PRODUCT INFORMATION LAMINAR FLOW GAUGE

Highly accurate and responsive sensor instantly measures flow rate.
DF-241BA is ideal for flow or leak test in production line.

DF-241BA
Laminar Flow Gauge

■ Features

High accuracy: ±2% of F.S.
Highly responsive with Laminar Flow Tube
Various flow ranges available
Stability and durability using highly accurate and high proof pressure DPS
Temperature sensor for automatic temperature compensation
Multifunctional display designed to meet various measurement requirements

■ Application Examples

High speed flow measurement
Pass/Fail judgment based on flow rate
Leak test by flow rate
Flow data collection, PC data recording

■ Specification

Laminar Flow Tube Flow Range	10, 20, 50, 100, 200, 500 mL/min 1, 2, 5, 10, 20, 30, 50, 100, 200, 500 L/min
Pressure Media	Air
Accuracy	±2 % of F.S. ±1 digit
Conversion Temperature / Atmospheric Pressure	20°C (or 0°C), Flow rate is based on 1 atmospheric pressure
Operating Temperature	5 to 35 °C
Test Pressure	Depends on the selected range
Temperature Sensor	Built in the Laminar Flow Tube or connected to the outlet of Laminar Flow Tube
Generated Differential Pressure	Approx. 0.6 kPa at F.S. flow
Pressure Loss	150% of Measured Differential Pressure
Port Size	Differential Pressure Connection Port: Rc1/8 Flor Sensor Connection Port: Refer to “Laminar Flow Tube Ranges” on the next page.
DPS Proof Pressure	1 MPa (PT-110FC-A) 10 kPa (PT-103B-A)
Power Source	24 VDC ±10 %, 0.3 Amax With A/C Adapter

■ Multifunctional Display

Number of Channels	10 channels
Upper/Lower limits	4 Settings HH, HI, LO, LL
Zero Adjustment	One push Zero Method
Auto-Zero	Auto Zero button
Display Hold	Hold button
Display Response	Digitall Filter (High, Medium, Low)
RS-232C	1200, 9600 and 19200 bps switchable
BCD Output	Open collector
Display Digits	3.5 digits (1999) and 4.5 digits (19999)
Sample Rate	250 ms and 50 ms switchable
User Span	0.001 to 9.999 (Default: 1.000)
Panel Cutting Dimension	W133 x H61 mm
External Dimensions	Display: W140 x H66 x D172 mm Sensor: Refer to “External Appearances of Laminar Flow Tube & DPS” on the next page.
Analog Output (Option)	F1: F.S / 5V, F2: F.S / 10V, F3: Match with display

■ Model Classification

DF-241BA-(①, ②)-③④-⑤

① Flow Range		② Line Pressure		③ Option		④ Power/Voltage		⑤ Conversion Temperature	
Code	Unit	Code	Unit	Code	Description	Code	Description	Code	Description
□□ML	mL/min	**□□KP**	kPa	**B**	Low line pressure sensor *1	**VG**	A/C adapter 100 V cable (3 m)	**S**	Conversion at 20 °C
□□L	L/min	**□□MP**	MPa	**F1**	5 V analog output	**VH**	A/C adapter 240 V cable (2 m)	**N**	Conversion at 0 °C
				F2	10 V analog output	**VJ**	Without A/C adapter		
				F3	Match with display				

***1** Low line pressure sensor (PT-103B-A) is used at 10 kPa or lower.

Laminar Flow Tube Ranges

Model	Flow range (Atm pressure)	Max. line pressure	Port size	Temp. sensor
LF-104 N - 10C	0 to 10 mL/min	990 kPa	R1/4	Built in the Laminar Flow Tube
LF-104 N - 20C	0 to 20 mL/min			
LF-104 N - 50C	0 to 50 mL/min			
LF-104 N -100C	0 to 100 mL/min			
LF-104 N -200C	0 to 200 mL/min			
LF-104 N -500C	0 to 500 mL/min			
LF-104 N - 1L	0 to 1 L/min	700 kPa		
LF-104 N - 2L	0 to 2 L/min			
LF-104 N - 5L	0 to 5 L/min			
LF-104 N - 10L	0 to 10 L/min	500 kPa	R1/2	
LF-104 N - 20L	0 to 20 L/min			
LF-104 N - 30L	0 to 30 L/min			
LF-105B N - 50L	0 to 50 L/min	350 kPa		
LF-105B N -100L	0 to 100 L/min			
LF2-200L	0 to 200 L/min	50 kPa	R3/4	Connected to the outlet of Laminar Flow Tube
LF2-500L	0 to 500 L/min			

The table (left) shows the flow ranges when used at the atmospheric pressure.
When to be used at a line pressure, use the following formula to select the flow range.

Laminar flow range: X (mL/min)
Line pressure: P (kPa)
Max. flow(atm pressure): Q (atm mL/min)

$$X = \frac{101.3}{101.3 + P} \times Q$$

The table (below) shows the Laminar Flow Tubes to be used under specific flow range and line pressure conditions. The first digits of the flow ranges are in the order of 1, 2, 5.
(**E.g.**)
Test pressure: 300 kPa, Max. flow rate: 500 mL/min
See the point where 300 kPa (x-axis) and 500 mL/min (y-axis) cross each other. The point shows 200C.
LF-104N-200C is the most appropriate choice.

Selection of Laminar Flow Tube

The point where the line pressure (x-axis) and the flow range (y-axis) cross each other shows the appropriate choice. The "-" means unavailable.

Code	Line pressure (kPa) / Flow range	-61 to -70	-51 to -60	-41 to -50	-35 to -40	-1 to -34	0 to 50	51 to 67	68 to 100	101 to 150	151 to 200	201 to 235	236 to 300	301 to 350	351 to 400	401 to 500	501 to 700	701 to 910	911 to 990
10 ML	10 mL/min	50 C	50 C	20 C	20 C	20 C	10 C	10 C	10 C	10 C	10 C	10 C	10 C	10 C	10 C	10 C	10 C	10 C	10 C
20 ML	20 mL/min	100 C	50 C	50 C	50 C	50 C	20 C	20 C	20 C	10 C	10 C	10 C	10 C	10 C	10 C	10 C	10 C	10 C	10 C
50 ML	50 mL/min	200 C	200 C	100 C	100 C	100 C	50 C	50 C	50 C	50 C	20 C	20 C	20 C	20 C	20 C	10 C	10 C	10 C	10 C
100 ML	100 mL/min	500 C	500 C	200 C	200 C	200 C	100 C	100 C	100 C	50 C	50 C	50 C	50 C	50 C	50 C	20 C	20 C	20 C	10 C
200 ML	200 mL/min	1 L	500 C	500 C	500 C	500 C	200 C	200 C	200 C	100 C	100 C	100 C	100 C	50 C	50 C	50 C	50 C	50 C	20 C
500 ML	500 mL/min	2 L	2 L	1 L	1 L	1 L	500 C	500 C	500 C	500 C	200 C	200 C	200 C	200 C	200 C	100 C	100 C	100 C	50 C
1 L	1 L/min	5 L	5 L	2 L	2 L	2 L	1 L	1 L	1 L	500 C	500 C	500 C	500 C	500 C	500 C	200 C	200 C	200 C	100 C
2 L	2 L/min	10 L	5 L	5 L	5 L	5 L	2 L	2 L	2 L	1 L	1 L	1 L	1 L	500 C	500 C	500 C	500 C	500 C	200 C
5 L	5 L/min	20 L	20 L	10 L	10 L	10 L	5 L	5 L	5 L	5 L	2 L	2 L	2 L	2 L	2 L	1 L	1 L	--	500 C
10 L	10 L/min	50 L	50 L	20 L	20 L	20 L	10 L	10 L	10 L	5 L	5 L	5 L	5 L	5 L	5 L	2 L	2 L	--	--
20 L	20 L/min	100 L	50 L	50 L	50 L	30 L	20 L	20 L	20 L	10 L	10 L	10 L	10 L	5 L	5 L	5 L	5 L	--	--
30 L	30 L/min	100 L	100 L	100 L	50 L	50 L	30 L	20 L	20 L	20 L	20 L	10 L	10 L	10 L	10 L	10 L	--	--	--
50 L	50 L/min	--	--	100 L	100 L	100 L	50 L	50 L	30 L	30 L	20 L	20 L	20 L	20 L	20 L	10 L	--	--	--
100 L	100 L/min	--	--	--	--	--	100 L	100 L	100 L	50 L	50 L	50 L	30 L	30 L	30 L	20 L	--	--	--
200 L	200 L/min	--	--	--	--	--	200 L	--	--	100 L	100 L	100 L	100 L	50 L	--	--	--	--	--
500 L	500 L/min	--	--	--	--	--	500 L	--	--	--	--	--	--	--	--	--	--	--	--

■ External Appearances of Laminar Flow Tube & DPS

LF-104N φ50 × 230 mm

LF-105BN ϕ64 × 300 mm

LF2-200L φ59.5 × 334 mm
LF2-500L φ89.5 × 448.5 mm

DPS: PT-110FC-A
W70 × H108 × D66 mm

* The contents in this Product Information are as of December 2016. The specifications are subject to change without prior notice.

Cosmo Instruments Co., Ltd.
2974-23 Ishikawa, Hachioji, Tokyo 192-0032 Japan
http://www.cosmo-k.co.jp
Phone: +81-(0)42-642-1357 Fax: +81-(0)42-646-2439

China:	Cosmo (Shanghai) Trading Co., Ltd.	+86-(0)21-6575-6880
	Shanghai, Tianjin, Guangzhou, Chongqing, Changchun, and Wuhan	
Korea:	Cosmo Korea Co., Ltd.	+82-(0)32-623-6961
Taiwan:	Taiwan Cosmo Instruments Co., Ltd.	+886-(0)2-2707-3131
Malaysia:	Wave Electronics & Electrical System Sdn. Bhd.	+60-(0)3-51626677
Thailand:	Cosmowave Technology Co., Ltd.	+66-(0)2-7361667
Indonesia:	Pt. Cosmowave	+62-(0)21-42900043
Vietnam:	Cosmowave Technology Co.,Ltd. Vietnam Representative Office	+84-(0)47876085

India:	Cosmo Instruments India Pvt. Ltd. Head Office	+91-(0)124-421-0946
	Cosmo Instruments India Pvt. Ltd. South Zone Regional Office	+91-(0)9663384423
	Cosmo Instruments India Pvt. Ltd. Pune - Chakan Office	+91-(0)20-6933-2345
Germany:	Cosmo EU Solutions Technology GmbH	+49-(0)212-383671-71
UK:	Fletcher-Moorland Ltd.	+44-(0)1782-411021
USA:	Cosmo Solutions Technology, Inc.	+1-248-488-2580
Mexico:	Cosmo De Mexico	+52 472 748 62 94
Brazil:	Tex Equipamentos Eletronicos Ind. Com. Ltda.	+55-(0)11-4591-2825
Australia:	Industrial Research Technology Pty. Ltd.	+61-(0)412-176-674