



# TECHNICAL GUIDANCE

Metal tube PFA lining  
Variable Area Flowmeter

## NMX1LFF Series

### OUTLINE

NMX1LFF series is 250 mm variable area flowmeters made of PFA lined metal tubes. Reasonably priced, they have excellent chemical resistance and impermeability, and are applicable to corrosive fluids and chemicals.

### FEATURES

- PFA used as standard lining material of metal tubes
- Capable of measuring corrosive fluids
- Excellent chemical resistance, impermeability, and stress crack resistance
- Standardized total length  
Easy piping with standardized product concept of 250mm total length.
- Detecting section with a basic structure of variable area flowmeters.  
Flow rate detection by a combination of tapered tube and float.  
Less effect on the accuracy by a change of viscosity, compared with a taper float structure, allowing no accumulation of fluid in the detecting section.
- Punching metal inserted into the PFA lining material.  
The punching metal is united to the metal tube body to suppress buckling, exfoliation, and deformation of PFA layer.

### STANDARD SPECIFICATION

- Meter size : 20,25,40,50,80,100 (mm)
- Connecting method : Flange connection
- Connection rating : Equivalent to JIS 10K, 20KRF  
Equivalent to ANSI Class 150, 300RF  
Equivalent to DIN PN16, 40  
Equivalent to GB PN1.6, 4.0  
(Some sizes may have the flanges thicker than the standards)
- Connection size : Same as the meter size or one size above
- Measuring object : Liquid (Consult our office for measurement of gases)
- Fluid pressure : 0 to 3.3 MPa (Conforms to the connection standards)
- Fluid temperature : -20 to +120°C
- Ambient temperature : -25 to +120°C  
-10 to +60°C  
(with alarm output type)
- Ambient humidity : 95%RH or less
- Accuracy : ±2.0%F.S.
- Rangeability : 10:1
- Material : Material of the liquid contact part:  
PFA or PTFE  
(For details of the material, refer to the DIMENSION.)
- Painting : Epoxy resin (Converter case only)
- Color : RAL5018 (Equivalent to Munsell 7.5BG 5/4.5)
- Protection : JIS C 0920  
(Equivalent to IP65 and NEMA 12/13)



### ADDITIONAL FUNCTIONS

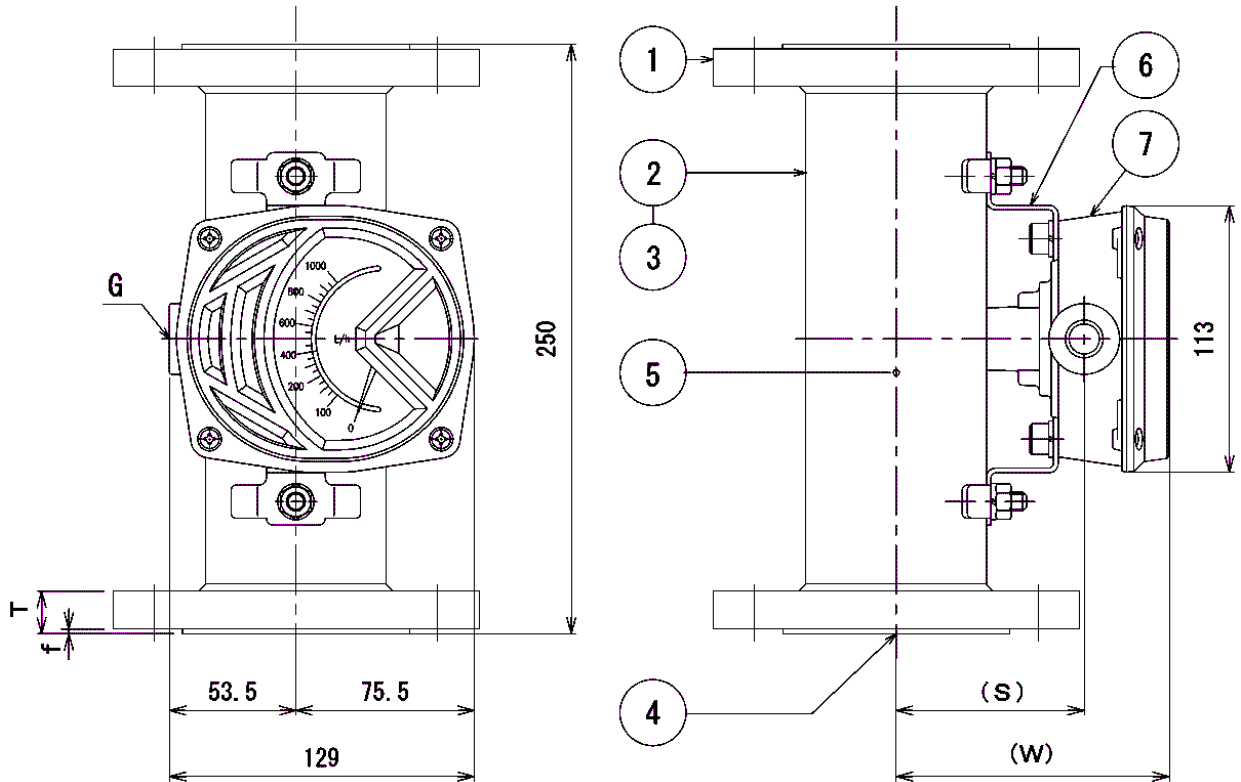
- Alarm transmitter  
Alarm function can be added to local indicator upon your request at the time of ordering.  
Either low or high alarm can be selected as the alarm mode.  
Be sure to specify the alarm mode and alarm motions (ON/OFF) at the time of ordering, because they are required for manufacturing.
- Alarm output specification
  - Contact system : Reed switch ; 1 point  
Setting point variable  
(with setting needle)
  - Electrical ratings  
Max. voltage ; 125 V AC or 100 V DC  
Operating current range ; 10μA to 0.5 A  
Max. make-and-break capacity ; 10 VA or 10 W  
(Note) The above-mentioned ratings are for resistance load. When using other load, the contacts may be deposited by a rush current. Ensure that the ratings are not exceeded even at the maximum rush current.
  - Applicable wiring : 0.2 to 2.5 mm<sup>2</sup>, 24 to 12 AWG  
(Single wire, Stranded wire)
  - Insulation resistance : 100 MΩ or more (100 V DC)
  - Withstand voltage : 1500 V AC (Hold time ; 1 min.)
  - Setting accuracy : ±2% F.S.
  - Ret span : Within 15% F.S.
- Conduit  
If the alarm transmitter is attached, cable entry connection can be selected.  
Refer to the MODEL CODE.

**MODEL CODE**

Model code											Description	Reference				
NMX	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	/	<input type="checkbox"/>			
Indicator type	1													Weatherproof indicator		
Main body	L													Lining type		
Material in contact with fluid	F													PFA liner		
Float	F													PFA liner or PFA/PTFE		
Connection rating	- J1													Equivalent to JIS 10K	Common	
	- J4													Equivalent to JIS 20K		
	- A2													Equivalent to ANSI Class 150		
	- A5													Equivalent to ANSI Class 300		
	- G1													Equivalent to GB PN1.6		
	- G4													Equivalent to GB PN4.0		
	- D1													Equivalent to DIN PN16		
- D4													Equivalent to DIN PN40			
Connection type	RF													RF flange		
Connection size	2													20A, 3/4", DN20	Same as the meter size or one size above	
	3													25A, 1", DN25		
	4													40A, 1 1/2", DN40		
	5													50A, 2", DN50		
	6													65A, 2 1/2", DN65		
	7													80A, 3", DN80		
	8													100A, 4", DN100		
9													125A, 5", DN125			
Meter size	- 2													20mm	Refer to the FLOW RATE TABLE.	
	- 3													25mm		
	- 4													40mm		
	- 5													50mm		
	- 7													80mm		
- 8													100mm			
Tapered tube										<input type="checkbox"/>				Tapered tube code	Manufacturer's code	
Float											<input type="checkbox"/>			Float code		
Float damper												1		Not provided		
Additional function	Output function	/ 1A												1 point alarm output (HC) (CLOSE)	Duplication selection cannot be performed.	
		/ 1B												1 point alarm output (HO) (OPEN)		
		/ 1C												1 point alarm output (LC) (CLOSE)		
		/ 1D												1 point alarm output (LO) (OPEN)		
	Conduit	/ M1													M16×1.5 (F)	Duplication selection cannot be performed.
		/ M2													M20×1.5 (F)	
		/ GH													G1/2 (F)	
/ NP														NPT1/2 (F)		
Special													/ Z	Provided	Consult factory for details.	

**DIMENSION**

●Outline drawing



●Size

Meter size	Size (mm)					Conduit G	Mass (Approx.) (kg)
	L	W	S	T	f		
20mm	250	115.5	79.5	21	5	If alarm output is attached, select from the MODEL CODE.	2.5
25mm	250	115.5	79.5	24	5		4.0
40mm	250	115.5	79.5	26	5		4.5
50mm	250	115.5	79.5	28.4	5		7.0
80mm	250	115.5	79.5	36	6		13.0
100mm	250	135.5	99.5	39.5	6		18.0

- The values in the Mass (Approx.) column are when the size is the same as the flange JIS10K.
- The flange thickness is common to all the meter sizes and thicker than the specified flange dimension. When mounting, check the flange thickness to select appropriate bolt length.

●Parts and Material

No.	Parts	Material
1	Flange	SUS316
2	Body	SUS316
3	Lining of main body	PFA
4	Float guide	PFA
5	Float	PFA or PTFE/PFA
6	Fittings	SUS316
7	Indicator	ADC12

**FLOW RATE TABLE**

Meter size	Water	
	Flow rate (L/h)	Max. pressure drop (kPa)
20mm	150 to 1200	7.0
25mm	700 to 3500	10.0
40mm	3000 to 6000	5.0
50mm	5000 to 15000	9.0
80mm	10000 to 25000	10.0
100mm	20000 to 50000	8.0

Flow rate shows the value converted into water (Density 1.0g/cm<sup>3</sup>, Viscosity 1.0mPa·s). The numeric value as indicated shows the flow range in the maximum graduation. Consult our office for measurement of gases.

## FLOW CONVERSION (DENSITY COMPENSATION)

### □ Flow conversion method

In accordance with the specification of instrumentation by customer, the conversion shall be made in the following method and meter size is to be selected.

Flow rates on the FLOW RATE TABLE are for liquid application equivalent to water (Density 1.0g/cm<sup>3</sup> and Viscosity 1.0 mPa·s). If actual fluid condition has different values, a conversion calculation is required per following formula:

$$Q_w = Q \times 2 / \sqrt{[(5 / \rho) - 1]}$$

Q<sub>w</sub> : Water converted flow rate (L/h)

Q : Flow rate of actual fluid (L/h)

ρ : Density of actual fluid (g/cm<sup>3</sup>)

In case water converted flow rate is close to the high limit of each meter size, meter size must be selected by reference to viscosity factor in the table.

Consult our office for viscosity correction.

## VISCOSITY LIMITS

Meter size	Upper-limit viscosity for assured accuracy mPa·s	Upper-limit viscosity for measurement mPa·s
20mm	10	30
25mm	15	150
40mm	15	150
50mm	50	200
80mm	50	200
100mm	50	200

## STANDARD GRADUATION DIVISION

There are 16 kinds of standard graduation pattern as shown to the right.

Scale range	Subdivision of graduation						
1 - 10	1	2	4	6	8	10	
1.2 - 12	1.2	2	4	6	8	10	12
1.5 - 15	1.5	2.5	5	7.5	10	12.5	15
1.6 - 16	1.6	5	10	15	16		
2 - 20	2	5	10	15	20		
2.5 - 25	2.5	5	10	15	20	25	
3 - 30	3	5	10	15	20	25	30
3.5 - 35	3.5	10	20	30	35		
4 - 40	4	10	20	30	40		
4.5 - 45	4.5	10	20	30	40	45	
5 - 50	5	10	20	30	40	50	
6 - 60	6	10	20	30	40	50	60
7 - 70	7	20	40	60	70		
7.5 - 75	7.5	20	40	60	75		
8 - 80	8	20	40	60	80		
9 - 90	9	20	40	60	80	90	

## CAUTIONS

- This flowmeter transmits displacement by magnetic coupling. Influence may be received in the measurement to which a magnetic field exists on the spot.
- Please choose a place without a magnetic field around installation. The approaching magnetic material may also affect measurement. Please do not bring close to less than 20cm. Keeping-warm cover etc. should be careful.
- In installing a flow instrument adjacently, in order to avoid a mutual interference, please install the interval of 30cm or more.
- Metal tube body has a vent hole to release a gas. Care should be taken not to block it by coating or a heat insulating material. If moisture is adhered to the vent hole, a corrosive gas may be dissolved and corrode the metal tube. Ensure that the vent hole is free from moisture such as rainwater, dew condensation, etc.
- The following gaskets are recommended for flange connection:
  - T#/9010 series (Made by NICHIAS CORPORATION)
  - V#/N7030 series (Made by NIPPON VALQUA INDUSTRIES, LTD.)

\* Specification is subject to change without notice.

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