

**GAS MIXERS**

**MG 25/45/75/95/125-2 /-3 FIX**



**MG 25/45/75/95/125-2 FLEX**



**Gas mixing systems for 2 or 3 defined gases, designed for variable processes with a mixing range from 5-92%. (See other ranges on overleaf)**

**FIX: pre-set, for 2 or 3-component gas mixtures.**

**FLEX: adjustable, for 2-component gas mixtures.**

**Using a new mixing technology, no receiver is required.**

MG 25 capacity range up to approx. 22 Nm<sup>3</sup>/h.  
 MG 45 capacity range up to approx. 46 Nm<sup>3</sup>/h.  
 MG 75 capacity range up to approx. 68 Nm<sup>3</sup>/h.  
 MG 95 capacity range up to approx. 90 Nm<sup>3</sup>/h.  
 MG 125 capacity range up to approx. 135 Nm<sup>3</sup>/h.  
 For the exact pressure and flow capacity ratios, please see the technical data overleaf.

**Benefits**

- high mixing accuracy
- avoids the need to stock multiple pre-mixes (cost saving)
- does not require receiver (cost and space saving)
- inlet gas filters protect the device against impurities
- pneumatic operating principle, no electrical connections required
- mixed gas production from 2 l/min to the max. flow
- robust, compact design
- panel for wall mounting
- minimal maintenance required

**Easy operation**

- blends are factory set and tamper proof (FIX)
- a mixing valve with a control knob and %-scale provides infinitely variable mixture settings (FLEX)

**High process reliability**

- independent of pressure fluctuations in the gas supply
- independent of withdrawal fluctuations (in permitted range)
- fail safe design (unit shuts down on failure of either gas supply)
- lockable to prevent tampering (FLEX)

**Options**

- monitoring of the gas supply by means of pressure switches; a low inlet pressure triggers a visual alarm (audible optional) and switches a potential free contact (e.g. to shut down machinery to avoid quality problems) - electrical connections required

**Other models, options and accessories available on request.**

**Please identify the individual gases at the time of enquiring!**

## GAS MIXERS

<b>Type</b>	MG 25/45/75/95/125-2 FIX; MG 45/95/125-3 FIX; MG 25/45/75/95/125-2 FLEX
<b>Gases</b>	all technical gases (excluding toxic or corrosive gases, also no mixtures of fuel gases with air, O <sub>2</sub> or N <sub>2</sub> O)
<b>Mixing range</b>	
MG 25/45/75/95/125	-2 FIX/FLEX: 5-92%
MG 45/75/95/125 (diluted)	-2 FIX/FLEX: 2-46%
MG 75/125 (diluted)	-2 FIX/FLEX: 1-23%
MG 45/95/125	-3 FIX/: carrier gas 47-96% 1 <sup>st</sup> admix gas 2-27% 2 <sup>nd</sup> admix gas 2-29% according to the pre-set gas blend smaller admix concentrations for MG 125 on request
<b>Pressure settings</b>	see tables
<b>Inlet pressure differential between the gases</b>	max. 3 bar
<b>Mixture output (N<sub>2</sub>)</b>	see tables (other gases according to calculating rule see last page)
<b>Setting accuracy</b>	
Mixing range 1: < 5%	± 0.5% absolute
Mixing range 2: 5 up to 20%	± 10% of the nominal value
Mixing range 3: > 20%	± 2% absolute
<b>Temperature (gas/environment)</b>	-25 °C to +50 °C (-13 °F to +122 °F)
<b>Gas connections</b>	
MG 25/45/75	G 1/2 RH with cone, soldering nipple for pipe OD 15 mm
MG 95/125	G 1 RH with cone, soldering nipple for pipe OD 22 mm
<b>Housing</b>	stainless steel
<b>Weight</b>	
MG 25/.../125-2 /-3 FIX	approx. 18 ... 27 kg
MG 25/.../125-2 FLEX	approx. 20 ... 32 kg
<b>Dimensions (HxWxD)</b>	approx. 570 x 470 x 240 mm (22.4 x 18.5 x 9.4 inch) without connections
<b>Approvals</b>	Company certified according to ISO 9001 CE-marked according to: - ATEX 95 Directive 94/9/EC

Flow MG 25-2 (in Nm <sup>3</sup> /h) in relation to N <sub>2</sub>		min. mixed gas production 2 l/min														
		outlet pressure in barg														
		0.5	1	2	3	4	5	6	7	8	9	10	11	12	13	14
min. inlet pressure in barg (max. 20 bar)	4	2.7	2.1	-	-	-	-	-	-	-	-	-	-	-	-	-
	5	4.9	4.3	2.7	-	-	-	-	-	-	-	-	-	-	-	-
	6	7.6	7.0	5.5	3.4	-	-	-	-	-	-	-	-	-	-	-
	7	10.5	10.1	8.5	6.5	3.8	-	-	-	-	-	-	-	-	-	-
	8	14.5	14.0	12.6	10.5	8.2	5.0	-	-	-	-	-	-	-	-	-
	9	18.5	18.1	16.8	14.8	12.3	9.4	5.8	-	-	-	-	-	-	-	-
	10	22.4	22.0	20.7	18.9	16.5	13.6	9.9	6.0	-	-	-	-	-	-	-
	11	26.7	26.6	25.5	23.7	21.6	19.0	15.8	12.3	8.2	-	-	-	-	-	-
	12	30.2	29.8	29.1	27.5	25.3	22.8	19.7	16.1	12.5	8.0	-	-	-	-	-
	13	35.0	34.9	33.9	32.5	30.3	28.0	24.9	21.6	17.6	13.3	8.5	-	-	-	-
	14	40.2	39.7	39.0	37.9	36.1	34.2	31.0	27.5	23.8	19.4	14.8	9.7	-	-	-
	15	47.2	46.9	46.5	45.0	43.0	39.0	36.5	33.5	30.1	25.8	20.9	15.6	10.2	-	-
	16	50.3	50.3	49.8	48.6	47.0	44.8	42.3	39.4	36.1	32.6	26.6	22.5	16.9	10.9	-
	17	56.7	56.3	55.5	54.5	52.8	50.8	48.5	45.9	42.8	39.4	35.3	30.5	24.5	18.6	12.5

Note:  
Flow values higher P<sub>v</sub> 10 bar  
not for O<sub>2</sub> and CO<sub>2</sub>

Technical Data

E02/L2 subject to change

**GAS MIXERS**

Flow **MG 45-2 /-3** (in Nm<sup>3</sup>/h) in relation to N<sub>2</sub> min. mixed gas production 4 l/min

		outlet pressure in barg														
		0.5	1	2	3	4	5	6	7	8	9	10	11	12	13	14
min. inlet pressure in barg (max. 25 bar)	4	5.9	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-
	5	12.1	8.4	5.1	-	-	-	-	-	-	-	-	-	-	-	-
	6	17.4	14.5	11.3	6.9	-	-	-	-	-	-	-	-	-	-	-
	7	24.2	21.2	18.1	13.9	8.3	-	-	-	-	-	-	-	-	-	-
	8	32.0	28.7	25.6	21.6	16.1	9.7	-	-	-	-	-	-	-	-	-
	9	39.0	36.9	33.8	30.1	25.0	18.7	10.5	-	-	-	-	-	-	-	-
	10	46.4	45.0	42.7	38.7	33.7	28.0	20.5	11.4	-	-	-	-	-	-	-
	11	54.0	53.4	51.3	48.4	44.3	39.0	32.4	24.4	14.3	-	-	-	-	-	-
	12	61.7	61.1	59.3	56.6	52.9	48.1	42.0	34.9	25.9	14.9	-	-	-	-	-
	13	70.0	69.6	68.1	65.7	62.3	58.0	52.7	45.9	37.7	27.8	15.4	-	-	-	-
	14	77.2	76.9	75.6	73.4	70.4	66.6	61.7	56.4	48.9	40.3	29.2	16.6	-	-	-
	15	84.9	84.6	83.6	81.7	78.8	75.2	70.9	65.4	59.1	51.3	42.2	30.2	17.7	-	-
	16	92.5	92.3	91.6	90.2	88.2	85.1	81.6	76.8	70.8	64.2	55.8	46.5	33.6	19.5	-
	17	99.3	99.0	98.7	97.3	95.5	92.9	89.3	85.2	79.7	73.4	66.1	57.4	47.1	35.6	19.9

Note:  
Flow values higher P<sub>v</sub> 10 bar  
not for O<sub>2</sub> and CO<sub>2</sub>

Flow **MG 75-2** (in Nm<sup>3</sup>/h) in relation to N<sub>2</sub> min. mixed gas production 8 l/min

		outlet pressure in barg														
		0.5	1	2	3	4	5	6	7	8	9	10	11	12	13	14
min. inlet pressure in barg (max. 25 bar)	4	11.4	9.2	-	-	-	-	-	-	-	-	-	-	-	-	-
	5	19.4	17.4	11.4	-	-	-	-	-	-	-	-	-	-	-	-
	6	29.1	27.5	22.3	14.2	-	-	-	-	-	-	-	-	-	-	-
	7	38.3	37.0	32.8	26.5	16.3	-	-	-	-	-	-	-	-	-	-
	8	47.4	46.3	42.9	37.8	30.3	18.6	-	-	-	-	-	-	-	-	-
	9	57.5	57.3	54.0	49.5	43.2	34.5	21.6	-	-	-	-	-	-	-	-
	10	67.7	67.2	64.8	60.9	55.6	47.1	37.3	22.3	-	-	-	-	-	-	-
	11	78.9	78.4	76.5	74.5	70.0	63.2	54.1	41.4	24.9	-	-	-	-	-	-
	12	87.8	87.5	86.2	83.9	80.8	75.8	68.5	58.8	45.2	27.5	-	-	-	-	-
	13	94.8	94.6	93.7	91.5	88.8	85.2	80.3	73.5	63.2	48.8	29.2	-	-	-	-
	14	102.9	102.7	101.9	100.3	97.8	94.3	90.3	85.2	77.8	66.7	51.7	31.3	-	-	-
	15	111.0	111.0	110.3	108.8	106.7	103.6	100.1	94.7	89.3	82.0	70.2	54.6	32.3	-	-
	16	120.6	120.6	120.4	119.3	113.9	111.8	109.1	105.4	101.3	95.8	87.8	74.3	58.2	35.5	-
	17	133.7	133.7	133.7	129.9	129.5	128.2	126.3	120.7	116.8	112.8	104.4	92.9	79.6	61.9	37.6

Note:  
Flow values higher P<sub>v</sub> 10 bar  
not for O<sub>2</sub> and CO<sub>2</sub>

Flow **MG 95-2 /-3** (in Nm<sup>3</sup>/h) in relation to N<sub>2</sub> min. mixed gas production 8 l/min

		outlet pressure in barg														
		0.5	1	2	3	4	5	6	7	8	9	10	11	12	13	14
min. inlet pressure in barg (max. 25 bar)	4	11.6	9.4	-	-	-	-	-	-	-	-	-	-	-	-	-
	5	21.2	19.1	13.0	-	-	-	-	-	-	-	-	-	-	-	-
	6	33.0	30.8	24.9	16.3	-	-	-	-	-	-	-	-	-	-	-
	7	45.2	43.2	37.3	29.1	18.0	-	-	-	-	-	-	-	-	-	-
	8	61.0	59.0	52.6	45.3	35.5	22.3	-	-	-	-	-	-	-	-	-
	9	75.1	73.5	68.7	65.4	52.9	40.6	25.6	-	-	-	-	-	-	-	-
	10	89.8	88.6	84.2	81.6	69.2	58.6	44.6	27.1	-	-	-	-	-	-	-
	11	109.1	108.6	104.6	98.9	90.6	79.7	66.7	50.7	31.2	-	-	-	-	-	-
	12	124.2	124.1	121.0	115.1	108.8	99.1	87.4	72.2	55.0	33.5	-	-	-	-	-
	13	138.4	138.1	136.1	132.1	126.1	119.3	109.3	94.9	79.1	59.9	36.3	-	-	-	-
	14	152.1	152.0	150.1	146.1	141.5	134.9	126.6	115.5	101.7	84.7	63.5	37.8	-	-	-
	15	166.1	166.1	165.6	162.1	158.1	153.2	145.6	136.7	124.1	109.7	91.3	68.1	40.1	-	-
	16	182.2	182.2	179.1	177.7	174.1	168.5	162.8	154.2	145.1	133.2	117.5	97.2	73.4	43.7	-
	17	196.2	196.2	195.9	191.4	184.3	178.2	176.3	172.4	164.2	154.1	141.5	124.1	103.3	77.8	45.2

Note:  
Flow values higher P<sub>v</sub> 10 bar  
not for O<sub>2</sub> and CO<sub>2</sub>

Technical Data

E02/L2 subject to change

## GAS MIXERS

Flow MG 125-2 /-3 (in Nm <sup>3</sup> /h) in relation to N <sub>2</sub>		outlet pressure in barg														min. mixed gas production 16 l/min		
		0.5	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
min. inlet pressure in barg (max. 25 bar)	4	24.2	19.8	-	-	-	-	-	-	-	-	-	-	-	-	-	Note: Flow values higher P <sub>v</sub> 10 bar not for O <sub>2</sub> and CO <sub>2</sub>	-
	5	41.3	37.4	25.7	-	-	-	-	-	-	-	-	-	-	-	-		-
	6	60.7	57.3	46.9	31.7	-	-	-	-	-	-	-	-	-	-	-		-
	7	80.7	78.3	69.6	55.6	37.7	-	-	-	-	-	-	-	-	-	-	-	-
	8	98.6	96.9	90.4	79.3	62.9	41.1	-	-	-	-	-	-	-	-	-	-	-
	9	118.3	117.8	113.1	105.2	93.4	76.0	50.4	-	-	-	-	-	-	-	-	-	-
	10	135.4	135.3	131.6	124.8	115.3	102.3	82.8	54.8	-	-	-	-	-	-	-	-	-
	11	150.6	150.6	148.9	143.8	135.8	124.8	109.1	87.2	55.6	-	-	-	-	-	-	-	-
	12	166.2	166.2	166.0	160.9	154.4	145.4	132.8	117.0	92.5	58.1	-	-	-	-	-	-	-
	13	182.2	182.2	181.1	178.1	173.7	167.4	157.3	143.4	126.3	102.0	59.8	-	-	-	-	-	-
	14	205.6	205.6	205.6	201.7	198.8	189.4	180.6	168.3	153.8	133.6	104.3	61.1	-	-	-	-	-
	15	219.2	219.2	219.2	217.4	213.2	207.8	200.6	190.6	178.6	162.1	143.1	112.3	64.3	-	-	-	-
	16	237.2	237.2	237.2	237.1	232.3	228.0	224.1	215.8	205.6	190.8	173.8	153.7	123.7	72.1	-	-	-
	17	249.5	249.5	249.5	249.4	247.0	241.2	237.3	232.1	224.9	212.2	198.1	183.2	161.6	129.1	77.6	-	-

### Calculating rule for two-component mixtures:

Conversion factors F<sub>i</sub>:

Argon	F <sub>AR</sub>	= 0.82
Oxygen	F <sub>O2</sub>	= 0.88
Nitrogen	F <sub>N2</sub>	= 1.00
Helium	F <sub>He</sub>	= 1.05
Carbon dioxide	F <sub>CO2</sub>	= 1.16

$$\dot{V}_{mix} = \dot{V}_{N_2} \times F_{mix}$$

$$F_{mix} = F_{Gas1} \frac{X_1}{100} + F_{Gas2} \frac{X_2}{100}$$

X<sub>1</sub> = vol.% gas

**Example:** 30 vol.% CO<sub>2</sub> 70 vol.% N<sub>2</sub>

⇒ X<sub>CO2</sub> = 30 X<sub>N2</sub> = 70

⇒ F<sub>CO2</sub> = 1.16 F<sub>N2</sub> = 1.00

$\dot{V}_{N_2} = 102.3 \text{ Nm}^3/\text{h}$  (see table MG 125)

$$F_{mix} = 1.16 \frac{30}{100} + 1.00 \frac{70}{100} = 1.048$$

$$\dot{V}_{mix} = 102.3 \text{ Nm}^3/\text{h} \times 1.048 = \underline{107.21 \text{ Nm}^3/\text{h}}$$

### F<sub>mix</sub> for concentrations (example):

	Gas 1	Gas 2	F <sub>mix</sub>
<b>mixture</b>	<b>CO<sub>2</sub></b>	<b>Ar</b>	
admix propotion in vol.%	18	82	0.8812
admix propotion in vol.%	4	96	0.8336
admix propotion in vol.%	25	75	0.905
<b>mixture</b>	<b>CO<sub>2</sub></b>	<b>N<sub>2</sub></b>	
admix propotion in vol.%	30	70	1.048
admix propotion in vol.%	5	95	1.008
admix propotion in vol.%	80	20	1.128
<b>mixture</b>	<b>He</b>	<b>Ar</b>	
admix propotion in vol.%	20	80	0.866
admix propotion in vol.%	60	40	0.958
<b>mixture</b>	<b>He</b>	<b>N<sub>2</sub></b>	
admix propotion in vol.%	10	90	1.005
<b>mixture</b>	<b>O<sub>2</sub></b>	<b>Ar</b>	
admix propotion in vol.%	4	96	0.8224
admix propotion in vol.%	10	90	0.826
<b>mixture</b>	<b>O<sub>2</sub></b>	<b>N<sub>2</sub></b>	
admix propotion in vol.%	4	96	0.9952
admix propotion in vol.%	25	75	0.97
<b>mixture</b>	<b>O<sub>2</sub></b>	<b>CO<sub>2</sub></b>	
admix propotion in vol.%	50	50	1.02
admix propotion in vol.%	85	15	0.922