



TECHNICAL GUIDANCE

TOTAL CARGO MEASUREMENT AND MONITORING SYSTEM FOR MARINE APPLICATIONS

TA840 RADAR MONITORING SYSTEM

GENERAL

This monitoring system consists the radar level gauge TA840, cargo temperature and inert gas pressure transmitter I-NODE, intrinsically safe power supply IS-POWER M1, control module CONTROL M1. This system communicates with Multi-monitor SuperDIR series to measure and monitor each cargo level, temperature and pressure. This system is suitable for measurement and control of liquid cargos at crude oil tankers and product/chemical carriers.

TA840 radar level gauge has been in operation for over 15 years and more than 6,000 units are installed on board all kind of ships and platforms. Offering the latest upgraded version and ensuring the required stability and reliability of the cargo measurement and monitoring system.

FEATURES

- TA840 radar level gauge is a stand-alone radar type level transmitter using a frequency modulated continuous wave (FMCW) that can measure the level of liquid cargo without being affected by the temperature and viscosity change of the liquid cargo.
- TA840 radar level gauge can be compatible with the cargo temperature (max.3points)and inert gas pressure data by connecting the I-NODE on the same power & communication lines to cargo control room, thus saving wiring.
- IS-POWER M1 intrinsically safe power supply provides RS-485 isolator/barrier to meet the intrinsic safety requirements and its outputs is extremely stable, thus ensuring the best performance and longevity of the equipments which are connected.
- CONTROL M1 control module is a flexible control unit which provides I/O and network interfaces. It comes with a unique feature that brings plug and play capability to all the equipments which are connected.
- This system is suitable for retrofitting of existing TA840 radar system as it has the compatibility with old TA840 radar system.

TA840 RADAR LEVEL GAUGE

SPECIFICATIONS

• Measuring range	: 0.5m ~ 42m
• Measuring accuracy	: ±10mm
• Resolution	: 0.1 mm
• Antenna aperture angle (3dB)	: 10°
• Output protocol	: Proprietary
• Intrinsic safety approval	: Exia [ia] IIB T6··T5 or IIC T6··T5 (ATEX standard)
• Protection class	: IP66/67
• Maximum tank pressure	: 1bar
• Operating temperature	: -40°C ~ +70°C
• Weight	: 18kg

* PTFE protection sheet is provided and set under the antenna surface as standard installation.

* High temperature cargo may be measureable by special installation arrangement. Please confirm with us separately.



TA840
RADAR LEVEL GAUGE



I-NODE
TEMPERATURE & PRESSURE TRANSMITTER

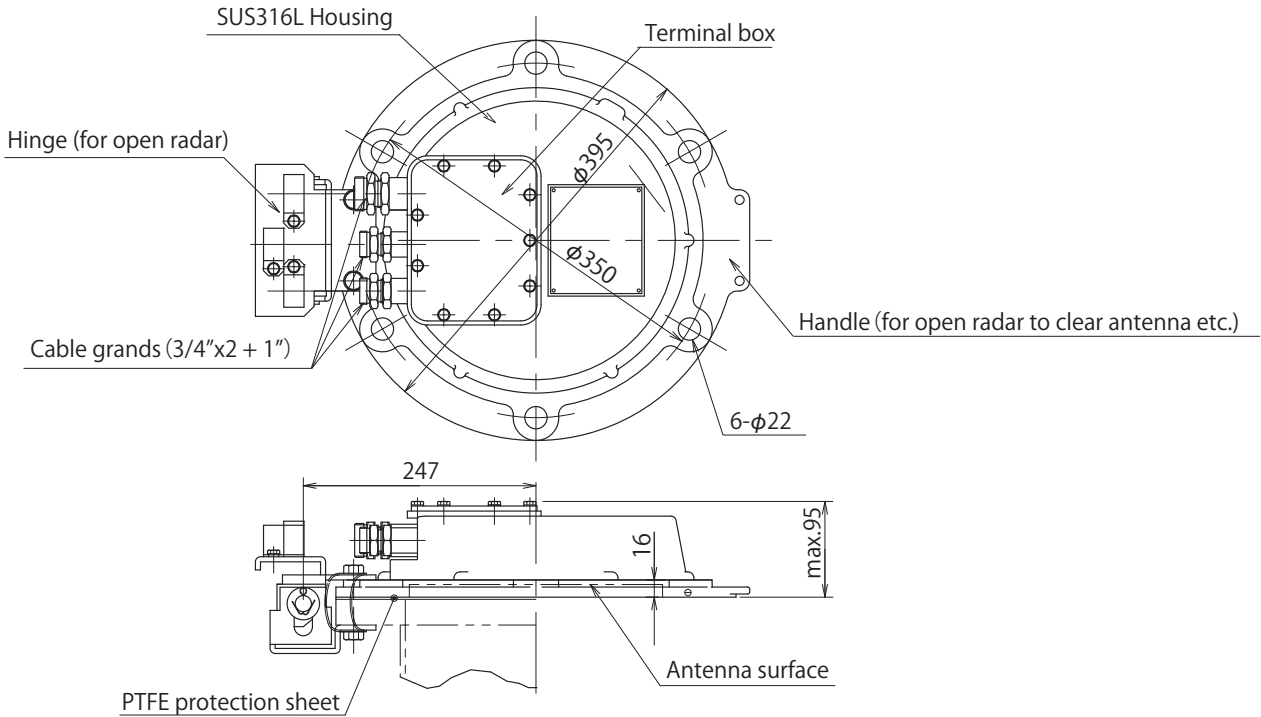


IS-POWER M1
INTRINSICALLY SAFE POWER SUPPLY



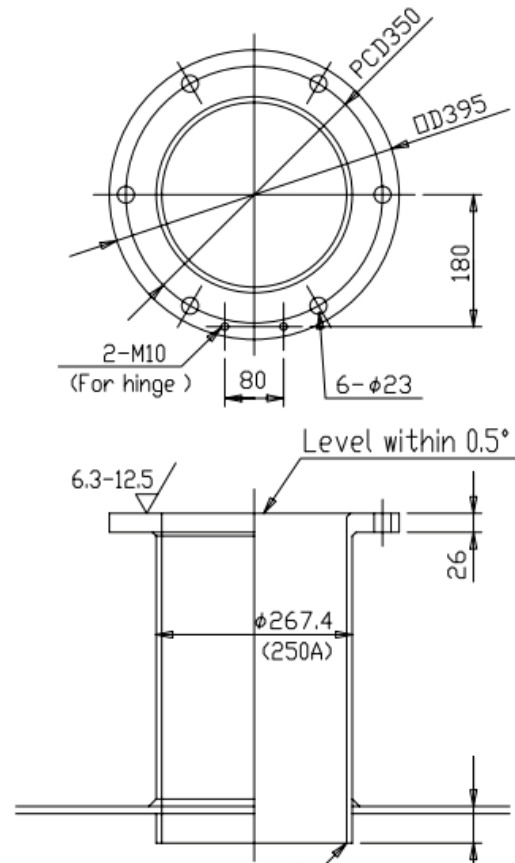
CONTROL M1
CONTROL MODULE

OUTLINES & DIMENSIONS



PRECAUTIONS FOR INSTALLATION

- A nozzle pipe 250A (10") should be prepared and welded with inserting its lower end into cargo tank previously by shipyard for installing TA840 radar gauge. (Dimension of standard fitting is shown in right sketch)
- Fitting flange is equivalent to ISO PN10 DN250 with 6.3^{12.5}Ra roughness.
- Two threaded holes (2-M10) for installing the maintenance hinge on the flange also should be prepared.
- Install fitting stand on deck so as to top face of the flange is parallel to even keel of ship and finish the level of surface within $\pm 0.5^\circ$ by using with a water level.
- The thickness of the nozzle pipe is recommended by sch.40.
- Finish inner bottom edge of the pipe with minimum chamfered (or rounded) to remove burr.
- Construct the flange and pipe within the right angle of 1° by welding.
- The height of fitting stand from the upper deck is 600mm in minimum.
- TA840 radar gauge should be installed at the appropriate place for measuring liquid in tank. Tokyo Keiso will consult gauge positioning (suitable place of sensor installation). If you have some difficulty for positioning, contact us with submitting the relative drawings of tank inside structures.

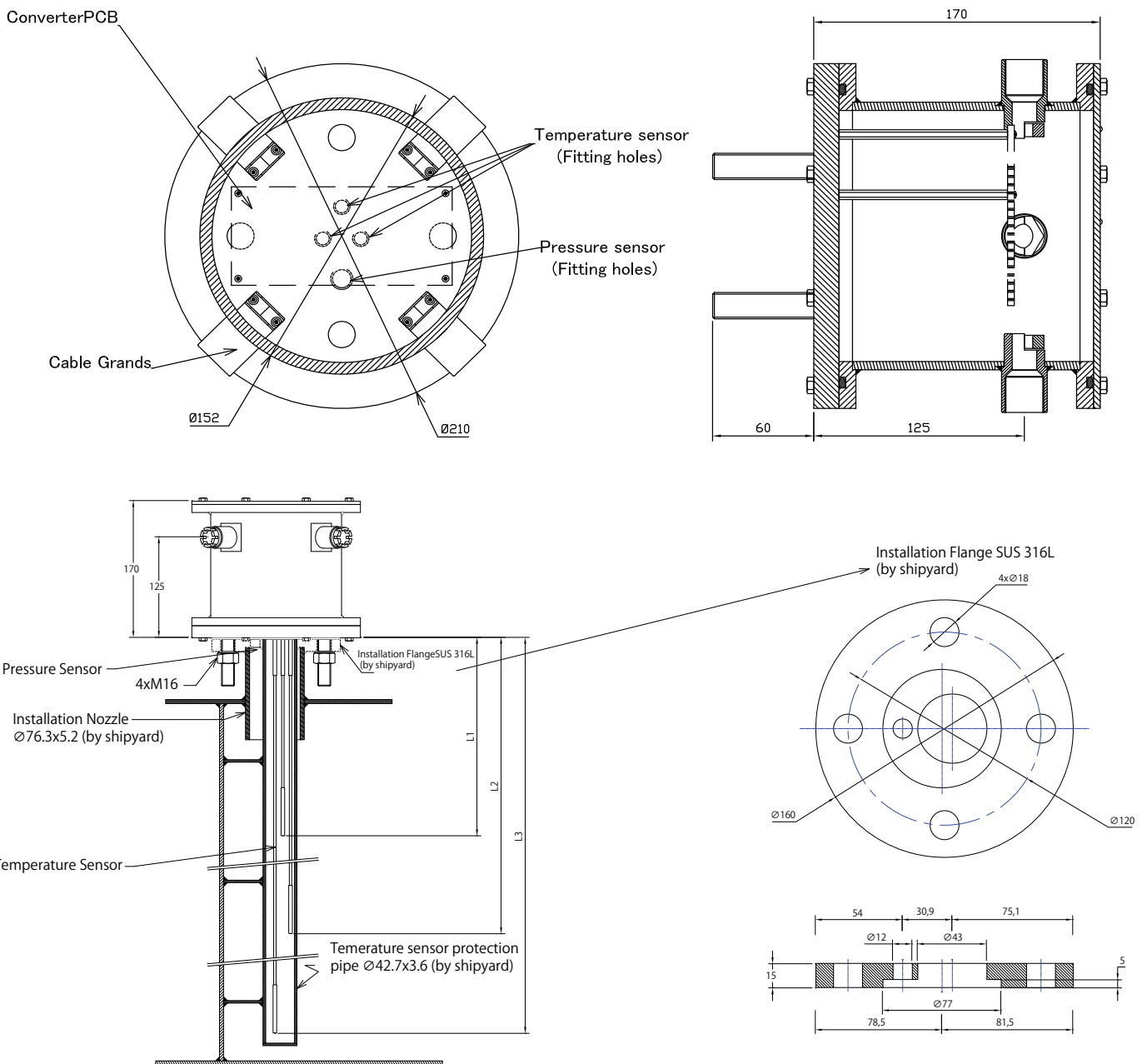


I-NODE TEMPERATURE & PRESSUR TRANSMITTER

SPECIFICATIONS

- Material : Housing SUS 316L
 Temperature sensor SUS 316L
 Pressure sensor SUS 316L
- Sensor type : Temperature sensor PT100Ω 3wires (Max. 3 points)
 Pressure sensor Absolute pressure sensor.
 (No obstruction like salt content because of no introduction space for atmospheric pressure)
- Measuring range : Temperature -40°C~+ 250°C
 Pressure 1600hPa
- Measuring accuracy : Temperature ±2°C
 Pressure ±1% F.S.
- Operating temperature : - 40°C~+ 85°C
- Intrinsic safety approval : Exia [ia] IIB T4 or IIC T4 (ATEX standard)
- Protection class : IP66/67

OUTLINES & DIMENSIONS

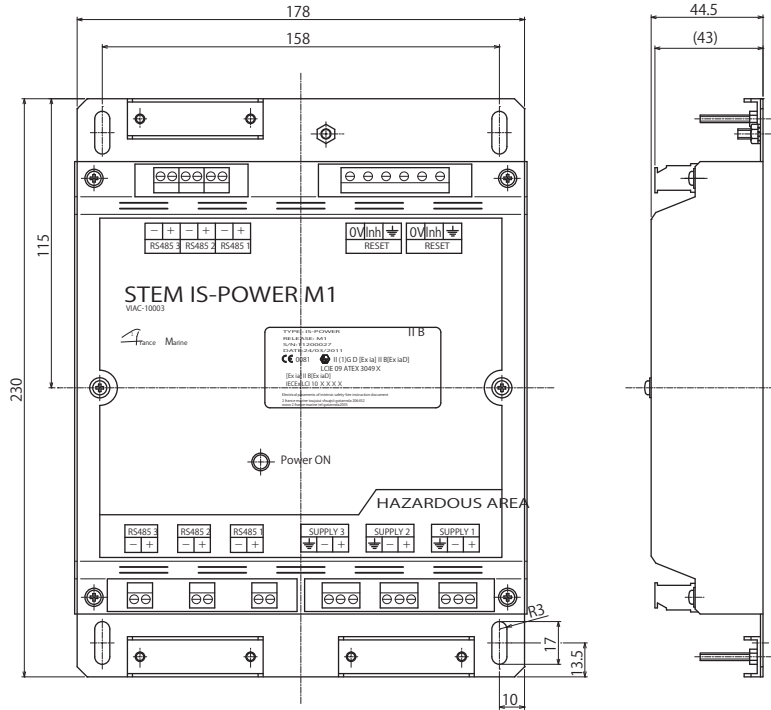


IS-POWER M1 INTRINSICALLY SAFE POWER SUPPLY

SPECIFICATIONS

- Power input : 85 – 264Vac / 50 ~ 60Hz
- Power output : IIC:11.0Vdc, IIB:12.2Vdc
- Consumption : 30W (max)
- Output channel : Power 3ch. & Serial (RS-485) 3ch.
- Operating temperature : -25°C ~ 70°C
- Intrinsic safety approval : Exia [ia] IIB or IIC (ATEX standard)
- Dimensions : 180 x 330 x 45 mm
- Terminal wiring size : 2.5mm²
- Weight : 1.1 kg

OUTLINES & DIMENSIONS

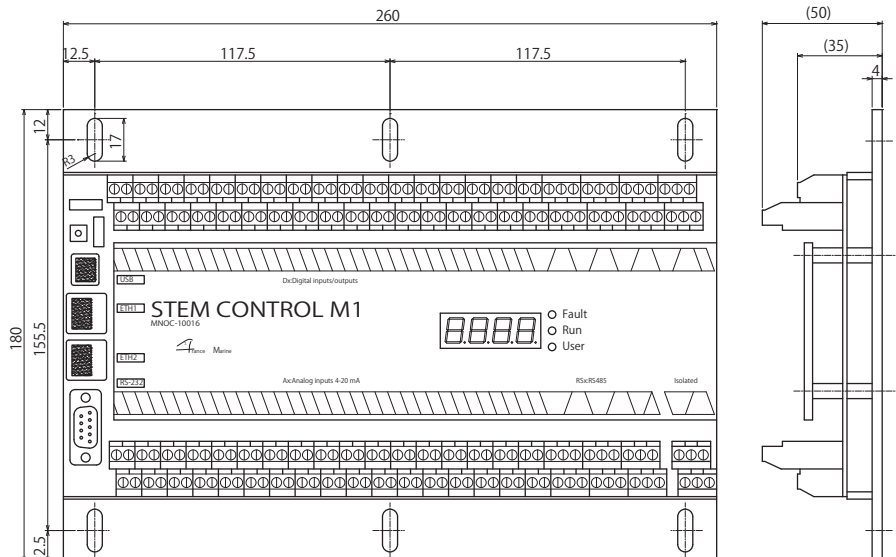


CONTROL M1 CONTROL MODULE

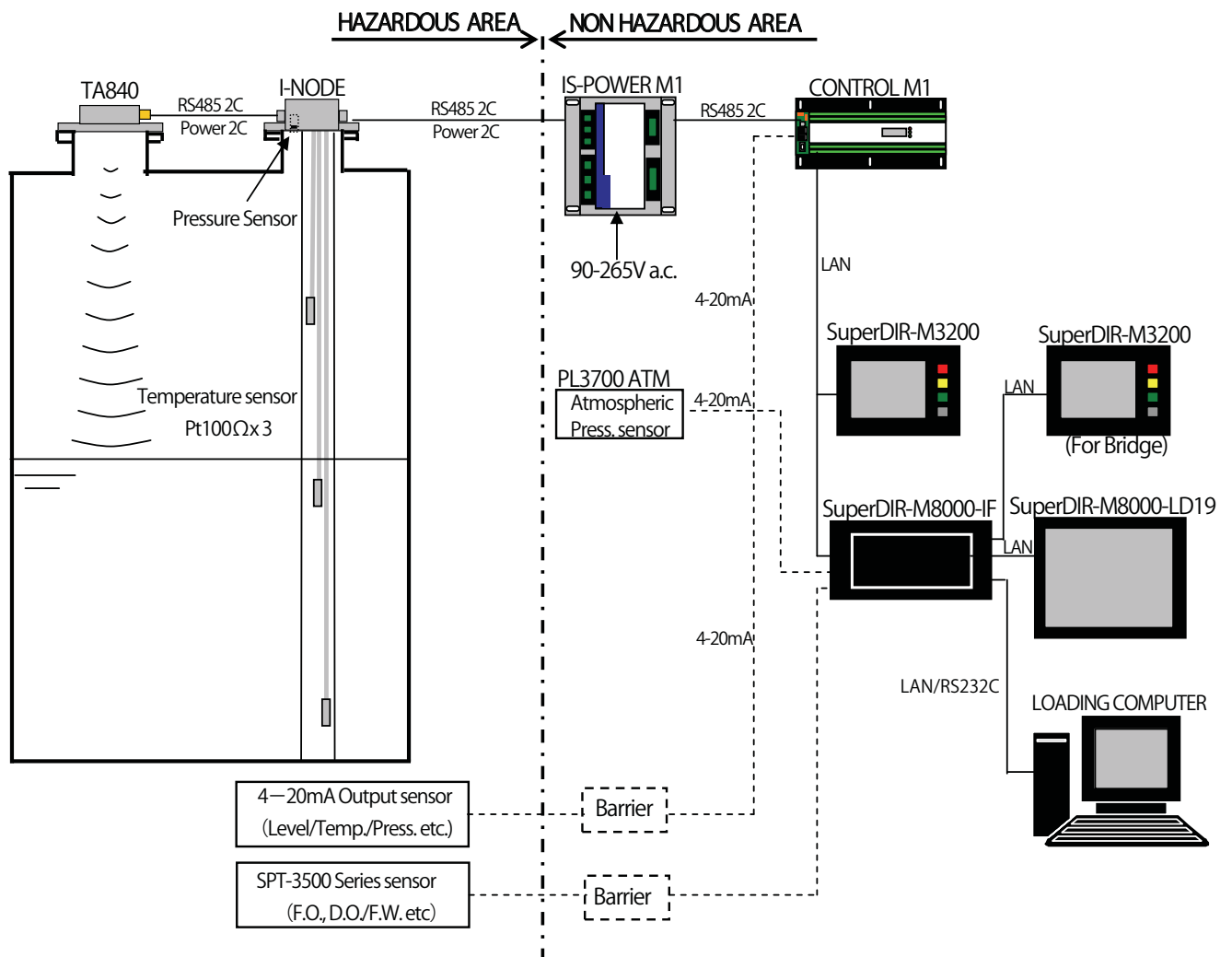
SPECIFICATIONS

- CPU & Memory : 32 bits ARM7 RAM: 32MB FLASH: 1.5MB
- Power input : 24Vdc
- Consumption : no 4-20mA AI 12W
32ch. 4-20 mA AI 30W
- Serial (RS-485) port : 16ch.
- Input/Output channel : AI (4-20mA) 32ch., DI-DO 32ch.
- Operating temperature : 5°C ~ 70°C
- Terminal wiring size : 2.5mm²
- Interface : Ethernet10Mb/s.x1, CANx1, RS-232x1, USBx1
- Dimensions : 260 x 180 x 40mm
- Self monitoring function : Enable
- Weight : 0.9 kg

OUTLINES & DIMENSION



■ SYSTEM CONFIGURATION (SAMPLE)



* Specification is subject to change without notice.

TOKYO KEISO CO., LTD.

Head Office : Shiba Toho Building, 1-7-24 Shibakoen, Minato-ku, Tokyo 105-8558
 Tel : +81-3-3431-1625 (KEY) ; Fax : +81-3-3433-4922
 e-mail : overseas.sales@tokyokeiso.co.jp ; URL : http://www.tokyokeiso.co.jp