

ELECTROMAGNETIC CONDUCTIVITY ANALYZER ELECTROMAGNETIC CONCENTRATION ANALYZER

Model MBM-160
Model MBM-162

FEATURES

Filed installed, 4-wire Conductivity transmitter : sturdy die-cast aluminium case, multi-voltage operating power, user-friendly operation and large digital display. For wetted parts, PVC (heatproof vinyl chloride) and PFA (Teflon) are used instead of metals to achieve corrosion resistance and heat resistance against most chemicals.

Microcomputer adjusts the temperature. The temperature compensating is carried out by microcomputer.

3 types of compensation are applicable.: NaCl temperature characteristics (2 types), % / C, and manual input (5 point at maximum). (for MBM-160 conductivity meter) A density value calculated from density (6 points), temperature (5 points) and conductivity data (30 points) at maximum is linearly outputted as transmission output 4-20mA.(for MBM-162 concentration analyzer)

Transmission outputs have 2 circuits: electric conductivity / density, and liquid temperature. Each output range can be freely set separately. The 2 output circuits are common.

Since this device includes adjustment function, it is possible to conform the device to other standard device or analytical values.

During the maintenance mode, the indication turns on ST-BY and transmission output can be held at the same value as that of just before switching a mode. Furthermore , alarm output turns OFF and it does not interrupt the control system. In case that the operator forgot to release the maintenance mode, a setting for



automatic return to the measurement mode is also available.

The device includes 2 circuits with adjustment contact point outputs. (c contact point each) It is possible to freely set a value as long as it is within a measuring range.

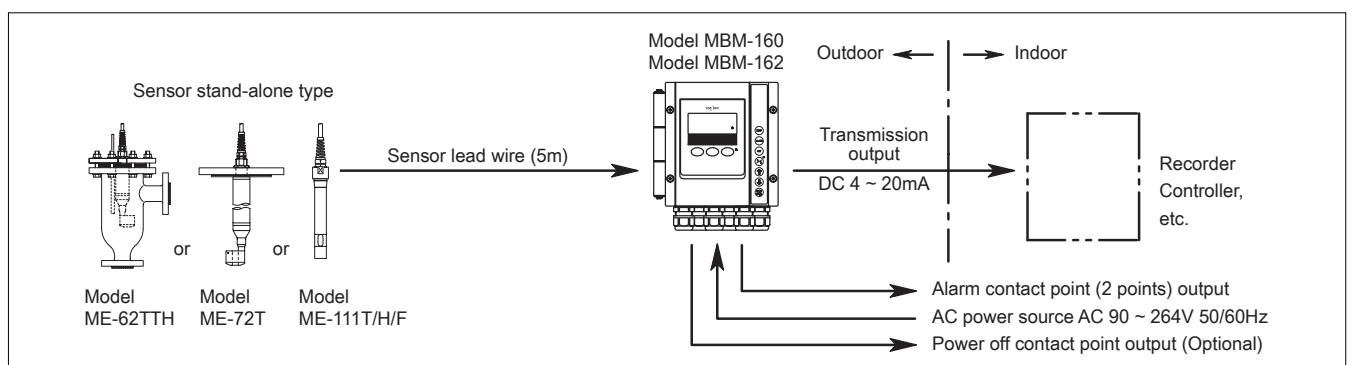
[Options]

It is possible to transmit data to a PC with RS-232C communication feature. (A dedicated cable is required separately.)

Provided by client's data, it is possible to make the device to a specific concentration analyzer. By using RS-232C, the operator enables to make the device that suits customer's specifications.

It is possible to output power off signals (closing contact points) when power supply stops.

Configuration Diagram



Standard Specifications

[Common specification]

Indicator : Liquid crystal display
 Output : Insulation type ... DC 4 ~ 20mA (linear),
 load resistance 650Ω or less
 Electric conductivity (concentration) and
 liquid temperature (2 circuits common)
 Processor : Per micro computer
 Ambient temperature : -20~55°C, 95%RH or less
 and humidity
 Operating power : AC 90 ~ 264V 50/60Hz
 Power consumption : Approximately 10 VA
 Construction : Outdoor installation, dust resistant, jet
 proof type (equivalent to IP65)
 Transmitter : 181(W) X 180(H) X 95(D)mm
 Dimensions (weatherproof connection not included)

Mounting : 50A pipe mounting
 (Option: wall, rack installation)
 Material : Console ... Aluminum die cast
 Window ... Polyester
 Paint Finish : Metallic silver
 Cable Entries : 6 points of cable grounds
 (external diameter Ø6 ~ Ø12 for a cable)
 Possible to remove the cable grounds and
 connect an electric wire tube
 (G 1/2X6)
 Weight : Approximately 2kg
 Combination Sensor: Model ME-11T, Model ME-111
 Cable length : Standard 5m
 Possible to extend it to 20m after
 confirmation with customers

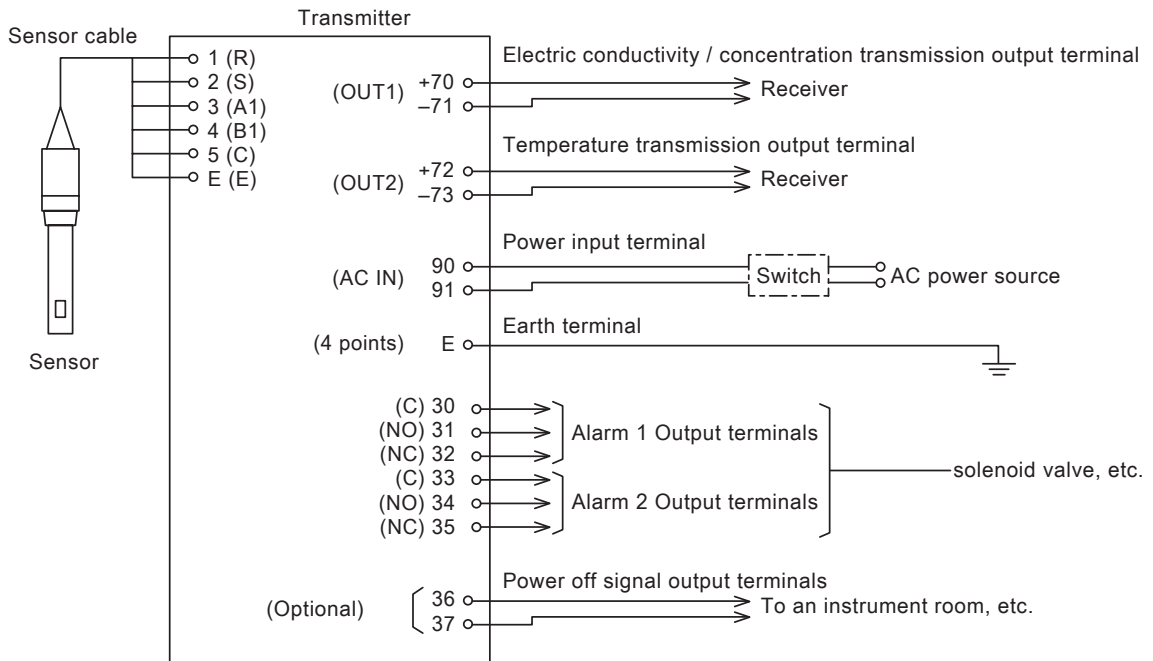
[Electromagnetic conductivity analyzer]

Product name : Electromagnetic conductivity analyzer
 Model : MBM-160
 Measurement range: Electric conductivity (unit: mS/cm)
 Selecting from the following 7 ranges
 0.000 ~ 2.100
 0.00 ~ 7.00
 0.00 ~ 21.00
 0.0 ~ 70.0
 0.0 ~ 210.0
 0 ~ 700
 0 ~ 2100
 Temperature ... -5~120°C (resolution 0.1°C)
 (depending heat-resistant of the sensor)
 Sample temperature : -5~105°C (depending materials of the
 compensating sensor)
 Transmission : Electric conductivity ... 23.8% or more of
 output range the measuring range
 (A range can be set freely.)
 Temperature ... 10°C or more in a unit of 1°C
 (Can be set freely in a range of -5 ~ 120°C)
 Performance : Linearity ... within ±0.5%±1digit
 (with an equivalent Note that, it should be within ±0.8%FS in
 resistance) 0.000 ~ 2.100mS/cm range.
 Repeatability ... within ±0.2%FS
 Temperature compensating ... Within
 ±1.5%FS
 Alarm function : Target ... electric conductivity
 Alarm contact point ... 2 points with
 contact point c
 Contact point capacity ... AC 250V 3A or
 less (load resistance)
 DC 30V 3A or less (load resistance)
 Setting range ... Free setting is allowed (2
 points), 0~FS
 Power off signal : Outputs closing contact point signal when
 output (Optional) power is off.
 Contact rating ... AC 250V 3A or less
 (resistance load)

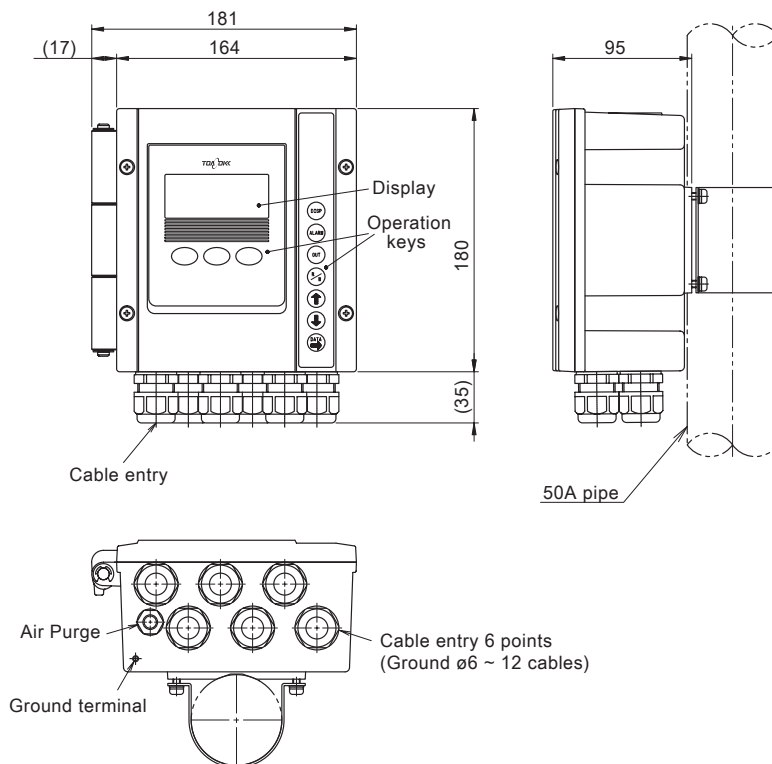
[Electromagnetic concentration analyzer]

Product name : Electromagnetic concentration analyzer
 Model : MBM-162
 Measurement range: Please see a product code table for
 inorganic salt concentration analyzers.
 Concentration example
 Sodium chloride (NaCl)
 Sodium hydrate (NaOH)
 Hydrochloric acid (HCl)
 Sulfuric acid (H₂SO₄)
 Nitric (HNO₃)
 * Fuming sulfuric acid (SO₃)
 * Fluorinated acid (HF)
 * Potassium hydrate (KOH)
 * Phosphoric acid (H₃PO₄)
 * Calcium chloride (CaCl₂), etc.
 A star mark (*) means that our factory can
 input density conversion data and make
 the device usable, if client send the data
 to our factory.
 Temperature compensating range : Temperature... -5~120°C (resolution 0.1°C)
 (depending heat-resistant of the detector)
 Transmission : Standard 20°C in width (depending on
 output range measuring density type)
 : Concentration or concentration ... Linear
 output to support solution Concentration
 Alarm feature or concentration (Can be set freely)
 Temperature ... 10°C or more in a unit of 1°C
 (Can be set freely in a range of -5 ~ 120°C)
 : Target ... Concentration or concentration
 Alarm contact point ... 2 points with
 contact point c
 Contact rating ... AC 250V 3A or less
 (resistance load)
 DC 30V 3A or less (resistance load)
 Power off signal : Setting range ... Free setting is allowed (2
 connection (Optional) points), 0~FS
 : Outputs closing contact point signal when
 power is off.
 Contact rating ... AC 250V 3A or less
 (resistance load)

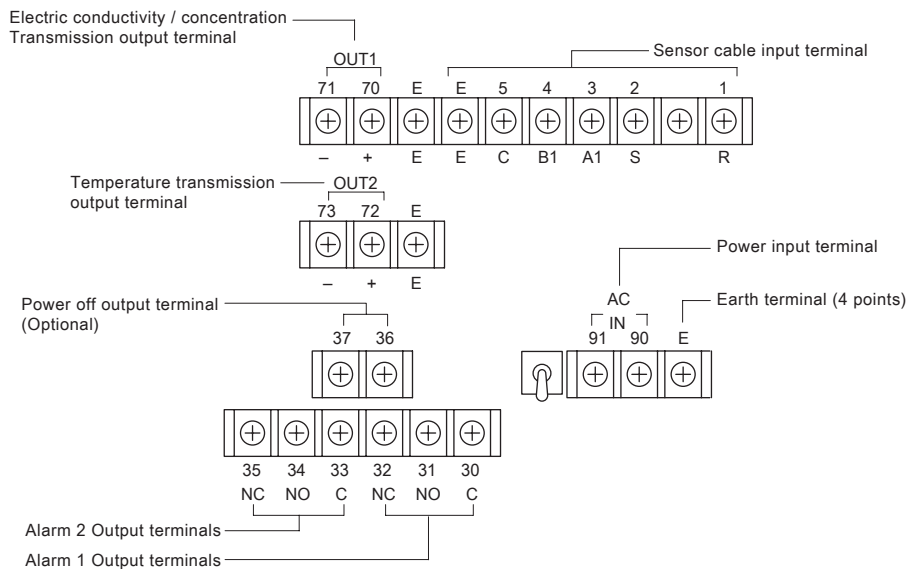
Measurement principle



Transmitter Dimensions or Dimensions in : mm



Terminal Connections



Product code

MBM160A-0-	□□□□□□□□□□□□□□	Measurement / indication range (unit mS/cm) *1
MBM160B-0-	□□□□□□□□□□□□□□	Measurement / indication range (unit S/m) *1
1	.....	Power
A	.....	AC 90 ~ 264V 50/60Hz
B	.....	Output
1	.....	DC 4 ~ 20mA
2	.....	DC 4 ~ 20mA and with RS-232C interface
A	.....	Combination sensor cell constant number
1	.....	2.6cm ⁻¹ (260m ⁻¹)(ME-11T)
2	.....	9.0cm ⁻¹ (900m ⁻¹)(ME-*** H/T series)
A	.....	Electric conductivity transmission output range *2
5	.....
Y	.....	Appendix
1	.....	Temperature compensating coefficient
2	.....	NaCl
8	.....	%/°C Specify a numeric value.
0	.....	INPUT (6 point at maximum) Specify a numeric value.
8	.....	Temperature compensating conversion temperature at 25°C
A	.....	Others (5 ~ 95°C in a unit of 5°C) Specify a numeric value.
Y	.....	liquid temperature output range (-5 ~ 120°C)
0	.....	0 ~ 50°C
1	.....	Other specification (10°C or more in width in units of 1°C)
0	.....	Alarm output
1	.....	2 points alarms (2 circuits with contact point c)
2	.....	2 points alarms (2 circuits with contact point c) + Power off signal (1 circuit with contact point a)
1	.....	Mounting metal fittings
2	.....	for installing 50A pipes
0	.....	For installing on a wall
1	.....	Cable entry *4
2	.....	Standard (Cable ground for Ø6 ~ Ø12)
0	.....	G1/2 (PF1/2)
1	.....	NPT1/2
2	.....	Air purge
0	.....	No
1	.....	Yes
0	.....	With/without a hood
1	.....	No
0	.....	Yes
1	.....	Marking
0	.....	Standard
1	.....	English
0	.....	Combination Sensor
A	.....	No *5
B	.....	Supplied together with instrument

Codes of special specifications
 Digits of numbers : 9
 Digits of characters : Z

*1. MBM-160 has 7 hard ranges inside as described below.

Range 1	0.000 ~ 2.100 mS/cm at 25°C	or	.0000 ~ .2100 S/m at 25°C
Range 2	0.00 ~ 7.00 mS/cm at 25°C	or	0.000 ~ 0.700 S/m at 25°C
Range 3	0.00 ~ 21.00 mS/cm at 25°C	or	0.000 ~ 2.100 S/m at 25°C
Range 4	0.0 ~ 70.0 mS/cm at 25°C	or	0.00 ~ 7.00 S/m at 25°C
Range 5	0.0 ~ 210.0 mS/cm at 25°C	or	0.00 ~ 21.00 S/m at 25°C
Range 6	0 ~ 700 mS/cm at 25°C	or	0.0 ~ 70.0 S/m at 25°C
Range 7	0 ~ 2100 mS/cm at 25°C	or	0.0 ~ 210.0 S/m at 25°C

*2. When A~X is selected, setting is made in accordance with a specifications. Data of the instrument is acquired before shipment.

*3. It is possible to set any transmission output range at 5/12 or over in width of the measuring range described above.

Example : 500 ~ 1000 mS/cm at 25°C

20.0 ~ 50.0 S/m at 25°C

*4. We make shipment with a standard cable ground if an electric tube is a screw specification. (Details are shown below.)

Standard : Cable ground (for Ø6 ~ Ø12) 6 points

G1/2 : Remove a cable ground for a connector of conduit piping, and use G1/2 female screws at the console side.

NPT1/2 : Remove a cable ground for a connector of conduit piping, and apply attached NPT1/2 adapters (5 units) to the console.

Leave the cable ground without conduit piping to use it as a plug (sealing a hole).

*5. If it is not produced together with a detector, it is necessary to send us date of the combination detector (production number, etc.)

The combination detectors are limited to ME-100 series and ME-11T series.

Note 1. The temperature compensating range is -5 ~ 105°C, but the limitation may be introduced depending on a material of the detector.

Unit		mS/cm	S/m	
Appendix Electric conductivity transmission output range 04 digits	A	0.000 ~ 0.500	.0000 ~ .0500	Range 1
	B	0.000 ~ 1.000	.0000 ~ .1000	
	C	0.000 ~ 1.500	.0000 ~ .1500	
	D	0.000 ~ 2.000	.0000 ~ .2000	
	E	0.00 ~ 3.00	0.000 ~ 0.300	Range 2
	F	0.00 ~ 4.00	0.000 ~ 0.400	
	G	0.00 ~ 5.00	0.000 ~ 0.500	
	H	0.00 ~ 10.00	0.000 ~ 1.000	Range 3
	J	0.00 ~ 15.00	0.000 ~ 1.500	
	K	0.00 ~ 20.00	0.000 ~ 2.000	
	L	0.0 ~ 30.0	0.00 ~ 3.00	Range 4
	M	0.0 ~ 40.0	0.00 ~ 4.00	
	N	0.0 ~ 50.0	0.00 ~ 5.00	
	P	0.0 ~ 100.0	0.00 ~ 10.00	Range 5
	Q	0.0 ~ 150.0	0.00 ~ 15.00	
	R	0.0 ~ 200.0	0.00 ~ 20.00	
	S	0 ~ 300	0.0 ~ 30.0	Range 6
	T	0 ~ 400	0.0 ~ 40.0	
	U	0 ~ 500	0.0 ~ 50.0	
	V	0 ~ 1000	0.0 ~ 100.0	Range 7
W	0 ~ 1500	0.0 ~ 150.0		
X	0 ~ 2000	0.0 ~ 200.0		
Y	Other specification*3			

Product code

MBM162A-0-□□□□□□□□□□□□□□□□	(Sodium chloride densitometer)
B-0-□□□□□□□□□□□□□□□□	(Hydrochloric acid densitometer)
C-0-□□□□□□□□□□□□□□□□	(Nitric densitometer)
D-0-□□□□□□□□□□□□□□□□	(Sodium hydrate densitometer)
E-0-□□□□□□□□□□□□□□□□	(Sulfuric acid densitometer)
F-0-□□□□□□□□□□□□□□□□	(Other densitometer)
1	Power
	AC 90 ~ 264V 50/60Hz
A	Output
	DC 4 ~ 20mA (linear)
B	DC 4 ~ 20mA and with RS-232C interface
	Combination sensor cell constant number
1	2.6cm ⁻¹ (ME-11T series, ME-6□, 7□)
2	9.0cm ⁻¹ (ME-***H/T series)
	Concentration measuring range
A	Appendix 1
s	
Y	
	Temperature compensating range
A	Appendix 2
s	
Y	
	Liquid temperature output range (-5 ~ 120°C)
A	0.0 ~ 50.0°C
Y	Other specification (10°C or more in width in units of 1°C)
	Alarm output
0	2 points alarms (2 circuits with contact point c)
1	2 points alarms (2 circuits with contact point c) + Power off signal (1 circuit with contact point a)
	Mounting metal fittings
1	for installing 50A pipes
2	For installing on a wall
	Cable port *1
0	Standard (Cable ground for Ø6 ~ Ø12)
1	G1/2 (PF1/2)
2	NPT1/2
	Air purge
0	No
1	Yes
	With/without a hood
0	No
1	Yes
	Marking
0	Standard
1	English
	Combination sensor
A	No *2
B	Supplied together with instrument

Codes of special specifications

Digits of numbers : 9
 Digits of characters : Z

- *1. We make shipment with a standard cable ground if an electric tube is a screw specification. (Details are shown below.)
 Standard : Cable ground (for Ø6 ~ Ø12) 6 points
 G1/2 : Remove a cable ground for a connector of conduit piping, and use G1/2 female screws at the console side.
 NPT1/2 : Remove a cable ground for a connector of conduit piping, and apply attached NPT1/2 adapters (5 units) to the console.
 Leave the cable ground without conduit piping to use it as a plug (sealing a hole).
- *2. If it is not produced together with a detector, it is necessary to send us date of the combination detector (production number, etc.)
 The combination detectors are limited to ME-100 series and ME-11T series.

Note 1. For the temperature compensating range, see Appendix 2. A limitation may be introduced depending on a measuring target and a material of the detector.

Note 2. Temperature indication and transmission output are at -5 ~ 120°C . However, take account of a measuring target, a material of the detector and temperature compensating range, and use it with a temperature less than the specified value.

<Appendix 1>

Measurement object		Sodium chloride concentration analyzer	Hydrochloric acid concentration analyzer	Nitric concentration analyzer	Sodium hydrate concentration analyzer	Sulfuric acid concentration analyzer	Other concentration analyzer	
Digits								
Concentration measuring range	04 digits	A	0 ~ 5 % NaCl	0 ~ 5 % HCl	0 ~ 5 % HNO ₃	0 ~ 5 % NaOH	0 ~ 5 % H ₂ SO ₄	
		B	0 ~10 % NaCl	0 ~10 % HCl	0 ~10 % HNO ₃	0 ~10 % NaOH	0 ~10 % H ₂ SO ₄	
		C	0 ~20 % NaCl	0 ~15 % HCl	0 ~20 % HNO ₃	0 ~15 % NaOH *2	0 ~20 % H ₂ SO ₄	
		D	0 ~25 % NaCl	25 ~35 % HCl	0 ~25 % HNO ₃	20 ~40 % NaOH *2	0 ~30 % H ₂ SO ₄ *2	
		E		25 ~40 % HCl	40 ~80 % HNO ₃		40 ~80 % H ₂ SO ₄	
		F		30 ~40 % HCl	60 ~70 % HNO ₃		60 ~80 % H ₂ SO ₄	
		G			60 ~80 % HNO ₃		93 ~99.5 % H ₂ SO ₄ *2	
		H					94 ~99.5 % H ₂ SO ₄ *2	
		Y	Other NaCl	Other HCl	Other HNO ₃	Other NaOH	Other H ₂ SO ₄	Specified *3
		Z	Special	Special	Special	Special	Special	Special

*2. Please be aware that there is a limitation in the temperature compensating range. (See Appendix 2 below.)

*3. Please specify the measurement target, a measurement range and a unit

<Appendix 2>

Measurement object		Sodium chloride concentration analyzer	Hydrochloric acid concentration analyzer	Nitric concentration analyzer	Sodium hydrate concentration analyzer	Sulfuric acid concentration analyzer	Other concentration analyzer	
Digits								
Temperature compensating range	04 digits	A	0 ~ 20°C	0 ~ 20°C	0 ~ 20°C	0 ~ 20°C *4	0 ~ 20°C *6	
		B	10 ~ 30°C	10 ~ 30°C	10 ~ 30°C	10 ~ 30°C	10 ~ 30°C *6	
		C	20 ~ 40°C	20 ~ 40°C	20 ~ 40°C	20 ~ 40°C	20 ~ 40°C	
		D	30 ~ 50°C	30 ~ 50°C	30 ~ 50°C	30 ~ 50°C	30 ~ 50°C	
		E	40 ~ 60°C	40 ~ 60°C	40 ~ 60°C	40 ~ 60°C *5	40 ~ 60°C	
		F	50 ~ 70°C	50 ~ 70°C	50 ~ 70°C	50 ~ 70°C	50 ~ 70°C	
		G	60 ~ 80°C	60 ~ 80°C	60 ~ 80°C	60 ~ 80°C	60 ~ 80°C	
		H	70 ~ 90°C	70 ~ 90°C	70 ~ 90°C	70 ~ 90°C	70 ~ 90°C	
		J	80 ~100°C	80 ~100°C	80 ~100°C	80 ~100°C	80 ~100°C	
		Y	Specified	Specified *7	Specified *7	Specified	Specified	Specified
Z	Special	Special *7	Special *7	Special	Special	Special		

*4. Measurement range 0 ~ 15% is impossible to produce.

*5. Measurement range 20 ~ 40% is impossible to produce.

*6. Measurement range 0 ~ 30% is impossible to produce.

*7. When an intermediate temperature exceeds 70°C, let us know about it in advance.



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Do not operate products before consulting instruction manual.

For continuous product improvement, DKK-TOA reserves the right to change specifications without notice.