



Multitec[®] 545/540

Series

Type/model	• Multitec 545: 066 13
	• Multitec 540: 066 12

Certificates

Certificate	TÜV 07 ATEX 553353 X
	• II 2G Ex db eb ib IIB T4 Gb basic device without leather bag for: ◦ CH ₄ , C ₃ H ₈ , C ₄ H ₁₀ , C ₉ H ₂₀ , H ₂ S, CO
	• II 2G Ex db eb ib IIC T4 Gb basic device with leather bag for: ◦ CH ₄ , C ₃ H ₈ , C ₄ H ₁₀ , C ₉ H ₂₀ , H ₂ S, CO, H ₂

Device data

Dimensions (W x D x H)	approx. 148 x 57 x 205 mm (5.83 x 2.24 x 8.07 in) approx. 148 x 57 x 253 mm (5.83 x 2.24 x 9.96 in) with supporting bracket
Weight	approx. 1000 g (35 oz), depending on equipment

Features

Display	monochrome, 320 x 240 pixel
Buzzer	• frequency: 2,4 kHz • volume: 80 dB (A) / 1m (3.28 ft)
Signal light	red
Pump	• vacuum: > 250 mbar • volume flow: typically 50 l/h ±20 l/h • pump error (F100) depending on volume flow: ◦ ≤ 20 l/h F100 certain ◦ > 20 l/h – ≤ 35 l/h F100 possible
Interface	USB 2.0
Memory	8 MB
Control	• ON/OFF key • 3 function keys • jog dial
Sensors	• IR for flammable gases (CH ₄) • IR for CO ₂ optional: • EC for CO, H ₂ , H ₂ S, O ₂

Operating conditions*

Operating temperature	-20 – 40°C (-4 °F – 104 °F)
Humidity	5 – 90% r.h., non-condensing
Atmospheric pressure	800 – 1100 hPa
Pressure at gas inlet	-175 – 65 hPa
Protection rating	IP54
Position of use	any

*Optional sensors can affect the operating conditions of the device.

Storage conditions

Storage temperature	-25 – 60°C (-13 °F – 140 °F) temperatures above 40°C (104 °F) reduce the service life of the sensors
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Power supply

Power supply	4 cells, type Mignon AA, optionally: • rechargeable batteries: NiMH • disposable batteries: Alkaline
Operating time, typical	at least 6 h
Battery capacity	2000 mAh
Charging time	approx. 3 h (complete charge), depending on capacity
Charging temperature	0 – 35°C (32 to 95 °F)
Charging voltage	12 V DC (max. 1 A)

Data transmission

Communication	USB
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Gas types

Default	CH ₄ , CO ₂
Optional	CO, H ₂ , H ₂ S, O ₂

Sensors

Note:

when using probes, the specified response times are longer.

Note for EC sensors:

at temperatures below 0 °C (32 °F) the specified response times and decay times may be longer.

Methane CH₄ (Interspace application)

Type	infrared sensor (IR)	
Use	Multitec 545/540	
Measuring range	0 ppm – 1.00% vol.	
Indication range	0 ppm – 2.5% vol.	
Resolution	• 50 ppm (0 – 950 ppm) • 0.01% vol (0.10 – 2.50% vol.)	
Response times	t ₅₀ < 9 s	t ₉₀ < 17 s
Warm-up time	< 60 s	
Temperature range	-20 – 40 °C (-4 °F – 104 °F)	
Measuring error	±15% of measured value (linearity), at least ±100 ppm	
Interference, known	all hydrocarbons C _x H _y	
Lifetime, expected	5 years	
Adjustment	test gas concentration: • zero point: hydrocarbon-free, clean air • CH₄: 1% vol., utilisable 0.50 – 1.00% vol.	

Methane CH₄ (Gas measuring application)

Type	infrared sensor (IR)	
Use	Multitec 545/540	
Measuring range	0 – 100% vol.	
Resolution	• 0.1% vol. (0 – 79.9% vol.) • 1% vol. (80 – 100% vol.)	
Response times	t ₅₀ < 9 s	t ₉₀ < 17 s
Warm-up time	< 30 s	
Temperature range	-20 – 40 °C (-4 °F – 104 °F)	
Measuring error	±1.5% of measured value, at least ±0.5% vol.	
Interference, known	all hydrocarbons C _x H _y	
Lifetime, expected	5 years	
Adjustment	test gas concentration: • zero point: hydrocarbon-free, clean air • CH₄: ◦ 100% vol. ◦ gas mixture 60% vol. CH₄ / 40% vol. CO₂	

Carbon dioxide CO₂

Type	infrared sensor (IR)
Use	Multitec 545/540
Measuring range	0 – 100% vol.
Resolution	• 0.1% vol. (0 – 9.9% vol.) • 1% vol. (10 – 100% vol.)
Response times	t ₉₀ < 20 s
Warm-up time	< 30 s
Temperature range	-20 – 40 °C (-4 °F – 104 °F)
Measuring error	±1.5% vol.
Zero point deviation	0.04% vol.
Interference, known	none
Humidity	5 – 90% r.h., non-condensing • short term: 0% r.h
Lifetime, expected	5 years
Adjustment	test gas concentration: • zero point: carbon dioxide-free, clean air • CO₂: ◦ 100% vol. ◦ gas mixture 60% vol. CH₄ / 40% vol. CO₂

Oxygen O₂

Type	electrochemical sensor (EC)
Use	Multitec 545/540
Measuring range	0 – 25% vol.
Indication range	0 – 30% vol.
Resolution	0.1% vol.
Response times	t ₉₀ < 30 s
Warm-up time	up to 90 s
Temperature range	-20 – 40 °C (-4 °F – 104 °F)
Measuring error	• linearity: ≤ 1.5% of measured value, minimum ≤ 0.3% vol. • long-term stability: ≤ 0.2% vol. (3 months)
Drift	< 2% within 3 months
Interference, known	none
Humidity	5 – 90% r.h., non-condensing • short term: 0% r.h
Lifetime, expected	2 years
Adjustment	test gas concentration: • zero point: ◦ oxygen-free air ◦ 100% vol. N₂ ◦ 100% vol. CH₄ • O₂: 20.9% vol., e.g. clean air

Carbon monoxide CO

Type	electrochemical sensor (EC)	
Use	Multitec 545/540	
Measuring range	0 – 500 ppm • lower limit: ◦ 0 – 100 ppm: 4 ppm ◦ > 100 ppm: 11 ppm	
Indication range	0 – 600 ppm	
Resolution	1 ppm	
Response times	t ₉₀ < 30 s	
Decay times	t ₁₀ ≤ 25 s	
Warm-up time	up to 90 s	
Temperature range	-20 – 40 °C (-4 °F – 104 °F)	
Measuring error	• ±3 %, minimum ±3 ppm (±3 digit) • long-term stability ◦ test gas: ≤ 4% of measured value ◦ zero point (fresh air): ≤ 1 ppm	
Drift	< 10% within 6 months	
Zero point deviation	• 0 – 100 ppm: 3 ppm • > 100 ppm: 13 ppm	
Interference, known	at 20°C (68 °F) • C ₂ H ₂ 100 ppm: approx. 90 ppm CO • C ₂ H ₄ 100 ppm: approx. 96 ppm CO • Cl ₂ 15 ppm: approx. 1 ppm CO • H ₂ 200 ppm: approx. 30 ppm CO • H ₂ S 50 ppm: approx. 1 ppm CO • NH ₃ 50 ppm: approx. 0 ppm CO • NO 50 ppm: approx. 15 ppm CO • SO ₂ 20 ppm: approx. 0 ppm CO	
Humidity	15 – 90% r.h., non-condensing • short term: 0% r.h	
Lifetime, expected	3 years	
Adjustment	test gas concentration: • zero point: clean air • CO: 40 ppm, utilisable 10 – 150 ppm	

Hydrogen H2

Type	electrochemical sensor (EC)	
Use	Multitec 545/540	
Measuring range	0 – 1000 ppm	
Indication range	0 – 1200 ppm	
Resolution	5 ppm	
Response times	t ₉₀ < 60 s	
Decay times	t ₁₀ ≤ 60 s	
Warm-up time	up to 90 s	
Temperature range	-20 – 40 °C (-4 °F – 104 °F)	
Measuring error	±10 %, minimum ±15 ppm (±3 digit)	
Drift	< 10% within 6 months	
Zero point deviation	±10 ppm (±2 digit)	
Interference, known	at 20°C (68 °F) • CO 200 ppm approx. 150 ppm H₂ • H₂S 25 ppm approx. -0.5 ppm H₂ • N₂O 20 ppm approx. -1 ppm H₂ • NO 50 ppm approx. 20 ppm H₂ • S₂O 20 ppm approx. -1 ppm H₂	
Humidity	15 – 90% r.h., non-condensing • short term: 0% r.h	
Lifetime, expected	3 years	
Adjustment	test gas concentration: • zero point: clean air • H₂: 1000 ppm, utilisable 100 – 1000 ppm	

Hydrogen sulphide H₂S

Type	electrochemical sensor (EC)	
Use	Multitec 545	
Measuring range	0 – 5000 ppm	
	• lower limit:	1 ppm
Indication range	0 – 6000 ppm	
Resolution	• 1 ppm (0 – 100 ppm) • 2 ppm (100 - 998 ppm) • 0.02% vol. / 200 ppm (0.10 - 0.5% vol.)	
Response times	t ₉₀ < 60 s	
Decay times	t ₁₀ < 90 s	
Warm-up time	up to 120 s	
Temperature range	-20 – 40 °C (-4 °F – 104 °F)	
Measuring error	• ±3% or ±3 ppm (±3 digits) • ±3 ppm (long-term stability)	
Drift	< 10% within 6 months	
Zero point deviation	2 ppm	
Interference, known	at 20°C (68 °F) • CO 200 ppm: approx. 2 ppm • SO₂ 20 ppm: approx. 3 ppm • NO₂ 200 ppm: approx. -30 ppm • H₂ 100 ppm: approx. 2 ppm	
Humidity	15 – 90% r.h., non-condensing • short term: 0% r.h	
Lifetime, expected	2 years	
Adjustment	test gas concentration: • zero point: clean air • H₂S: 180 ppm, utilisable 10 – 1200 ppm	

Hydrogen sulphide H₂S

Type	electrochemical sensor (EC)	
Use	Multitec 540	
Measuring range	0 – 2000 ppm	
	• lower limit:	1 ppm
Indication range	0 – 2400 ppm	
Resolution	• 1 ppm (0 – 100 ppm) • 2 ppm (100 - 998 ppm) • 0.02% vol. / 200 ppm (0.10 - 0.2% vol.)	
Response times	t ₉₀ < 60 s	
Decay times	t ₁₀ < 90 s	
Warm-up time	up to 120 s	
Temperature range	-20 – 40 °C (-4 °F – 104 °F)	
Measuring error	• ±3% or ±3 ppm (±3 digits) • ±3 ppm (long-term stability)	
Drift	< 10% within 6 months	
Zero point deviation	2 ppm	
Interference, known	at 20°C (68 °F) • H₂ 2% vol.: approx. 150 ppm H₂S • Isopropanol 1% vol.: approx. 0 ppm H₂S • NH₃ 1000 ppm: approx. 0 ppm H₂S	
Humidity	15 – 90% r.h., non-condensing • short term: 0% r.h	
Lifetime, expected	2 years	
Adjustment	test gas concentration: • zero point: clean air • H₂S: 180 ppm, utilisable 10 – 1200 ppm	