DPM

WWW.AALBORG.COM - E-MAIL ✉ : INFO@AALBORG.COM - PHONE ☎ **845.770.3000** - TOLL FREE IN U.S.A. AND CANADA **1.800.866.3837** ● ORANGEBURG N.Y. U.S.A.   **1**

BULLETIN EM2017103 DPM

Design Features

- Multi-Parameter functionality: Mass Flow, Volumetric Flow, Gas Pressure and Temperature.
- Multi-Gas functionality: support for 90 different gases and gas mixes.
- "User Defined Mixture" functionality allows to create and store up 20 custom gas mixes with up to 5 different gases each.
- Quick (< 20ms) response time.
- Standard accuracy ± (0.5% RD + 0.2% FS).
- 200 to 1 turndown ratio.
- Two programmable mass flow rate totalizers.
- High, Low or In Range Alarms with preset action delay for Mass Flow, Temperature and Pressure.
- User programmable mass flow rate Pulse Output (via SSR).
- Extensive Self Diagnostics with status LED or OLED indication.
- All 3 user selectable analog output interfaces are standard: 0-5Vdc, 0-10Vdc, 4-20mA.
- Two user selectable digital communication interfaces (RS-232 and RS-485) are standard.
- Optional Modbus RTU network interface with isolated RS485 transceiver.
- User programmable solid state relay with latch option.
- Universal 9-26 Vdc power supply input.
- Local high contrast OLED (optional) graphic display with joystick control.
- Free, easy-to-use configuration and calibration software (RS-232/RS-485).

General Description

Aalborg Instruments' DPM series digital multi-parameter mass flow meter provides accurate measurements of mass flow rate, volumetric flow rate, pressure and temperature of process gases. It can be used in a variety of industries: scientific and analytical applications, bioreactors and surface depositions, gas sampling, manufacturing and metrology activities.

DPM series digital mass flow meters incorporate multi-parameter multi-gas functionality which allows users on site to select up to 30 different gases locally via optional OLED/Joystick interface, remotely via the RS232/RS485 interface or optional Modbus RTU interface.

DPM flow meters support various functions including: two programmable flow totalizers, low, high or range flow, temperature and pressure alarms, automatic zero adjustment (activated via local or communication interface), programmable SSR relay, programmable 0-5 Vdc, 0-10 Vdc or 4-20 mA analog outputs, user-programmable pulse output (via SSR), and extensive self-diagnostics functionality.

AALBORG DPM series mass flow meters multi-parameter/multi-gas functionality, high ±(0.5% RD + 0.2%FS) standard accuracy, 200:1 turndown ratio and less than 20 ms response time allow users to save considerable costs of owning and installation discreet application specific instruments required to perform similar measurements.

Principles of Operation

DPM flow meters are based on the measurement of the differential pressure across specially designed restrictor flow elements. The restrictor flow element is designed to establish laminar flow across the entire range of the instrument's operation from 0 to 133% of full scale range. A high accuracy and high resolution differential pressure sensor is utilized to measure pressure drop across laminar flow channel, which is linearly proportional to volumetric flow rate. To convert volumetric flow in to the mass flow, high accuracy and high resolution absolute pressure and temperature sensors are utilized. Based on data from the sensors and Gas Properties from the built-in data base of the instrument, the micro-controller calculates Volumetric and Mass Flow, which along with Pressure and Temperature parameters are available on the instrument display or via digital interfaces. In addition, the Mass Flow reading is accessible via the instrument Analog interface which can be set by user to 0-5, 0-10 Vdc or 4-20mA mode.

BULLETIN EM2017II03 DPM

DPM FLOW RANGES

MODEL NO.	FULL SCALE MASS FLOW RATE	PRESSURE DROP AT FULL SCALE FLOW (PSID)	PROCESS CONNECTION
DPM07	0.5 to 50 sml/min	1.0	10-32 Female Thread
DPM17	51 sml/min to 20 sl/min	1.0	1/8" NPT Female
DPM37	21 sl/min to 50 sl/min	2.0	1/8" NPT Female
DPM47	51 sl/min to 100 sl/min	2.5	1/4" NPT Female

DPM ACCESSORY'S

FITTINGS

MODEL NO.	FITTING CODE	DESCRIPTION
DPM07	F0C2	10-32 Thread, Face Seal, 316 ss
DPM17	F2C2	1/8 NPT thread, 1/8 tubing, 316 ss
DPM17	F2C4	1/8 NPT thread, 1/4 tubing, 316 ss
DPM37	F4C4	1/4 NPT thread, 1/4 tubing, 316 ss
DPM47	F4C6	1/4 NPT thread, 3/8 tubing, 316 ss

POWER SUPPLIES

PS-GFM-110NA-2	Power Supply, 110 V / 12 Vdc /North America
PS-GFM-110NA-4	Power Supply, 110 V / 24 Vdc /North America
PS-GFM-230EU-2	Power Supply, 220 V / 12 Vdc /Europe
PS-GFM-230EU-4	Power Supply, 220 V / 24Vdc /Europe
PS-GFM-240UK-2	Power Supply 240 V / 12 Vdc /United Kingdom

CABLES

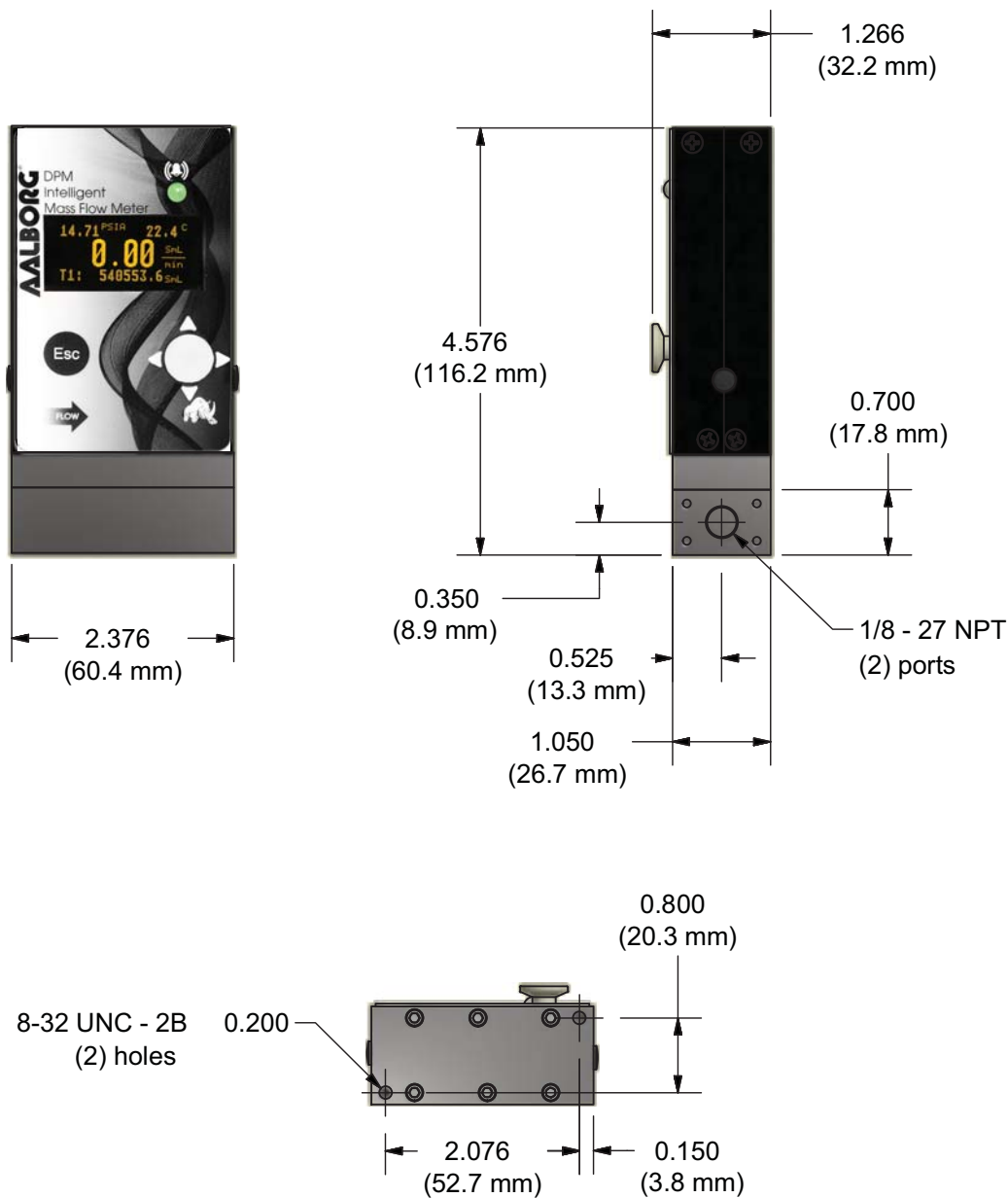|	
CBL-A232	Communication Cable for DPM with RS-232 Interface 6 FT 3.5mm stereo audio con. with 3-wire to 9 pins female D-connector (included with each DPM).
CBL-A485	Communication Cable for DPM with RS-485 Interface 6 FT 3.5mm stereo audio con. with 3-wire to stripped ends.
CBL-8MINIDIN-3	Shielded cable 8 pins MinDin with stripped ends 3 feet long
CBL-8MINIDIN-12	Shielded cable 8 pins MinDin with stripped ends 12 feet long

COMMUNICATION PORT ACCESSORIES

USB-RS232	USB to RS232 converter
USB-RS485	USB to RS485 converter

MODBUS INTERFACE ACCESSORIES

ECS803-1	RJ45 shielded Y-adapter (Passive TAP).
TDG1026-8C	RJ45 Modular Coupler.
MOD27T	RJ45 Line Terminator (100 Ohm 0.25 W).
JMOD4S-1	RJ45 Splitter fully shielded (5xRJ45, 1 input 4 outputs).
TRD815BL-2	Category 5E Patch Twisted Pair Cable, RJ45 / RJ45, Blue 2.0 feet.
TRD815BL-10	Category 5E Patch Twisted Pair Cable, RJ45 / RJ45, Blue 10.0 feet.
TRD815BL-25	Category 5E Patch Twisted Pair Cable, RJ45 / RJ45, Blue 25.0 feet.

BULLETIN EM2017 1103 DPM

WWW.AALBORG.COM - E-MAIL ✉ : INFO@AALBORG.COM - PHONE ☎ 845.770.3000 - TOLL FREE IN U.S.A. AND CANADA 1.800.866.3837 ● ORANGEBURG N.Y. U.S.A. **3**

DPM Dimensional Drawing

1.266
(32.2 mm)

4.576
(116.2 mm)

0.700
(17.8 mm)

0.350
(8.9 mm)

0.525
(13.3 mm)

1.050
(26.7 mm)

1/8 - 27 NPT
(2) ports

2.376
(60.4 mm)

0.800
(20.3 mm)

8-32 UNC - 2B
(2) holes

0.200

2.076
(52.7 mm)

0.150
(3.8 mm)

BULLETIN EM20171103 DPM

DPM SPECIFICATIONS

FLOW MEDIUM	Please note that DPM Mass Flow Meters are designed to work only with clean, not corrosive gases. Never try to measure flow rates of liquids with any DPM.
CALIBRATIONS	Performed at standard conditions [14.7 psia (101.4 kPa) and 70 °F (21.1 °C)] unless otherwise requested or stated.
ENVIRONMENTAL (PER IEC 664):	Installation Level II; Pollution Degree II.
FLOW ACCURACY (INCLUDING LINEARITY):	±(0.5% RD + 0.2% FS) at calibration temperature and pressure.
REPEATABILITY:	±0.15% of full scale.
FLOW TEMPERATURE COEFFICIENT:	0.05% of full scale/ °C or better.
FLOW PRESSURE COEFFICIENT:	0.01% of full scale/psi (6.895 kPa) or better.
FLOW RESPONSE TIME:	Default 20 ms (adjustable by user).
INSTRUMENT WARM-UP TIME:	< 5 seconds.
MAXIMUM MEASURABLE FLOW RANGE:	133% Full Scale.
OPERATING RANGE / TURNDOWN RATIO:	0.5% to 100% Full Scale / 200:1.
MASS REFERENCE CONDITIONS (STP):	70F & 14.696 PSIA (other available on request).
MAXIMUM INTERNAL GAS PRESSURE (STATIC):	120 PSIG.
MAXIMUM INSTANTANEOUSE DIFFERENTIAL PRESSURE ACROSS INLET AND OUTLET:	12 PSID.
PROOF PRESSURE:	145 PSIG.
OPERATING TEMPERATURE:	-10 to +60 °C (14 to 140 °F).
MOUNTING ATTITUDE SENSITIVITY:	None.
RELATIVE GAS HUMIDITY RANGE:	0 to 100% (Non -Condensing).
INGRESS PROTECTION:	IP40.
OUTPUT SIGNALS:	Linear 0-5 Vdc (3000 ohms min. load impedance);
	Linear 0-10 Vdc (5000 ohms min. load impedance); with power supply >= 12Vdc.
	Linear 4-20 mA (550 ohms maximum loop resistance) with power supply >= 12Vdc.
	Maximum noise 10mV peak to peak (for 0-5/0-10 Vdc output).
TRANSDUCER INPUT POWER:	9 to 26 Vdc, 150 mV maximum peak to peak output noise. Power consumption: 100 mA maximum. Circuit board have built-in polarity reversal protection, 300mA resettable fuse provide power input protection.
DIGITAL OUTPUT SIGNALS:	Standard RS-232 or RS-485 (user selectable). Optional Modbus over isolated RS-485 trancever.
WETTED MATERIALS:	316 stainless steel, 416 stainless steel, high temperature polyamide, alumina ceramic, epoxy, silicone, glass, gold. Viton® O-rings; Buna-N®, Neoprene® or Kalrez® O-rings are optional.

WWW.AALBORG.COM - E-MAIL ✉ : INFO@AALBORG.COM - PHONE ☎ 845.770.3000 - TOLL FREE IN U.S.A. AND CANADA 1.800.866.3837 ● ORANGEBURG N.Y. U.S.A. **5**

BULLETIN EM20171103 DPM

DPM	MODEL

MAX FLOW (N2)

07	0.5 sml/min to 50 sml/min
17	51 sml/min to 20 sl/min
37	21 sl/min to 50 sl/min
47	51 sl/min to 100 sl/min

MATERIAL

S	Stainless Steel

SEALS

V	Viton®
B	Buna®
E	EPR
T	PTFE/ Kalrez®

CONNECTIONS

0	Not Included (Opotional Accssesory)

OLED READOUT

N	NO Display
L	OLED Readout

POWER

6	Universal 9 to 26 VDC

OUTPUT SIGNAL

A	0-5 VDC
B	4-20 mA
M	0-10 VDC

DIGITAL INTERFACE

2	RS232
5	RS485
3	RS232 with Modbus
4	RS485 with Modbus

DPM	17	S	—	V	0	L	6	—	A	3

EXAMPLE: DPM17S-V0L6-A3

SPECIFY: FLOW RANGE, GAS,and PRESSURE *n.a. = not applicable.*

DPM17, 316 stainless steel, Viton® seals, with OLED readout 9-26 VDC, 0-5 Vdc output signal,RS 232 with Modbus

BULLETIN EM2017111103 DPM