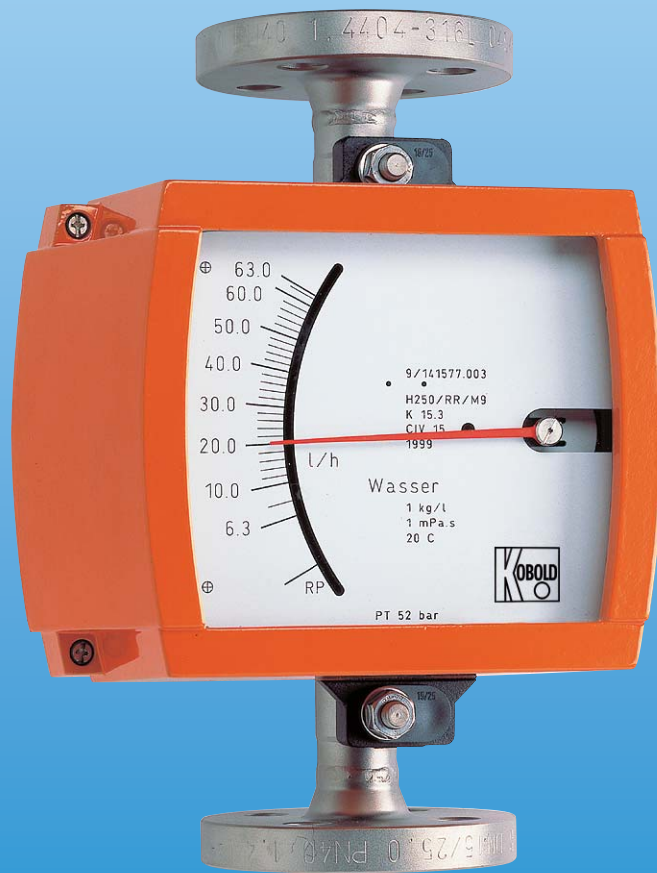


KDM ARMORED FLOW METER & SWITCH



Flow
Pressure
Level
Temperature
measurement
monitoring
control



- Short Installation Length
- SS, PTFE or Hastelloy Wetted Parts
- Analog Output Available
- - 110 °F to + 390 °F Temperature Range (Higher on Request)
- Pressures to 300 lb ANSI (Higher on Request)

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Model:
KDM

Features

- Short Installation Length
- SS, PTFE or Hastelloy Wetted Parts
- Analog Output Available
- - 110 °F to + 390 °F Temperature Range (Special Designs to 600°F)
- Pressures to 300 lb ANSI (Higher on Request)

The KDM variable area flow meter is ideal for difficult applications requiring high pressure operation or low pressure loss. Its all metal, armored design is available in stainless steel, PTFE clad stainless steel, or Hastelloy C4.

In standard configuration, the KDM is a purely mechanical meter. However, electronic limit switches or an analog flow transmitter may be added if so desired. Switches and analog outputs are available which operate in an intrinsically safe mode and may be used with explosive gases in intrinsically safe installations.

The indicator translates the linear motion of the float into an indication via a direct magnetic coupling.

KDM Flow Meters



with M9 Indicator

Specifications

Accuracy

- Metal Versions:** ± 1.6 % F.S.
- PTFE Version:** ± 2.5 % F.S.

Fittings: ANSI Flanges
150 lb or 300 lb RF

Wetted Parts

- Standard:** 316-Ti SS (Viton seal in NPT versions)
- Optional:** PTFE clad SS or Hastelloy C4
- Damping System:** Sapphire

Operating Temperature

- Ambient:** - 10 to 140 °F
 - Medium**
 - No Options:** - 110 to 390 °F
 - With Options:** - see table
 - PTFE Clad:** - 110 to 160 °F
- High temperature versions on request

Maximum Pressure

- NPT Thread:** 580 PSIG
 - Flanged:** Per ANSI B16.5
- High pressure units on request

Electrical Characteristics

- Switches (optional)**
- Standard**
- Type:** Proximity, 3-wire
- Power:** 10-30 VDC
- Output:** PNP, 100mA Max.
- Intrinsically Safe**
- Type:** Proximity
- Output:** NAMUR
- Rating:** EEx ia IIC T6

Analog Output (optional)

- Type:** 2-wire 4-20 mA
- Input (Vcc):** 12.7 to 30 VDC
- Max. Load (Ω):** Vcc-12 V/0.02 A
- Resolution:** + 0.5 % F.S.
- Repeatability:** + 0.1 % F.S.
- Rating:** EEx ia II C T6
EEx ib II C T6 (applies to intrinsically safe version only)
- Housing:** NEMA 4
- Counter:** 6-Digit LED resettable (M9 indicator only)

Optional Steam Jacket

- Fittings:** ANSI Flange
NPT



Meter Selection

The KDM flow meter series can be calibrated to provide direct reading scales for a variety of media. To do a custom calibration, Kobold requires information on media density, viscosity, the operating temperature and the operating pressure.

It is required that option -D, the damping mechanism, be added for all gas applications whose downstream pressure is less than 7 PSIG. This is necessary to prevent unstable operation of the float. Addition of the damping mechanism increases the meter's pressure loss to 4.3 PSI.

Once an appropriate range has been selected, refer to the Ordering Table on the next page and assemble a part number.

KDM Flow Ranges

Fitting Size ANSI Flange	Water Ranges		Air Ranges		Measuring Range Code
	Range (GPM)	Pressure Loss (PSI)	Range (SCFM)	Pressure Loss (PSI)	
1/2"	0.011– 0.11	0.37	0.041– 0.41	0.30	01
	0.018– 0.18	0.37	0.059– 0.59	0.30	02
	0.028– 0.28	0.37	0.088– 0.88	0.30	03
	0.044– 0.44	0.37	0.13 – 1.3	0.30	04
	0.070– 0.70	0.37	0.21 – 2.1	0.30	05
	0.11 – 1.1	0.37	0.32 – 3.2	0.30	06
	0.18 – 1.8	0.40	0.59 – 5.9	0.30	07
	0.28 – 2.8	0.46	0.82 – 8.2	0.31	08
1"	0.28 – 2.8	0.46	0.82 – 8.2	0.34	09
	0.44 – 4.4	0.47	1.3 – 13	0.34	10
	0.70 – 7.0	0.49	2.1 – 21	0.36	11
	1.1 – 11	0.54	2.9 – 29	0.54	12
	1.8 – 18	0.64	4.7 – 47	0.64	13
	2.8 – 28	1.47	6.5 – 65*	4.30	14
	–	–	10 –100*	4.30	15
2"	2.8 – 28	0.93	4.7 – 47	0.19	16
	4.4 – 44	1.00	6.5 – 65	0.19	17
	7.0 – 70	1.06	8.2 – 82	0.19	18
	11 –110	1.39	12 –120	0.64	19
	–	–	16 –160*	4.30	20
	–	–	24 –240*	4.30	21
	–	–	37 –370*	4.30	22
3"	11 –110	0.97	24 –240	0.23	23
	18 –180	1.27	29 –290	0.27	24
4"	28 –280	1.72	–	–	25
	44 –440	3.15	–	–	26

* Units whose range is marked with an asterisk come standard with damping mechanism.

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Operating Temperature with Options, Non-Hazardous Location Service

Meter Size	Selected Options	Ambient Temperature	
		< 100 °F	< 140 °F
1/2"	H0, I0, L0 K0	390 °F 392 °F	350°F 176 °F
1", 2"	H0, I0, L0 K0	392 °F 356 °F	129 °F 167 °F
3", 4"	H0, I0, L0 K0	390 °F 302 °F	302 °F 158 °F

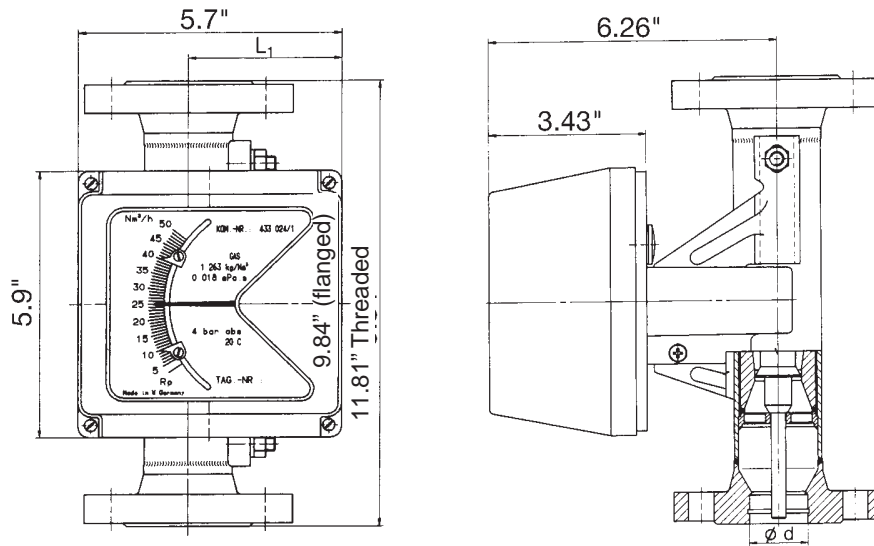
*Consult factory for temperature limits for hazardous location service.



KDM Ordering Information

KDM Options	
KDM	= Armored Flow Meter
-V -T -C	Construction and Wetted Parts = 316-Ti Stainless Steel Flow Meter = PTFE Clad 316-Ti Stainless Steel Flow Meter = Hastelloy C4 Flow Meter
-A15 -A25 -A50 -A80 -A1H	Instrument Fittings = 1/2" Raised Face ANSI Flange = 1" Raised Face ANSI Flange = 2" Raised Face ANSI Flange = 3" Raised Face ANSI Flange = 4" Raised Face ANSI Flange
-N15 -N25 -N50	= 1/2" NPT Thread = 1" NPT Thread = 2" NPT Thread
-1	Flange Ratings = 150 lb ANSI Flange Rating
-2	= No Flange (Threaded connections)
-3	= 300 lb ANSI Flange Rating
-W -L -A	Medium = Water = Air. Specify operating temperature and pressure with order. = Other. Specify density at STP, operating temperature, pressure and viscosity.
-(1-26)	Measuring Range Measuring Range Code as chosen from the KDM Flow Range Table.
-9	Indicator Type = Directly Coupled, Standard Display M9
-AO -HO -HE -IO -IE -LO -LE -KO	Output Options = Indicator Only = 1 Standard Switch = 1 Intrinsically Safe Switch = 2 Standard Switches = 2 Intrinsically Safe Switches = Standard Analog Output = Intrinsically Safe Analog Output = Standard Analog Output with Digital Counter (M9 Indicator Only)
-D -H -T	Other Options = Dampening Mechanism for gas flow less than 7 PSIG. = Steam Jacket = Temperature Isolation (-50°F to 600°F)
KDM -V -A025 -1 -W -17 -7 -F -H	Sample KDM Specification

KDM-M9

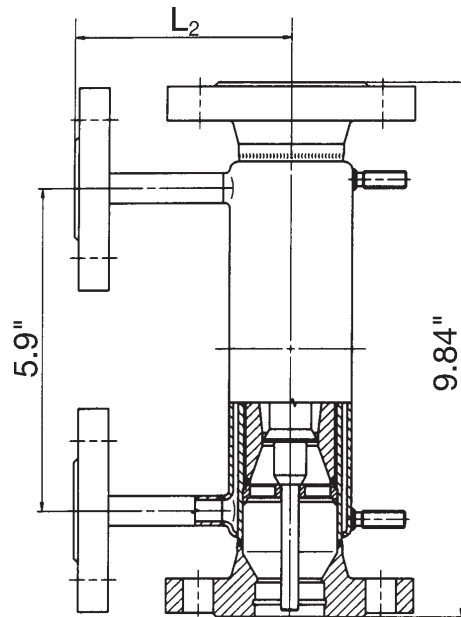


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KDM Dimensions

Nominal Fitting Size	Dimensions in inches	
	L ₁	L ₂
1/2"	2.81	3.94
1"	3.30	3.94
2"	3.90	4.72
3"	4.53	6.30
4"	5.16	5.91

KDM Meter Tube with Steam Jacket





<p>KDM Series Flowmeters Application Guide Form # KDM-001 Rev. 11/03/03</p> <p>FAX to: KOBOLD Instruments Inc. 412-788-4890 (USA) 514-428-8899 (Canada)</p>	<p>Customer Name: _____</p> <p>Company Name: _____</p> <p>Phone: _____</p> <p>Fax: _____</p>
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Quote #: _____ Date: _____ Price: _____ Each

Part Number: _____

* To ensure fast order processing, please retain the completed quote form and send it along with your purchase order.

Calibrated Measuring Range: _____

Design Conditions

Accurate design pressure and temperature are essential to ensure the flowmeter will be built to operate without damage. Please fill out accurately and completely.

List Design Conditions

- 1. **Pressure:** Maximum _____ PSIG
- 2. **Temperature:** Maximum _____ °F

Calibration Conditions: Accurate calibration conditions are required to ensure that the flowmeter will be factory calibrated to give accurate readings at the user's **normal operating conditions**. Please fill out accurately and completely.

Calibration Conditions for Liquid Flow Applications

- 1. **Type of Liquid:** _____
- 2. **Normal Operating Temperature:** _____ °F
- 3. **Viscosity at Normal Operating Temp:** _____
- 4. **Specific Gravity at Normal Operating Temp:** _____
- 5. **Desired Measuring Range and Units:** _____

Note: Items 3 & 4 not required for water flow

Calibration Conditions for Gas Flow Applications

- 1. **Type of Gas:** _____
- 2. **Normal Operating Temperature:** _____ °F
- 3. **Normal Pressure at Outlet Fitting:** _____ PSIG
- 4. **Specific Gravity (required for gas mixes only):** _____
- 5. **Desired Measuring Range and Units:** _____

Note: The calibration pressure required is the pressure that the meter sees at its outlet fitting.

Flowmeter Options

- 1. **Measuring Tube Material:** 316 Stainless Steel Teflon Lined Stainless Steel Hastelloy C
- 2. **Desired Fitting Size:** 1/2" 1" 2" 3" 4"
- 3. **Fitting Type:** 150 LB ANSI Flange 300 LB ANSI Flange NPT Thread (2" maximum)
 Other (specify): _____

Other Options:

- 1. 1 NAMUR Flow Switch
- 2. 2 NAMUR Flow Switches
- 3. 4-20 mA Output
- 4. 4-20 mA Output, Intrinsically Safe
- 5. 4-20 mA Output w/ Digital Counter
- 6. High Temperature Process Isolation (600°F Max.)
- 7. Heating Jacket
- 8. Other Options (specify): _____