

**Overview**

MaxiFlo™ KM Series Metal Tube Rotameters are rugged, versatile and accurate variable area (VA) flow meter offering 2.0% full scale accuracy.

It's based on simple and easy-to-understand flow measuring principle but is versatile in the types of fluid it can measure and site conditions, under which it can be installed.

The meter is manufactured to the user's application specifications. So, there's no configuration or calculation required at the time of installation or operation. So, it's simple to install and operate.

The flow rate is indicated on a scale with a needle that is coupled to the rotating float using a magnet. Using potentiometer circuitry, the meter can output 4-20mA signal for flow rate, which can in turn be used to display the instant flow rate and the totalized flow on a digital LCD and output pulse signal for the accumulated flow. It can also output alarm contact signal for low and/or high set points for flow controlling processes.

Various materials can be used for wetted parts. So, the meter can handle almost all liquids and gases that are highly corrosive. Also, the meter can be used for hazardous areas using Ex-Proof enclosure option.

**Main Features**

**Simple Measurement Principle**

This is one of the earliest flow meters that came into use. It adopts easy-to-understand and very intuitive principle of variable-area flow meter principle. *(Please refer to Operation Principle overleaf)*

**Simple Design**

In its primitive basics, the measuring element is composed of just a tapered tube and a float.

**Low Maintenance**

Constructed to sustain corrosion, abrasion and shocks, etc., the meter requires minimum maintenance.

**Versatile Construction**

The meter can measure all liquids, gases and steam.

**Various Flow Directions**

The meter can be configured for Bottom to Top, Bottom to Top Side, Bottom Side to Top, Bottom Side to Top Side and Bottom Rear to Top Rear.

**Various Output and Display Options**

4-20mA, pulse, alarm contact, flow rate display and total display are available.

**Explosion Proof Enclosure**

For signal output models, the user can choose ex-proof enclosure for hazardous environment.

100% Customer Satisfaction

**MAXIFLO**

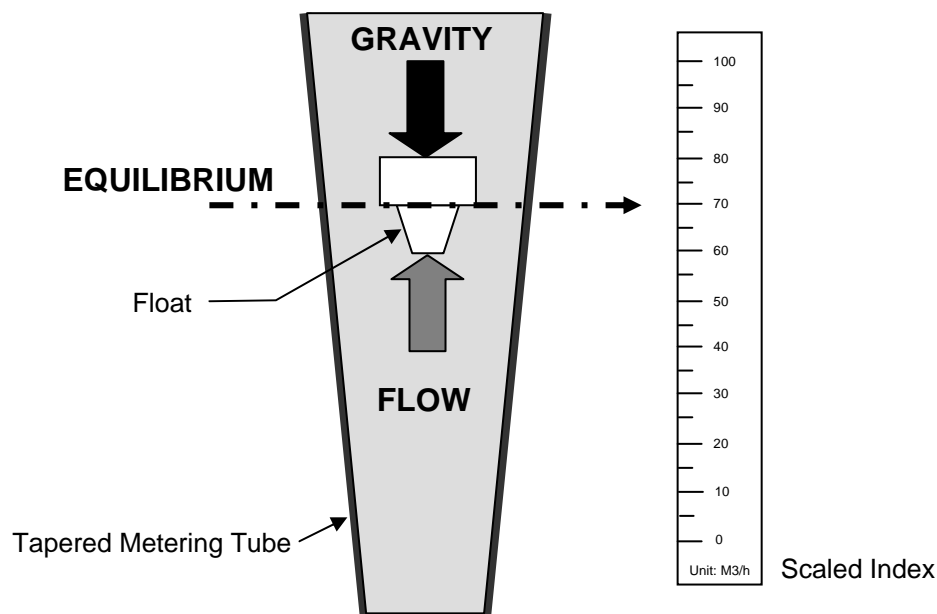
**Metal Tube Variable-Area Flow Meter (Series KM, KMS, KMSS)**



## Operation Principle

Variable-area flow meters, often called rotameters, consist essentially of a tapered tube, a float and scaled indicator as you see in the figure below. Although classified as differential pressure units, they are, in reality, constant differential pressure devices. Flanged-end or screwed-end fittings provide an easy means for installing them in pipes. When there is no flow, the float rests freely at the bottom of the tube. As the fluid enters the bottom of the tube, the float begins to rise. The float material is selected so as to have a density higher than that of the fluid and the position of the float varies directly with the flow rate. Its exact position is at the point where the differential pressure between the upper and the lower surfaces balance the weight of the float.

Because the flow rate can be read directly on a scale mounted next to the tube, no secondary flow-reading devices are necessary. However, if desired, automatic sensing devices can be used to sense the float's level and transmit a flow signal. Rotameter tubes are manufactured from glass, metal, or plastic. Tube diameters vary from 1/4 to greater than 6 in.



## Applications

- Hot and cold water as well as air flow measurement in air conditioning
- Medium and large line measurement in general process industry
- Cooling water lines
- Water treatment process
- Pure and ultra-pure water production facilities
- Testing of fire fighting pumps
- Testing of blowers
- Etc.

### Model Overview

Model Code	Description	Remarks
<b>KM</b>	<b>Metal Tube Variable Area Flow Meter (Rotameter)</b>	
<b>KMS</b>	<b>Small-Size Metal Tube Variable Area Flow Meter (Rotameter)</b>	25A and below sizes
<b>KMSS</b>	<b>Micro-Flow Metal Tube Variable Area Flow Meter (Rotameter)</b>	25A and below sizes for low flow rates

### Specifications

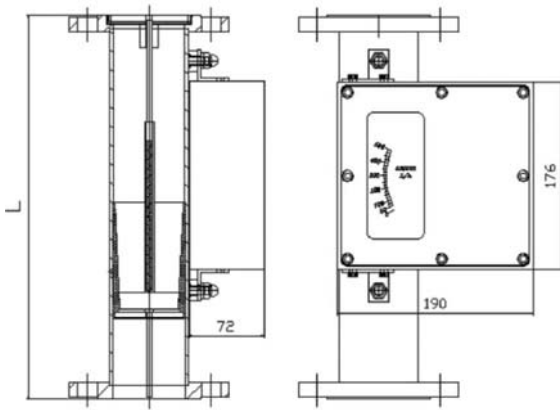
Item	Specifications	Remarks
<b>Size</b>	8A (1/4") ~ 250A (10")	
<b>Media Measured</b>	Liquids and Gases	
<b>Flow Ranges</b>	Liquids: Water Max: ~ 250 m <sup>3</sup> /h Min: 0.01 ~ 0.1 m <sup>3</sup> /h	
	Gases: Air Max: ~ 4000 Nm <sup>3</sup> /h Min: 0.5 ~ 5 Nm <sup>3</sup> /h	Normal Condition: 20 °C, 0 MPa
<b>Operating Temperature</b>	- 20 ~ 120 °C	Optionally up to 150 °C
<b>Operating Pressure</b>	Max. 4.1 MpaG at ambient temperature Max. 3.3 MpaG at 120 °C	
<b>Process Connections</b>	Flanges: JIS, ANSI, DIN, etc. Screws: NPT, PT, etc. Sanitary Ferrule	
<b>Flow Directions</b>	Bottom to Top Bottom to Top Side Bottom Side to Top Side Side to Side	
<b>Materials</b>	Taper Tube: SUS 304, SUS 316, SUS 316L, PVC, etc. Float: SUS 304, SUS 316, SUS 316L, PVC, etc. Flange: Carbon Steel, SUS 304, SUS 316, SUS 316L, SCS13, SCS 14, PVC, etc.	
<b>Accuracy</b>	± 2% of Full Scale	
<b>Turndown Ratio (Rangeability)</b>	10:1	
<b>Outputs</b>	4-20mA (2-wire) 4-20mA with HART (2-wire) Alarm Switch Contacts	
<b>Enclosure (Indicator)</b>	Weather Proof (IP65) Intrinsic Safety (Exia II CT6) Flame Proof (Exia II CT6)	

## Model Code

## Model Selection Guide

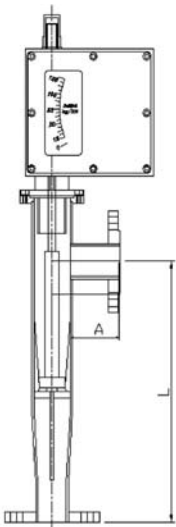
KM	Description		Code
Connection	Flange		F
	Screw		N
	Sanitary		FS
Indicator	Square Aluminum Case for Meter Length (Face to Face) over 350mm		J
	Square Aluminum Case for Meter Length (Face to Face) under 250mm		A
	Dial Aluminum Case for Meter Length (Face to Face) under 250mm		B
	Float Axle Indicator		E
	Side Indicator		G
	Mechanical Scale Index with Digital Indicator (Flow Rate & Total)		Q
Flow Direction	Bottom to Top		1
	Bottom to Top Side		2
	Bottom Side to Top		3
	Bottom Side to Top Side		4
	Side to Side		5
Material	SUS 304		B
	SUS 316		C
	SUS 316L		D
	PVC		P
	Teflon-Lining for Wetted Part on the Body Material		T
	Special		X
Options	4-20mA Output		S
	4-20mA with HART		SH
	Pulse Output ( <i>Only for "Q" type indicator</i> )		S2
	1-point Alarm Contact (Reed Switch)		R1
	2-point Alarm Contact (Reed Switch)		R2
	1-point Alarm Contact (Fiber Sensor)		F1
	Cooling Fin		CF
	Damper		DR
	Full Heat Jacket		FJ
	Semi Heat Jacket		SJ
	Explosion Proof Enclosure		EX
	Control Valve		GV
	Reducer Pipe Large Flow		LF
	Air Chamber		AC

**Flow Directions, Flow Rates, Dimensions and Weights**



**Bottom to Top**  
(KMF-1-B)

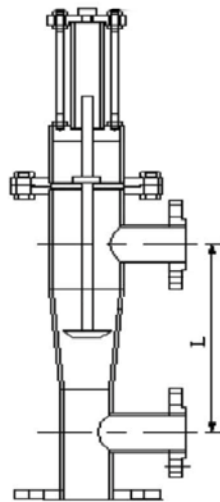
KMF-1-B	Liquid (m <sup>3</sup> /h)	Gas (Nm <sup>3</sup> /h)	L (mm)	Weight (Kg)
15A	0.1 ~ 1	1.0 ~ 10	350	5
20A	0.15 ~ 1.5	3 ~ 30	350	5
25A	0.4 ~ 4	10 ~ 100	350	6
32A	0.6 ~ 6	15 ~ 150	360	7
40A	1 ~ 10	20 ~ 200	360	8
50A	1.5 ~ 15	25 ~ 250	360	10
65A	2.5 ~ 25	60 ~ 600	600	20
80A	4 ~ 40	100 ~ 1000	650	23
100A	7 ~ 70	180 ~ 1800	700	30
125A	12 ~ 120	230 ~ 2300	800	43
150A	18 ~ 180	300 ~ 3000	850	50
200A	~ 200		950	-
250A	~ 250		1050	-



**Bottom to Top Side**  
(KMF-2-B)

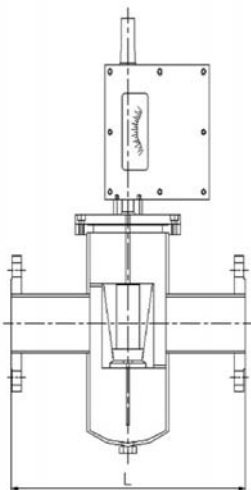
KMF-2/3-B	Liquid (m <sup>3</sup> /h)	Gas (Nm <sup>3</sup> /h)	L (mm)	A (mm)	Weight
15A	0.1 ~ 1.0	1.5 ~ 15	250	100	8
20A	0.2 ~ 2.0	4.0 ~ 40	250	100	9
25A	0.4 ~ 4.0	8.0 ~ 80	250	100	10
32A	0.6 ~ 60	10 ~ 100	250	100	12
40A	1 ~ 10	15 ~ 150	250	100	13
50A	1.5 ~ 15	25 ~ 250	250	100	18
65A	2.5 ~ 25	45 ~ 450	350	150	25
80A	4 ~ 40	80 ~ 800	350	150	33
100A	6.5 ~ 65	180 ~ 1800	350	150	50
125A	10 ~ 100	250 ~ 2500	370	250	72
150A	18 ~ 180	-	480	250	95

**Bottom Side to Top**  
(KMF-3-B)



**Bottom Side to Top Side**  
(KMF-4-B)

KMF-4-B	Liquid (m <sup>3</sup> /h)	Gas (Nm <sup>3</sup> /h)	L (mm)	Weight (Kg)
15A	0.1 ~ 1.0	2 ~ 20	300	5.5
20A	0.2 ~ 2.0	4.0 ~ 40	350	6.5
25A	0.4 ~ 4.0	12 ~ 120	350	9
32A	0.6 ~ 60	15 ~ 150	350	9
40A	1 ~ 10	20 ~ 200	38	13
50A	2 ~ 20	40 ~ 400	420	17
65A	3 ~ 30	80 ~ 800	460	26
80A	4 ~ 40	150 ~ 1500	480	32
100A	8 ~ 80	250 ~ 2500	550	45
125A	14 ~ 140	450 ~ 4500	570	65
150A	22 ~ 220	650 ~ 6500	590	85



**Side to Side**  
(KMF-5-B)

KMF-5-B	Liquid (m <sup>3</sup> /h)	Gas (Nm <sup>3</sup> /h)	L (mm)	Weight (Kg)
15A	0.1 ~ 1.0	1.5 ~ 15	160	10
20A	0.2 ~ 2.0	5.0 ~ 50	160	12
25A	0.4 ~ 4.0	10 ~ 100	180	14
32A	0.6 ~ 60	15 ~ 150	200	16
40A	1 ~ 10	20 ~ 200	240	18
50A	1.5 ~ 15	30 ~ 300	260	22
65A	2.5 ~ 25	60 ~ 600	340	35
80A	4 ~ 40	100 ~ 1000	360	42
100A	6.5 ~ 65	150 ~ 1500	360	62
125A	10 ~ 100	250 ~ 2500	440	93
150A	18 ~ 150	450 ~ 4500	440	115

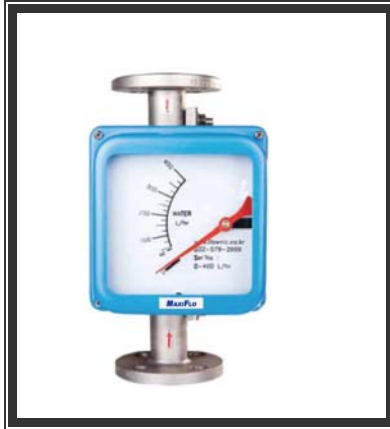
**Indicator Options**

Option Code - **J** -



Mechanical Scale Index for Face to Face <= 350mm  
Material: Cast Aluminum

Option Code - **A** -



Square Scaled Mechanical Index for Face to Face <= 250mm  
Material: Cast Aluminum

Option Code - **B** -



Round Scaled Mechanical Index for Face to Face <= 250mm  
Material: Cast Aluminum

Option Code - **E** -



Float Axle Indicator

Option Code - **G** -



Scaled Mechanical Index attached on the Side  
Material: Cast Aluminum

Option Code - **Q** -

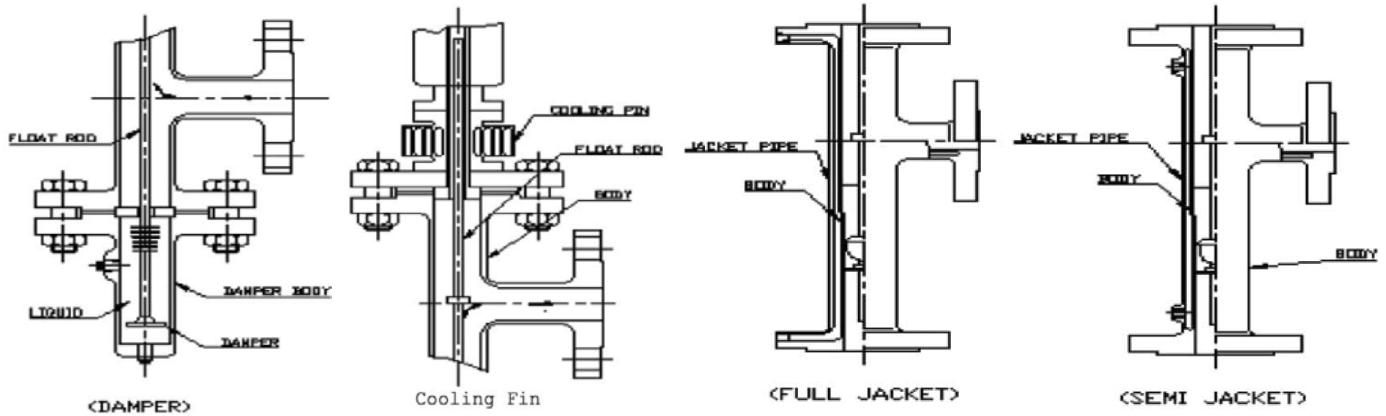


Round Scaled Mechanical Index for Face to Face <= 250mm  
Material: Cast Aluminum

**Output Options (Code: S1, S2, R1, R2 and F1)**

Output	Description	Remarks
4-20mA	Loop powered, 2 wire type	The flow range for the output is set at the factory.
Alarm Contact	1 point or 2 point contacts, Reed Switch type Rating: AC250V, 0.5A or DC 125V, 0.5A	
	1 point contact, Fiber type	
Pulse Output	Open Collector type	Available only with "Q" type indicator

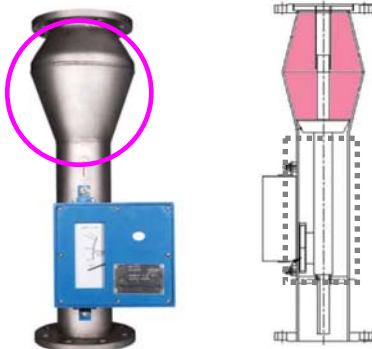
**Damper, Cooling Fin and Heat Jacket Options (Code: DR, CF, FJ and SJ)**



**Explosion Proof Enclosure (Code: EX)**

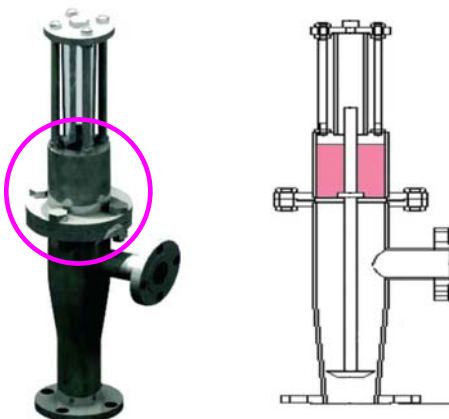
- EXd IIC T6 (KTL Certified)

**Reducer Pipe Large Flow (Code: LF)**



This option is applied to sizes from 65A. The flow sensing part (tapered tube) is compacted into the section highlighted in pink color, while the normal types have flow sensing part (tapered tube) into the longer meter body highlighted in grey color.

**Air Chamber (Code: AC)**



The air chamber is available as an option for the Axle Type Indicator model (Indicator option code: E).

The air chamber blocks the liquid from entering into the indicator.

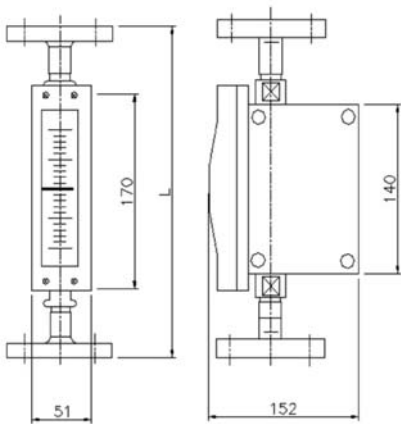


**Model Code**



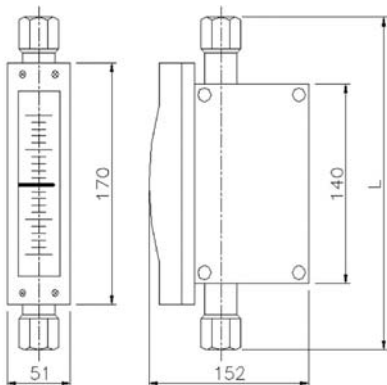
Model Selection Guide		
KMS	Description	Code
Connection	Flange	F
	Screw	N
Flow Direction	Bottom to Top	1
	Bottom to Top Side	2
	Bottom Side to Top	3
	Bottom Side to Top Side	4
Material	SUS 304	B
	SUS 316	C
	SUS 316L	D
	Special	X
Options	1-point Alarm Contact (Reed Switch)	R1
	Control Valve	GV

**Flow Rates, Dimensions and Weights**



**Flange Connection**

KMS-F-1-B	Liquid (L/hr)	Gas (Nm <sup>3</sup> /hr)	Length (mm)	Weight (kg)
8A	5 ~ 50	0.3 ~ 3	280	3.5
10A	5 ~ 100	0.3 ~ 5		4
15A	5 ~ 150	1 ~ 10		5.5
20A	5 ~ 300	5 ~ 15		7
25A	5 ~ 450	8 ~ 25		8



**Screw Connection**

KMS-N-1-B	Liquid (L/hr)	Gas (Nm <sup>3</sup> /hr)	Length (mm)	Weight (kg)
8A	5 ~ 50	0.3 ~ 3	280	3
10A	5 ~ 100	0.3 ~ 5		3.5
15A	5 ~ 150	1 ~ 10		4.5
20A	5 ~ 300	5 ~ 15		5
25A	5 ~ 450	8 ~ 25		6



**Model Code**



KMSS-M



KMSS-M-R1



KMSS-M2



KMSS-M2-R1

**Model Selection Guide**

KMSS		Description	Code
Connection	Flange		F
	Screw		N
Indicator	Metal Tube Magnetic Coupling		M
	Metal Tube Magnetic Coupling with Protect Case		M2
Flow Direction	Bottom to Top		1
	Left to Right		2
	Right to Left		3
Material	SUS 304		B
	SUS 316		C
	Special		X
Options	1-point Alarm Contact (Reed Switch)		R1
	2-point Alarm Contact (Reed Switch)		R2

**Specifications**

Item	Specifications	Remarks
Size	8A (1/4") ~ 25A (1")	
Media Measured	Liquids and Gases with Low Viscosity	
Available Scale Range	Min. 0.2 ~ 2 L/min, Max. 15 ~ 150 L/min	
Max. Temperature	100°C	Optionally 180°C
Max. Pressure	1.0 MPa	
Connection Type	RC, NPT, JIS, ANSI, DIN, etc.	
Accuracy	Indicator - ±5%, FS, Alarm Setting - ±3%, FS	

**Flow Rates, Dimensions and Weights**

Size	Length (mm)	Weight (kg)	Flow Rate							
			KMSS-M				KMSS-M2			
			Liquid (L/hr)		Gas (Nm <sup>3</sup> /hr)		Liquid (L/hr)		Gas (Nm <sup>3</sup> /hr)	
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
8A	180	2	~ 5	~ 250	~ 0.3	~ 5	~ 5	~ 250	~ 0.3	~ 3
10A		2.5	~ 5	~ 600	~ 0.3	~ 15	~ 5	~ 600	~ 0.3	~ 5
15A		4	~ 5	~ 900	~ 1	~ 30	~ 5	~ 900	~ 1	~ 10
20A		5	~ 5	~ 1500	~ 5	~ 50	~ 5	~ 1500	~ 5	~ 15
25A		6	~ 5	~ 3000	~ 8	~ 80	~ 5	~ 3000	~ 8	~ 25

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