

Type M330H & M330AH

HEATABLE MASS FLOW CONTROLLER FOR HIGH TEMPERATURE APPLICATIONS UP TO 150°C

MKS Instruments has been at the forefront of developing instrumentation for the delivery of low vapor pressure materials. The M330H and M330AH provide two additional choices for the neat delivery of high boiling materials. The maximum operational temperatures of these devices are 80° and 150°C respectively, allowing direct flow control of low vapor pressure materials with thermal MFCs, without the need for a carrier gas.

Features & Benefits

- Rated for temperatures up to 150°C (M330AH)
- Full scale flowrates from 10 to 40,000 sccm N₂ equivalent
- Heatable flowbody connected to remote ambient temperature electronics by a 2 meter high temperature cable
- Patented flow sensor and sensor/ bypass/valve assembly for stable flow over widely varying conditions (US Patents 5410912, 5295394, and 5727769)
- Corrosion resistant, metal-sealed flowbody
- PTFE Valve Plug
- CE Compliant

Applications

- CVD Materials Delivery: DiEthyl Zinc, TriMethyl Phosphate, DecaBorane
- Coating Applications: Titanium TetraChloride, Titanium i-Propoxide
- Cleaning Processes: Water Vapor delivery
- Fiber Optics Manufacture: Germanium TetraChloride, Silicon TetraChloride delivery
- Effluent Testing and Monitoring



Flow
& Control
Measurement

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Operating Environment

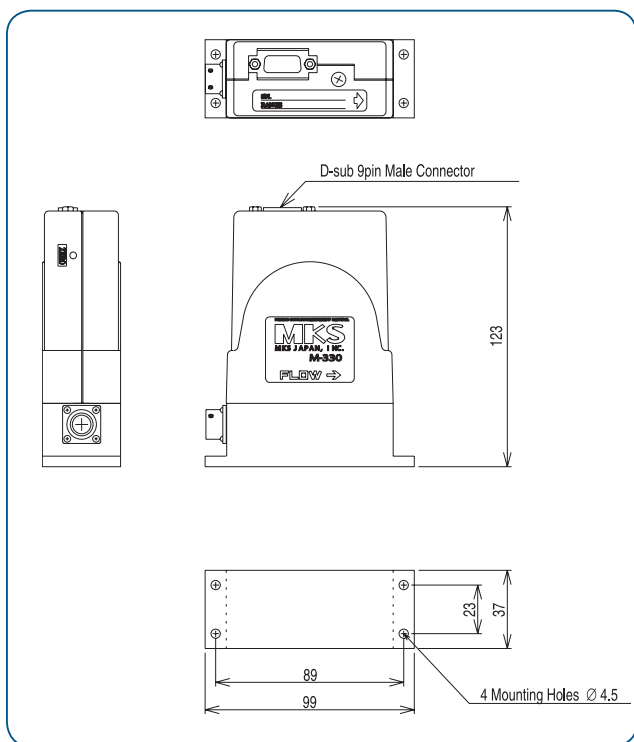
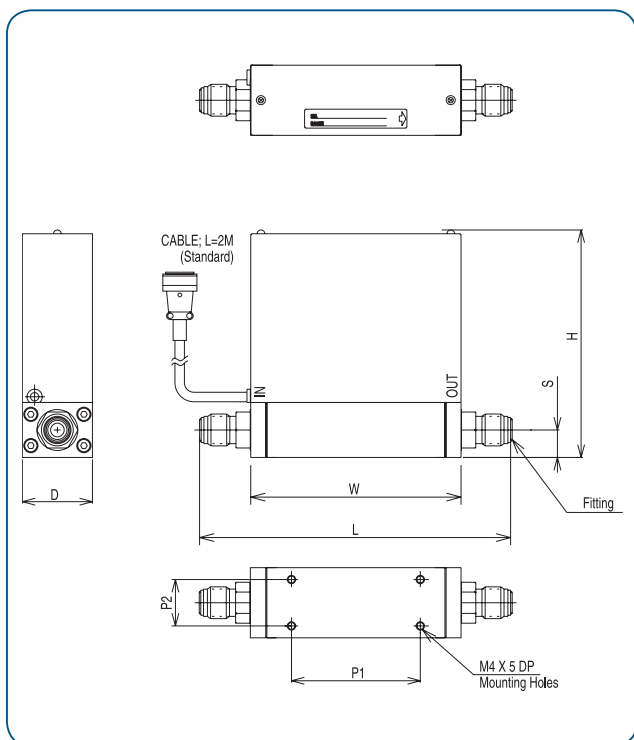
Both the M330H and M330AH are calibrated for specific materials and processes. Therefore, it is highly recommended that they be operated in a constant temperature environment to ensure accurate flow measurement and/or prevent condensation of vapors in the MFC or connected piping.

Specifications

Performance	M330H	M330AH
Full Scale (N ₂ equivalent)	10 sccm - 40,000 sccm	10 sccm - 40,000 sccm
Operating Temperature	A customer specified temperature (Max 80°C)	A customer specified temperature (Max 150°C) Consult factory over 150°C
Control Range	5% to 100% of F.S.	5% to 100% of F.S.
Normal Operating Pressure		
10-5000 sccm (N ₂ equivalent)	7-45 psid	7-45 psid
10,000-40,000 sccm (N ₂ equivalent)	15-45 psid	5-45 psid
Calibration Accuracy	1% of F.S. by N ₂ calibration	1% of F.S. by N ₂ calibration
Temperature Coefficient	0.1% F.S./°C	0.1% F.S./°C
Repeatability	±0.2% of F.S.	±0.2% of F.S.
Typical Controller Settling Time (per SEMI E17-600)	2 seconds (0-100% setpoint)	
Mechanical		
Fittings		
< 30000 sccm (N ₂ equivalent)	4 VCR	4 VCR
≥ 30000 sccm (N ₂ equivalent)	8 VCR	8 VCR
Leak Integrity		
External (scc/sec He) Through Closed Valve	< 1 x 10 ⁻¹⁰ < 1%	< 1 x 10 ⁻¹⁰ < 1%
Major Wetted Material	SUS316L, SUS316L VAR, Anti corrosive magnetic alloy	SUS316L, SUS316L VAR, Anti-corrosive magnetic alloy
Valve Plug Material	PTFE, Metal(Optional)	PTFE, Metal(Optional)
Valve Type	Normally closed solenoid	Normally closed solenoid
Weight		
< 30000 sccm (N ₂ equivalent)	Approx. 1.6kg	Approx. 1.6 kg
≥ 30000 sccm (N ₂ equivalent)	Approx. 2kg	Approx. 2kg
Surface Finish	5μ inch Ra	5μ inch Ra
Electronics		
Input Power Requirement	±15VDC ±5%, 100mA	±15VDC ±5%, 100mA
Input Command Signal	0-5 VDC	0-5 VDC
Output Signal	0-5 VDC	0-5 VDC
Connector	D-sub 9 Pin male	D-sub 9 Pin male
Electromagnetic Compatibility	Fully CE Compliant to EMC Directive 89/336/EEC when used with an overall metal braided shielded cable, properly grounded at both ends.	



Dimensional Drawings



Dimensional Drawings —

Note: Unless otherwise specified, dimensions are nominal values in inches (mm referenced).

Dimensions, mm

Flow Range ⁽¹⁾	10-30,000 sccm ⁽¹⁾	30,000 - 40,000 ⁽¹⁾
L	124	165
S	12.7	14.5
H	119	119
P1	38	68
P2	18.5	24.5
D	37	37
W	79	123
Fitting	4 VCR	8 VCR

Note:

(1) N₂ equivalent at standard conditions (760 Torr, 0°C)

Electrical Interface

D-sub 9 Pin Connector (male)	
Pin No.	Description, Signal
1	Valve Open/Close Input ⁽¹⁾
2	Flow Rate Output Signal (0 to +5VDC)
3	Power Supply +15 VDC Input ⁽²⁾
4	Power Common
5	Power Supply -15 VDC Input ⁽²⁾
6	Flow Rate Set Point Input (0 to +5 VDC)
7	Signal Common
8	Signal Common
9	Optional Signal Input ⁽³⁾

Notes:

- (1) Valve open: connect pin 1 to +15VDC
Valve close: connect pin 1 to -15VDC
- (2) Connect to proper power source. Requires at least 120mA/MFC channel with acceptable noise performance under EMC Directive 89/336/EEC
- (3) Pressure signal input for closed loop pressure control.

For more information, please contact the MKS applications group.



Ordering Information

Please contact MKS Applications Engineering with the following information to determine the correct MFC for the application: Material to be delivered, Maximum Flow Rate, Source Temperature, Source Pressure, Process Temperature, and Process Pressure.

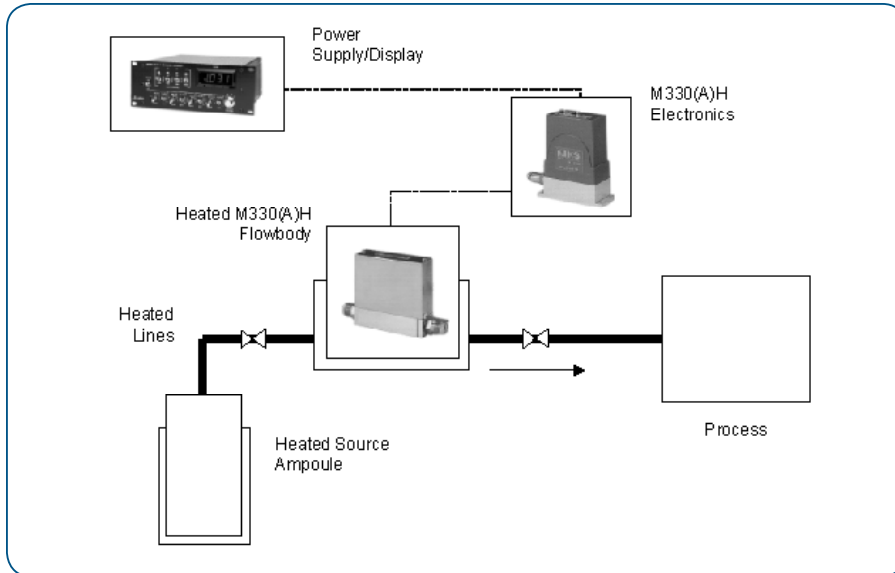


Figure 1 —
Typical Schematic for CVD Materials Delivery, Coating Applications, Cleaning Processes and Fiber Optic Manufacture

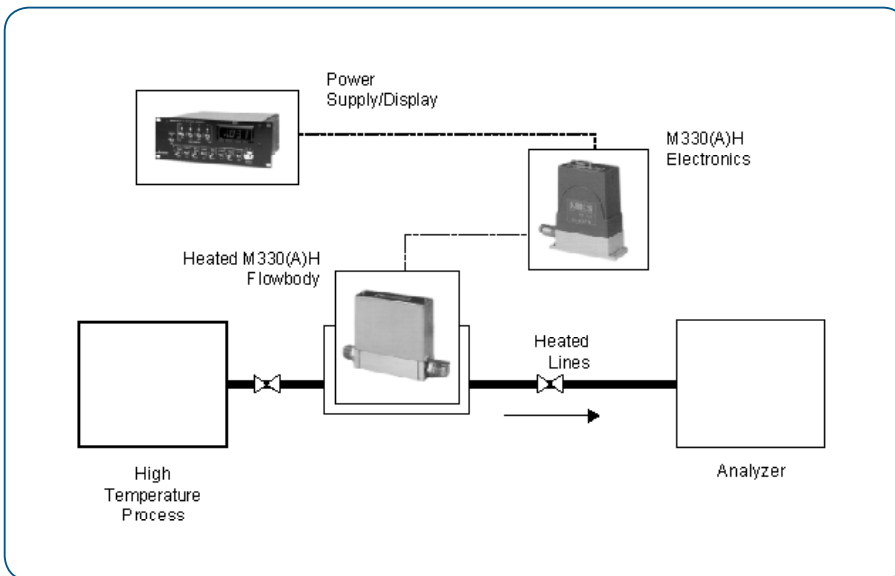


Figure 2 —
Typical Schematic for Effluent Testing and Monitoring



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