SPECIFICATION SHEET

TOA DKK

CO/O_2 Gas Analyzer — Model GCO-200

Partial revision of the Ordinance for Enforcement of the Waste Management and Public Cleansing Act (put in effect in December 1997), it is now mandatory to continuously measure and record CO concentration in the exhaust of refuse incinerators and, when incinerating refuse, limit CO concentration in the exhaust to no more than 100 ppm.

Our system is based on the CO concentration measurement method (controlled potential electrolysis method, as explained in JIS B 7951 - 1986 "Automatic Measuring Device for Carbon Monoxide in the Air") designated in the above Ordinance and the Guideline for Prevention of Dioxins related to Refuse Disposal ("New Guidelines" dated Jan. 1997).

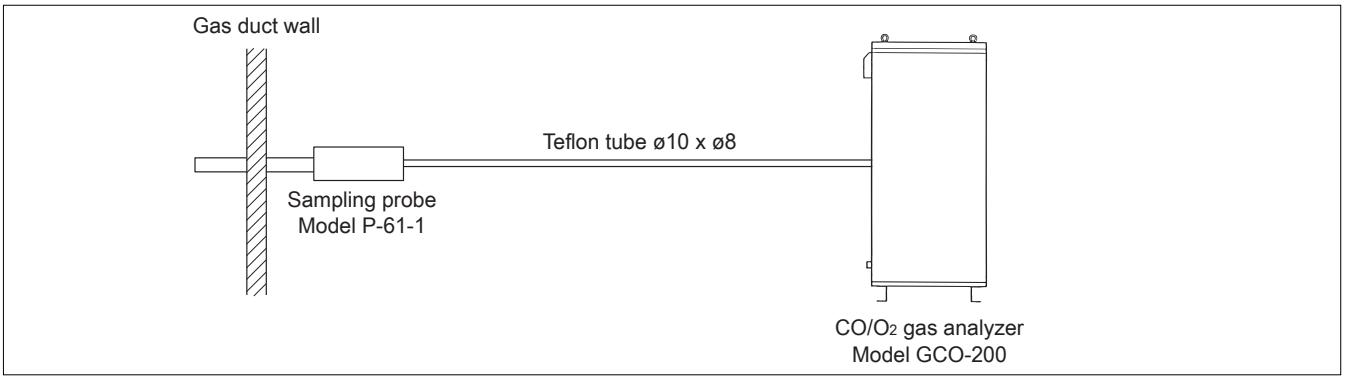
The system has four transmission outputs, or CO instantaneous value, O_2 instantaneous value, CO instantaneous value converted to O_2 12%, and one-hour or four-hour average CO value converted to O_2 12%, all of which may be output simultaneously.

Since the system uses a controlled potential electrolysis CO sensor and galvanic cell O_2 sensor, it has achieved excellent cost performance and functional performance with a simple structure and ease of maintenance. The operation panel is located at the front side, allowing it to be operated in a small place.
(* Patent pending)

Features

- Easy to maintain, install and move because of simple structure.
  The main maintenance work includes regular replacement of filters (once every two weeks to one month) and standard gas calibration (once in three months). It uses a compact sensor which, when broken, can be easily replaced.
- Excellent in long-term stability
  In ordinary use, the system requires no standard gas calibration for over three months.
- Quick responsibility can cope with measurement of samples for combustion management, such as for violent concentration changes.

Configuration Diagram



◦ Newly equipped with the function to cut off O_2 conversion

When the oxygen concentration exceeds the predetermined upper limit while the furnace is stopped, the system cancels conversion to prevent exceeding the meter.

Operational expression for CO instantaneous converted to O2 12% and average CO value converted to O_2 12%

$$C = \frac{21 - On}{21 - Os} \times Cs$$

Cs : CO concentration (ppm)

Cs : O_2 concentration (%)

On: Conversion factor (%)

Regulatory O_2 12% conversion is On = 12.

(21 – 12 = 9)

C : CO concentration after conversion

When refuse is not loaded in the incinerator furnace, oxygen concentration can go up to almost 21%. If so, “21” will be substituted for Os in the above calculation expression, and CO concentration after conversion will show “infinite” (•). When O_2 concentration exceeded the upper limit alarm set value, as the system in the "0_2.H" mode carries out arithmetic calculation by incorporating the actually measured O_2 concentration, which makes the converted CO concentration become infinite. But the “02.CE” mode carries out an operation using not the actually measured O_2 concentration, but the “O_2 instantaneous upper limit alarm value” previously input through this window as the maximum O_2 concentration for conversion purposes. Thus, when the input value is set between 18.0 and 20.0%, the reading will not become infinite.

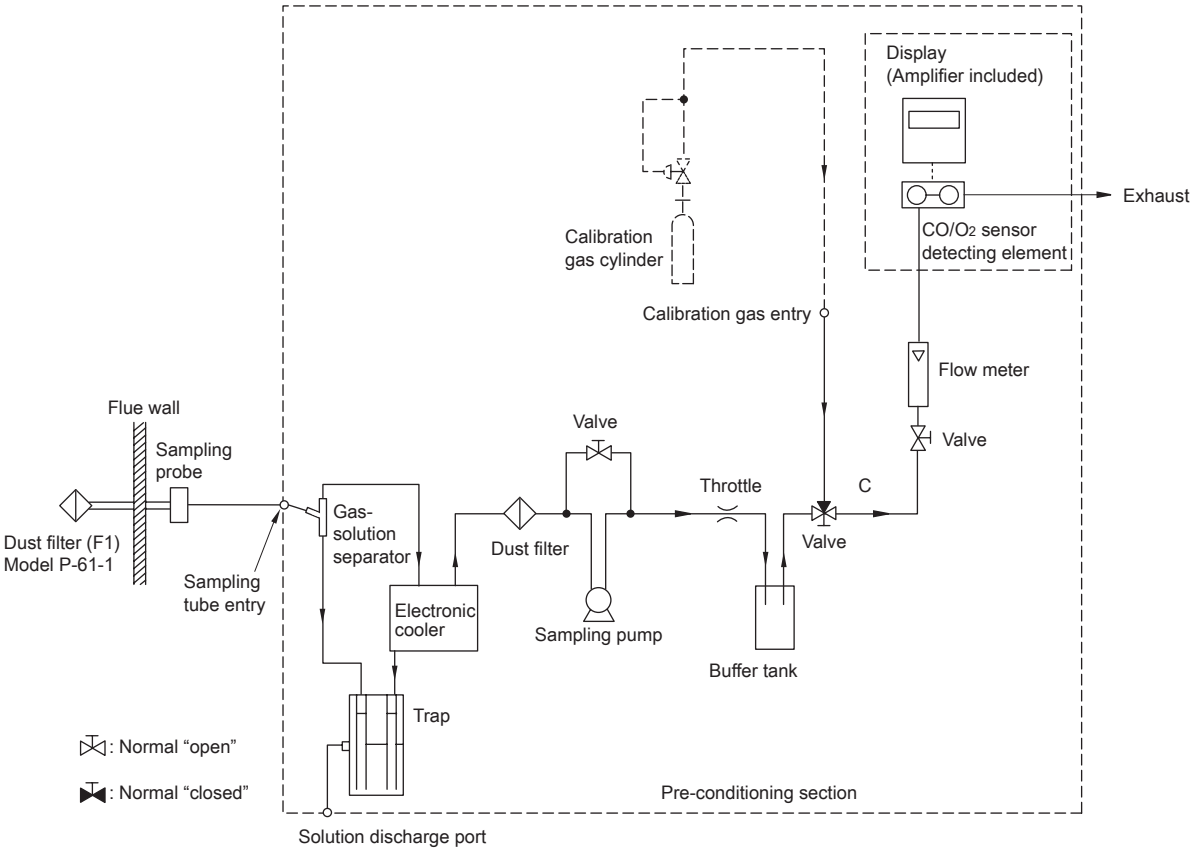
◦ Upper limit and maximum upper limit alarm

Alarms used by the system include peak count alarm, CO maximum upper limit, CO upper limit, O_2 upper limit, O_2 lower limit, and analyzer anomaly.

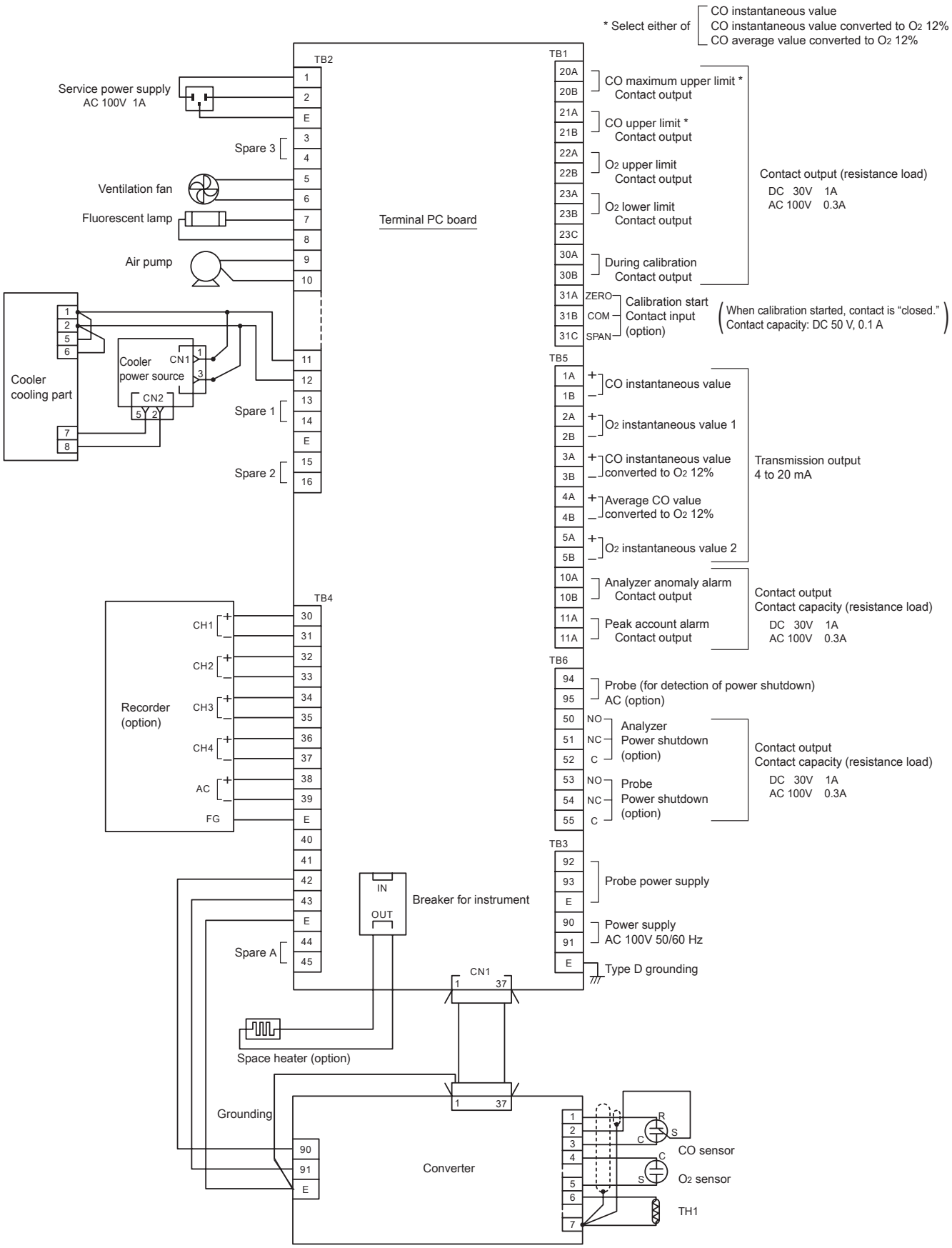
Standard Specifications

Product	: CO/O_2 gas analyzer
Model	: GCO-200
Measurement method	: (CO) Controlled potential electrolysis method/(O_2) galvanic battery
Measurement object	: CO and O_2 in exhaust gas from refuse incineration plant
Measurement range	: (CO) 0 to 200 ppm; capable of measuring ppm of over 200 at a pitch of 100 ppm; maximum 2,000 ppm (O_2) 0 to 25%
Linearity	: (CO) within ± 1.0% FS (200 ppm range) ± 2% FS (300 to 2,000 ppm range) (O_2) ± 3% FS
Repeatability	: Within ± 0.5% FS
Zero drift	: Not more than ± 2% FS/week
Response time	: Within 60 sec. for 90% response time (after introducing gas at the detecting element entry)
Flow of gas to be measured	: Approx. 500 mL/min
Temperature of gas to be measured	: 5 to 45∞C (after treatment at the pre-conditioner section)
Humidity of gas to be measured	: 15 to 90% RH (after treatment at the pre-conditioner section), providing there shall be no dew condensation
Output signal and indication	: DC 4 to 20 mA; load resistance of not more than 600W (No. of digits: maximum 4 for CO and 3 for O_2) (1) CO instantaneous value (2) O2 instantaneous value (3) CO instantaneous value converted to O_2 12% (4) One-hour average CO value converted to O2 12% or 4-hour average CO value converted to O_2 12%
Contact output	: Contact capacity AC 100 V 0.1 A (non-voltage) (1) Peak count alarm (2) CO maximum upper limit alarm * (3) CO upper limit alarm * (4) O_2 upper limit alarm (5) O_2 lower limit alarm (6) Analyzer anomaly alarm (7) Calibration signal (* either of CO instantaneous value, CO instantaneous value converted to O_2 12%, or CO average value converted to O_2 12%)
Contact input (option)	: Calibration start signal (zero or span)
External dimension	: 673 (W) x 656 (D) x 1532 (H) mm (indoor) 722 (W) x 656 (D) x 1532 (H) mm (outdoor)
Power source	: AC 100 V ± 10%
Power consumption	: Approx. 200 VA (excluding gas sampler)
Weight	: Approx. 130 kg
Maintenance	: Gas calibration (generally once in three months)
Main components that need change	: Filter (every two weeks to one month) Sensor (generally one year), filter
Related products	: (Options) (1) Recorder (2) Model P-61-1 sampling probe (3) Standard gas cylinder (100 ppm CO + O_2 21% / N_2 basis) (4) Pressure reducing valve (5) Sampling tube
Sample gas conditions	: Temperature; 200 to 400∞C Pressure ; -2.94 to + 2.94 KPa Dust ; 0 to 100 mg/m3N Nox ; 0 to 100 ppm SO_2 ; 0 to 500 ppm CO ; 0 to 2000 ppm CO_2 ; 0 to 15% O_2 ; 0.1 to 21% HCl ; 0 to 1000 ppm N_2 ; the remainder Contact us if other components are included in the exhaust gas to measure.

Flow Sheet

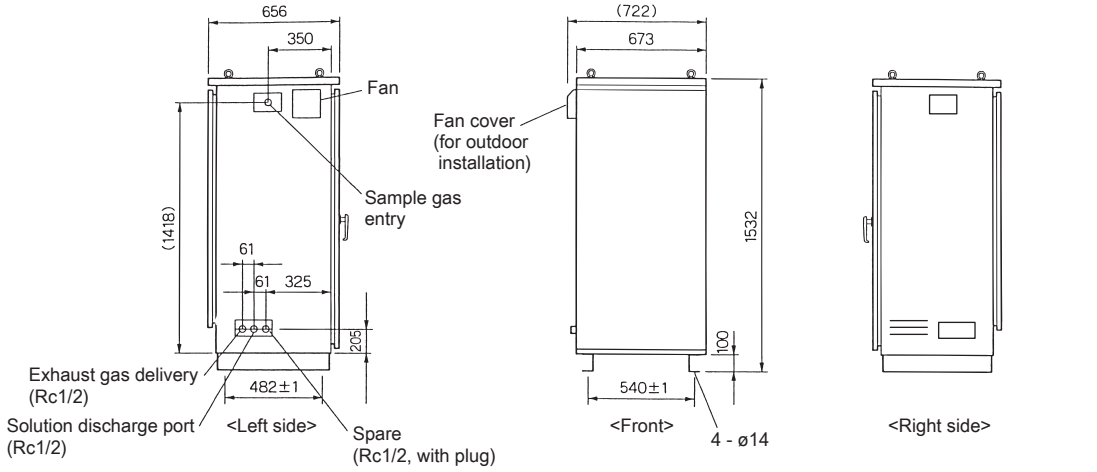

Display
(Amplifier included)
Exhaust
Calibration
gas cylinder
CO/O2 sensor
detecting element
Calibration gas entry
Flow meter
Flue wall
Valve
Valve
Sampling
probe
Throttle
C
Gas-
solution
separator
Dust filter
Valve
Dust filter (F1)
Model P-61-1
Sampling
tube entry
Electronic
cooler
Sampling pump
Buffer tank
Trap
: Normal “open”
: Normal “closed”
Pre-conditioning section
Solution discharge port

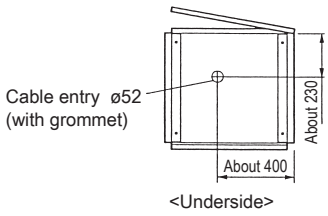
Terminal Connection Diagram

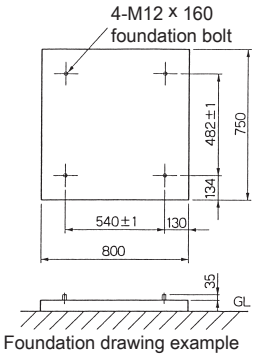


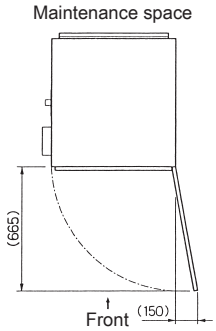
Dimensions

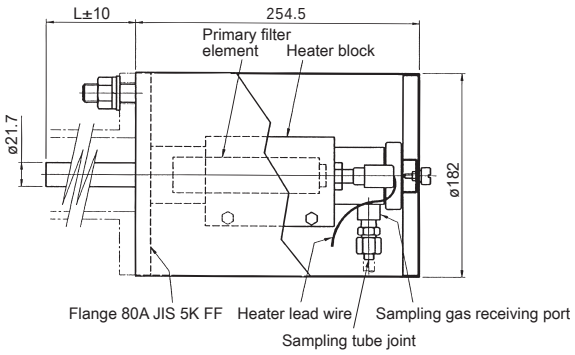
in : mm

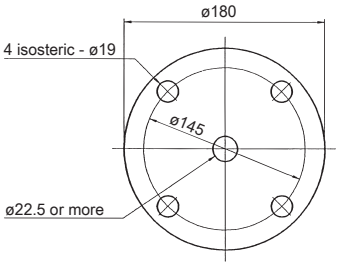












Flange standard: equivalent to 80A JIS 5K FF

Sampling probe specifications

Product	: Sampling probe
Model	: P-61-1
Material in contact with gas	: SUS316
Temperature of gas to be sampled	: max 400°C
Flange standard	: 80A JIS 5K FF (standard)
Filter	: SUS 316 metallic mesh 75 mm
Power	: AC 100 V
Power consumption	:Approx. 100 W (50 W x 2)
Weight	: Approx. 8 kg

Product code

CO/O_2 gas analyzer

GCO200-2-□□□□□□□□□□

- Power voltage
  - 1 ····· AC 100 V
  - 9 ····· Special
- Power frequency
  - A ····· 50 Hz
  - B ····· 60 Hz
- Measurement item
  - 1 ····· CO/O_2 (standard)
  - 2 ····· CO
  - 3 ····· O_2
- Transmission output
  - 1 ····· DC 4 to 20 mA (4 items) (standard)
  - 8 ····· Designated
  - 9 ····· Special
- Pre-conditioner section
  - 1 ····· Pre-conditioner (standard)
  - 9 ····· Special
- Structure
  - 3 ····· Not applicable
  - 4 ····· Indoor cubicle (standard)
  - Y ····· Outdoor cubicle (standard)
  - 9 ····· Custom spec.
- Recorder
  - 0 ····· Installed
  - 1 ····· Not installed
    (100 mm wide, 100 equal parts, non-unit, 6 dots)
  - 8 ····· Custom spec.
- Heater
  - 0 ····· Not installed
  - 1 ····· Installed
- Mode of indication
  - A ····· Standard
  - B ····· English designated
  - 8 ····· Special
  - Z ····· Custom spec.

Model P61-1 sampling probe

P611-0-□□□□□□

- Flange standard
  - 1 ····· 80A JIS 5K FF (standard)
  - 2 ····· 80A JIS 10K FF
  - 3 ····· 100A JIS 5K FF
  - 4 ····· 100A JIS 10K FF
  - 5 ····· 65A JIS 5K FF
  - 6 ····· 65A JIS 10K FF
  - 9 ····· Special
- Length of probe
  - 1 ····· 400 mm
  - 2 ····· 600 mm
  - 3 ····· 1000 mm (standard)
  - 4 ····· 1500 mm
  - 9 ····· Special
- Material of insertion part
  - 1 ····· SUS316 (standard)
  - 2 ····· SUS316L
  - 9 ····· Special
- Length of sampling tube
  - A ····· None
  - B ····· 5 m
  - C ····· 10 m
  - D ····· 15 m
  - E ····· 20 m
  - J ····· Custom spec.
- Heater standard
  - 0 ····· 100 V, 50 W x 2, lead wire 3 m
  - 9 ····· Designated
  - A ····· None
- Mode of indication
  - 0 ····· Standard
  - 1 ····· English designated
  - 9 ····· Designated

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⚠CAUTION

Do not operate products before consulting instruction manual.

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