



JQA-2894



JQA-EM0561
Nobeoka Office

OIL LEAK DETECTION SYSTEM

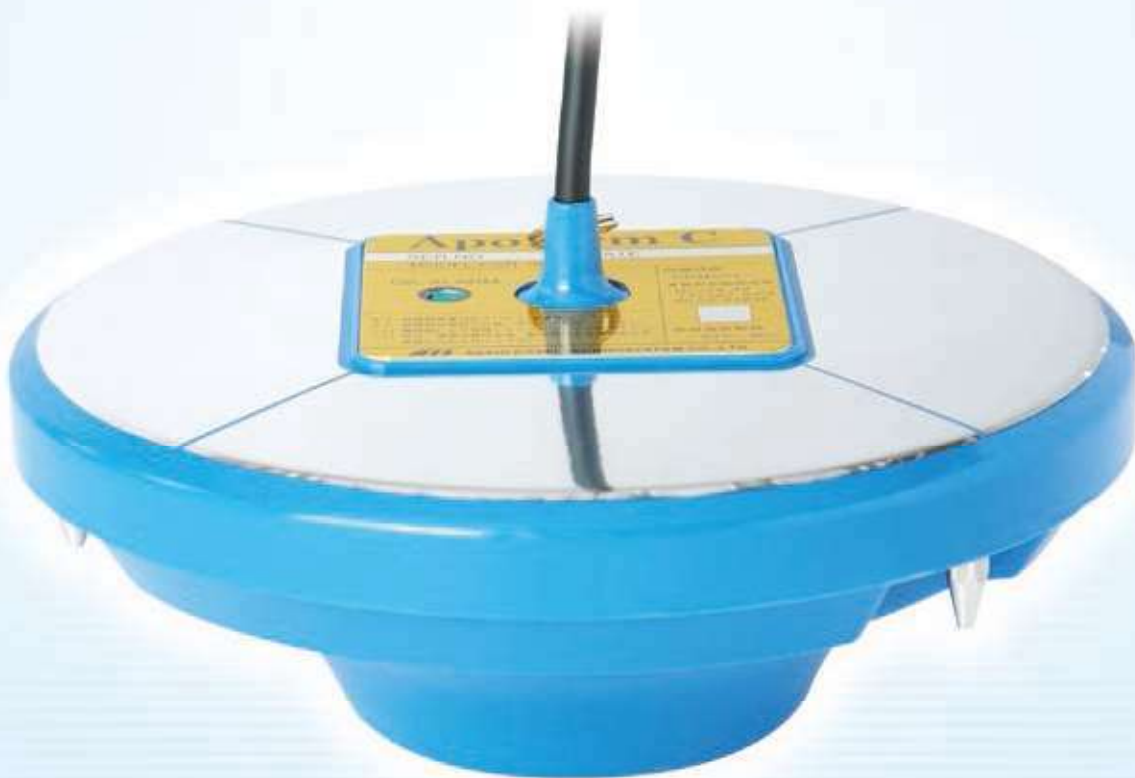
Apolarm™ C

CSR-3005E

Capacitance Sensor

AS-40E

Signal Converter

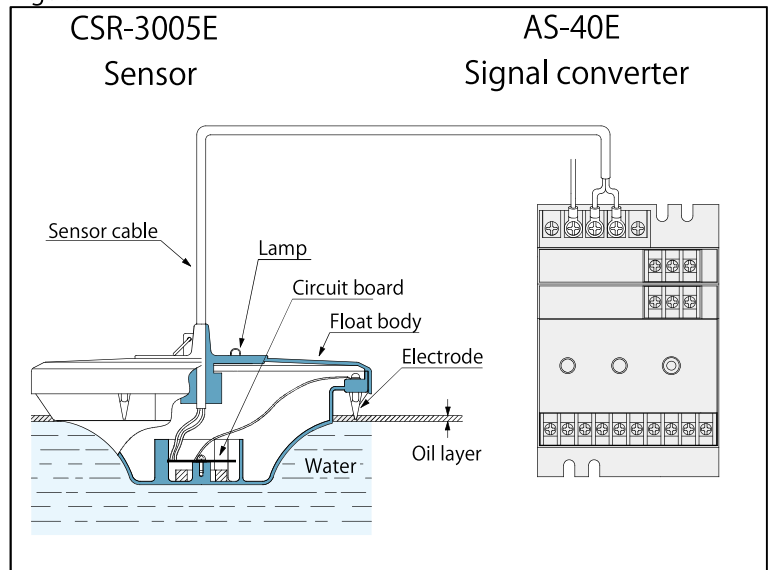


ASAHI KASEI TECHNOSYSTEM CORPORATION

The Apolarm™ C oil leak detection system comprises a hermetically sealed floating-body sensor (CSR-3005E) and an intrinsically safe signal converter (AS-40E) for power supply, signal conversion, and alarm activation. The CSR-3005 sensor circuit applies a high-frequency potential to three electrodes which project downward from the float into the water below.

If an oil layer forms on the water surface, and the electrodes thus project into oil rather than water, it effectively lowers the capacitance between the electrodes and ground. This change is detected, amplified, and conveyed from the sensor circuit as a signal current via the sensor cable to the signal converter, which then engages the oil leak alarm circuit.

Figure 1



Salient features

- Inherent operational reliability
 - Asymmetric float conformation at waterline, for stable function and operation.
 - Signal converter delay circuit, to prevent false alarms due to transient loss of contact with water surface.
 - Lower-body conformation and electrode positioning designed to prevent short-circuiting by sludge or slime deposits (Fig. 2).
 - Electrodes designed to prevent false alarms due to grease or grime adhesion (Fig. 3)
- Capability for detection of high-viscosity oils (Fig. 4).
- Minimum detectable oil-layer thickness 3 – 5 mm; up to 50 mm with optional electrodes.
- Display lamp on sensor body, for visual on-site check of operational status.
- Sensor body composed of oil-, chemical-, and weather-resistant self-extinguishing plastic.
- System alarm automatically engaged by relay circuit, in the event of power loss at signal converter, cable disconnection, or cable short-circuit.
- Intrinsically safe construction for Zone-0 hazardous-location applications.

Figure 2

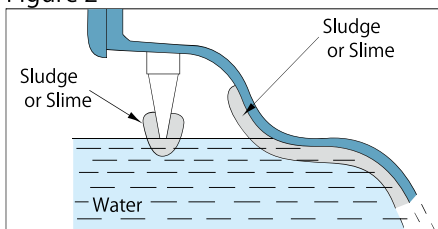


Figure 3

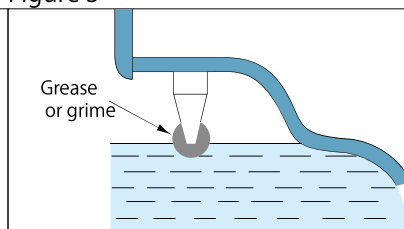
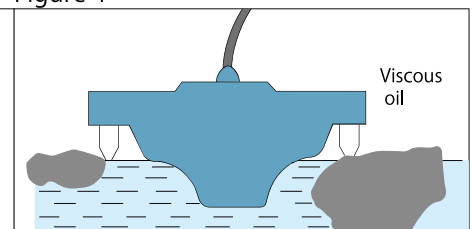


Figure 4



Specifications

Sensor – Apolarm™ CSR-3005E

Minimum detectable oil layer thickness	3–5 mm
Detected oils	Crude oil, gasoline, diesel fuel, kerosene, heavy fuel oil, lubricating oil, organic solvents, animal and vegetable fats and oils
Housing structure	Watertight, IEC Class IP67 equivalent
Housing material	High impact PVC
Electrode material	SUS 316
Oil detection lamp	Green LED normally ON, turns OFF upon oil detection.
Weight	Approx. 2.6 kg (excluding sensor cable)
Signal cable(included)	PVC sheathing, two 0.75 mm ² wires, 12 m length Highly flex-, heat-, and oil-resistant
Max. cable length	Extension up to 2 km maximum (limit under IIC T4 rating)
Operating temperature	–20 to +60°C (liquid layers must be free from freezing)

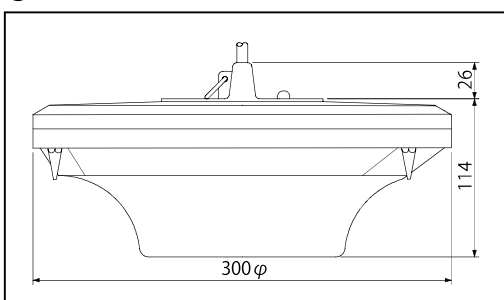
Signal converter – AS-40E*

System alarm	Initiated by power loss at signal converter, cable disconnect, or cable short-circuit
Delay timer	Adjustable, approx. 1–10 sec.
Power source	AC100/110V, 200/220V; 50/60 Hz
Power consumption	Approx. 2VA
Relay contacts	Form C configuration for both oil detection signal and system malfunction signal
Terminal rating	AC250V, 4A; DC30V, 4A
Operating temperature	–10 to +50 °C
Operating humidity	≤95% RH
Weight	Approx. 0.8 kg
Structure	Intrinsically safe, Class IIC
Oil detection lamp	Green LED normally ON, turns OFF upon oil detection.
System alarm lamp	Red LED normally OFF, turns ON upon power abnormality

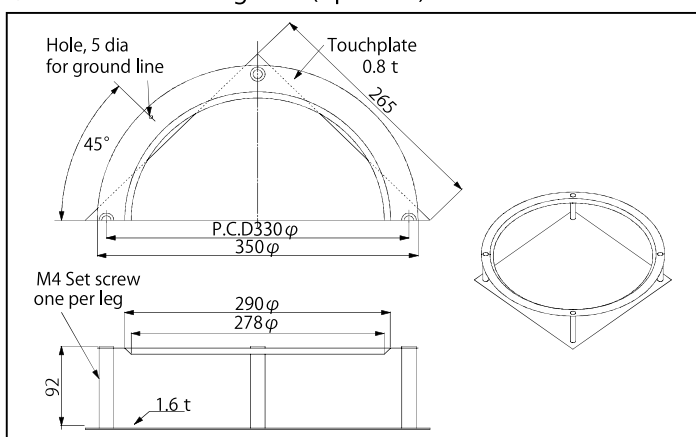
*Explosion-proof model: AS-40EX. Please inquire on particulars and availability.

Dimensional views

● CSR-3005E sensor

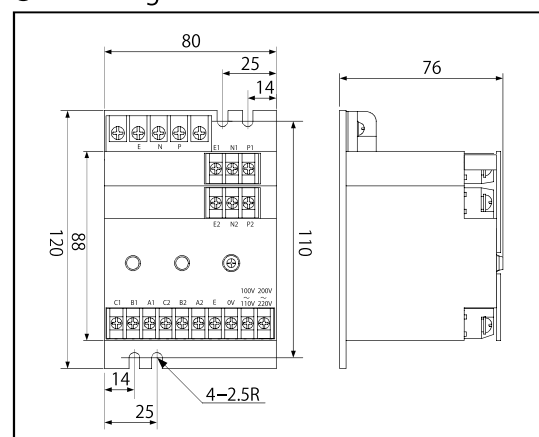


● TC-SE low-water guard (optional)



All dimensions in millimeters unless otherwise noted.

● AS-40E signal converter

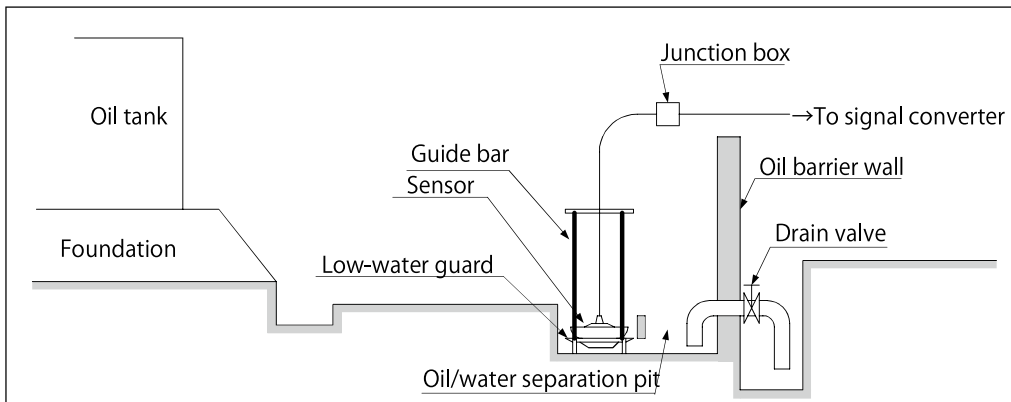


Prevents alarm initiation in event of low water level, by grounding sensor electrodes.

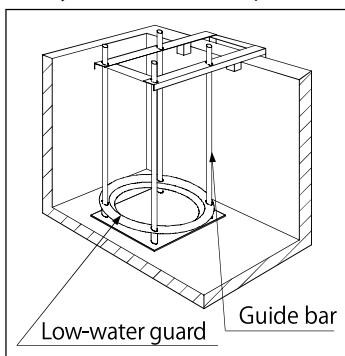
- Material: stainless steel (SUS 304)
- Weight: approx. 1.4 kg
- Legs: 10.9 mm I.D., for arrester guide bars (6A pipes or 10 mm dia. rods)

Typical installations

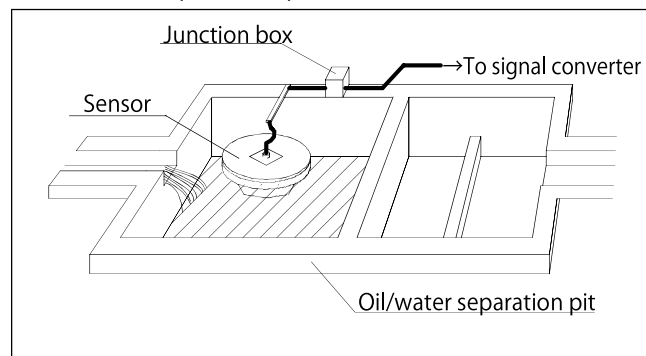
● Tank yard



● Dry-channel drain pit

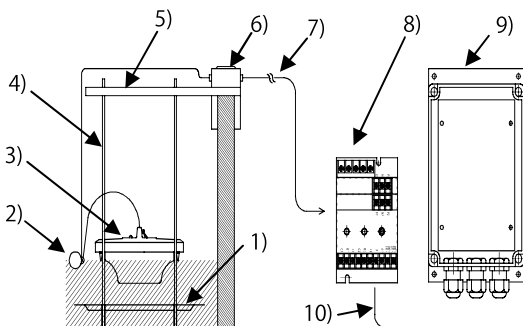


● Oil/water separation pit



System schematic

All components optional other than sensor and signal converter.



1. Low-water guard
2. Cable float* (to prevent cable entanglement)
3. CSR-3005E sensor
4. Guide bar (to prevent drifting and tilting of sensor float)
5. Guide bar support
6. Junction box
7. Extension cable
8. AS-40E signal converter
9. Signal converter case (for non-ingress class IEC IP65)
10. Power and alarm cable

Important notes and precautions

- Product must be handled and used in conformity with Owner's Manual.
- Product specifications and all other descriptions contained herein are subject to change without notice.
- Actual product color may differ from that of photographs, due to color printing limitations.

ASAHI KASEI TECHNOSYSTEM CORPORATION

Head office : Hibiya Mitsui Tower,

1-1-2 Yurakucho, Chiyoda-ku, Tokyo 100-0006, Japan

Tel : +81-(0) 3-6699-2293 Fax : +81-(0) 3-6699-3922

Website : <http://www.asahi-kasei.co.jp/ats/> Email : ats@om.asahi-kasei.co.jp



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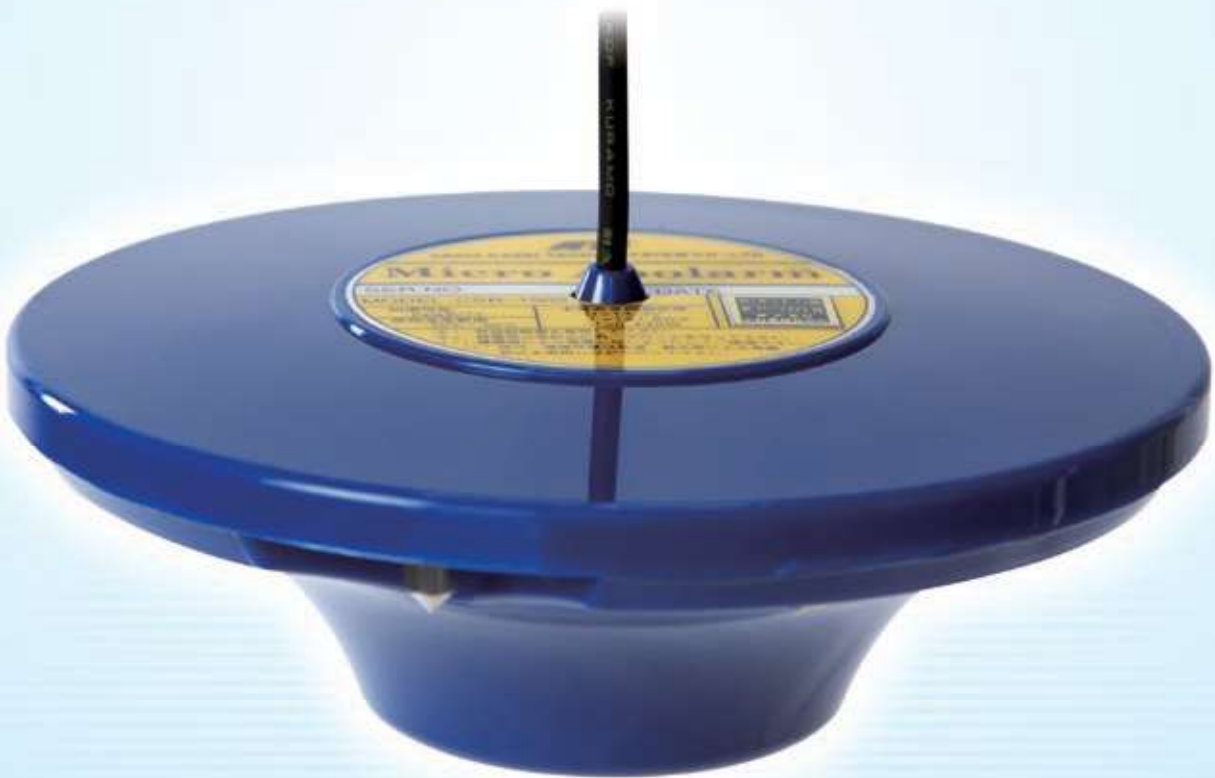
MicroApolarmTM

CSR-1505

Capacitance Sensor

AS-20

Signal Converter



ASAHI KASEI TECHNOSYSTEM CORPORATION

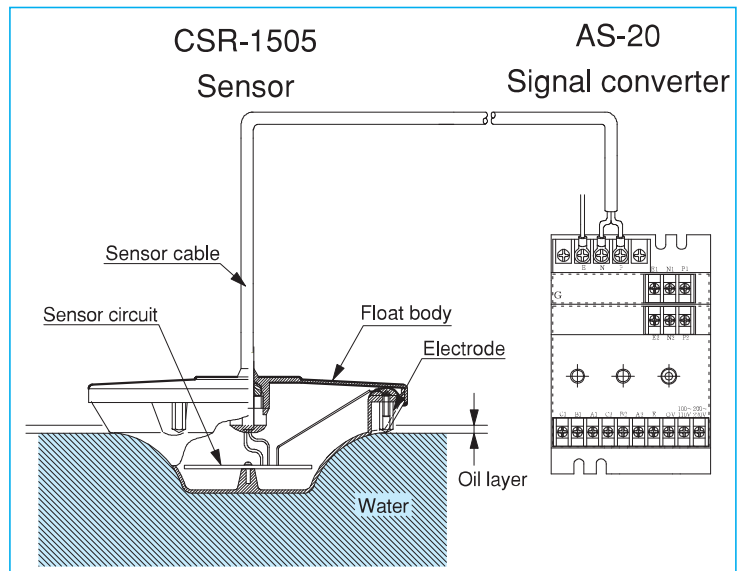
MicroApolarm™ — for early oil leak detection

The MicroApolarm™ oil leak detection system is designed for optimum performance in small indoor or underground drain pits for conduits or channels.

It comprises a floating-body hermetically-sealed capacitance sensor (CSR-1505) and a signal converter (AS-20) for power supply, signal conversion, and alarm activation. The CSR-1505 sensor circuit applies a high-frequency potential to three electrodes which project downward from the float body.

If an oil layer forms on the water, and the electrodes thus project into oil rather than water, it effectively lowers the capacitance between the electrodes and ground. This change is detected, amplified, and conveyed as a signal current from the sensor circuit via the sensor cable to the AS-20 signal converter, which then engages the oil leak alarm circuit.

Figure 1



Salient features

- **Optimum performance in confined spaces**
 - Sure, accurate oil detection by sensor just 150 mm in diameter.
 - Efficiency and ease of use in indoor and underground channel drain pits.
- **Inherent operational reliability**
 - Asymmetric float conformation at waterline, for stable function and operation.
 - Delay circuit in signal converter, to prevent false alarms due to transient electrode lift-out from water.
 - Float and electrode geometry designed to prevent short-circuiting by sludge or slime deposits.
 - Electrodes designed to prevent false alarms due to grease or grime adhesion.
- **Strong, durable construction**
 - Impact-resistant PVC float body.
 - Stainless steel (SUS 316) electrodes.
 - Flex-, heat-, and oil-resistant sensor cable with PVC sheathing.
- **Fail-safe alert**
 - System alarm automatically initiated by relay circuit, in the event of power loss at signal converter, cable disconnection, or cable short-circuit.
- **Intrinsically safe construction for Zone -0 hazardous-location applications.**

Note that the MicroApolarm™ system is designed specifically for indoor or covered pits or channels with minimal wave motion. For outdoor installations, use the weather-, wave-, and wind-resistant Apolarm™ C system.

Specifications

Sensor – MicroApolarm™ CSR-1505

Minimum detectable oil layer thickness	3–5 mm
Detected oils	Crude oil, gasoline, diesel fuel, kerosene, heavy fuel oil, lubricating oil, organic solvents, animal and vegetable fats and oils
Housing structure	Watertight, IEC Class IP67 equivalent
Housing material	High impact PVC
Electrode material	SUS 316
Weight	Approx. 170g (excluding sensor cable)
Signal cable(included)	PVC sheathing, two 0.2 mm ² wires, 12 m length Highly flex-, heat-, and oil-resistant
Operating temperature	-20 to +60°C (liquid layers must be free from freezing)

Signal converter – AS-20

System alarm	Initiated by power loss at signal converter, cable disconnect, or cable short-circuit
Delay timer	Adjustable, approx. 1–10 sec.
Power source	AC100/110V, 200/220V; 50/60 Hz
Power consumption	Approx. 2VA
Relay contacts	Form C configuration for both oil detection signal and system malfunction signal
Terminal rating	AC250V, 4A; DC30V, 4A
Operating temperature	-10 to +50°C
Operating humidity	≤95% RH
Weight	Approx. 0.8 kg
Structure	Intrinsically safe, Class IIC
Oil detection lamp	Green LED normally ON, turns OFF upon oil detection.
System alarm lamp	Red LED normally OFF, turns ON upon power abnormality

*Explosion-proof model: AS-20EX. Please inquire on particulars and availability.

Float arrester – TC-ME2

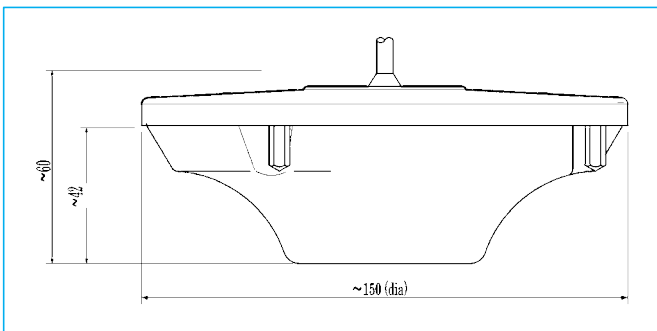
The TC-ME2 float arrester prevents sensor drifting or transport by water currents, while permitting its free vertical displacement with rising or falling water levels.

The MicroApolarm™ system is not designed for operation in fast-flowing water or strong wind, and should not be used in such circumstances.

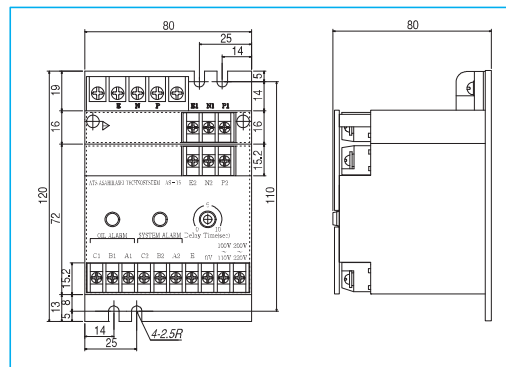
Dimensional views

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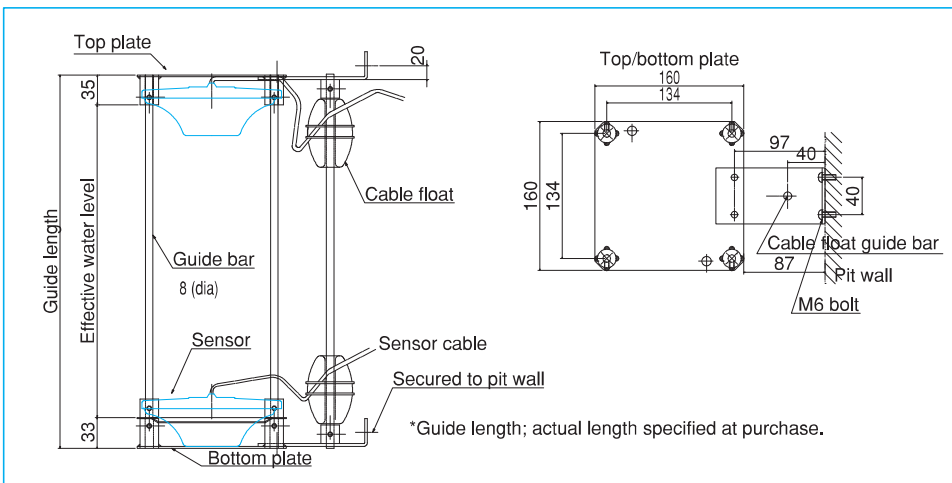
●CSR-1505 sensor



●AS-20 signal converter



●TC-ME2 float arrester



MicroApolarm™ — for early oil leak detection

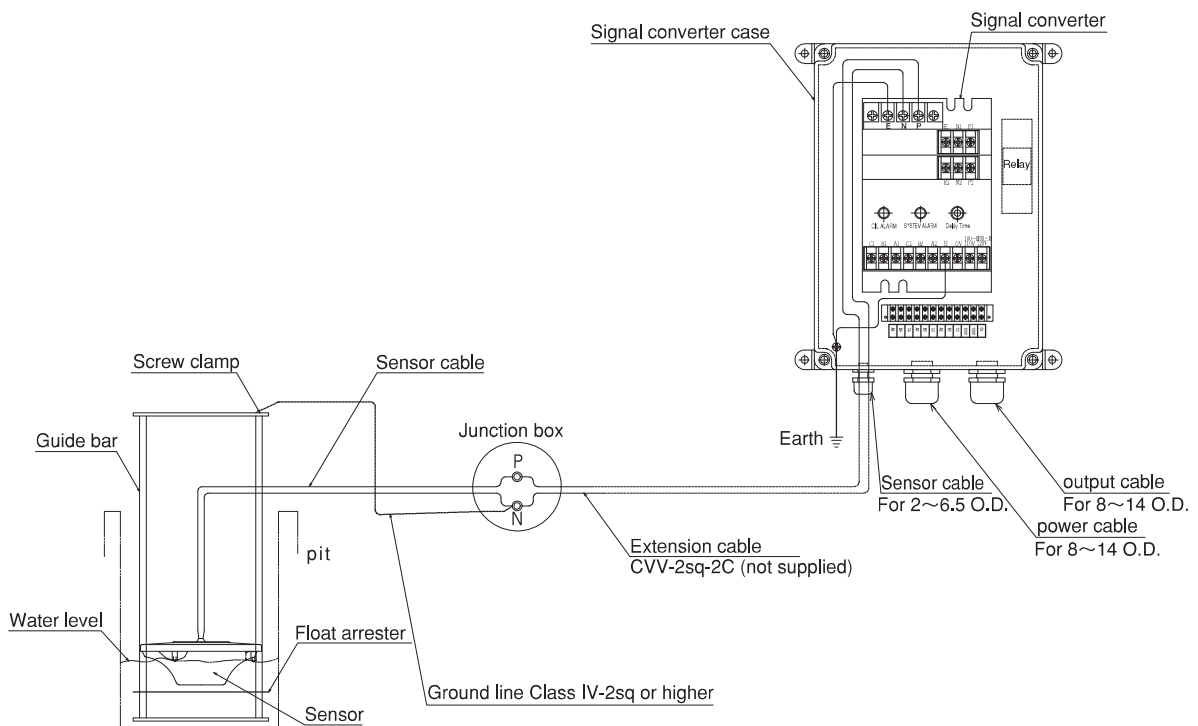
Typical installations

● Underground drain pits



System schematic

Junction box and signal converter case are optional.



Important notes and precautions

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