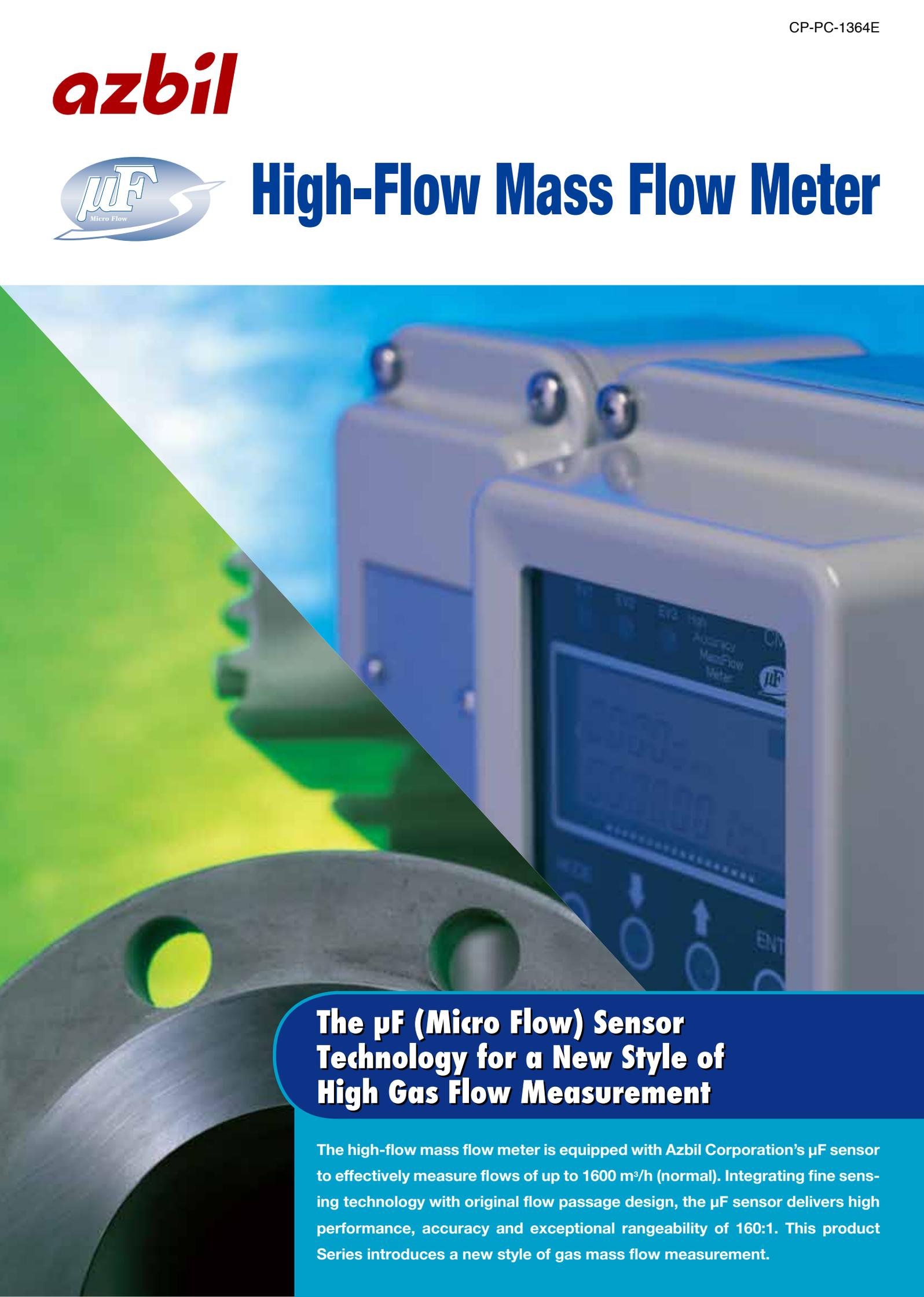


**azbil**

# High-Flow Mass Flow Meter

A photograph of a high-flow mass flow meter. The device is white and rectangular, with a digital display screen showing numerical values. Below the screen are several control buttons, including a power button and an 'ENT' button. The meter is connected to a large, circular metal flange with two circular ports. The background is a blurred green and blue, suggesting an industrial or laboratory setting.

## The $\mu$ F (Micro Flow) Sensor Technology for a New Style of High Gas Flow Measurement

The high-flow mass flow meter is equipped with Azbil Corporation's  $\mu$ F sensor to effectively measure flows of up to 1600 m<sup>3</sup>/h (normal). Integrating fine sensing technology with original flow passage design, the  $\mu$ F sensor delivers high performance, accuracy and exceptional rangeability of 160:1. This product Series introduces a new style of gas mass flow measurement.

# High-Flow, Stable and Highly Accurate Flow Measurement Made Possible by $\mu$ F(Micro Flow) Sensor Technology.



**The  $\mu$ F sensor can reliably measure gas mass flow to a maximum of 1600m<sup>3</sup>/h (normal).**

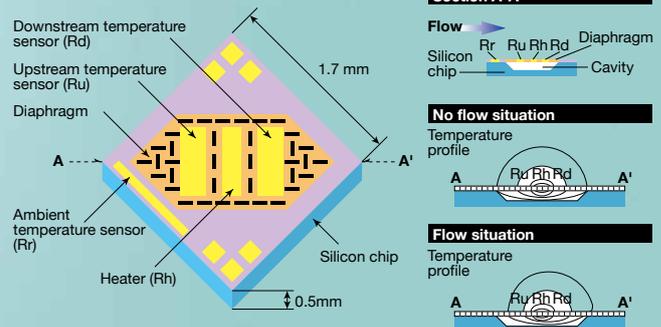
**Note: "normal" indicates the volume flow converted to the conditions of 0°C and 1 atmospheric pressure.**

## Structure and features of $\mu$ F (Micro Flow) sensor

- Manufactured by silicon micro-machining and thin-film technologies, this thermal type flow sensor is a mere 1.7mm (squared) and 0.5mm thickness.

- The use of ultra-precision machining technology minimizes variations in element layout and thermal capacity. High resolution of 1 mm/s in flow speed and high-speed response of approx. 2ms are achieved at the sensor chip level.

[Principle of Measurement] When gas flow does not exist, the temperature distribution around the heater is symmetric. When the gas starts to flow from Ru to Rd, the temperature at Ru upstream begins to decrease, while the temperature at Rd downstream increases, thus causing a distortion in the symmetry in temperature distribution. This temperature difference between Ru and Rd is used to calculate the mass velocity (velocity x density).



### Air consumption monitoring



A mass flow meter is necessary to measure the actual load and air consumption of a compressor. This product can precisely measure the flow with no need for adjustment in temperature and pressure.

### Gas consumption monitoring



This product is most suitable as a meter for managing boiler and burner operations. Its high rangeability allows flow monitoring of low loads, which makes it ideal for energy management.

### Various types of flow measurement equipment and control devices



This product offers high response of 160ms scanning speed which makes it appropriate for a variety of high-speed equipment. Its high rangeability covers a wide range of flow measurement, thus eliminating the use of multiple meters.



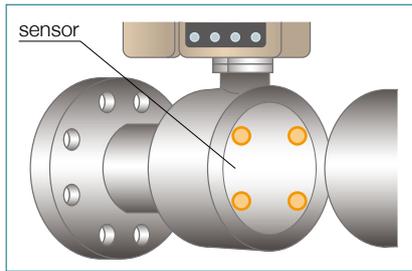
### The $\mu$ F (Micro Flow) sensor unaffected by changes in temperature and pressure

As this product is a thermal type flow meter, this product is unaffected by changes in temperature and pressure. With no need for any computing device to correct performance, this product is effective in reducing cost.



### High accuracy ( $\pm 2\%$ RD) and high rangeability from low to high flow region

Two sets of sensors for high and low flow ranges are mounted on the flow passage walls of the sensing unit at 90° intervals. By selecting sensors according to flow region and rate, this product delivers high accuracy and rangeability in flow measurement.



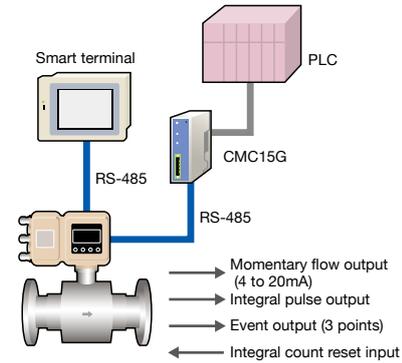
### Superior structure for outdoor applications

This product has a protective structure that meets IP65 standards of water-proof structures for outdoor applications. When installed in direct sunlight, this product requires a sun-blind.



### A variety of advanced functions, including communication functions, equipped as standard

This product is equipped with the following standard functions to flexibly respond to various application needs: Analog output function, LCD display (momentary, conversion and integration), integral pulse output and alarm contact output.



### Photoelectric touch sensors adopted for easy setting

Event output or pulse weight etc. can be set or reset from the front panel of the operating section. Photoelectric touch sensors are used to allow easy setting without opening the case.



### Low pressure loss is ideal in a range of applications

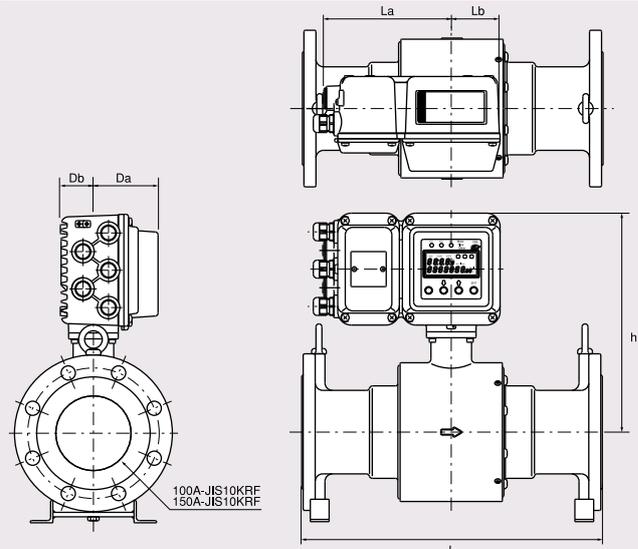
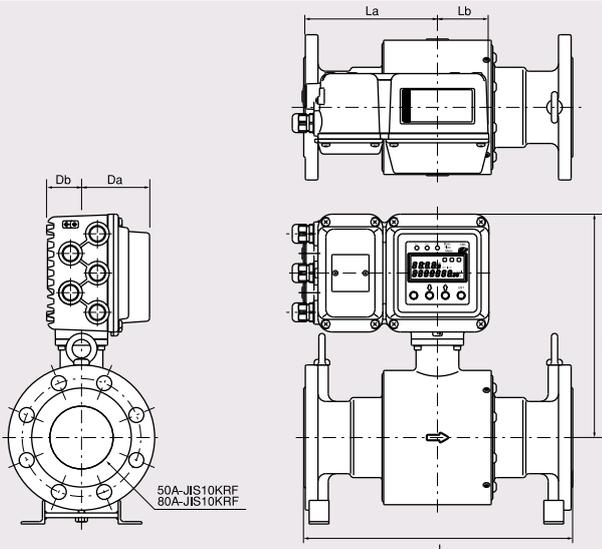
This product has a structure for low pressure loss (2.5kPa max. at 50kPa air), and is effective in reducing loss of measuring energy. This product is suitable in applications that need to control the pressure loss.

## Dimensions

(unit:mm)

CML050/080 Connecting port size 50A/80A

CML100/150 Connecting port size 100A/150A



Model No.	L	h	La	Lb	Da	Db
	Face-to-face	Height	Converter length at terminal unit side (from center)	Converter length (from center)	Converter thickness at front side	Converter thickness at rear side
CML050	254	270	166	65	84	44
CML080	340	285	166	65	84	44
CML100	400	295	166	65	84	44
CML150	400	330	166	65	84	44

# Specifications

Model number	CML050	CML080	CML100	CML150
Control flow rate range(Note)	160m <sup>3</sup> /h(normal)	400m <sup>3</sup> /h(normal)	650m <sup>3</sup> /h(normal)	1600m <sup>3</sup> /h(normal)
Type of gas	Air/nitrogen, Oxygen, argon, carbon dioxide, citygas, propane, butane			
Measurement accuracy (Total accuracy including repeatability)	Differs by measurement flow X m <sup>3</sup> /h(normal) range			
	1.0 ≤ X < 8.0 ±3%RD 8.0 ≤ X ≤ 160.0 ±2%RD	2.5 ≤ X < 20.0 ±3%RD 20.0 ≤ X ≤ 400.0 ±2%RD	4.0 ≤ X < 32.5 ±3%RD 32.5 ≤ X ≤ 650.0 ±2%RD	10.0 ≤ X < 80.0 ±3%RD 80.0 ≤ X ≤ 1600.0 ±2%RD
Applicable pressure	0 to 1.0MPa			
Operating temperature	-25 to +60°C			
Storage temperature	-30 to +70°C			
Humidity	10 to 90%RH (no condensation allowed)			
Flow rate output	Instantaneous flow output: 4 to 20mAdc (allowable load resistance 600Ω max.) 24mA max.			
Contact output (3 points)	SPST relay contact (common), Contact rating: 250Vac/30Vdc, 3A max. (resistive load) Minimum load for switching: 100mVdc, 100μA			
Integrated pulse output (2 points)	Pulse output 1 (P1): Open collector, Contact rating: 30Vdc, 50mA max., Pulse weight 10L/pulse, 100L/pulse, 1000L/pulse, changeable by key operation Pulse output 2 (P2): Open collector, Contact rating: 30Vdc, 50mA max., Pulse weight 1L/pulse, fixed.			
External contact input (standard function) (1 point)	Counter circuit: Dry contact or open collector Function: Dedicated for resetting an integrated count			
Flow rate indication	Instantaneous flow rate indication: LCD 5 digits, Integrated flow rate indication: LCD 9 digits			
Instantaneous flow rate indication range	0.0 to 192.0	0.0 to 480.0	0.0 to 780.0	0.0 to 1920.0
Integrated flow rate	Indication unit: 0.01m <sup>3</sup> , Indication range: 0 to 9999999.99(7+2 digits), Integrated count data can be hold even though during power off			
Power supply	Free power supply 85 to 264V ac			
Material in gas flow passage	SUS304 / SCS13A			
Weight	14kg	24kg	29kg	45kg

Note: m<sup>3</sup>/h(normal) volume flow per hour converted to the conditions of 0°C and 1 atmospheric pressure.

# Selection Guide

· Example: CML0800SJN01000D0

Table	Selection	Description
I	Basic model No.	CML High flow mass flow meter
II	Pipe size	050 Size 50A(2B)
		080 Size 80A(3B)
		100 Size 100A(4B)
		150 Size 150A(6B)
III	Model type	0 Applicable pressure range 0 to 1MPa
IV	Material	S Material of major parts SUS304/SCS13
V	Connection	J JIS10KRF Flange
VI	type of gas	N Air, Nitrogen (Setting can be changed to standard compatible gases*1)
		S Oxygen *3
VII	Output	0 4 to 20mA output + Integration pulse output
VIII	Power supply	F Free power supply 85 to 264V ac
IX	Communication	1 RS-485 Communication
X	Mounting direction	0 Horizontal (Flow direction:left to right) *2
		1 Horizontal (Flow direction:right to left) *2
		2 Vertical (Flow direction:down to up) *2
		3 Vertical (Flow direction:up to down) *2
XI	Option 1	0 Without optional function
		1 Gas-contacting parts treated to be oil-inhibited
XII	Option 2	0 be oil-inhibited
		D Inspection Certificate provided
		Y Inspection Certificate provided+ Complying with the traceability certification
XIII	Design code	K Inspection Certificate provided+ Complying with the traceability certification+ Calibration certificate provided
		0 Product version

\*1. Standard compatible gases indicate air/nitrogen, natural gas 13A (LNG), argon, butane, propane and carbon dioxide. The setting of this device can be changed by key operation.

\*2. Specify at the order entry. Cannot be changed after delivery.

\*3. When gas type S is selected, specify the code 1 (oil-inhibition treatment) at Option 1.

Please read the "Terms and Conditions" from the following URL before ordering or use:

<http://www.azbil.com/products/bi/order.html>

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## Azbil Corporation

Advanced Automation Company

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