# DATASHEET D-6320-AND-D-6420

## MASS-STREAM D-6320 & D-6420 MFM

Direct Thermal Mass Flow Meter for Gases, IP65 protected




### Compact IP65 Mass Flow Meters for low flow rates of gases

Bronkhorst® models D-6320 and D-6420 Mass Flow Meters (MFMs) are suited for precise measurement of flow ranges between 0,05…1 ln/min and 0,35…7 ln/min at operating pressures between vacuum and 10 bar (Aluminium) or 20 bar (Stainless Steel). The MFM consists of a proven inline thermal (CTA) mass flow sensor and a microprocessor based pc-board with signal and fieldbus conversion and a PID controller for optional mass flow control by means of a separately mounted control valve. The instument is IP65 complient and can optionally be equipped with a modern, multi-functional and multi-colour display, with operator buttons on the instrument.

The digital MASS-STREAM™ series is characterized by a high degree of signal integrity and, as an option, up to 8 calibration curves of different gases and process conditions can be memorized in the instrument. In addition to the standard RS232 output the instruments also offer analog I/O. As an option, an on-board interface can be mounted to provide CANopen®, DeviceNet™, EtherCAT®, PROFIBUS DP, PROFINET, Modbus RTU, ASCII or TCP/IP, EtherNet/IP, POWERLINK or FLOW-BUS protocols.

### Technical specifications

**Measurement / control system**

| | |
|---|---|
| Flow range (intermediate ranges available) | min. 0,05…1 $l_n$/min<br>max. 0,35…7 $l_n$/min<br>(based on $N_2$) |
| Accuracy (incl. linearity) (based on actual calibration) | ± 1,0 % RD plus ± 0.5% FS (at calibration conditions) |
| Repeatability | < 0,2 % FS |
| Turndown ratio | 1:20 |
| Type of gases | almost all gases, compatible with chosen materials |
| Response time (sensor) | approx. 0,3 sec. |
| Operating temperature | 0 … 50 °C |
| Storage / Transport conditions | -20 … +80 °C, max. 95% RH (non-condensing) |
| Temperature sensitivity | D-63xx : ±0,2% Rd/°C (Air)<br>D-64xx : ±0,1% Rd/°C (Air) |
| Pressure sensitivity | ± 0,3 % |
| Leak integrity, outboard | tested < 2 x $10^{-8}$ mbar l/s He |
| Attitude sensitivity | at 90° deviation from horizontal max. error 0,2 % at 1 bar typical $N_2$ |
| Warm-up time | 30 min. for optimum accuracy,<br>within 30 seconds for accuracy ±4% FS |

**Mechanical parts**

| | |
|---|---|
| Sensor | Stainless steel SS 316 (AISI 316L) |
| Instrument body | D-63xx : Aluminium AL 50ST/51ST (anodised) or stainless steel SS 316 /<br>D-64xx : Aluminium EN AW-6082-T6 (non-anodised) or stainless steel SS 316 |
| Sieves and rings | Stainless steel SS 316 |
| Pressure rating (PN) | 10 bar g for instrument body in aluminium,<br>20 bar g for instrument body in stainless steel SS 316 |
| Process connections | G1/4" (D-63xx : RP-type cavity / D-64xx : ISO1179-1 cavity) /<br>compression type or face seal (VCR/VCO) couplings |
| Seals | standard: FKM/Viton®;<br>options: EPDM, FFKM/Kalrez®, FDA and USP Class VI approved compounds |
| Weight | Aluminium: 1,0 kg<br>Stainless steel: 1,5 kg |
| Ingress protection | IP65 |

**Electrical properties**

| | | | | |
|---|---|---|---|---|
| Power supply | +15 … 24 Vdc ±10% | | | |
| Max. power consumption | Supply | Basic model | Add. for fieldbus | Add. for display |
| | 15 V | 115 mA | 80 mA | 30 mA |
| | 24 V | 85 mA | 50 mA | 20 mA |
| Analog output | 0…5 (10) Vdc or 0 (4)…20 mA sourcing output) | | | |
| Digital communication | standard: RS232<br>options: CANopen®, DeviceNet™, EtherCAT®, PROFIBUS DP, PROFINET, Modbus RTU, ASCII or TCP/IP, EtherNet/IP, POWERLINK or FLOW-BUS | | | |

**Electrical connection**

| | |
|---|---|
| Analog/RS232 | 8 DIN (male); |
| PROFIBUS DP | bus: 5-pin M12 (female);<br>power: 8 DIN (male) |
| CANopen® / DeviceNet™ | 5-pin M12 (male) |
| Modbus RTU / FLOW-BUS | 5-pin M12 (male) |
| Modbus TCP / EtherNet/IP / POWERLINK | bus: 2 x 5-pin M12 (female) (in/out);<br>power: 8 DIN (male); |
| EtherCAT®/ PROFINET | bus: 2 x 5-pin M12 (female) (in/out);<br>power: 8 DIN (male) |

**Control valve options**

**External actuator options to be connected to the controller**

**Ex-proof specifications**

**Approvals / certificates**

Technical specifications subject to change without notice.

*For dimensional drawings and hook-up diagrams please visit the product page on our website*

## Recommended accessories



**PIPS SERIES**

**Plug-in Power Supply**

For lab-style or industrial devices

Interchangeable plugs (Euro, UK, USA, Australian, IEC) for mains connection

## Related products




**MASS-STREAM D-6310 & D-6410 MFM**

Min. flow 0,01…0,2 ln/min
Max. flow 0,1…2 ln/min

Pressure rating up to 20 bar

Rugged sensor and housing (IP65)

Optional integrated TFT display




**MASS-STREAM D-6340 MFM**

Min. flow 0,14…7 ln/min
Max. flow 0,5…50 ln/min

Pressure rating up to 20 bar

Rugged sensor and housing (IP65)

Optional integrated TFT display




**MASS-STREAM D-6321 & D-6421 MFC**

Min. flow 0,05…1 ln/min
Max. flow 0,35…7 ln/min

Pressure rating up to 20 bar

Rugged sensor and housing (IP65)

Optional integrated TFT display

Bronkhorst®

www.bronkhorst.com

Bronkhorst High-Tech designs and manufactures innovative instruments and subsystems for low-flow measurement and control for use in laboratories, machinery and industry. Driven by a strong sense of sustainability and with many years of experience, we offer an extensive range of (mass) flow meters and controllers for gases and liquids, based on thermal, Coriolis and ultrasonic measuring principles. Our global sales and service network provides local support in more than 40 countries. Discover Bronkhorst®!