Aalborg DPC mass flow controllers

Digital differential-pressure mass flow controllers with multi-gas functionality, from 0.5 smL/min to 1000 sL/min full scale in air

The DPC measures the pressure drop across a laminar flow element and calculates mass flow from it. It shows mass flow, volumetric flow, pressure and temperature together, stores 90 gases and 20 user mixes. The corrosion-resistant DPC08 and DPC18 also take corrosive gases; never for liquids.



1000 sL/min	±0.5 % rd	200:1	150 ms	8.3 bar g
Largest full scale in air; smallest 0.5 smL/min	Accuracy, plus 0.2 % of full scale	Turndown ratio	Default response time (adjustable)	Max. pressure, standard models except DPC04, 14

Performance

Mass reference conditions	21.11 °C, 1013.25 mbar; for others, ask Analyt-MTC
Accuracy [1]	±(0.5 % rd + 0.2 % FS) at calibration temperature and pressure, after tare
Repeatability	±0.2 % FS
Operating range	0.5–100 % FS; controllable up to 133 % FS
Turndown ratio	200:1
Response time, typical	Default 150 ms, adjustable; slightly longer at 20 smL/min and below
Warm-up time, valve	Warm-up under 5 s; valve normally closed
Coefficients	Temperature: 0.05 % FS/°C or better Pressure: 0.01 % FS/psi (6.895 kPa) or better
Calibration conditions	21.1 °C and 101.4 kPa (70 °F, 14.7 psia), unless ordered otherwise
Mounting position	DPC04, 07, 14, 17, 37, 47: no sensitivity DPC57, 58, 67, 68, 77, 78: valve cylinder vertical, upright DPC08, 18, 38, 48: none after the sensor tare
Gas library	90 gases and gas mixes User mixes: up to 20, of up to 5 gases each

Operating conditions

Maximum internal pressure	DPC07, 17, 37, 47, 57, 67, 77: 8.3 bar g (120 psig) DPC04, 14: 3.4 bar g (50 psig) DPC08, 18, 38, 48, 58, 68, 78: 150 psig
Maximum sensor differential pressure	DPC07, 17, 37, 47, 57, 67, 77: 830 mbar (12 psid) DPC04, 14: 670 mbar (9.75 psid) DPC08, 18, 38, 48, 58, 68, 78: 10 psid
Proof pressure	DPC07, 17, 37, 47, 57, 67, 77: 10.0 bar g (145 psig) DPC04, 14: 3.4 bar g (50 psig) DPC08, 18, 38, 48, 58, 68, 78: 175 psig
Valve operating pressure, upstream	DPC04, 07, 08, 14, 18 (below 2 sL/min): 10.3 bar g (150 psig) DPC17, 18, 2–5 sL/min: 6.9 bar g (100 psig) DPC17, 18, 5–20 sL/min: 3.4 bar g (50 psig) DPC37 to DPC78: 3.4 bar g (50 psig)
Temperature, humidity	−10 to 60 °C (14–140 °F) Gas humidity 0–100 %, non-condensing
Gas medium [2]	Standard and Breeze models: clean, non-corrosive gases only DPC08, 18, 38, 48, 58, 68, 78: also the corrosive gases listed in the operating manual Never liquids
Leak integrity	1 × 10⁻⁹ smL/s helium maximum, to the outside
Environmental	Installation category II, pollution degree II (IEC 664)

Mechanical

Wetted materials [3]	316 and 416 stainless steel, alumina ceramic, glass, gold High-temperature polyamide, epoxy, silicone O-rings: FKM Corrosion-resistant models: 316 stainless steel; FKM or FFKM O-rings
Process connections	Female: 10-32 or 1/8"–3/4" NPT, by model (page 3)
Ingress protection	IP40

Electrical and communication

Analogue output	0–5 V DC, load 5 kΩ minimum 0–10 V DC, load 5000 Ω minimum 4–20 mA, loop 550 Ω maximum, supply 14 V DC or more Noise: 10 mV peak-to-peak maximum (voltage outputs)
Analogue set point input	0–5 V DC or 0–10 V DC, input impedance 100 kΩ 4–20 mA, input impedance 250 Ω
Digital interface	RS-232 or RS-485, user selectable; Modbus RTU optional Reads flow, pressure, temperature, totalisers, alarms
Supply and consumption	12–26 V DC, 150 mV peak-to-peak noise maximum DPC04, 07, 14, 17: 12–26 V DC, 250 mA maximum DPC37, 47: 12–26 V DC, 300 mA maximum DPC57, 67, 77: 24–26 V DC, 650 mA maximum
Circuit protection	Reverse-polarity protection; resettable fuse 300 mA (750 mA for DPC57, 67, 77)
Supplied cable	RS-232: 1.5 ft, 3.5 mm stereo plug to 9-pin female D-connector; order code CBL-A232

Functions and display

Display	Optional OLED with joystick; shows mass flow, volumetric flow, pressure and temperature together
Totalisers	Two programmable mass-flow totalisers with batch mode
Alarms	High, low or in-range for mass flow, temperature and pressure, with preset action delay
Set point	Local, analogue, digital or programmed table of up to 16 steps with ramping
Relay and pulse output	Programmable solid-state relay with latch option; programmable mass-flow pulse output via the relay
Zero, diagnostics	Automatic zero from the display or interface; self-diagnostics with status LED or OLED
Software	Free Aalborg configuration and calibration software (RS-232/RS-485)

Compression fittings (accessory)

10-32 port	1/8" tube, 316 stainless steel (F1C5): DPC04, DPC07, DPC08 1/8" tube, nickel-plated brass (F2C5): DPC04, DPC07
1/8" NPT port	1/8" or 1/4" tube, 316 stainless steel (F2C2, F2C4): DPC14, DPC17, DPC18
1/4" NPT port	1/4" tube, 316 stainless steel (F4C4): DPC37 3/8" tube, 316 stainless steel (F4C6): DPC47
1/2" NPT port	3/8" or 1/2" tube, 300 series stainless steel (F8C6, F8C8): DPC57
3/4" NPT port	3/4" tube, 300 series stainless steel (1210-1-12-316): DPC67, DPC77 Not included with the controller; order codes in brackets

Models and full-scale ranges (21.11 °C, 1013.25 mbar)

Model	Full scale (air)	Version
DPC07	0.5–50 smL/min	Standard
DPC17	51 smL/min–20 sL/min	Standard
DPC37	21–50 sL/min	Standard
DPC47	51–100 sL/min	Standard
DPC57	250 sL/min	Standard
DPC67	500 sL/min	Standard

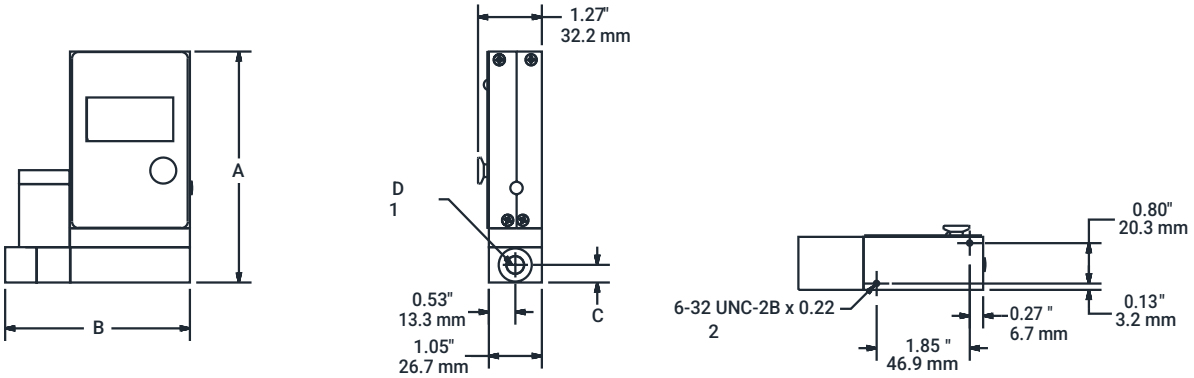
Model	Full scale (air)	Version
DPC77	1000 sL/min	Standard
DPC08	0.5–50 smL/min	Corrosion-resistant
DPC18	51 smL/min–20 sL/min	Corrosion-resistant
DPC04	0.5–20 smL/min	Breeze, low pressure drop
DPC14	21 smL/min–2 sL/min	Breeze, low pressure drop

Full scale for air.

Pressure drop at full-scale flow, connection

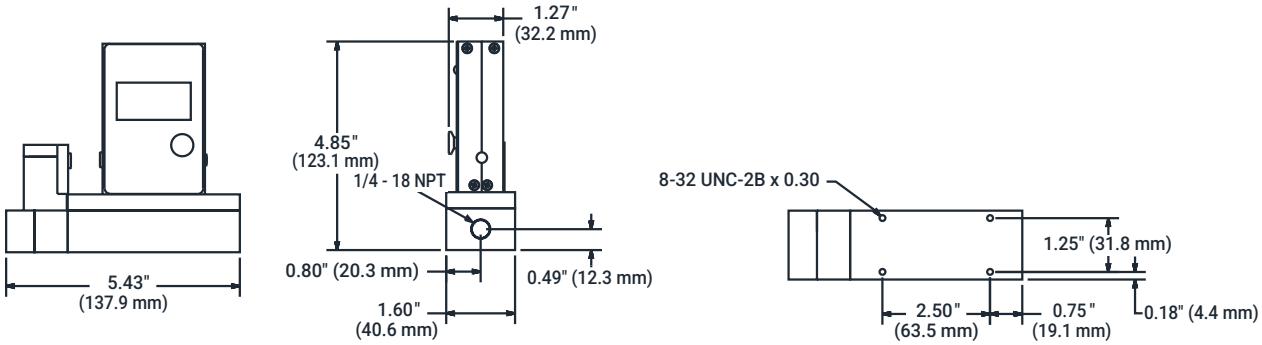
Model	Δp, psid	Connection (female)
DPC07	1.0	10-32
DPC17	1.0–20.0	1/8" NPT
DPC37	5.0–8.5	1/4" NPT
DPC47	10.0–20.0	1/4" NPT
DPC57	2.5	1/2" NPT
DPC67	6.9	3/4" NPT

Model	Δp, psid	Connection (female)
DPC77	15.0	3/4" NPT
DPC08	1.0	10-32
DPC18	1.0–20.0	1/8" NPT
DPC04	0.08	10-32
DPC14	0.19	1/8" NPT

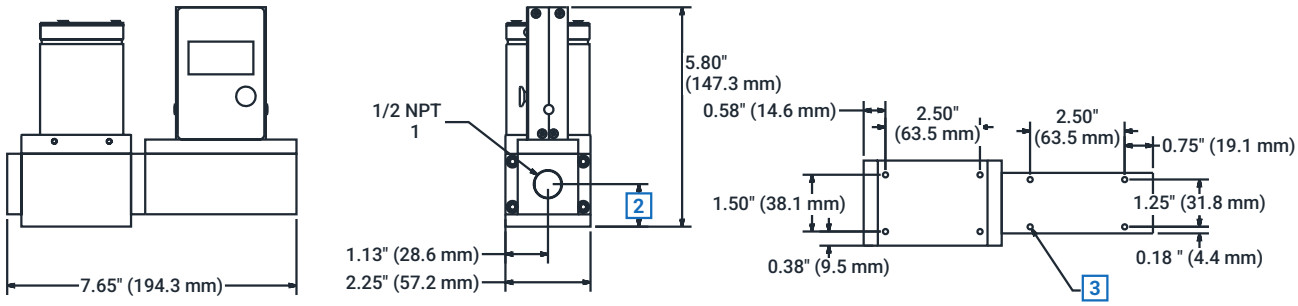


1 Process ports D, both sides 2 Mounting holes (2)

DPC04, DPC07, DPC08, DPC14, DPC17, DPC18: front, side and base views. Dimensions in inches, mm in brackets.



DPC37 and DPC47: front, side and base views. Dimensions in inches, mm in brackets.



1 Process ports, both sides 2 1.13" (28.6 mm) 3 Mounting holes, 8 x 8-32 UNC-2B x 0.300

DPC57: front, side and base views; DPC67 and DPC77 are 7.28" (184.8 mm) long, base holes 0.20" (5.1 mm) from the end. Inches, mm in brackets.

Dimensions in mm

Models	A, non-corrosive	A, corrosion-resistant	B	C	D
DPC04, DPC07, DPC08	93.4	126.5	116.2	8.5	10-32 UNF
DPC14	97.7	–	122.8	10.7	1/4 NPT
DPC17, DPC18	92.9	130.4	111.8	8.9	1/8 NPT
DPC37, DPC47	123.1	–	137.9	12.3	1/4-18 NPT
DPC57	147.3	–	194.3	28.6	1/2 NPT
DPC67, DPC77	147.3	–	184.8	28.6	–

A height, B length, C port height, D port thread, as printed; for DPC14 the range table gives 1/8" NPT, Analyt-MTC confirms on order. Nominal dimensions.

Ordering code, for example DPC17S-V0L6-AA3

Position	Code	Meaning
Model, standard	07, 17, 37, 47, 57, 67, 77	Full scale as in the range table
Model, corrosion-resistant	08, 18	Full scale as in the range table
Model, Breeze low Δp	04, 14	Full scale as in the range table
Material	S	316 stainless steel
Seals	V or T	V FKM; T FFKM
Connections	0	Not included (accessory)
Readout	N or L	N no display; L OLED readout
Power	6	12–26 V DC; DPC57, 67, 77: 24–26 V DC
Set point input	A, B, M	A 0–5, M 0–10 V DC; B 4–20 mA
Output signal	A, B, M	A 0–5, M 0–10 V DC; B 4–20 mA
Digital interface	2, 5	2 RS-232; 5 RS-485
Digital interface	3, 4	3 RS-232 with Modbus; 4 RS-485 with Modbus

Example DPC17S-V0L6-AA3: DPC17, 316 stainless steel, FKM seals, OLED readout, 12–26 V DC, 0–5 V DC input and output, RS-232 with Modbus. Specify flow range, gas and pressure.

Standard versions, order codes

Model	No display	No display, Modbus	OLED display	OLED display, Modbus
DPC04	DPC04-N0	DPC04-NM	DPC04-L0	DPC04-LM
DPC07	DPC07-N0	DPC07-NM	DPC07-L0	DPC07-LM
DPC14	DPC14-N0	DPC14-NM	DPC14-L0	DPC14-LM
DPC17	DPC17-N0	DPC17-NM	DPC17-L0	DPC17-LM
DPC37	DPC37-N0	DPC37-NM	DPC37-L0	DPC37-LM
DPC47	DPC47-N0	DPC47-NM	DPC47-L0	DPC47-LM
DPC57	DPC57-N0	DPC57-NM	DPC57-L0	DPC57-LM
DPC67	DPC67-N0	DPC67-NM	DPC67-L0	DPC67-LM
DPC77	DPC77-N0	DPC77-NM	DPC77-L0	DPC77-LM

Order from Analyt-MTC with the order codes. For the corrosion-resistant DPC08 and DPC18 and any other version, contact Analyt-MTC.

Accessories

Universal benchtop baseplate	35780
Rugged transport case	1200-000-110E
Inline filter, 1/8" NPT, 20 µm	ILF-1/8-20
Inline filter, 1/4" NPT, 40 µm	ILF-1/4-40
Inline filter, 1/2" NPT, 40 µm	ILF-1/2-40
Inline filter, 3/4" NPT, 40 µm	ILF-3/4-40
RS-485 cable, 3.5 mm plug to stripped ends, 3 ft	CBL-A485
Shielded 8-pin Mini-DIN cable, stripped ends, 12 ft	CBL-8MMINIDIN-12
USB to RS-232 converter	USB-RS232
USB to RS-485 converter	USB-RS485
Power supply 240 V / 12 V DC, UK plug	PS-GFM-240UK-2

Notes

1. rd = of reading, FS = of full scale. Accuracy includes linearity.
2. Clean, non-corrosive gases only, except the corrosion-resistant models. Never use the DPC for liquids.
3. Choose wetted materials to suit your gas; if unsure, ask Analyt-MTC before you order.
4. Power supplies, 12 or 24 V DC: PS-USA and PS-GFM-110NA-4 (110 V AC, North America); PS-GFM-230EU-2 and PS-GFM-230EU-4 (220 V AC, Europe). Mini-DIN cable, 3 ft: CBL-8MINIDIN-3.
5. Modbus RJ45 parts: Y adapter ECS803-1, coupler TDG1026-8C, line terminator MOD27T, splitter JMOD4S-1; patch cables TRD815BL-2, TRD815BL-10, TRD815BL-25 (2, 10, 25 ft).

ANALYT-MTC Messtechnik GmbH
Sales, service and calibration

www.analyt-mtc.com

German Headquarters
Klosterrunsstraße 18, 79379 Müllheim
+49 7631 5545
info@analyt-mtc.de

French Subsidiary
175 Avenue d'Alsace, 68000 Colmar
+33 3 89 41 47 78
info@analyt-mtc.fr

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