TECHNICAL GUIDANCE

Analog / Digital Type
NM-1500 series
Mass Flow Meter/Controller

GENERAL

NM-1500 series is Thermal-Mass Flow Meter / Controller, by which various kinds of gas can be measured and controlled.

The flow rate of gas can be measured from 10mL/min(nor) to 150L/min(nor) and controlled without being influenced by the change in temperature and pressure.

Models of cost effective type in high performance was lined up in order to comply with any requirements.

FEATURES

- ☐ Analog Mass Flow Meter / Controller (NM-1500AM, NM-1500AC):
  - Low cost.
  - Wide flow range available 10mL/min(nor)~150L/min(nor)
- ☐ Digital Mass Flow Meter / Controller (NM-1500DM, NM-1500DC):
  - 5-points linearity calibration
  - Wide flow range available 10mL/min(nor)~150L/min(nor)
  - Two RS485 connector (RJ45)，easy for multidrop connection.
  - Self-Diagnosis.
  - Set zero by switch or command
- ☐ Accuracy
  NM-1500A: ±2.0%~±3.0%F.S.
  NM-1500D: ±1.5%F.S.(Option: ±1%F.S.)
- ☐ Accessory (Option) : ARP-100 Controller
  Power source, digital indicator and flow control function are integrated.

APPLICATIONS

- ☐ Utility gas supply lines in industries
- ☐ Various instruments for analysis
- ☐ Gas constant flow control
- ☐ Gas mixture and division system

MODEL CODE

NM-1500	□	□	–	□	□	□	–	□	□	–	□	□	□	□
Type	A	Analog												
	D	Digital												
Function		M	Meter											
		C	Controller											
Range*			ABC	(10xA+B)x10^{C}										
Gas				□□	Gas type code									
				ZZ	Others									
Fitting	VCR	V												
	SWL	S												
	其他	Z												
Fitting Size	1/4”	1												
	3/8”	2												
	其他	Z												
Signal	DC 0~5V	1												
	其他	Z												
Power	DC 24V	1												
	DC ±15V	2												
	其他	Z												

*The scale range is shown by the exponential expression as the unit of multiplier unit of mL/min(nor) ,

Example:

5mL/min(nor) is 0 5 0

500mL/min(nor) is 5 0 1

50 L/min(nor) is 5 0 3

SPECIFICATION (Analog Type)

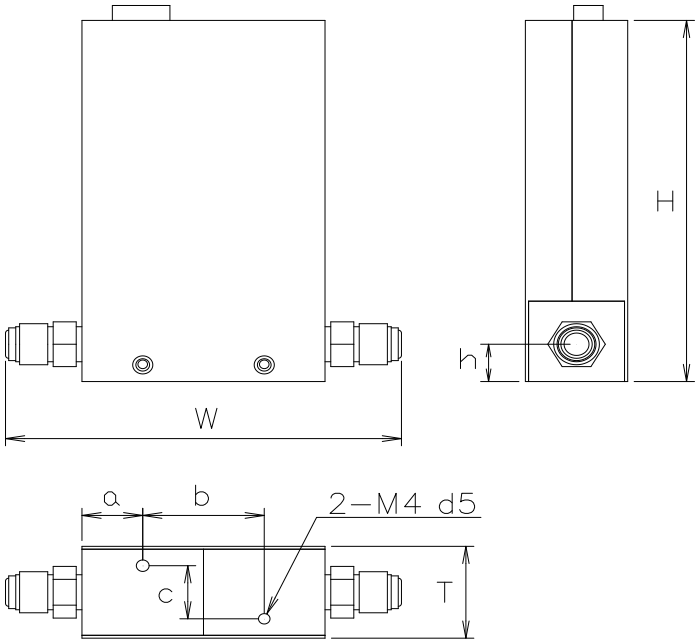
Function			Meter			Controller				
Standard Model			NM-1510AM	NM-1520AM	NM-1530AM	NM-1510AC	NM-1520AC	NM-1530AC		
Range(full scale)	mL/min(nor)		10,20,50 100,200, 500			10,20,50 100,200, 500				
	L/min(nor)		1,2,5	10,20	50	100,150	1,2,5	10,20	50	100	150
Valve operation mode						Normally Closed				
Minimum controllable flow rate(%F.S.)						2.0				
Response time(sec)(2-98% F.S.)			1.5			3.0	2.0			
Accuracy(%F.S.)			±2.0		±2.5	±2.0		±3.0		
Linearity(%F.S.)			±1.0		±1.5	±1.0		±1.5		
Repeatability(% F.S.)			±0.5			±0.5		±1.0		
Required differential pressure		kPa				49-294	98-294	147-294	294-392	392-490
Maximum operation pressure		kPa				294			392	490
Withstand pressure		kPa	980							
Operation temperature		℃	15-35							
Temperature coefficient (% F.S.)/ ℃		Zero Span	0.1 0.1							
Leak rate		Pa·m3/sec	$<1\cdot10^{-11}$		$1\cdot10^{-9}$	$<1\cdot10^{-11}$		$1\cdot10^{-9}$		
Control valve						Solenoid				
Materials exposed by gas	Body		SUS-316L							
	Control valve					PTFE				
	Seals		Metal		Viton	Metal		Viton		
	Blazing at sensor		Nickel(Ni)							
Fitting	Standard		OD 1/4" VCR,SWL		OD 3/8" SWL	OD 1/4" VCR,SWL		OD 3/8" SWL		
	Optional		OD 3/8" SWL OD 3/8" VCR OD 1/4" VCO		OD 3/8" VCR	OD 3/8" SWL OD 3/8"VCR OD 1/4" VCO		OD 3/8"VCR		
Flow rate output signal			DC 0~5V (DC 1~5V, DC 4~20mA)							
Flow rate setting signal						DC 0-5V (DC 1~5V, DC 4~20mA)				
Zero adjustment			Zero VR							
Cable connector			D-Sub 9 Pin connector							
Power supply requirement			DC +15V 60mA / DC -15V 200mA DC 24V 250mA							

SPECIFICATION (Digital Type)

Function		Meter				Controller				
Standard Model (Digital Type)		NM-1510DM	NM-1520DM		NM-1530DM	NM-1510DC	NM-1520DC		NM-1530DC	
Range(full scale)	mL/min(nor)	10,20,50 100,200, 500				10,20,50 100,200, 500				
	L/min(nor)	1,2,5	10,20	50	100,150	1,2,5	10,20	50	100	150
Valve operation mode						Normally Closed				
Minimum controllable flow rate(% F.S.)						2.0				
Response time(sec)(2-98% F.S.)		1.0				1.5	1.0			
Accuracy(%F.S.)		±1.5				±1.5				
Linearity(%F.S.)		±0.7				±0.7				
Repeatability(% F.S.)		±0.5				±0.5				
Required differential pressure	kPa					49-294	98-294	147-294	294-392	392-490
Maximum operation pressure	kPa					294			392	490
Withstand pressure	kPa	980								
Operation temperature	℃	15-35								
Temperature coefficient (% F.S.)/ ℃	Zero Span	0.1 0.1								
Leak rate	Pa·m3/sec	$1\cdot10^{-11}$			$1\cdot10^{-9}$	$1\cdot10^{-11}$			$1\cdot10^{-9}$	
Control valve						Solenoid				
Materials exposed by gas	Body	SUS-316L								
	Control valve					PTFE				
	Seals	Metal			Viton	Metal			Viton	
	Blazing at sensor	Nickel(Ni)								
Fitting	Standard	OD 1/4" VCR,SWL			OD 3/8" SWL	OD 1/4" VCR,SWL			OD 3/8" SWL	
	Optional	OD 3/8" SWL OD 3/8" VCR OD 1/4" VCO			OD 3/8" VCR	OD 3/8" SWL OD 3/8"VCR OD 1/4" VCO			OD 3/8"VCR	
Flow rate output signal		DC 0~5V (DC 1~5V, DC 4~20mA)								
Flow rate setting signal						DC 0-5V (DC 1~5V, DC 4~20mA)				
Zero adjustment		Set Zero (Switch & Command)								
Digital communication		RS485								
Electrical connection		D-Sub 9 pin connector								
Communication connection		RJ45 connector								
Power supply requirement		DC +15V 150mA / DC -15V 200mA DC 24V 300mA								

*option: ±1.0%F.S.

DIMENSION



Dim.:mm

Model	Seal	W(Install)				T	H	h	Bottom		
		1/4" VCR	1/4" SWL	3/8" VCR	3/8" SWL				a	b	c
NM-1500	Viton (≧100NL/min)	123.8	127.4	130.0	130.0	32	126	13	19	38	18.5
	Metal (<100NL/min)	123.8	127.4								

Gas type selection Code

Code	Gas	Seal	Code	Gas	Seal	Code	Gas	Seal	Code	Gas	Seal
00	N_2	Ag	10	Ne	Ag	20	NH_3	Au	30	NF_3	Au
01	Air	Ag	11	CH_4	Ag	21	NO_2 (3)	Au	31	BCl_3	Au
02	O_2	Ag	12	C_2H_2	Ag	22	HCl	Au	32	BF_3	Au
03	Ar	Ag	13	C_2H_4	Ag	23	HBr	Au	33	AsH_3	Au
04	He	Ag	14	C_2H_6	Ag	24	SO_2	Au	34	ClF_3	Au
05	H_2	Ag	15	C_3H_6	Ag	25	SiF_4	Au	35	$SiCl_4$	Au
06	CO	Ag	16	C_3H_8	Ag	26	SiH_4	Au	36	$AsCl_3$	Au
07	CO_2	Ag	17	C_4H_{10}	Ag	27	PH_3	Au	37	$SbCl_5$	Au
08	NO	Ag	18	Cl_2	Au	28	B_2H_6	Au	38	CF_4	Au
09	N_2O	Ag	19	F_2	Au	29	WF_6	Au	39	H_2S	Au