



Dansensor® **MAP Mix 9001 ME** User Manual **EN**

This blank page has been inserted to enable double sided printing of the document!

Dansensor®
MAP Mix 9001 ME
User Manual

EN

Published by:


MOCON Europe A/S
Rønnedevej 18
4100 Ringsted, Denmark
Tel +45 57 66 00 88
info.dk.mocon@ametek.com
www.dansensor.com

Table of Contents

- 1. Introduction..... 5
- 2. Safety instructions..... 7
- 3. Equipment set up..... 9
 - Gas connection 9**
 - Mounting of filters and gas connection fittings 11**
 - Electrical connection 13**
- 4. Control panel..... 15
 - Flow control 15**
- 5. Spare parts and options 19
 - Options 19**
 - Recommended spare parts 19**
 - Consumable parts 19**
- 6. Technical specifications 21

1. Introduction

Dansensor® MAP Mix 9001 ME is MOCON Europe A/S' equipment for gas mixing and monitoring of gas and pressure.

Dansensor® MAP Mix 9001 ME is a proportional gas mixer especially designed for packaging machines and other industrial applications, where the gases N_2 , CO_2 and O_2 are used in either 2-gas or 3-gas combinations.

The mixing principle of **Dansensor® MAP Mix 9001 ME** is very stable and can be used for all types of packaging machines, both flow packaging machines, vacuum packaging machines and other industrial processes.

Dansensor® MAP Mix 9001 ME is user-friendly with very high precision, also under conditions which usually cause problems for most other types of gas mixers.



Fig. 1. Dansensor® MAP Mix 9001 ME

2. Safety instructions

Read and understand this manual for your own safety and for the quality of the work you perform with this equipment.

The following terms are used in this manual:



DANGER! Describes a condition which **MAY** lead to mortal danger or serious injury.



WARNING! Describes a condition which **MAY** lead to serious injury or destruction of the equipment in question.



ATTENTION! Describes a condition which **MAY** lead to incorrect operation of the equipment, resulting in incorrect measuring results.

Please observe the following instructions carefully:



DANGER! Opening the apparatus may involve the risk of mortal danger or serious injury. It may expose live high-voltage wires.

Dansensor® MAP Mix 9001 ME should be opened by authorised personnel only.

At the back of the mixer there is an indication of where the gases must be connected to the individual inlets. O₂ (oxygen) must **NEVER** be connected to other inlets than the one marked for O₂ (oxygen).

Do **NOT** use this equipment for air supply for human beings.

When using the mains supply Dansensor® MAP Mix 9001 ME must be grounded.



WARNING! Always use fittings and hoses which apply to the gasses used and to the intended use of the mixer.

Always use the correct tools and hold against on the gas in- and outlet fittings when connecting/disconnecting the gas connection fittings (see "**Gas connection**" on page 9 for details).

In order to avoid damage to the internal parts of the gas mixer, "1 **GAS IN**" must always be connected and supplied last.

When moving or transporting Dansensor® MAP Mix 9001 ME care must be taken not to bump the equipment.

Dansensor® MAP Mix 9001 ME must be transported in the original shipping container if warranty repairs are needed. Failure to do so invalidates the warranty. On buffer-tank versions make sure that the gas outlet is **NEVER** blocked or restricted in front of the buffer tank (see "**Gas connection**" on page 9 for details).

NEVER expose the device to more than 10 bars, as this may damage internal components in the device.



ATTENTION! When using the 3-gas mixer as a 2-gas mixer, you must **ALWAYS** connect N₂ or CO₂ to the inlet which "is not to be used".

See "**3-gas mixer used as 2-gas mixer**" on page 17.

3. Equipment set up

Gas connection



WARNING! When mounting/dismounting fittings in order to change filters or connect gasses, it is very important that you hold against on the already mounted fittings to avoid damaging the existing assemblies (see Fig. 2).

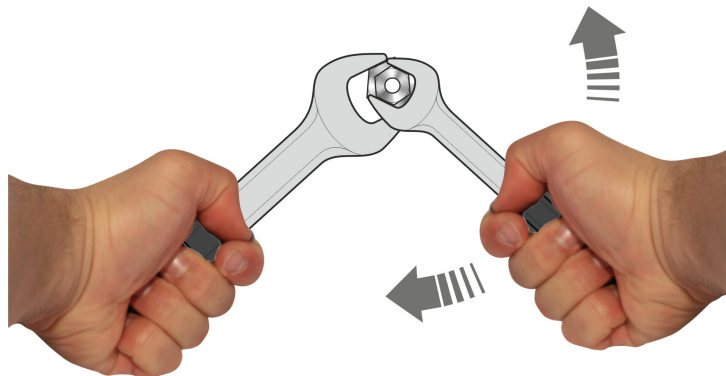


Fig. 2. Correct mounting/dismounting of fittings



DANGER! At the back of the mixer there are labels showing which gas to connect to the individual inlets (see Fig. 3). **NEVER** connect O₂ (oxygen) to other inlets than the one marked for O₂.



Fig. 3. Dansensor® MAP Mix 9001 ME Connections



ATTENTION! When using the 3-gas mixer as a 2-gas mixer, you must **ALWAYS** connect N₂ or CO₂ to the inlet which "is not to be used". See **"3-gas mixer used as 2-gas mixer" on page 17.**



WARNING! On buffer-tank versions make sure that the gas outlet is **NEVER** blocked or restricted in front of the buffer tank (see Fig. 4).

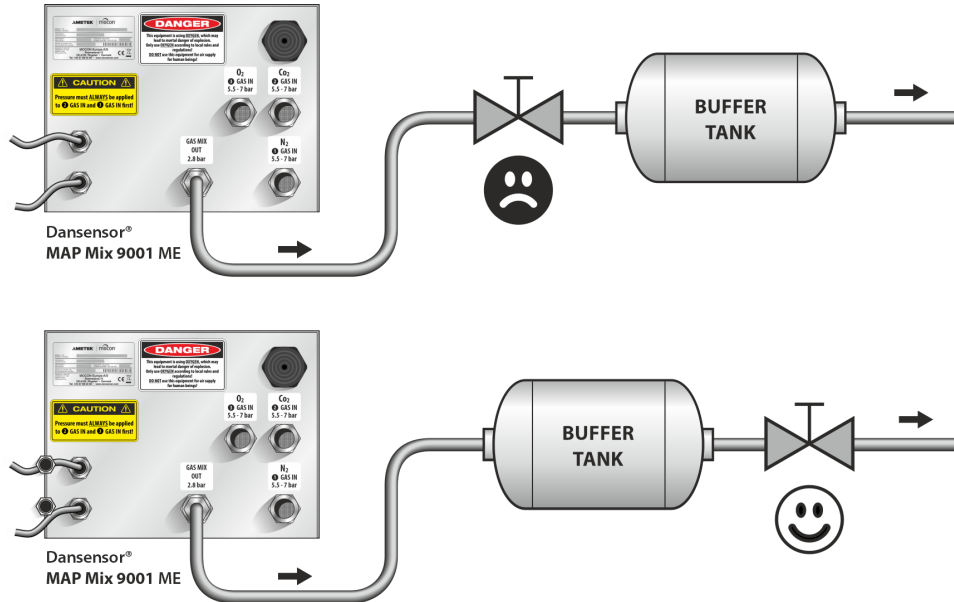


Fig. 4. Correct placement of gas outlet valve

Mounting of filters and gas connection fittings

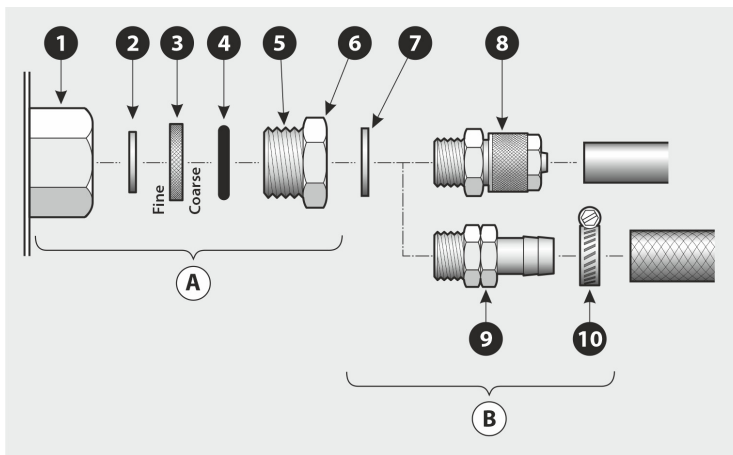


WARNING! ALWAYS use fittings and hoses which apply to the gasses used and to the intended use of the mixer.



WARNING! In order to avoid damage to the internal parts of the gas mixer, "1 GAS IN" must ALWAYS be connected and supplied last.

Models ≤ 400 liter/min.



Mounted from the factory (A)

- ❶ Gas inlet
- ❷ Nylon gasket 1/4" x 1.5 mm
- ❸ Filter, sinterbronz, 60µ
- ❹ O-ring Ø13.94 x 2.62 mm
- ❺ Loctite 542 hydraulic
- ❻ Reduction nipple 1/2"-3/8"

Supplied parts (B)

- ❼ Nylon gasket 3/8" x 1.5 mm
- ❽ Hose fitting 3/8"-6/8mm
- ❾ Hose nipple 3/8"-9/10mm cpl.
- ❿ Hose clamp 14 mm

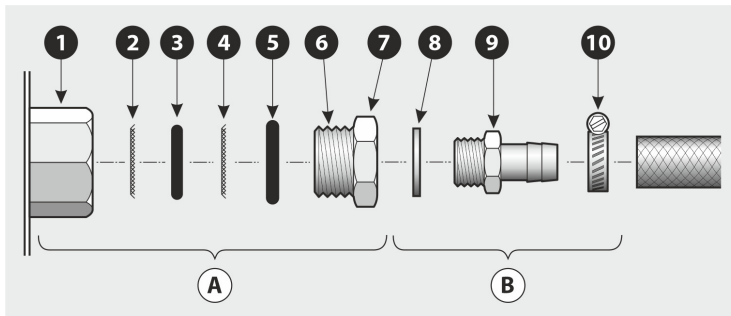


ATTENTION! ALWAYS use Loctite 542 ❺ when mounting the reduction nipple ❻ after having replaced the filter ❸.



WARNING! NEVER use Loctite or the like when mounting the connection fittings ❽ & ❾. Use the supplied nylon gasket ❼ instead.

Models > 400 liter/min.



Mounted from the factory (A)

- ❶ Gas inlet
- ❷ Filter insert (fine)
- ❸ O-ring Ø12.6 x 2.4 mm
- ❹ Filter inserts (coarse)
- ❺ O-ring Ø13.94 x 2.62 mm
- ❻ Loctite 542 hydraulic
- ❼ Reduction nipple 1/2"-3/8"

Supplied parts (B)

- ❽ Nylon gasket 3/8" x 1.5 mm
- ❾ Hose nipple 3/8"-10/11 mm
- ❿ Hose clamp 13-20 mm



ATTENTION! ALWAYS use Loctite 542 ❻ when mounting the reduction nipple ❼ after having replaced the filters ❷ + ❹.



WARNING! NEVER use Loctite or the like when mounting the connection fitting ❾. Use the supplied nylon gasket ❽ instead.

Electrical connection

The mixer is equipped with two cables which must be connected as follows:

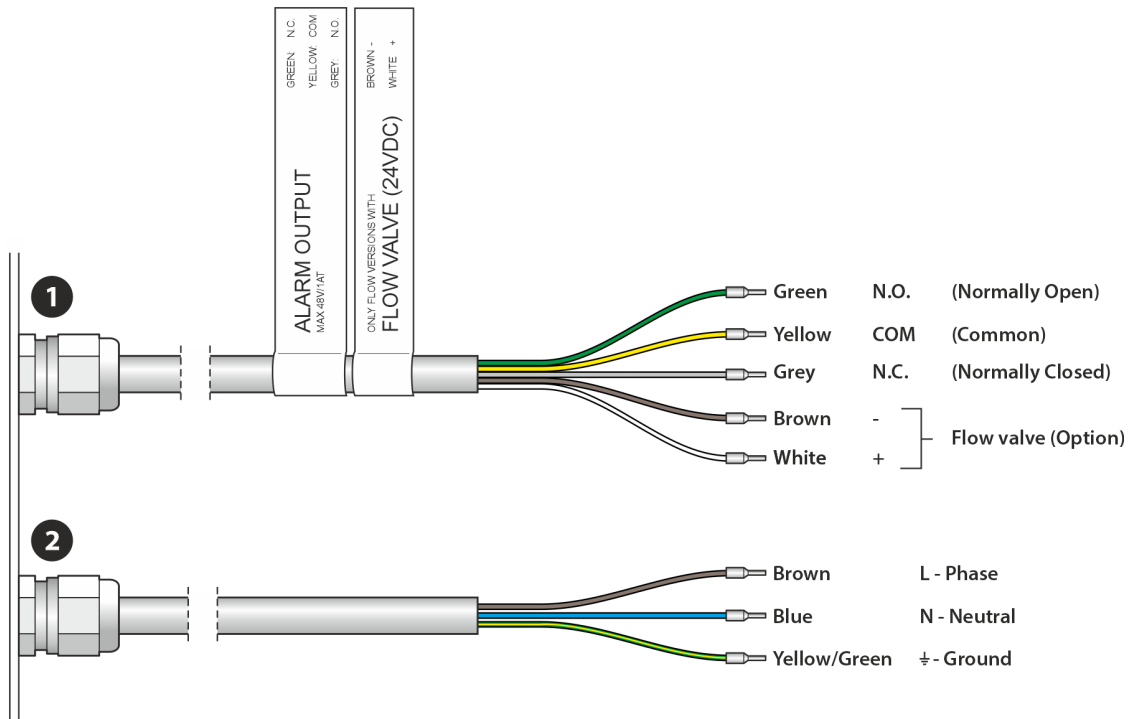


Fig. 5. Cable connections

Signal cable ①

ALARM OUTPUT

The alarm output can be connected in two different ways:

Between **Green (N.O.)** and **Yellow (COM)** - relay is normally open and closes in case of an alarm.

Between **Grey (N.C.)** and **Yellow (COM)** - relay is normally closed and opens in case of an alarm.

FLOW VALVE (24VDC) (Option)

For opening or closing the mixer's gas outlet valve.

24VDC is connected to **Brown (-)** and **White (+)** to open the valve.

Power supply cable ②

Connect supply voltage (**100 - 230VAC**) as shown in Fig.5.

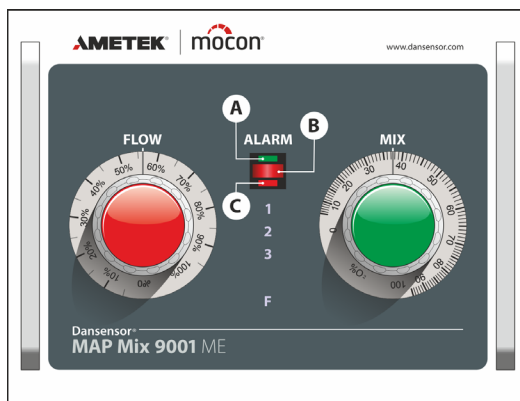


DANGER! ALWAYS connect the mixer to Ground (⚡).

4. Control panel

- (A) **Alarm monitoring on** - the green lamp lights up when alarm monitoring is on.
- (B) **On/off (reset) button** - for alarm monitoring (gas pressure monitoring).
- (C) **Alarm output on** - the red lamp lights up when the alarm relay is activated due to missing gas pressure.

2-gas with flowcontrol



3-gas with flowcontrol



Fig. 6. Control panel

- The lamp "1" lights up at too low pressure on "**1 GAS IN**".
- The lamp "2" lights up at too low pressure on "**2 GAS IN**".
- The lamp "3" lights up at too low pressure on gas "**3 GAS IN**" (3-gas mixer only).
- The lamp "F" lights up, when the solenoid valve for gas flow is open (optional).

Flow control

Turn the **FLOW** dial for setting of the wanted gas flow.

The scale shows an approx. % value of the mixer's capacity.



ATTENTION! Gas mixers without the flow control function do not have this button.

Setting 2-gas mix

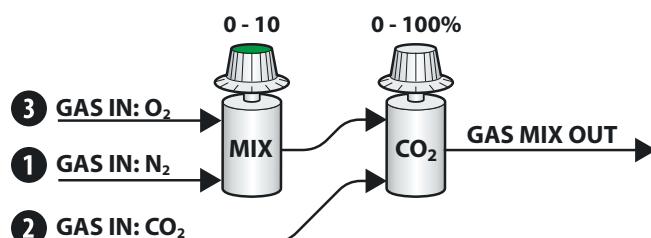
Turn the **MIX**-dial for setting of the wanted mixture proportion in % of the gas indicated on the scale. The remaining percentage constitutes the other gas.

Example: 30% CO₂ - 70% N₂

1. On the **MIX** scale it says N₂, i.e. it must be set to 70%.
2. The rest (30%) will be CO₂.

Setting 3-gas mix

Use the grey scale to set the required CO₂ (O₂) percentage. Then read the **X**-value in the lower part of this scale. The setting of the green **MIX** scale is calculated on the basis of the expression: $MIX = N_2 \text{ divided by } X$. The O₂ (CO₂) will constitute the rest.



Example 1: 60% CO₂ - 30% N₂ - 10% O₂

1. Set the **CO₂**-dial at 60%
2. Read the value of X (4)
3. Calculate MIX: $N_2 / X = 30\% / 4 = 7.5$
4. Set the **MIX**-dial to 7.5
5. The O₂ gas constitutes the rest (10%)

Example 2: 30% CO₂ - 20% N₂ - 50% O₂

1. Set the **CO₂**-dial at 30%
2. Read the value of X (7)
3. Calculate MIX: $N_2 / X = 20\% / 7 = 2.86$
4. Set the **MIX**-dial to 2.9
5. The O₂ gas constitutes the rest (50%)

Example 3 : 70% CO₂ - 20% N₂ - 10% O₂

1. Set the **CO₂**-dial at 70%
2. Read the value of X (3)
3. Calculate MIX: $N_2 / X = 20\% / 3 = 6.67$
4. Set the **MIX**-dial to 6.7
5. The O₂ gas constitutes the rest (10%)

Example 4: 0% CO₂ - 30% N₂ - 70% O₂

1. Set the **CO₂**-dial at 0%
2. Read the value of X (10)
3. Calculate MIX: $N_2 / X = 30\% / 10 = 3$
4. Set the **MIX**-dial to 3.0
5. The O₂ gas constitutes the rest (70%)

Example 5: 100% CO₂ - 0% N₂ - 0% O₂

1. Set the **CO₂**-dial at 100%
2. Never mind **MIX**-dial setting

Alarm on/off

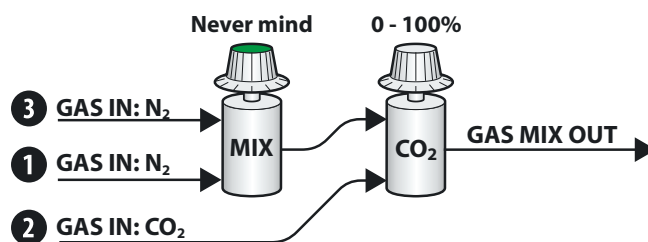
When the on/off button (B) is on, the pressure of the gases will be monitored. If the pressure on one of the gases is low, the alarm relay will be activated and the red lamp (C) will light up. The lamps "1", "2" and possibly "3" now indicate the gas having low pressure.

The alarm lamp (C) keeps lighting up, even if the pressure is re-established, until the alarm has been reset with the on/off button (B).

3-gas mixer used as 2-gas mixer

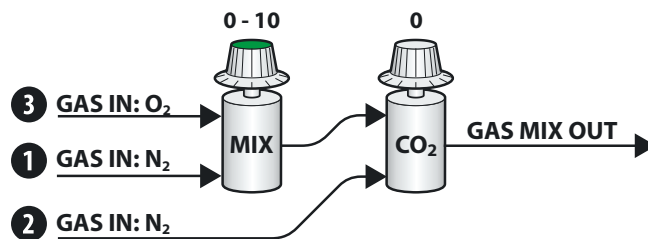
How to use the mixer for only N₂ and CO₂

1. Adjust the CO₂ % on the CO₂-dial.
2. Never mind the MIX-dial setting.



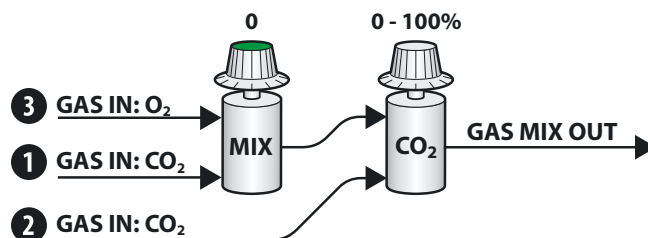
How to use the mixer for only N₂ and O₂

1. Set the CO₂-dial to 0.
2. Adjust the N₂ % on the MIX-dial : 0 ~ 0 % N₂ and 10 ~ 100 % N₂.



How to use the mixer for only CO₂ and O₂

1. Set the CO₂-dial to 0.
2. Adjust the CO₂ % on the MIX-dial : 0 ~ 0 % CO₂ and 10 ~ 100 % CO₂.



i **ATTENTION!** Be sure that all 3 gases are connected to the right gas input number (1, 2 and 3).
Using a 3-gas mixer as a 2-gas mixer will give a smaller capacity than an ordinary 2-gas mixer.

5. Spare parts and options

Options

- Option, lid MAP Mix/Check/Con P/N 980751

Recommended spare parts

- Power supply 24V P/N 240433
- Solenoid valve 24VDC 1/2" P/N 250154
- Kit, pressure section all MAP Mix and TGC ser. cpl. P/N 251382
- Pressure regulator 0-7 bar, O₂ cleaned P/N 270369
- Pressure switch, 1-10 bar, n. closed, O₂ cleaned P/N 270383
- Pressure switch 0-10 bar, n. open, O₂ cleaned P/N 270384
- CD, User manuals, MAP Mix 9001 ME P/N 300656

Consumable parts

- Kit, filter sinter bronze 60μ, ser.cpl. P/N 230236
- Kit, filter insert gas mixer, ser.cpl. P/N 230246

6. Technical specifications

Buffer tank models

Type/Gasses	Capacity [l/min]	Inlet pressure [bar]	Outlet pressure [bar]
250/2	25 - 250	5,5 - 10	3,8 - 6
400/2	100 - 400	5,5 - 10	3,8 - 6
200/3	20 - 200	5,5 - 10	2,8 - 5
400/3	100 - 400	5,5 - 10	2,8 - 5

Flow models

Type/Gasses	Capacity [l/min]	Inlet pressure [bar]
250/2	25 - 250	5,5 - 10
400/2	100 - 400	5,5 - 10
200/3	20 - 200	5,5 - 10
400/3	100 - 400	5,5 - 10

Flow (l/min)

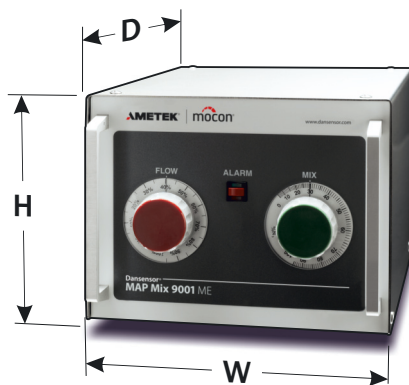
Type/Gasses	Inlet pressure [bar]	Outlet pressure [bar]				
		2	3	4	5	6
250/2	5,5	132	84			
	6,5	183	145	90		
	7,5	226	220	170	110	
	8,5	262	257	221	190	120
400/2	5,5	267	187			
	6,5	346	287	185		
	7,5	453	418	345	236	
	8,5	505	480	434	332	198

Type/Gasses	Inlet pressure [bar]	Outlet pressure [bar]			
		2	3	4	5
200/3	5,5				
	6,5	145	104		
	7,5	207	183	141	
	8,5	235	217	185	127
400/3	5,5				
	6,5	285	205		
	7,5	400	345	245	
	8,5	444	400	325	176

Gases	O ₂ , N ₂ , CO ₂
Mains supply	100-230 VAC Power cable without plug
Power consumption	Max. 20 W
Flow range	25-250 l/min, 2 gas (1,5 - 15 m ³ /h) 100-400 l/min, 2 gas (6 - 24 m ³ /h) 20-200 l/min, 3 gas (1,2 - 12 m ³ /h) 100-400 l/min, 3 gas (6 - 24 m ³ /h)
Regulating range	N ₂ , O ₂ , CO ₂ : 5 - 95 %
Accuracy	+/- 2 %
Inlet pressure	Min. 5.5 bar, Max. 10 bar The specific pressure interval is indicated on the mixer.
Outlet pressure	2-gas: 3,8 - 6 bar (55 - 87 psi) 3-gas: 2,8 - 5 bar (41 - 73 psi)
Gas connections	Models ≤ 400 liter/min.: 3/8" RG female Fittings are supplied for connection of 6/8 mm plastic hose or 9-10 mm reinforced hose. Models > 400 liter/min.: 3/8" RG female Hose nipples are supplied for connection of 10-11 mm reinforced hoses.

Inlet filter	Models ≤ 400 liter/min.: 60 µm Models > 400 liter/min.: 500 µm
Indicators for	Alarm monitoring on/off Low pressure on "1 GAS IN", "2 GAS IN" and "3 GAS IN" Alarm output active
Signal cable	Alarm output: N.O.+ N.C. + COM connection Max. 48V / 1A Flow control valve: (Option) Connection of 24 VDC
Material	Stainless steel, IP 54
Ambient temperature	Operational: 0 to +45°C, < 95% RH, non condensing Storage: -10 to +60°C, < 95% RH, non condensing
Weight/dimensions	(See illustration below)

Type	H x W x D [mm]	Weight [kg]
250/2	194 x 235 x 420	10,1
400/2	194 x 235 x 420	10,3
200/3	194 x 235 x 420	12,2
400/3	194 x 473 x 420	17,2



This blank page has been inserted to enable double sided printing of the document!



MOCON Europe A/S
Rønnedevej 18
4100 Ringsted, Denmark
Tel +45 57 66 00 88
info.dk.mocon@ametek.com
www.ametekmocon.com