ISO-14001
ISO-9001

SPECIFICATION SHEET

TOA DKK

SILICA ANALYZER

Model: **SLC-1605 (for very low concentration)**
SLC-1615 (for low concentration)
SLC-1625 (for high concentration)

This equipment is used for high accuracy measurement of silica (SiO2) concentration in pure and ultra pure water used for VLSI manufacture or as boiler feed water. The "Molybdenum-blue" measurement method is employed. Three versions are available according to the required measurement range. The following ranges are available, very low concentration, low concentration and high concentration. Both the microprocessor controller and analyzer are housed in a self-standing cabinet, providing ease of operation and maintenance.

FEATURES

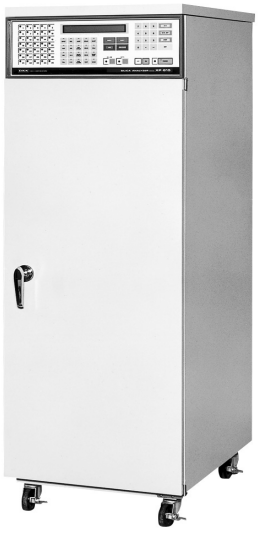
- Measurement of very low concentration 0~10ppb.
  SLC-1605 measures very low concentration with an accuracy (repeatability) within +/-2% FS.
- No generation of corrosive gas, and simple technique for reagent supplying.
  Ascorbic acid is used as the reducing agent, not sulfonic acid with irritating odor. The liquid system is a sealed type.
- Long-life colorimeter light source.
  The semi-conductor light source has a very long service life. It does not normally require replacement during the life of the instrument.
- Wide range measurement covering from ultra pure water to city water.
  Three models are available. For very low concentration, low concentration and high concentration. For each model, two ranges can be designated for each flow path. The auto-range system automatically switches the range according to the measured value.
- Wide range for measurement cycle setting.
  Freely set between 5 minutes and 999 minutes.
- Multi-stream measurement
  Up to four streams can be automatically switched successively.
- Connection to external computer.
  The analysis results can be transmitted as a serial signal in RS-232C format.
- Calibration with standard solution required only once every 6 months.
- Auto calibration function is available as an option.

STANDARD SPECIFICATIONS

Product name	Silica analyzer (for very low concentration)	Silica analyzer (for low concentration)	Silica analyzer (for high concentration)
Model	SLC-1605	SLC-1615	SLC-1625
Meas. object	Ultra pure water, pure water	Boiler water, pure water	Raw water for pure water production, city water
Meas. range	2 ranges between 0~10ppb and 0~500ppb (automatically switched)	2 ranges between 0~50ppb and 0~5,000ppb (automatically switched)	2 ranges between 0~5ppm and 0~50ppm (automatically switched)

Display : LCD 40 characters x 2 lines (with back light)
Measurement Method : Intermittent absorptiometry with Molybdenum blue
Measurement Cycle : Freely set between 5 min. and 999 min. (Please consult with DKK-TOA when sample contains phosphoric acid)
Measurement Flow Path : 1~4 (To be specified)
Automatic Calibration : Zero.....Auto zero
Repeatability : +/-2%FS (with minimum meas. time of 10 min.)

Sample Conditions
Flow rate : 0.2~2L/min.
Pressure : 10~200kPa
Temperature : 10~40°C



Ambient Temperature/ Humidity : 10~40°C, max. 85%RH (no condensing)
Construction : Indoor installation
Output : Isolated from input, 4~20mA DC (max. load 600Ω), hold output, 1 circuit/path or 1 circuit with channel marker
Alarms : Power cut-off signal, under maintenance signal, abnormal concentration signal, other common alarm signals (colorimeter abnormality, sample cut-off, abnormal calibration curve)
Contents of common alarm signals are indicated on the LCD, and printed by the printer (optional). All alarm signals are transmitted to a common set of terminals.
Voltage-free contact output (20VA, 110V AC or less)
Other Contact Outputs : Range signal (closed contact with high range)
Voltage-free contact output (20VA, 110V AC or less)
Interface : RS-232C
Power Requirements : 100V AC +/-10%, 50/60Hz
Power Consumption : Approx. 500VA
Instrument Air : Pressure...0.4~0.7MPa (normal usage 0.5NL/min., purge usage 4NL/min.)
Dimensions : 470(W) x 600(D) x 1450(H)mm
Weight : Approx. 100kg
Paint Color : Munsell 5Y7/1 acid-proof painting

OPTION

Calibration with standard solution required only once every 6 months.
One of the following auto calibration functions is available as an option.
1. Automatic calibration by standard solution
2. Simple span calibration with colored glass filter

RELATED EQUIPMENT

Printer (optional) : Dot-matrix, impact type 40 digits/line
Anti-freezing heater (opt.) : Integration in the analyzer is possible (120W)

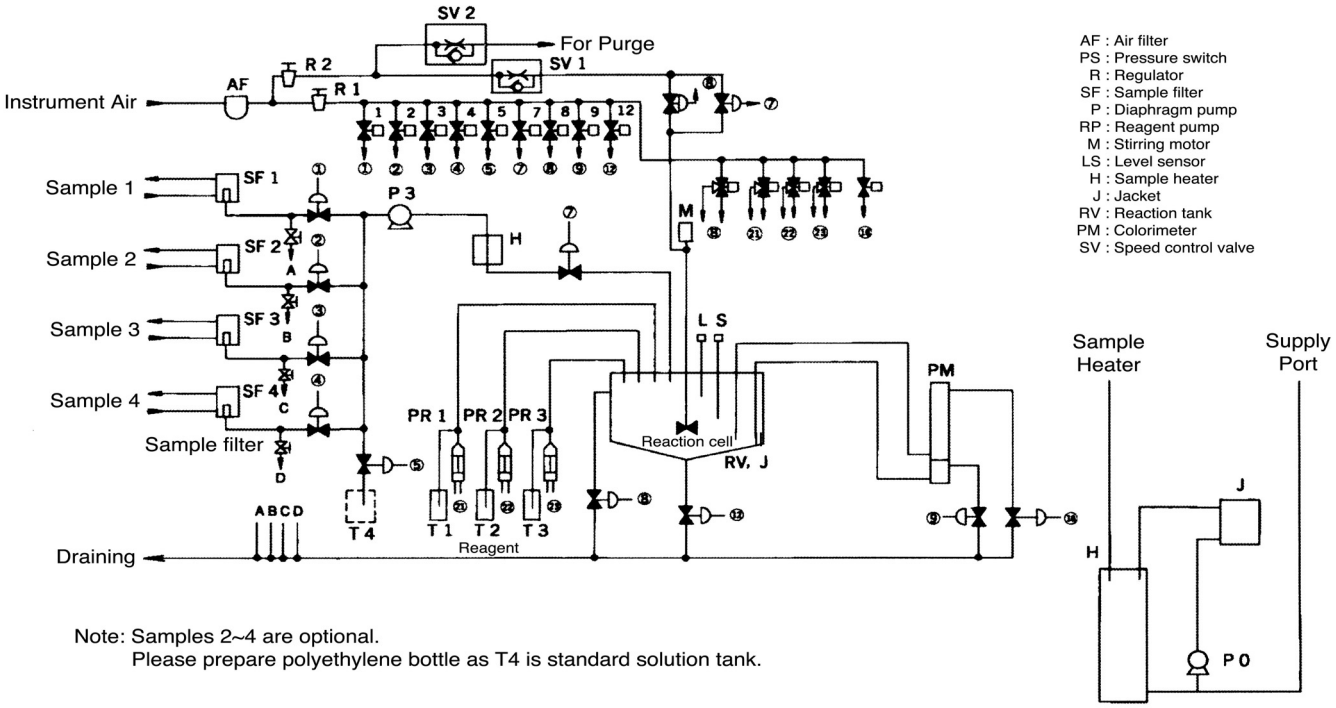
PRINCIPLE OF OPERATION

(Sampling)

To reduce the measurement delay time, the sample is continuously flowing in the sample filter (SF) of each stream. At the time of sampling, only the valve of the measured stream opens for filtration. The filtrated sample is transferred to the reaction cell as the sample for the color developing reaction.

(Reaction)
Ammonium molybdate is added to the sample to produce silicomolybdic acid.
Then tartaric acid is added to the sample to mask phosphoric acid, and the silicomolybdic acid is reduced to molybdenum blue using ascorbic acid. This solution is transferred to the colorimeter to measure its absorbance at a wave length of 860nm. The silica concentration is automatically calculated with the use of the previously prepared calibration curve.

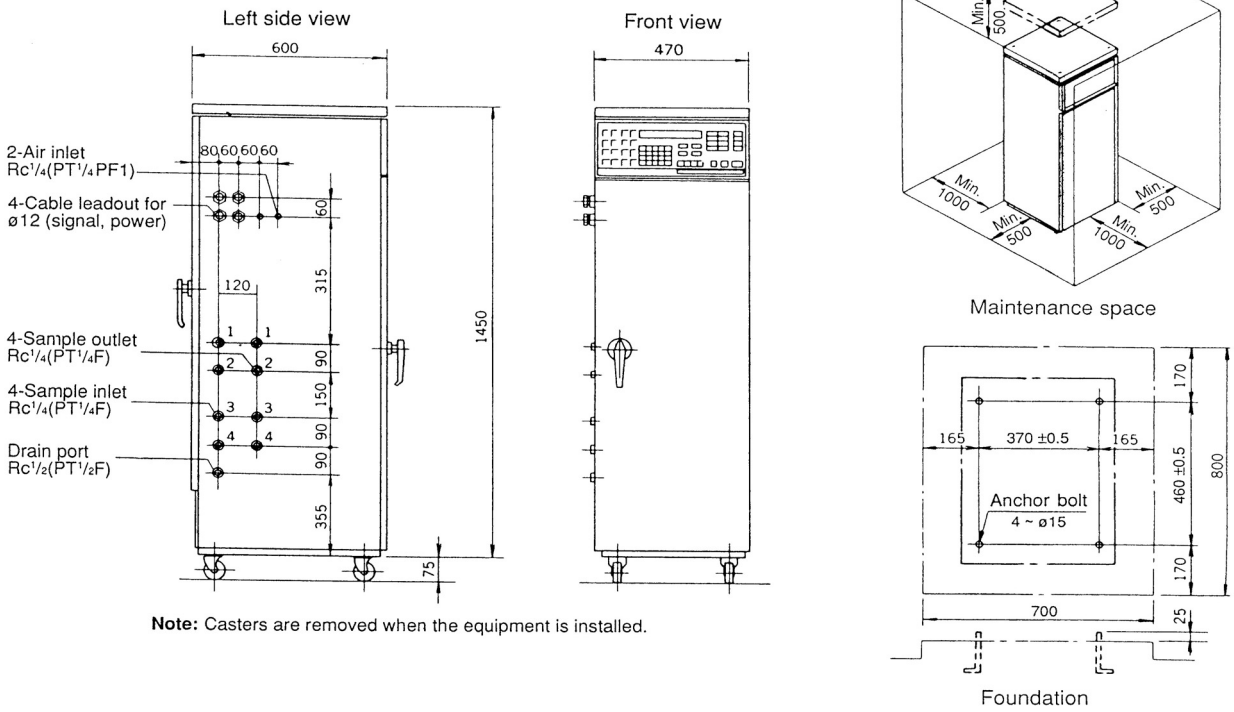
MEASUREMENT SYSTEM DIAGRAM



Note: Samples 2~4 are optional.
Please prepare polyethylene bottle as T4 is standard solution tank.

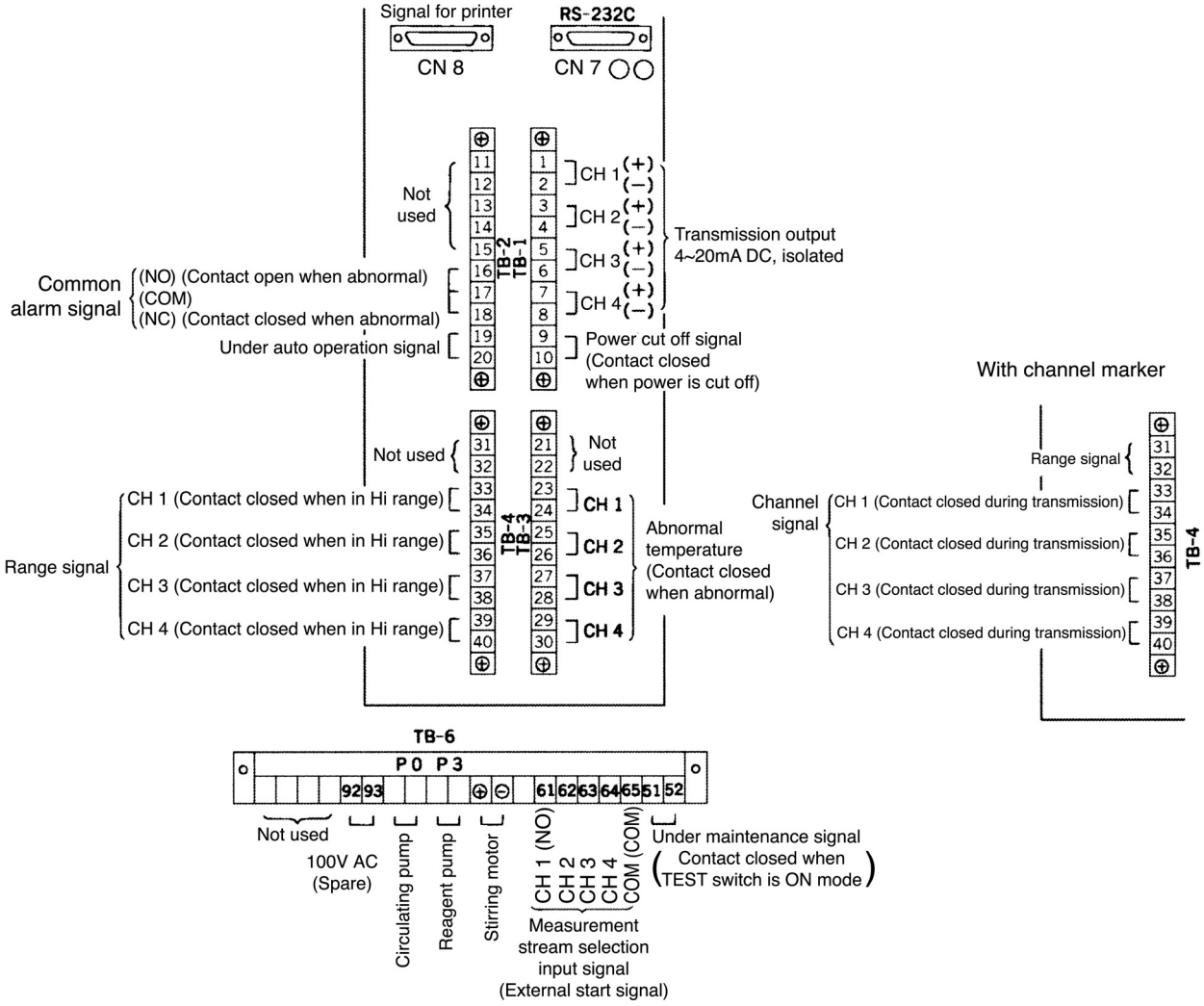
DIMENSIONS

Unit: mm



Note: Casters are removed when the equipment is installed.

TERMINAL CONNECTIONS



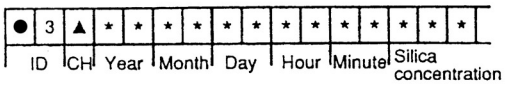
DATA COMMUNICATION SPECIFICATIONS

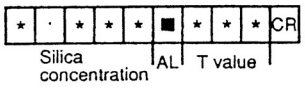
■ Interface specifications

Item	Description
Interface standard	RS-232C (2Semi-standard)
Communication method	Half duplex
Transmission	Variable word length serial transmission
Synchronism	Non-synchronous
Communication rate	1200bps
Transmission code	8 bit ASCII
Parity check	Nil
Start bit	1 bit
Stop bit	1 bit

■ Data format

(1) Measured value format

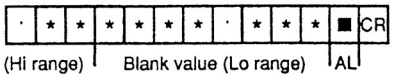




- ● Mark: 1 ~ 9 representing the appliance No. (Freely set)
- ▲ Mark: 1 ~ 4 representing the flow path No.
- ■ Mark: 0 or 1 representing the presence or absence of abnormal-concentration alarm

  0 = Not abnormal
  1 = Abnormal

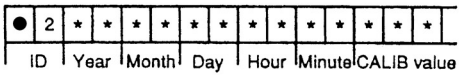
(2) Blank calibration format

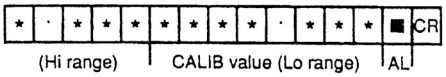


- ● Mark: 1 ~ 9 representing the appliance No. (Freely set)
- ■ Mark: 0 or 1 representing the presence or absence of abnormal-concentration alarm.

  0 = Not abnormal
  1 = Abnormal

(3) Span calibration format

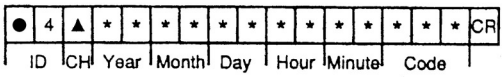




- ● Mark: 1 ~ 9 representing the appliance No. (Freely set)
- ■ Mark: 0 or 1 representing the presence or absence of abnormal concentration alarm.

  0 = Not abnormal
  1 = Abnormal

(4) Abnormal-equipment format

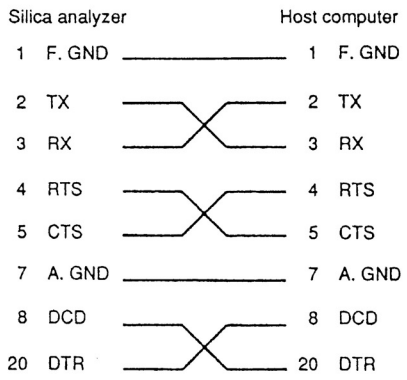


- ● Mark: 1 ~ 9 representing the appliance No. (Freely set)
- ▲ Mark: 1 ~ 4 representing the flow path No.

This code corresponds to the abnormality as follows.

Fault in detail	Code		
ABS OVER	1	0	0
CALIB ERR	0	1	0

■ Method of Connection



PRODUCT CODE

SLC-1605 (Very low concentration)

SLC1605–O–□□□□□□□□□□□□

- Power source
  - 1 ..... 100V AC 50/60Hz
  - 2 ..... 110V AC 50/60Hz
  - 3 ..... 115V AC 50/60Hz
  - 4 ..... 120V AC 50/60Hz
  - 5 ..... 200V AC 50/60Hz
  - 6 ..... 220V AC 50/60Hz
  - 7 ..... 230V AC 50/60Hz
  - 8 ..... 240V AC 50/60Hz
  - 9 ..... Custom spec.
- Output
  - 1 ..... 4 ~ 20mA DC
  - 9 ..... Custom spec.
- Measurement range
  - A ..... Given 2 ranges automatically switched between 0 ~ 10 ppb and 0 ~ 500ppb (Standard)
  - Z ..... Custom spec.
- Number of measurement points
  - 1 ..... 1 stream
  - 2 ..... 2 streams
  - 3 ..... 3 streams
  - 4 ..... 4 streams
- Output identification
  - Y ..... Not applicable (in the case of 1 flow path)
  - A ..... Identified by channel marker
  - B ..... Simultaneous output
- Printer
  - 0 ..... Nil
  - 1 ..... Equipped
  - 9 ..... Custom spec.
- Anti-freezing heater
  - 0 ..... Nil
  - 1 ..... Equipped
  - 9 ..... Custom spec.
- Piping connection port
  - A ..... Standard
  - Z ..... Custom spec.
- Cable port
  - 0 ..... Standard
  - 9 ..... Custom spec.
- Paint colour
  - 0 ..... Standard
  - 9 ..... Custom spec.
- Markings
  - 0 ..... Standard
  - 1 ..... English
  - 9 ..... Custom spec.

SLC-1615 (Low concentration)

SLC1615–O–□□□□□□□□□□□□

- Power source
  - 1 ..... 100V AC 50/60Hz
  - 2 ..... 110V AC 50/60Hz
  - 3 ..... 115V AC 50/60Hz
  - 4 ..... 120V AC 50/60Hz
  - 5 ..... 200V AC 50/60Hz
  - 6 ..... 220V AC 50/60Hz
  - 7 ..... 230V AC 50/60Hz
  - 8 ..... 240V AC 50/60Hz
  - 9 ..... Custom spec.
- Output
  - 1 ..... 4 ~ 20mA DC
  - 9 ..... Custom spec.
- Measurement range
  - A ..... Given 2 ranges automatically switched between 0 ~ 50 ppb and 0 ~ 5000ppb (Standard)
  - Z ..... Custom spec.
- Number of measurement points
  - 1 ..... 1 stream
  - 2 ..... 2 streams
  - 3 ..... 3 streams
  - 4 ..... 4 streams
- Output identification
  - Y ..... Not applicable (in the case of 1 flow path)
  - A ..... Identified by channel marker
  - B ..... Simultaneous output
- Printer
  - 0 ..... Nil
  - 1 ..... Equipped
  - 9 ..... Custom spec.
- Anti-freezing heater
  - 0 ..... Nil
  - 1 ..... Equipped
  - 9 ..... Custom spec.
- Piping connection port
  - A ..... Standard
  - Z ..... Custom spec.
- Cable port
  - 0 ..... Standard
  - 9 ..... Custom spec.
- Paint colour
  - 0 ..... Standard
  - 9 ..... Custom spec.
- Markings
  - 0 ..... Standard
  - 1 ..... English
  - 9 ..... Custom spec.

[Due to continuous product development and improvement, our product codes are subject to change.
Please confirm product code with our authorized agents or our International Sales Department prior to order placement.]

PRODUCT CODE

SLC-1625 (High concentration)

SLC1625–O□□□□□□□□□□□□

- Power source
  - 1 ..... 100V AC 50/60Hz
  - 2 ..... 110V AC 50/60Hz
  - 3 ..... 115V AC 50/60Hz
  - 4 ..... 120V AC 50/60Hz
  - 5 ..... 200V AC 50/60Hz
  - 6 ..... 220V AC 50/60Hz
  - 7 ..... 230V AC 50/60Hz
  - 8 ..... 240V AC 50/60Hz
  - 9 ..... Custom spec.
- Output
  - 1 ..... 4 ~ 20mA DC
  - 9 ..... Custom spec.
- Measurement range
  - A ..... Given 2 ranges automatically switched between 0 ~ 5ppm and 0 ~ 50ppm
  - Z ..... Custom spec.
- Number of measurement points
  - 1 ..... 1 stream
  - 2 ..... 2 streams
  - 3 ..... 3 streams
  - 4 ..... 4 streams
- Output identification
  - Y ..... Not applicable (in the case of 1 flow path)
  - A ..... Identified by channel marker
  - B ..... Simultaneous output
- Printer
  - 0 ..... Nil
  - 1 ..... Equipped
  - 9 ..... Custom spec.
- Anti-freezing heater
  - 0 ..... Nil
  - 1 ..... Equipped
  - 9 ..... Custom spec.
- Piping connection port
  - A ..... Standard
  - Z ..... Custom spec.
- Cable port
  - 0 ..... Standard
  - 9 ..... Custom spec.
- Paint colour
  - 0 ..... Standard
  - 9 ..... Custom spec.
- Markings
  - 0 ..... Standard
  - 1 ..... English
  - 9 ..... Custom spec.

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