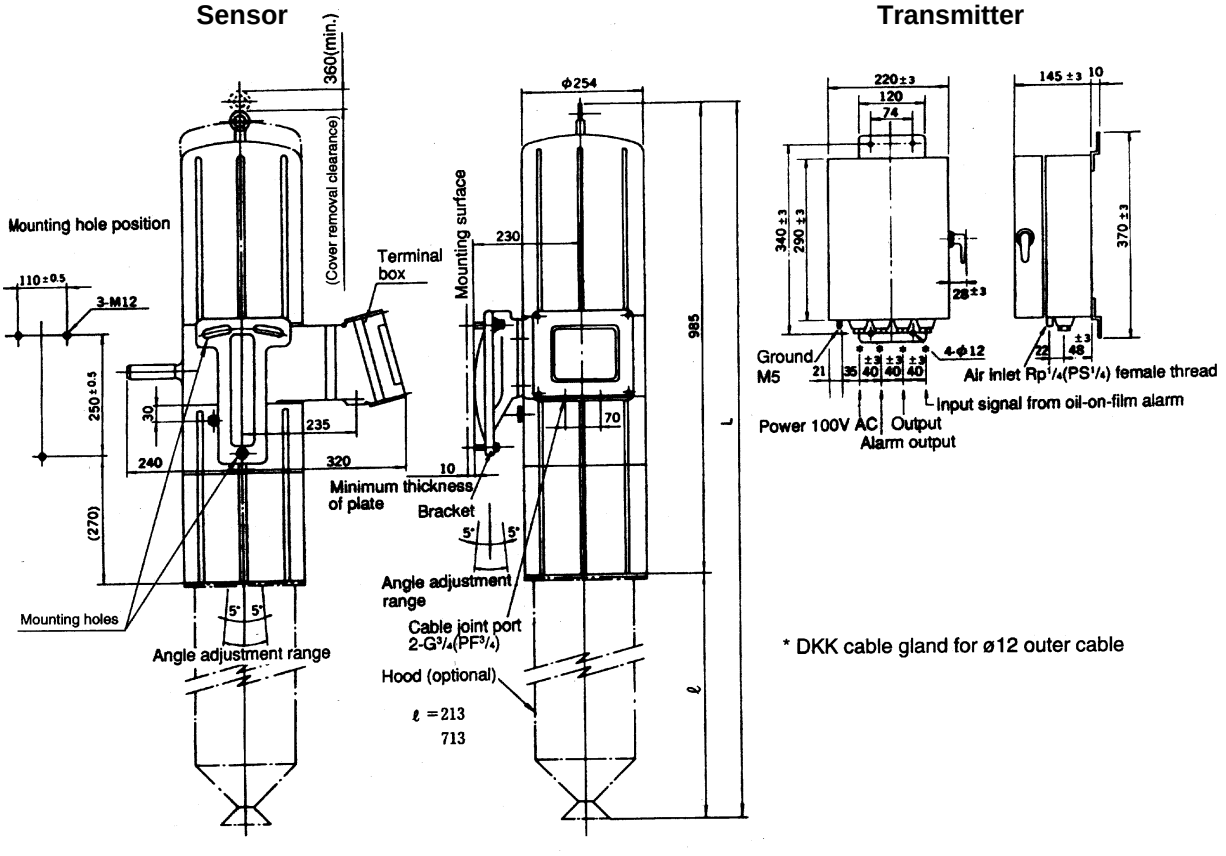
Ambient Temperature:	0-40 ºC.
Sample Temperature:	No freezing.
Output (Standard):	4- 20mA DC (max. load 600 Ohms).
Alarm Outputs:	High limit contact, contact rating 100V AC 0.5A (resistive load).
Power requirements:	100V AC ±10% or 110V AC ±10% 50/60 Hz.
Power Consumption:	Approx. 35VA.
Construction:	Frame mounted for outdoor installation.
Enclosure Material:	Corrosion resistant cast aluminum.

Dimensions (mm):	530(w) x 357(d) x 935(h).
Weight:	Approx. 55kg.
Surface Colour:	Metallic silver.
Installation:	To be installed on waterway wall, bridge, manhole or over ground. Above flood level.
Height Above Water Level:	0.3-2m for ODL-12. 0.3-1m for SODL-12. As short a distance as possible is recommended.
Related Equipment:	Bracket (with alignment angle adjuster). Mounting Rack (optional). Anti-vapour hood (optional). Support gantry and auto-height adjustment (optional).

Transmitter Specifications

Product Name:	Transmitter.
Model:	ZO-12.
Input Signal:	4-20mA DC.
Input Resistance:	250 Ohms.
Signal Processing:	(1) Peak hold time: 2.5/5/10/20/40/80 sec, 6 steps (switch selectable). (2) Span adjustment: Adjustable at 90% FS with heavy oil. (3) Lower limiter: ON/OFF switching. (4) Alarm setting range 0-100% FS.
Output (standard):	4-20mA DC (max. load 400 Ohms).
Alarm Contact Output:	SPDT (contact rating: 100V AC 0.5A, 24VDC 5A).
Power Requirements:	100/110V AC ± 10% 50/60Hz.
Power Consumption:	Approx. 10VA.
Dimensions (mm):	150(w) x 115(d) x 375(h).
Surface Colour:	Metallic silver.
Weight:	Approx. 4kg.

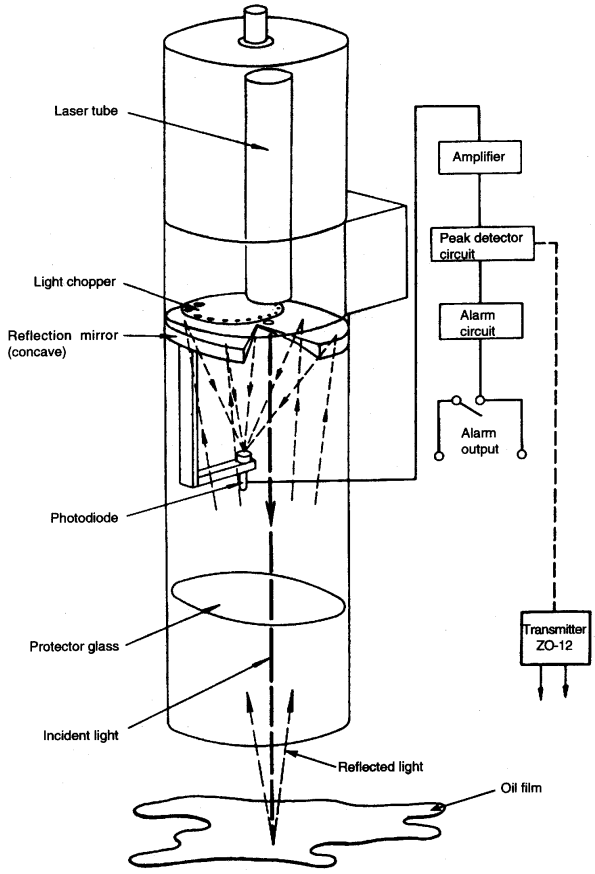
Outline & Mounting Dimensions



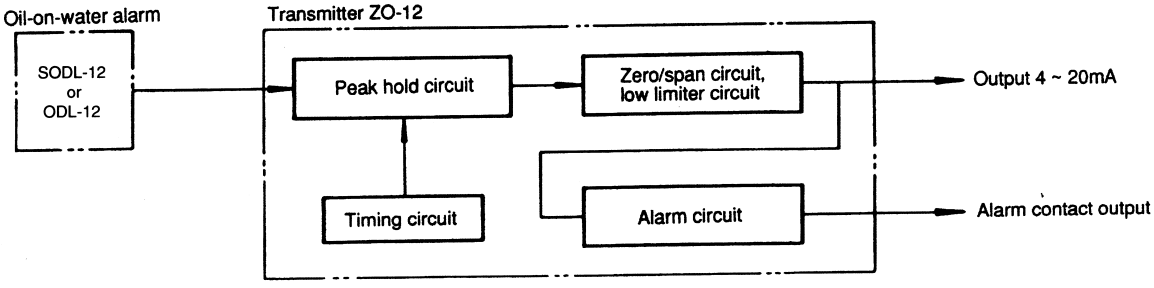
Principle Of Operation

The reflectance of an oil film is greater than that of water. From this property the presence of oil can be detected by applying a light beam of constant intensity to the water surface and then measuring the intensity of the reflected light.

A laser tube emits light at a perpendicular angle to the water surface. The laser beam passes through a hole in the centre of a concave mirror and strikes the water surface. Since the water/oil surface normally has ripples, the light is reflected in various directions from the incident point and strikes a large diameter (180mm) precision concave mirror which focuses the light onto a photodiode sensor located at the focal point. The focused light is then converted to an electrical signal. To remove the effect of interferences such as sunlight, the laser beam is pulsed using a chopper motor. The inner wall of this instrument is protected from irregular reflections and a solid, recessed glass plate at the bottom protects the concave mirror and sensor.
The pulsed photodiode output is sent to the peak detector via an AC amplifier and then to a peak hold circuit. When high peaks are continuously detected for a fixed period an alarm contact is activated. A 4-20mA output signal is coupled to model ZO-12 transmitter to drive a recorder (optional) and alarm device (optional) after further signal processing.

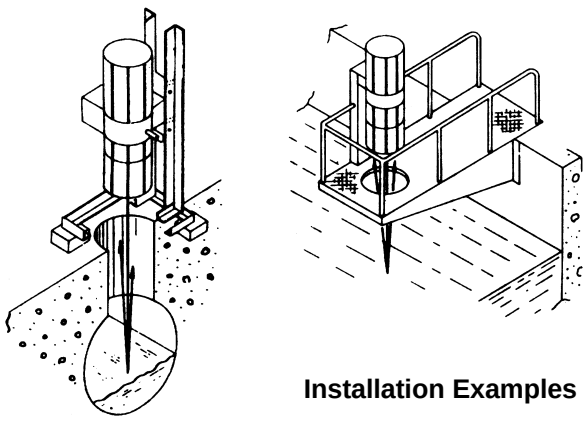


Block Diagram



Installation Recommendations

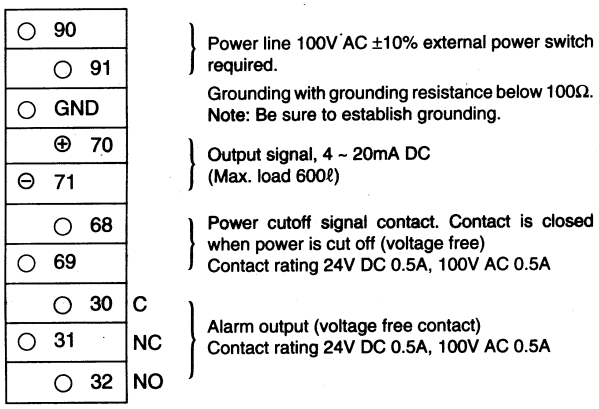
a. Install the analyser at a location where the water flows smoothly. Avoid turbulent water surfaces if possible.
b. Avoid installing the sensor at locations where vapours may rise due to high water temperature. If this is unavoidable, then an optional air purge system can be fitted to prevent condensation.
c. Install the sensor where the water level changes will be minimised. Additional measures such as providing a pit with overflow or automatic height adjustment system will be required for installations that have a very large water level variation.
d. Avoid locations where the sensor may be subjected to vibrations or mechanical shock.
e. Consideration should be given for safe and easy access during maintenance. A gantry or access ladder may be required depending upon installation conditions.



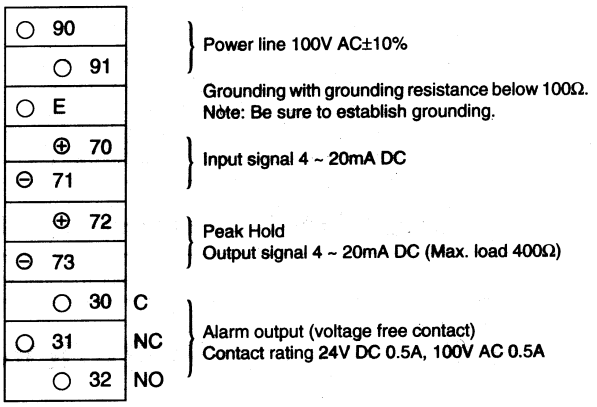
Installation Examples

Terminals

SODL-12
ODL-12



ZO-12



Product Code

ODL-12 (sensor), SODL-12 (sensor)

ODL12–1–□□□□□□
SODL12–1–□□□□□□

- Power source voltage
  - 1 ..... 100V AC
  - 2 ..... 110V AC
- Line frequency
  - 1 ..... 50Hz
  - 2 ..... 60Hz
- Output signal
  - 1 ..... 4 ~ 20mA DC
  - 2 ..... 0 ~ 10mA DC
  - 3 ..... 10 ~ 50mA DC
  - 4 ..... 1 ~ 5V DC
  - 5 ..... 0 ~ 1V DC
  - 9 ..... Custom spec.
- Air curtain nozzle
  - A ..... None
  - B ..... Equipped
  - Z ..... Custom spec.
- Hood
  - 0 ..... None
  - 1 ..... Total length 213mm
  - 2 ..... Total length 713mm
  - 9 ..... Custom spec.
- Markings
  - 0 ..... Japanese (Standard)
  - 1 ..... English
  - 9 ..... Custom spec.

ZO-12 (Transmitter)

ZO12–O–□□□□□

- Power source
  - 1 ..... 100V AC 50/60Hz
  - 2 ..... 110V AC 50/60Hz
  - 9 ..... Custom spec.
- Input signal
  - 1 ..... 4 ~ 20mA DC
  - 9 ..... Custom spec.
- Output signal
  - 1 ..... 4 ~ 20mA DC
  - 2 ..... 1 ~ 5V DC
  - 9 ..... Custom spec.
- Construction
  - A ..... Indoor installation (Standard)
  - B ..... Outdoor installation
  - Z ..... Custom spec.
- Markings
  - 0 ..... Japanese (Standard)
  - 1 ..... English
  - 9 ..... Custom spec.

Caution Do not operate equipment before consulting instruction manual.

International Headquarters

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Specifications are for a typical system and are subject to change without notice.