



Optimum for testing discharge flow and airtightness.
Flow sensor is selectable from Laminar Flow and Mass Flow.

■ Features



Easy-to-navigate configuration with icons Each menu opens by simply touching an icon.



Test pressure and flow can be monitored in charts.



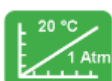
Language is selectable among English, Japanese, Chinese and Spanish



FTP function (option) realizes easy data management on the network.



Test results can be easily stored in a USB memory.



Display of equivalent flow rate at 1 atm, 20 °C
(Option K: The atmospheric pressure is automatically measured for the calculation.)



Flow Check (C-CHK) as standard feature



Flow Optimizer. When test pressure fluctuates, the flow at the specified test pressure is displayed.

■ Application Examples



Engine assembly leak test



Flow and leak tests for auto parts

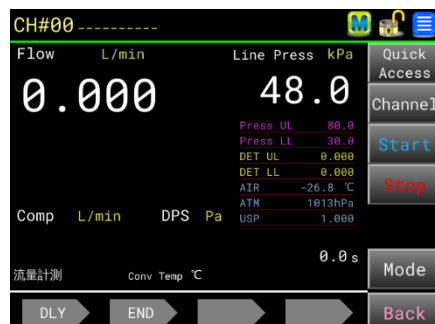


Gas equipment flow test

One-touch icons



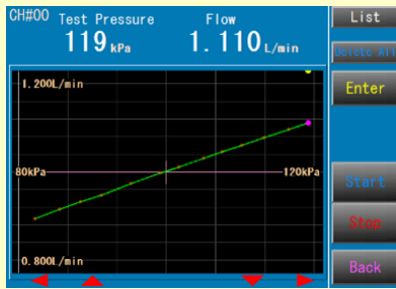
Measure Screen



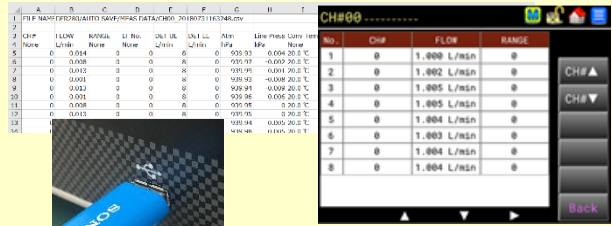
X-Chart/List and Statistics for Analysis



● Flow Optimizer
Multi-Point Optimizer Sampling

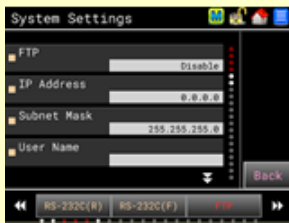


● Test parameters and results can be output to the USB memory.



Quality data stored

● FTP Function



- Settings
- IP Address
 - Subnet Mask
 - User Name
 - Passcode
 - FTP Directory
- FTP parameters



Share the quality data via Ethernet

■ Select Laminar Flow Sensor or Mass Flow Sensor.
Take advantages of excellent features of each Flow Sensor.

Laminar Flow Sensor (Laminar Flow Tube)



- ▶ Wide variety of ranges (F.S.10 mL/min to 100 L/min)
- ▶ Allows measurement of discharge flow rate of pulsative parts such as pumps
- ▶ Durable & robust with no moving parts

Mass Flow Sensor



- ▶ Allows measurement with different/variable test pressure
- ▶ No atmospheric compensation required. No need for compensation due to environmental changes
- ▶ High response speed

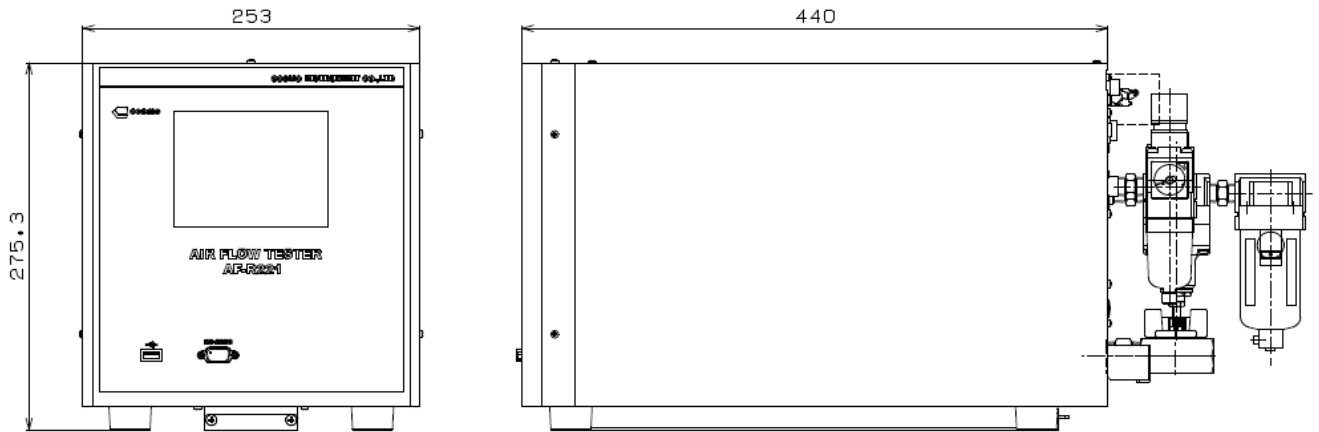
■ Standard Features

Display	Measurement screen is selectable from 6 different screens.		Data Acquisition	Up to 5000 data are stored. USB can be used for data storing.
Test Reliability	Blow Check	After the flow test, the fill valve is opened to check there is flow. Only for F4	Data Analysis	Counter, Statistics, Waveform display
	Flow Check (C-CHK)	The flow is compared with the value of Flow Master.	User Span	Span value is either manually entered or automatically setup.
	Flow Check (F-CHK)	The measured flow is compared with the value of Flow Master in every test. (Option CX)	Exhaust Interference Prevention	Externally controls the Exhaust timing after air flow test.
Flow Optimizer	Formula Optimizer	Samples the flows at Target Test Press (P1) to display the optimized flow.	Digital Filter	Averages the readings for more stable readings with less variation.
	Two-Point Optimizer	Samples the flows at two pressure points, Target Test Press (P1) and Off-Target Test Press (P2), to optimize the measured flow when the test pressure is off target.	Equivalent Flow Display	Displays the flow rate when air is flown in an environment of 1 atm at 20°C. When the atmospheric sensor (option) is used, this feature can be automatically used.
	Multi-Point Optimizer	Samples the flows at Target Test Press (P1) and other multiple pressure points within the allowable range to optimize the flow when the test pressure is off target.	Flow Limits	Upper limits: UL2/UL, Lower limits: LL2/LL
			DET Extension	When the flow is in the range between "DET LL and DET LL2" or "DET UL and DET UL2", the DET is repeated.
			Optional Feature	External Exhaust Valve (Exhaust valve unit is sold separately) Bypass circuit ready (Bypass circuit unit is sold separately.)

Specifications

Pressure Media	Air	Port Size	Pressure source / Pilot pressure source Rc 1/4 (Laminar Flow Model 100L only: Rc 3/8) WORK Port 200 mL/min or less: Rc 1/4 500 mL/min or more: Rc 1/2	
Accuracy	<ul style="list-style-type: none"> ■ Laminar Flow Sensor ±1.5% of F.S. ±1 digit (Specified pressure) ■ Mass Flow Sensor ±1.5% of F.S. ±1 digit (Specified pressure) ±3.0% of F.S. ±1 digit (Pressure not specified) 		Front panel port	Fixed-length output: T, IL, ML, D, P, F2
Specified Test Pressure Range	Micro (L01): 1 to 10 kPa (without Regulator) Micro low (L03): 10 to 30 kPa (Mass Flow only) Micro low (L05): 10 to 50 (Laminar Flow only) Low (L): 30 to 80 kPa Medium (M): 30 to 700 kPa Vacuum (V): -10 to -70 kPa (Laminar Flow 20L or less)	Rear panel port	Fixed-length output: T, IL, ML, D, P, F2	
		Test Data	Flow, Pressure, Comp value, Air temp, Flow limits, Atm press, and others	
Number of Channels	32 channels (#0 to #31)	Exporting test parameters	csv file	
Power Source	100 to 240 VAC±10%, 50/60 Hz, 60 VA max (Use the enclosed power cord at 125 VAC or less)	USB Port	Parameter Backup System Backup Software update Copy Operation Manual (PDF)	
Timer Setting	Up to 999.9 s (Resolution: 0.1 s)	Flow Unit	L/min, mL/min, L/s, mL/s, L/h, m³/h, mm³/s, USP (User Span)	
Pressure Source	Clean air The source pressure must be sufficiently higher than the test pressure.	Pressure Unit	kPa, MPa, (psi, kg/cm², bar, mbar, mmHg, cmHg, inHg, mmH₂O) The units in () are not available for SI unit models.	
Operating Temperature	5 to 45°C	Standard Accessories	Quick mounting brackets, Interface connectors, Power cord (3 m), Inspection record, Operation Manual	
Humidity	80 % RH or less / no dew condensation	Weight	Approx. 15 kg	

External Appearance



Peripheral Equipments

External Exhaust Valve Unit



Prevents contamination when testing parts having water, oil or other foreign matter on them.

External Bypass Circuit Unit



Reduces test time for low pressure/large-volume parts.

Remote Control Box



Externally controls START, STOP and CHG Hold.

Model

AF-R221 **F4** **1L** **M** - **BG W CX** ... (**L**, **KP**, **S**)

A B C D E F G

A Flow Sensor

Mass flow Sensor	Laminar Flow Sensor
F3	F4

B Flow Sensor Range

Mass Flow Sensor	500ML	2L	5L	20L	50L	100L								
Laminar Flow Sensor	10ML	20ML	50ML	100ML	200ML	500ML	1L	2L	5L	10L	20L	30L	50L	100L

C Pressure range

Pressure	Micro pressure	Micro low pressure	Micro low pressure	Low pressure		Medium pressure	Vacuum
Pressure range	1 to 10 kPa	10 to 30 kPa	10 to 50 kPa	30 to 80 kPa	15 to 80 kPa	30 to 700 kPa	-10 to -70 kPa
Code	L01	L03 Mass Flow only	L05 Laminar Flow only	L Mass Flow only	L Laminar Flow only	M	V

* Regulator is not enclosed for L01.

D Option

B1	Built-in Bypass Circuit	Effective for large-volume parts. Pressurizes the tested part during CHC stage.	FR	Dual Range Calibration (Only for F4)	L Range and U Range calibrations are available for 1L or higher ranges.
G1	Built-in Exhaust Valve	Exhaust Valve is built in the tester. Prevents testers from oils and dusts.	W	Stop Valve Monitoring	Checks open/close of stop valve.
F	Dual pressure ready (Bypass circuitry unit is sold separately.)	Reduces pressurization time by applying a pressure higher than the test pressure for a predetermined period of time (or to a target pressure) during CHC.	A	Filter Option	Filter with Auto-drain
			K	Atmospheric Pressure Sensor (For F4 only)	The atmospheric pressure is automatically captured with a high performance atmospheric pressure sensor and compensated.
C	Secondary Flow Measurement	The flow coming out of the tested part is measured and judged.	R1	EP Regulator connector for Dual pressure	Specify this option when EP Regulator is selected in option F.
CX	Automatic CAL Check	Automatically checks sensitivity with flow master	D	FTP memory	FTP function can be used.
			J1	NPT Connection ports	US only (NPT ball valve included)

E Flow Range

F Test Press

Mass Flow

E Flow range		F Pressure Range	
Code	Flow Range	Pressure	Vacuum
500 mL	0 to 500 mL/min	10 to 700 kPa	-10 to -70 kPa
2L	0 to 2 L/min	10 to 700 kPa	-10 to -70 kPa
5L	0 to 5 L/min	10 to 700 kPa	-10 to -70 kPa
20L	0 to 20 L/min	10 to 700 kPa	-10 to -70 kPa
50L	0 to 50 L/min	10 to 700 kPa	—
100L	0 to 100 L/min	10 to 700 kPa	—

- Select flow ranges from the table.
- Specify the test pressure within the applicable pressure range.
- Consult Cosmo if the test pressure exceeds the range.

Conv Temp

20°C	0°C
S	N

Laminar Flow

E Flow range		F Pressure Range	
Code	Flow Range	Pressure	Vacuum
10ML	0 to 10 mL/min	10 to 700 kPa	-10 to -70 kPa
20ML	0 to 20 mL/min	10 to 700 kPa	-10 to -70 kPa
50ML	0 to 50 mL/min	10 to 700 kPa	-10 to -70 kPa
100ML	0 to 100 mL/min	10 to 700 kPa	-10 to -70 kPa
200ML	0 to 200 mL/min	10 to 700 kPa	-10 to -70 kPa
500ML	0 to 500 mL/min	10 to 700 kPa	-10 to -70 kPa
1L	0 to 1 L/min	10 to 700 kPa	-10 to -70 kPa
2L	0 to 2 L/min	10 to 700 kPa	-10 to -70 kPa
5L	0 to 5 L/min	10 to 700 kPa	-10 to -70 kPa
10L	0 to 10 L/min	10 to 500 kPa	-10 to -70 kPa
20L	0 to 20 L/min	10 to 500 kPa	-10 to -70 kPa
30L	0 to 30 L/min	10 to 500 kPa	—
50L	0 to 50 L/min	10 to 350 kPa	—
100L	0 to 100 L/min	10 to 200 kPa	—

The contents in this product information are as of June, 2021. The specifications are subject to change without prior notice.

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