TECHNICAL GUIDANCE

For cooling water devices and semiconductor chillers with excellent cost performance

W-2000 and W-2000N

MINI-WHEEL FLOWMETER

OUTLINE

W-2000 and W-2000N are the rotary vane type flowmeters suitable for various liquid flow measurement. W-2000 has a window through which operators can watch the rotation of the wheel and the flowing status of liquids. W-2000N covers wider range of temperature. Made by precision casting, both compact-designed and cost-effective flowmeters are suitable for the measurement of the various cooling water devices and semiconductor chillers.

W-2000 series

W-2000N series

FEATURES

- ❏ Pulse or current output
- ❏ Visible wheel rotation
- ❏ Covering wide temperature range from -20 to 100℃
- ❏ Wide variety of material groups to cover many kinds of fluids
- ❏ Easy overhauling, cleaning and maintenance
- ❏ Low price owing to intensive cost down
- ❏ Complying with RoHS

STANDARD SPECIFICATION

● Measuring fluid	: Liquids including water, Fluorinert, Galden, ethylene glycol. The liquid viscosity is 2.0 mPa･s or less.
● Fluid pressure	: Maximum 1.0 MPa
● Fluid temperature	: See MODEL CODE table
● Ambient temperature	: 5 to 60℃
● Flow direction and posture	: The pipe line on which flowmeter is installed, is either in horizontal or vertical. For the installation on horizontal pipe, the wheel shaft must be always in horizontal and flow path (center line of pipe line) must be situated in the upper side of the wheel to fill the wheel chamber fully with liquids. See "FLOW DIRECTION AND POSTURE."
● Construction	: See MODEL CODE table
● Accuracy	: ± 5 % of F.S. for model W-20 □ 2 ± 3 % of F.S. for model W-20 □ 3 to W-20 □ 9

< W-2000 series >

Pulse output type

● Output	: Open collector pulse (Unscaled)
● Duty	: H (Changing depending on flow rate), L (2 ms for reference value)
● Pulse frequency	: Approximately 75 to 95 Hz (Actual measurement value is indicated on product name plate)
● Power supply	: 5 to 18 VDC 12mA
● Load rating	: Maximum 18 VDC 15mA.
● Electric connection	: 3 core cable (UL2936) equivalent to AWG25
● Fluid temperature	: 5 to 80℃
● Construction	: Protected against dripping water (Equivalent to IP62)

Current output type

● Output	: 4 to 20 mADC
● Power supply	: 24 VDC ± 10% 50 mA
● Load rating	: 500 Ω or less
● Electric connection	: 4 core cable (UL2941) equivalent to AWG26
● Fluid temperature	: 5 to 60℃
● Construction	: Protected against dripping water (Equivalent to IP62)

<W-2000N series for low and high temperature services>

Pulse output type

● Output	: Open collector pulse (Unscaled)
● Duty	: H (Changing depending on flow rate), L (2 ms for reference value)
● Pulse frequency	: Approximately 85 to 105 Hz (Actual measurement value is indicated on product name plate)
● Power supply	: 5 to 12 VDC 12mA
● Load rating	: Maximum 12 VDC 15mA
● Electric connection	: 3 core cable (UL2517) equivalent to AWG24
● Fluid temperature	: -20 to 100℃
● Construction	: Protected against water jets (Equivalent to IP65)
● Additional specification	: Degrease, Non-water and Conden sation-free treatment

TOKYO KEISO CO., LTD.

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TG-F1058-1E AUG 2013K

MODEL CODE

《W-2000 series》

Model code													Description	
W-20	□	□	-	□	□	-	□	□	□	□	-	□		
Output	1												Pulse output: Open collector	
	3												Current output : 4 to 20 mA DC	
Range of flow rate Connection size		2											0.5 to 3 L/min (Flow path nozzle ϕ3.0)	Rc 3/8
		3											0.7 to 5 L/min (Flow path nozzle ϕ4.0)	
		4											1 to 10 L/min (Flow path nozzle ϕ6.4)	
		5											2 to 20 L/min (Flow path nozzle ϕ10)	
		6											3 to 30 L/min (Flow path nozzle ϕ12)	Rc 1/2
		7											4 to 40 L/min (Flow path nozzle ϕ14)	
		8											5 to 50 L/min (Flow path nozzle ϕ16)	
		9											6 to 60 L/min (Flow path nozzle ϕ16)	Rc 3/4
Inflow direction				R									Right to Left or Bottom to Top (Wheel on left side against flow path) (Standard)	
				L									Left to Right or Bottom to Top (Wheel on right side against flow path)	
Cable length					1								1 m (Standard)	
					2								2 m	
Material of O-ring						N							NBR (Nitrile rubber)	
						F							FKM (Fluorocarbon rubber)	
						E							EPDM (Ethylene propylene rubber)	
						S							FVMQ (Fluorosilicone rubber)	
Material of monitoring window *1							C						Polycarbonate (Standard)	
							S						SCS14 Blind type (No monitoring)	
Material of wheel, bearing, shaft, and bush (Indicated as group) *2								1					Group 1 (Standard)	
								2					Group 2	
								3					Group 3	
Accessories									0				None	
									A				R3/8 X Rc1/4 Adapter (Overall length 18mm)	
Additional specification (Add applicable code numbers when multiple requirements are involved)												A	Degrease treatment (Standard)	
												B	Non-water treatment	

《W-2000N series》

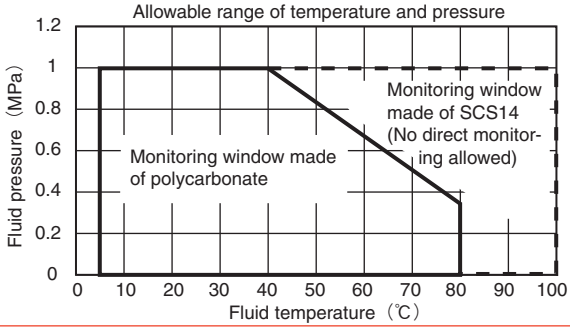
Model code												Description	
W-20	1	□	N	-	□	2	-	S	S	5	0		
Output	1											Pulse output: Open collector	
Range of flow rate Connection size		2	N									0.5 to 3 L/min（Flow path nozzle ϕ4.0）	Rc3/8
		3	N									0.7 to 5 L/min（Flow path nozzle ϕ5.7）	
		4	N									1.5 to 15 L/min（Flow path nozzle ϕ10）	
		5	N									2 to 20 L/min（Flow path nozzle ϕ11.5）	Rc1/2
		6	N									3 to 30 L/min（Flow path nozzle ϕ14）	
		7	N									4 to 40 L/min（Flow path nozzle ϕ16）	
		8	N									5 to 50 L/min（Flow path nozzle ϕ18）	Rc3/4
		9	N									6 to 60 L/min（Flow path nozzle ϕ18）	
Inflow direction					R							Right to Left or Bottom to Top (Wheel on left side against flow path) (Standard)	
					L							Left to Right or Bottom to Top (Wheel on right side against flow path)	
Cable length						2						2 m	
Material of O-ring								S				FVMQ (Fluorosilicone rubber)	
Material of monitoring window									S			SCS14	
Material of wheel, bearing, shaft, and bush (Indicated as group)										5		Group 5	
Accessories											0	None	

*1 Materials for monitoring window are determined by temperature and pressure. See allowable range of them in right hand table for which polycarbonate and stainless steel SCS14 are applicable. You can watch liquids flowing through the window made of polycarbonate, not through SCS14.

*2 Select a material group suitable for your service out of the material groups of the material table in the outline drawings.

Note : Do not hesitate to contact TOKYO KEISO Co., Ltd. for your specific requirements.

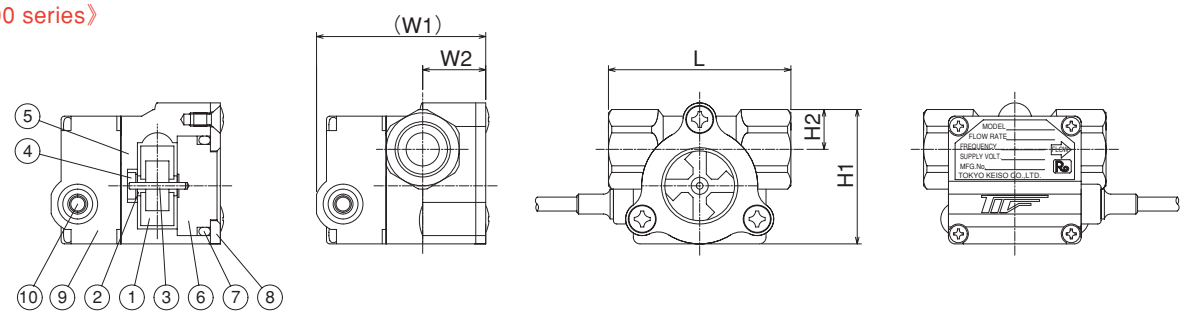
Allowable range of temperature and pressure



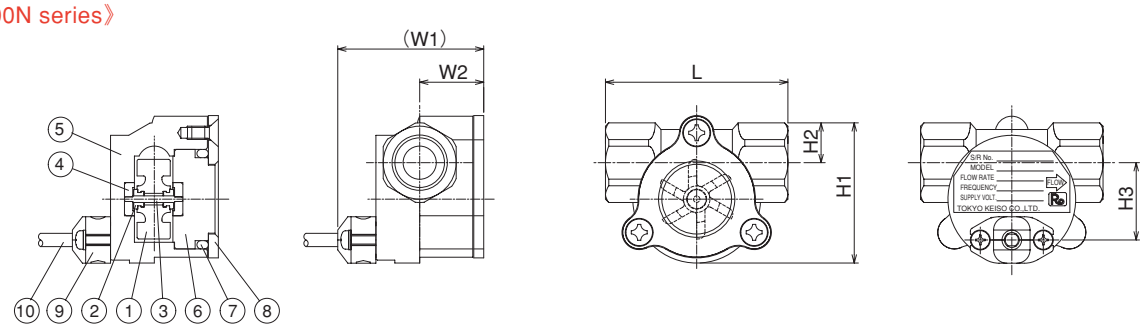
DIMENSION, CONSTRUCTION AND MATERIAL

Model		W-2000 series			W-2000N series
No.	Name	Material group 1 for cooling water	Material group 2 for non-carbon service	Material group 3 for Fluorinert and Galden	Material group 5 for Cooling water, Fluorionert and Galden
1	Wheel	PPS (Magnet mold)	PPS (Magnet mold)	PPS (Magnet mold)	PPS + Fe (Plastic magnet)
2	Bearing	Carbon containing PTFE	Glass containing PTFE	Carbon containing PTFE	Carbon containing PTFE
3	Shaft	Quartz glass	Quartz glass	Quartz glass	HC-276
4	Bush	PTFE	PTFE	Carbon containing PTFE	PPS
5	Flow path body	SCS14			SCS14
6	Monitoring window	See MODEL CODE			SCS14
7	O-ring	See MODEL CODE			See MODEL CODE
8	Cover plate	SUS316			SUS316
9	Cover (Holder)	Polycarbonate			PBT
10	Cable	PVC sheath			PVC sheath

《W-2000 series》



《W-2000N series》

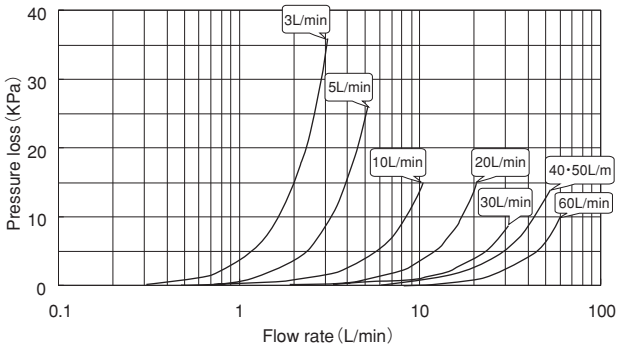


Model		W-2000 series					W-2000N series					
Connection size	L	H1	H2	W1	W2	Mass＊	H1	H2	H3	W1	W2	Mass
Rc3/8	55	41	12	51	19	240 g	42.5	12	23.3	44	19.3	330 g
Rc1/2	70	43	14.5	55	22	290 g	45	14.5	23.3	47	22.3	400 g
Rc3/4	80	49.5	17	57	22	380 g	51.5	17	27.3	49	24.3	490 g

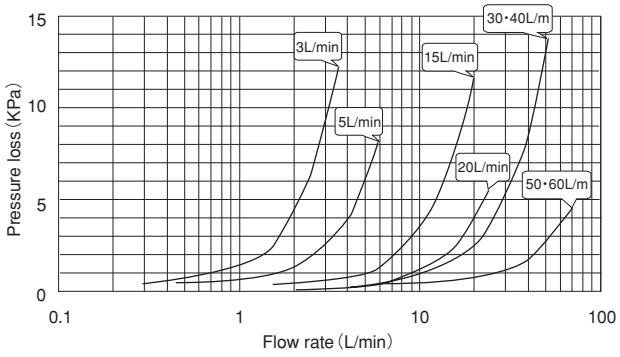
＊: With the window made of polycarbonate

PRESSURE LOSS

Pressure loss of W-2000



Pressure loss of W-2000N

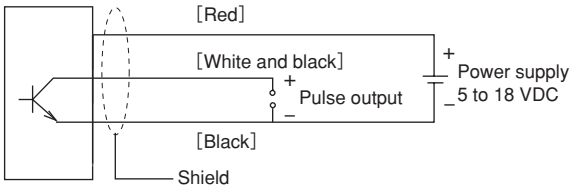


WIRING

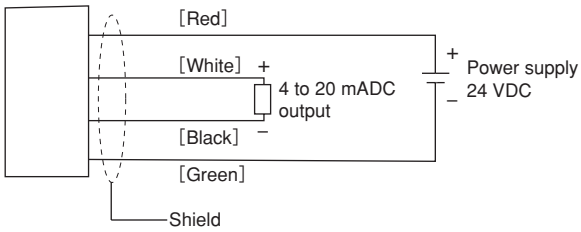
Following schematics show the interconnection for flowmeters. Variety of flow indicators are available in TOKYO KESO Co., Ltd for your applications.

《W-2000 series》

【Pulse output type】



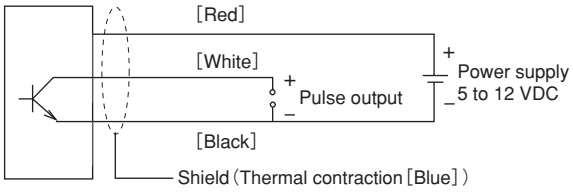
【Current output type】



Note: In the current output type the minus terminals of power supply and output are commonly connected. Therefore, use red, white and black wires when you connect 3 wire cables for the loop wiring.

《W-2000N series》

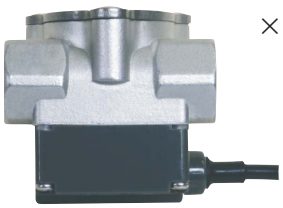
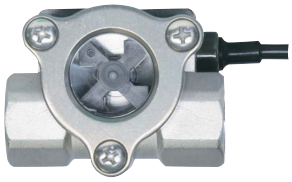
【Pulse output type】



FLOW DIRECTION AND POSTURE

Following drawings show how to install flowmeters considering easy gas venting and full liquid flowing inside fowmeters.

○: Recommended △: Conditionally accepted ×: Not accepted

 ○ Horizontal pipe with the shaft of wheel installed horizontally and liquid flowing lower side in wheel chamber.	 × Horizontal pipe with the shaft of wheel installed vertically.
 × Horizontal pipe with the shaft of wheel installed horizontally and liquid flowing upper side in wheel chamber.	 ○ Vertical pipe with the shaft of wheel installed horizontally and liquid flowing upward (from bottom to top). △ Vertical pipe with the shaft of wheel installed horizontally and liquid flowing downward (from top to bottom).

NOTES

- ❑ Do not put a signal cable along with other power lines.
- ❑ Inside diameter of process piping and fitting is to be more than that of flow path nozzle.
- ❑ Installation is to be made at the place free from the influence of external magnetic field which affects the characteristics.
- ❑ Use this flowmeter where there is no stagnation of air around the wheel and also in the state of water filled up.
- ❑ Avoid the air blow. Otherwise, the wheel and shaft might be damaged.
- ❑ The upstream straight runs of more than 10 D (D:inside diameter of pipe) is recommended when uneven or whirling flow is expected.

*Specification is subject to change without notice.

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