DB03

Thermal Flow and Consumption Sensor for Compressed Air and Gases

- **low cost series**

- **easy installation, high flexibility, no straight inlet section due to integrated flow conditioner necessary**

- **version Eco for air and N_2**
  Pro for different gases

- **data logger and pressure measurement optional**

- **smartphone Android app for wireless configuration**

- **measuring ranges: 0,5...50 l/min up to 35...3500 l/min**

- **process connection: G ¼ female up to G 1 female**

- **max. pressure: 10 bar**
  max. temperature: 50 °C

Description:

The DB03 thermal mass flowmeters measure the flow and consumption of air and various gases in the process. The medium flows to a heated temperature sensor and thus removes heat energy from the sensor. The energy required to maintain a constant temperature in the sensor is proportional to the flow rate of the medium. The flow rate of the medium can thus be determined reliably and cost-effectively using specially stored calibration curves. An analogue and a pulse output or Modbus/RTU are available for forwarding the measurement results.

Via the smartphone app, the measured values can be read and the device configured at any time. A data logger and a pressure measurement are optionally available.

Typical applications:

The very small design allows installation even in confined process areas. Since no straight inlet section is required due to an integrated flow conditioner, the DB03 can be installed in almost any position.

The DB03 offers a safe and cost-effective consumption measurement and monitoring of e.g. compressed air in pneumatic systems.

Versions:

E = Eco	P = Pro
for air or N_2	for different gases (see order code)
Measuring: volume flow and total consumption	Measuring: volume flow, total consumption, temperature and pressure (optional)
measuring span 50:1	measuring span 100:1
accuracy: ± 3 % o. RDG.	accuracy: ± 1,5 % o. RDG
response time T_{90}: 1 s	response time T_{90}: 0,1 s
no data logger	with data loger (USB-connection)

Measuring Range Air [l/min]:

	DN 08	DN 15	DN 20	DN 25
Eco Standard	5...250	20...1000	40...2000	70...3500
Eco reduced	1...50	4...200	8...400	14...700
Pro Standard	2,5...250	10...1000	20...2000	35...3500
Pro reduced	0,5...50	2...200	4...400	7...700

Conditions: 1 bar, 20 °C

Measuring Rages Nitrogen N_2 [l/min]:

	DN 08	DN 15	DN 20	DN 25
Eco Standard	4,4...222	17,8...890	35,6...1780	62,2...3110
Eco reduced	0,89...44,5	3,6...178	7,1...356	12,4...622
Pro Standard	2,2...222	8,9...890	17,8...1780	31,1...3110
Pro reduced	0,45...44,5	1,8...178	3,6...356	6,2...622

Conditions: 1013.25 mbar, 0 °C

Measuring Ragenes Oxygen O_2 [l/min]:

	DN 08	DN 15	DN 20	DN 25
Pro Standard	2,4...238	9,5...953	19,1...1907	33,3...3337
Pro reduced	0,5...47,7	1,9...191	3,8...381	6,7...667

Conditions: 1013.25 mbar, 0 °C

Order Code:

Order number:	DB03.	E.	S08.	0.	L.Z.	SI.	A.	0

Thermal flow and consuption sensor for compressed air and gases

Version:
E = Eco: for air or N_2, measuring span 50:1
P = Pro: for different gases, measuring span100:1, with data logger

Process connection / meas. range*:

standard-range*:	reduced range*:
S08 = G ¼ female	R08 = G ¼ female
S15 = G ½ female	R15 = G ½ female
S20 = G ¾ female	R20 = G ¾ female
S25 = G 1 female	R25 = G 1 female

*see tables measuring ranges

Pressure measurement:
0 = no
1 = measuring range 0...10 bar (for version P only)

Output signal:
A = analogue 4...20 mA and pulses
B = Modbus/RTU (RS-485)

Units:
SI = with SI-units
IM = with imperial units instead of SI units

Gas types:
for version E = Eco:
L.Z = air
N.Z = nitrogen N_2
for version P = Pro (please choose 2. E.g.: L.E.):
L = air
N = nitrogen N_2
C = carbon dioxide CO_2
O = oxygen O_2 (oil and grease-free cleaned)
D = nitrous oxide N_2O
A = Argon Ar
E = natural gas
W = hydrogen H_2 (real gas calibration)
H = Helium He (real gas calibration)
P = propane C_3H_8
X = different gas
Z = no second gas

Options:
0 = without
9 = please specify in plain text

5 m cable with plug conneciton is included in delivery. At version P additionally one USB cable.

Accessories:

Order number:	DB03-Z.	T

Accessories for DB03

Description:
N = mains power supply 100...240 VAC / 24 VDC, 0,5 A, 2 m cable with M8 connector
T = T-box for Modbus systems, incl. 2 m cable with M8 connector
S = data analysis software S4A for DB03.P data (free download at www.pkp.de)
H = mobile-service-app S4C (free download at www.pkp.de)
9 = speciality, please specify in plain text

Technical Data:

Materials:
process connection:	aluminium alloy
wetted parts:	aluminium alloy
housing:	PC + ABS

Process connection: G female thread (ISO 228-1)
DN 08, DN 15, DN 20, DN 25

Process pressure: 0...10 bar

Ambient temperature: 0...50 °C

Transport temperature: -30...+70 °C

Request on medium: 0...50 °C,
< 90 % rH, no condensation

Reference conditions: ISO1217 20°C 1000 mbar
(standard unit l/min)
DIN1343 0°C 1013.25 mbar
(norm unit Nl/min)

Power supply: 18...30 VDC / 120 mA

Analogue output: 4...20 mA

Pulse output: 1 pulse per consumption unit
(m^3 r ft^3), isolated switch,
max. 30 VDC, 200 mA
pulse length: 10...120 ms,
(depending on flow rate)

Modbus output: RS-485 (Modbus/RTU)

LED Display: 4-Digit, flow indication
(for version P pressure
indication optional)

Interface: wireless with service app
(for version P additionally with
USB for data transfer)

Protection class: IP54

Weights:

Process connection:	Eco-Version	Pro-Version
DN 08 (G ¼ IG)	0,44 kg	0,45 kg
DN 15 (G ½ IG)	0,45 kg	0,46 kg
DN 20 (G ¾ IG)	0,96 kg	0,97 kg
DN 25 (G 1 IG)	0,97 kg	0,98 kg

Accuracy:

Accuracy:
DB03.E (Eco):	± 3 % of m.v., ± 0,3 % FS
DB03.P (Pro):	± 1,5 % of m.v., ± 0,3 % FS

Specification for accuracy: ambient / process temp.:
23 °C ± 3 °C
ambient / process humidity:
< 90 %
process pressure: 6 bar

Temperature coefficient: < 0,1 % / K of FS

Pressure coefficient: < 0,5 % / bar

Measuring span:
DB03.E (Eco):	50:1
DB03.P (Pro):	100:1

Repeatability:
DB03.E (Eco):	± 1 % of measured value
DB03.P (Pro):	± 0,5 % of measured value

Sample Rate:
DB03.E (Eco):	3 sample / second
DB03.P (Pro):	10 sample / second

Pressure measurement (optional for version P):

Measuring range: 0...10 bar

Accuracy: ± 1 % of full scale

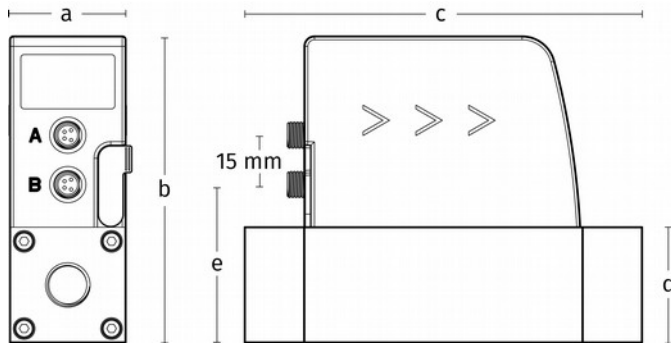## Data logger for version Pro DB03.P

Memory: up to 8.000.000 values

Channels: up to 4: flow, consumption,
temperature and pressure

Logger programming: via app app S4C-FS
(free available in google play
store)

Reading the logger data: via Windows® Software S4A
via USB

Dimensions:

Dimensions [mm]	a	b	c	d	e
DN 8 / DN 15	35,0	93,0	120,4	35,0	48,0
DN 20 / DN 25	48,0	106,0	178,0	48,0	61,0

Pressure loss:

max. pressure loss at max. flow at standard measuring range S:

Process connection:	Pressure loss:
DN 08 (G ¼ IG)	30 mbar
DN 15 (G ½ IG)	100 mbar
DN 20 (G ¾ IG)	100 mbar
DN 25 (G 1 IG)	200 mbar

Pulse rates (version Eco and Pro):

Volume flow [m³/s]	Volume flow [m³/h]	Pulse length [ms]	Max. pulses per hour
≦ 3	≦ 10800	120	1080
> 3	> 10800	60	2880
> 6	> 21600	30	3960

Smartphone Service App S4C:

- via Bluetooth-interface
- for android systems
- QR-Code for verification