ISO-14001
ISO-9001

SPECIFICATION SHEET

VAPOUR PRESSURE ANALYZER

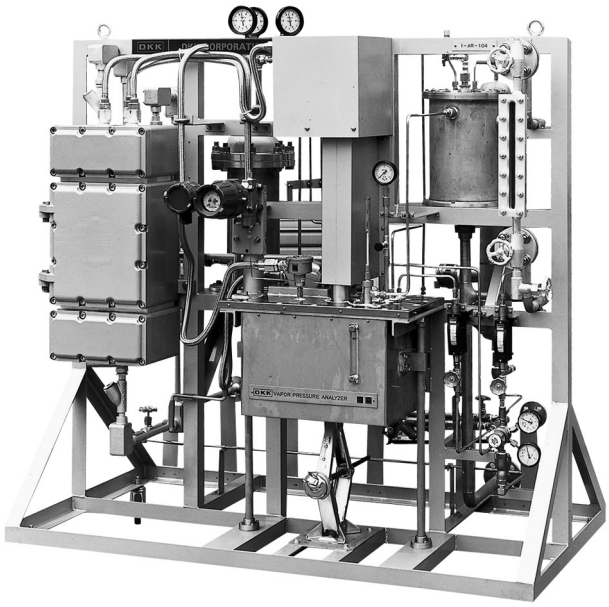
Model: DVP

FEATURES

- The sample is sprayed from a nozzle at a constant temperature and the vapour pressure is continuously determined from static pressure of the sample fluid.
- Correlation with vapour pressure measured by Reid method specified under JIS K2258 and ASTM D323.
- Flameproof explosion protected construction (JIS d2G4) for use in oil refinery plants. Equivalent to NEC Class1, Group D, Div1.

STANDARD SPECIFICATIONS

Product Name : Vapour pressure analyser
Model : DVP
Measurement Object : Vapour pressure of oil products such as automobile gasoline, aircraft gasoline and jet oil
Measurement Method : Dynamic pressure measurement of the sample sprayed from nozzle (Correlated with JIS K2258 and ASTM-D323: Continuous)
Explosion Protection Standard
Flameproof explosion protected construction d2G4
Certification No.3961 (Body)
Certification No.26646 (Temperature regulator)
Measurement Ranges : 0~100kPa/cm^2 or 0~150kPa/cm^2
Repeatability : ±1kPa FS or less
Linearity : Within 0.5%of FS
Response Time : Within 60 sec. For 90% response
Ambient Temperature : 0~40°C
Sample Conditions
Temperature : 20~35°C
Flow rate : 1~3 L/min.
Inlet pressure : 5~35kgf/cm^2
Outlet pressure : Atmospheric pressure
Viscosity : 9.5CP or less
Cooling Water Conditions
Temperature : 0~32°C
Flow rate : 0~2L/min.
Pressure : Min. 1kgf/cm^2
Power Requirements : 100V AC±10%, 50/60Hz (other operating voltages available as options.)
Power Consumption : 2KVA
Construction : Self-stand frame
Dimensions : 1500(w) x 700(d) x 1500(h) mm
Weight : Approx.600kg
Paint Colour : Metallic silver



Installation Site : Requires weather protection (Avoid direct sun light and provide rain protection when installed outdoors.)
Plumbing Connections
Liquid system
Sample inlet : Rc¼ (PT¼ F)
Sample outlet : Rc¼ (PT¼ F)
Cooling water inlet : Rc¼ (PT¼ F)
Cooling water outlet : Rc¼ (PT¼ F)
Electric system
Analyser switch section : G½ (PF½ F)
Absolute pres. converter : G½ (PF½ F) (when P/I converter is used.)
Pneumatic system
Absolute press. converter: Rc¼ (PT¼ F) (when P/P converter is used.)
Related Equipment
- P/I converter
- Chart Recorder
- Sample Recovery System

Contact DKK-TOA for further information.

PRINCIPLE OF OPERATION

The sample is sprayed from a nozzle at a constant temperature (100°F , 37.8°C) and at a constant pressure. The sample pressure is measured from the pressure when vaporized. This analyser employs the Kinetic Vapour Pressure which is correlated with the Reid Vapour Pressure method. (The method in which the pressure of the space above the sample in a fixed vessel is measured as the vapour pressure.)

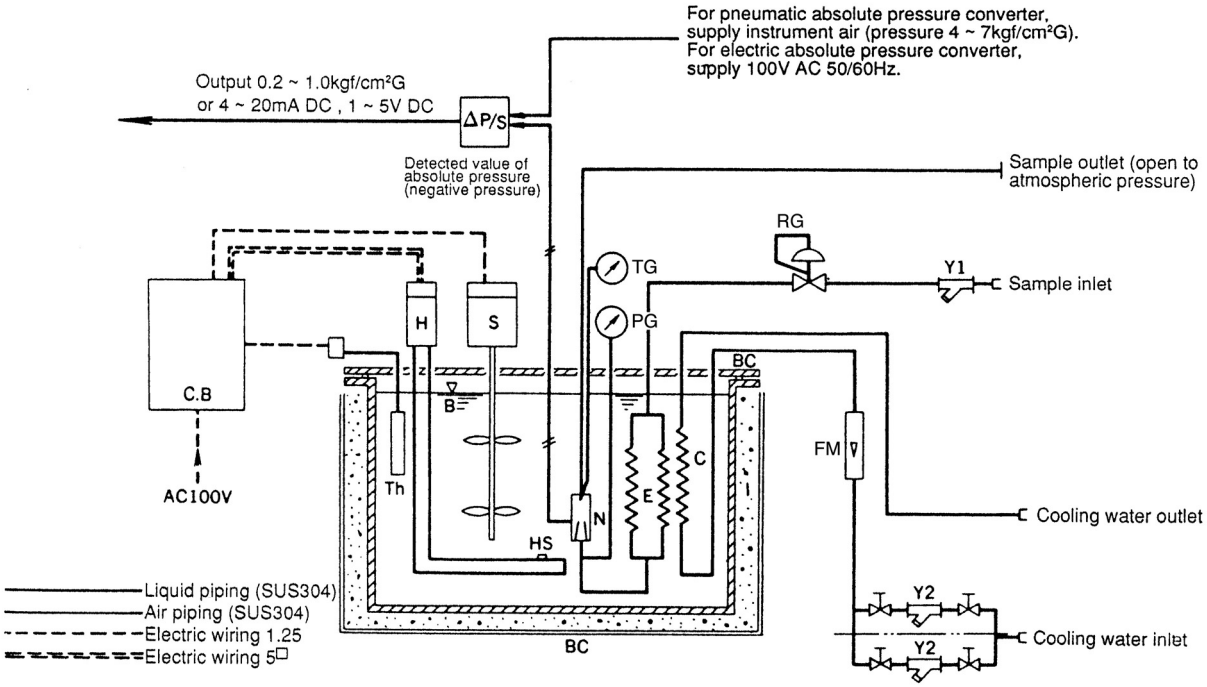
The sample is taken off from the process flow path and is subjected to adjustment to a fixed pressure (usually 3kgf/cm²G) at the regulator VG via strainer Y1, and enters the thermostat bath BC. The thermostat bath contains non-flammable insulation oil B as the thermal medium and its temperature is kept at 37.8°C. The sample reaches equilibrium at this temperature while it passed through the heat exchanger E. It is then sprayed from the nozzle at high speed to be vaporized. Since the outlet pressure of the nozzle opening corresponds to a sample vapour pressure, the outlet pressure is converted to an air pressure signal (0.2~1.0kgf/cm²G) or a current signal (4~20mADC) by the absolute pressure converter △ P/S for transmission. The inlet pressure of the sample that enters the nozzle can be read from the pressure gauge G.

The bar type mercury thermometer T indicates the sample temperature at the nozzle. The sample sprayed from the nozzle is guided to the outside and discharged to ambient atmospheric pressure. When the discharged sample is required to be returned to the process, a pump is required. The temperature of oil in the thermostat bath is detected by the thermistor resistance thermometer Th, and precisely kept at a constant value by the PID control of the heater (H) current and the precision temperature regulator circuit in the control box. The oil is agitated by the stirrer S to eliminate the temperature distribution of the bath and at the same time, effectively performs hear exchange of the sample.

When the sample temperature is higher than the set temperature of the thermostat bath (37.8°C) and when the ambient temperature is high, such as in summer, cooling water supply at an appropriate flow rate in the cooling tube C becomes necessary to achieve the temperature equilibrium. A platinum resistance thermometer HS is attached to the heater to prevent excessive temperature rise.

The heart of this equipment is the nozzle N. The sample is sprayed from the nozzle at a constant pressure. As a result of the rise in flow speed, a pressure drop occurs and the sample begins to vaporize. The static pressure of the sample sprayed from nozzle corresponds to the sample vapour pressure.

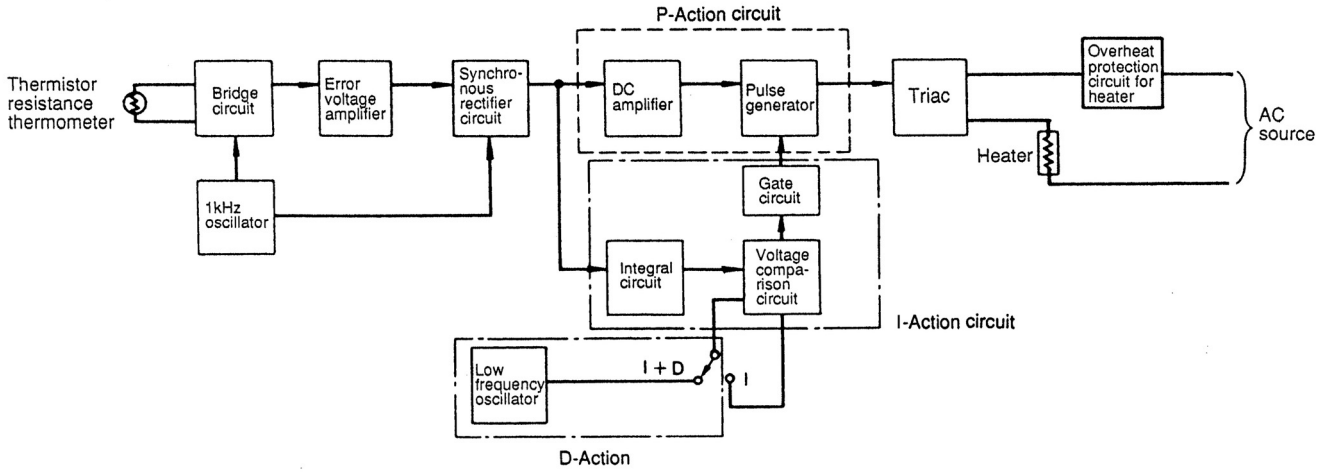
MEASUREMENT SYSTEM DIAGRAM



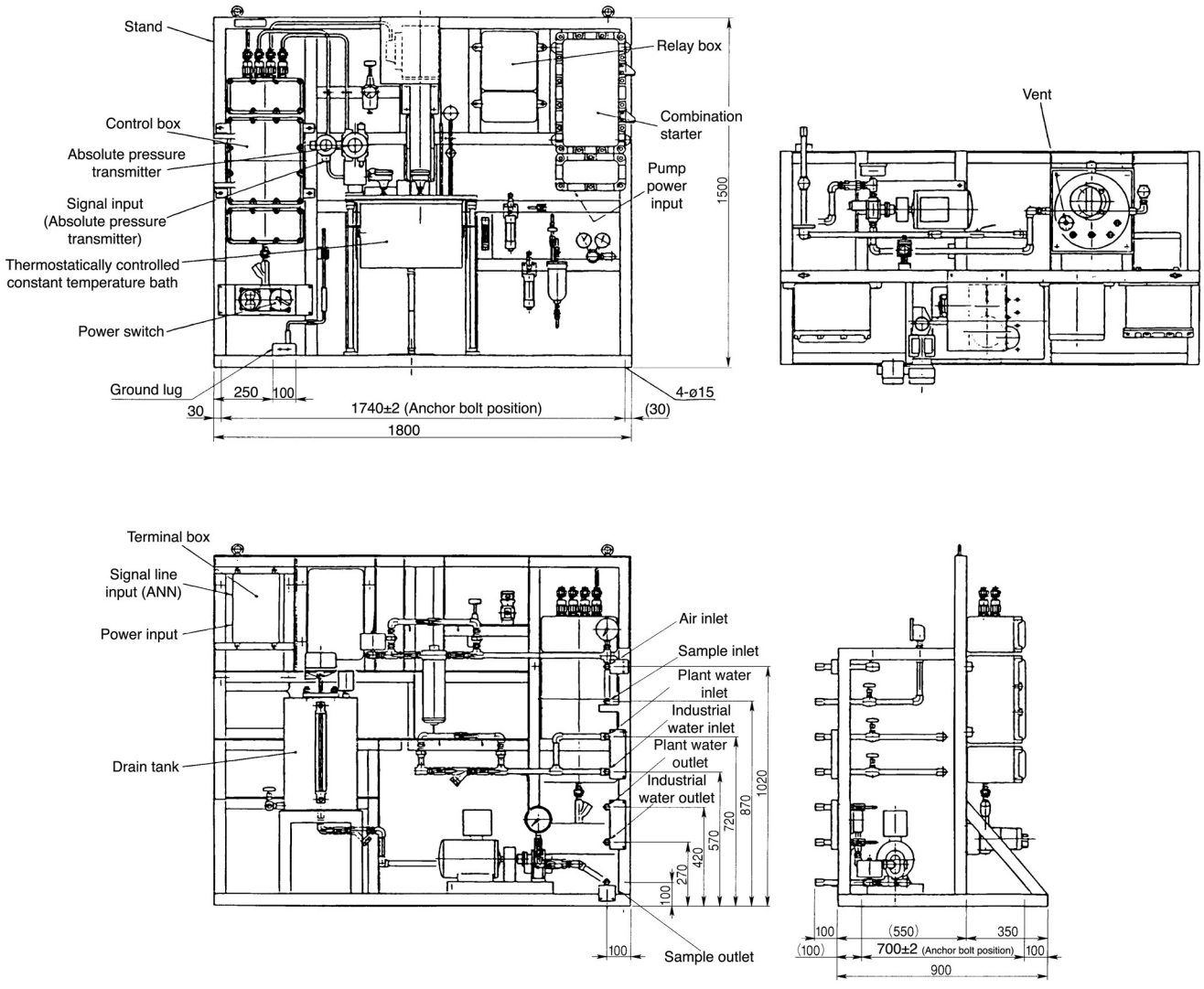
RG ---------- Regulator
FM ---------- Flow rate
Y1 ---------- Y strainer (sample)
Y2 ---------- Y strainer (cooling water)
B ---------- Thermal medium (oil)
C ---------- Cooling water
TG ---------- Mercury thermometer
N ---------- Nozzle
G ---------- Pressure gauge

S ---------- Stirrer
H ---------- Heater
Th ---------- Thermistor resistance thermometer
ΔP/S ---------- Absolute pressure converter
CB ---------- Control box
E ---------- Heat exchanger
I ---------- Thermal insulation
BC ---------- Oil bath enclosure
HS ---------- Heater sensor

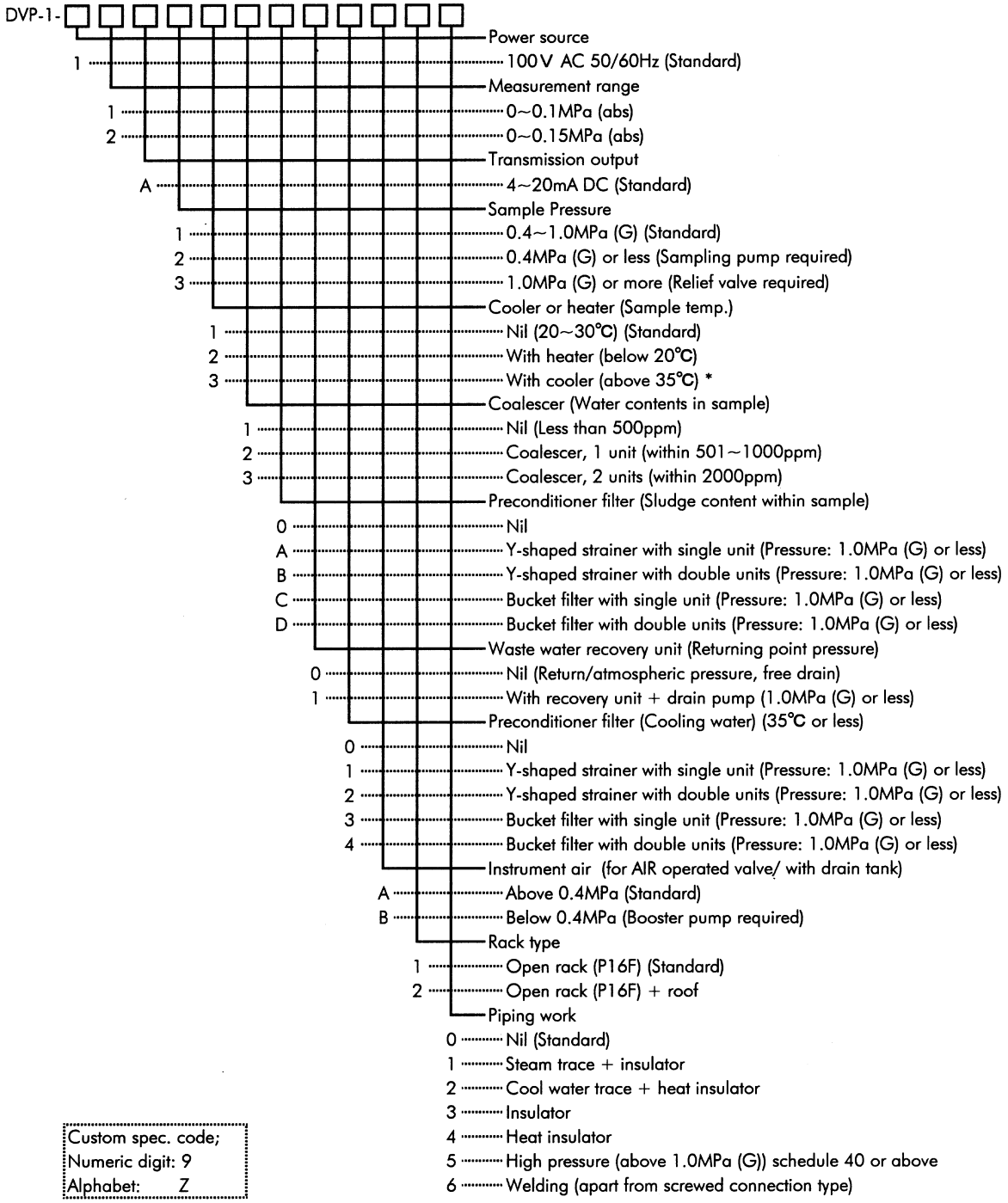
TEMPERATURE CONTROL CIRCUIT



DIMENSIONS



PRODUCT CODE



Custom spec. code;
Numeric digit: 9
Alphabet: Z

*Consult DKK-TOA as a cooler may be required depending on cooling water temperature.

DKK-TOA CORPORATION

International Operations:
DKK-TOA Corporation
29-10, 1-Chome, Takadanobaba, Shinjuku-ku, Tokyo 169-8648 Japan
Tel: +81-3-3202-0225 Fax: +81-3-3202-5685

Representative Office (Europe):
DKK-TOA European Representative
St. Johns Innovation Centre, Cowley Rd., Cambridge CB4 0WS UK.
Tel : +44 (0)1223-526471 Fax : +44 (0)1223-709239

http://www.toadkk.co.jp

⚠ **CAUTION** Do not operate products before consulting instruction manual.

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