Technical data sheet

VARIOTEC® 400 EX

Device data	
Dimensions (W x D x H)	approx. 148 x 57 x 205 mm approx. 148 x 57 x 253 mm with supporting bracket
Weight	approx. 1000 g, depending on equipment

Certificates	
Certificate	TÜV 07 ATEX 553353 X II2G Ex d e ib IIB T4 Gb basic device without leather bag for: CH4, C3H8, C4H10, C9H20, CO II2G Ex d e ib IIC T4 Gb basic device with leather bag for: CH4, C3H8, C4H10, C9H20, CO, H2

Device elements	
Display	monochromatic graphic display, 320 x 240 pixels
Buzzer	frequency 2.4 kHz, volume 80 db (A) / 1 m
Signal light	red
Pump capacity	vacuum > 250 mbar, volume flow approx. 50 l/h
Interface	USB
Memory	8 MB
Operation	ON/OFF key, 3 function keys, jog dial

Operating conditions	
Operating temperature	-20 °C – +40 °C
Storage temperature	-25 °C – +60 °C (temperatures above 40 °C reduce the lifetime of the sensors)
Humidity	5 – 90 % r.h., non-condensing
Atmospheric pressure	800 – 1100 hPa
Protection rating	IP54

Power supply	
Power supply	NiMH rechargeable or disposable alkaline batteries, type Mignon (AA)
Operating time, typical	at least 8 h
Charging time	approx. 3 h (complete charge) depending on capacity
Charging voltage	12 V DC, max. 1 A

Data transmission	
Communication	USB

Gas types	
Standard	methane
Optional	propane C3H8 (ppm) butane C4H10 (ppm)

Semiconductor sensor ppm range	
Measuring range	0 – 10000 ppm (CH4)
Resolution	1 ppm / 2 ppm / 20 ppm / 200 ppm
Response times	t90 < 7 s
Warm-up time	approx. 1 min
Measuring error	30 %
Interference	all flammable gases
Lifetime, expected	5 years

106907 – 06-06-2012 – Subject to technical changes.

Technical data sheet

VARIOTEC® 450 EX

Device data	
Dimensions (W x D x H)	approx. 148 x 57 x 205 mm approx. 148 x 57 x 253 mm with supporting bracket
Weight	approx. 1000 g, depending on equipment

Certificates	
Certificate	TÜV 07 ATEX 553353 X II2G Ex d e ib IIB T4 Gb basic device without leather bag for: CH4, C3H8, C4H10, C9H20, CO II2G Ex d e ib IIC T4 Gb basic device with leather bag for: CH4, C3H8, C4H10, C9H20, CO, H2 BVS 09 ATEX G 001 X, PFG 08 G 002 X (applies to Warning LEL and Warning ExTox applications for CH4, C3H8, O2, CO).

Device elements	
Display	monochromatic graphic display, 320 x 240 pixels
Buzzer	frequency 2.4 kHz, volume 80 db (A) / 1 m
Signal light	red
Pump capacity	vacuum > 250 mbar, volume flow approx. 50 l/h
Interface	USB
Memory	8 MB
Operation	ON/OFF key, 3 function keys, jog dial

Operating conditions	
Operating temperature	-20 °C – +40 °C
Storage temperature	-25 °C – +60 °C (temperatures above 40 °C reduce the lifetime of the sensors)
Humidity	5 – 90 % r.h., non-condensing
Atmospheric pressure	800 – 1100 hPa
Protection rating	IP54

Power supply	
Power supply	NiMH rechargeable or disposable alkaline batteries, type Mignon (AA)
Operating time, typical	at least 8 h
Charging time	approx. 3 h (complete charge) depending on capacity
Charging voltage	12 V DC, max. 1 A

Data transmission	
Communication	USB

Gas types	
Standard	methane
Optional	propane C3H8 (% LEL / % vol.) butane C4H10 (% LEL)

Catalytic combustion sensor CxHy LEL range	
Measuring range	0 – 4.4 % vol. (CH4), 0 – 100 % LEL
Resolution	0.05 % vol.
Response times	t50 < 5 s, t90 < 14 s (CH4) t50 < 6 s, t90 < 11 s (C4H10)
Measuring error	±1 % LEL CH4 (short-term stability as per EN 60079-29-1) ±4 % LEL CH4 (long-term stability as per EN 60079-29-1) ±1 % LEL C3H8 (short-term stability as per EN 60079-29-1) ±2 % LEL C3H8 (long-term stability as per EN 60079-29-1)
Interference	all flammable gases
Lifetime, expected	5 years

Thermal conductivity sensor CxHy % vol. range	
Measuring range	0 – 100 % vol. (CH4)
Resolution	1 % vol.
Response times	t50 < 9 s, t90 < 17 s (CH4) t50 < 11 s, t90 < 22 s (C4H10)
Measuring error	3 % (as per EN 60079-29-1)
Interference	all gases with a different thermal conductivity
Lifetime, expected	5 years

Electrochemical sensor oxygen O2	
Measuring range	0 – 25 % vol.
Resolution	0.1 % vol.
Response times	t90 < 15 s
Warm-up times	approx. 1 min
Measuring error	±3 % or ±0.3 % vol. (±3 digits)
Lifetime, expected	36 months

Electrochemical sensor carbon monoxide CO	
Measuring range	0 – 500 ppm
Resolution	1 ppm
Response times	t90 < 30 s
Warm-up times	approx. 1 min
Measuring error	±10 % or ±3 ppm (±3 digits) ±5 ppm (long-term stability as per EN 45544)
Interference	H2, NO
Lifetime, expected	36 months

106908 – 06-06-2012 – Subject to technical changes.

Technical data sheet

VARIOTEC® 460 EX

Device data	
Dimensions (W x D x H)	approx. 148 x 57 x 205 mm approx. 148 x 57 x 253 mm, with supporting bracket
Weight	approx. 1000 g, depending on equipment

Certificates	
Certificate	TÜV 07 ATEX 553353 X II2G Ex d e ib IIB T4 Gb basic device without leather bag for: CH4, C3H8, C4H10, C9H20, CO II2G Ex d e ib IIC T4 Gb basic device with leather bag for: CH4, C3H8, C4H10, C9H20, CO, H2

Device elements	
Display	monochromatic graphic display, 320 x 240 pixels
Buzzer	frequency 2.4 kHz, volume 80 db (A) / 1 m
Signal light	red
Pump capacity	vacuum > 250 mbar, volume flow approx. 50 l/h
Interface	USB
Memory	8 MB
Operation	ON/OFF key, 3 function keys, jog dial

Operating conditions	
Operating temperature	-20 °C – +40 °C
Storage temperature	-25 °C – +60 °C (temperatures above 40 °C reduce the lifetime of the sensors)
Humidity	5 – 90 % r.h., non-condensing
Atmospheric pressure	950 – 1100 hPa
Protection rating	IP54

Power supply	
Power supply	NiMH rechargeable or disposable alkaline batteries, type Mignon (AA)
Operating time, typical	at least 8 h
Charging time	approx. 3 h (complete charge) depending on capacity
Charging voltage	12 V DC, max. 1 A

Data transmission	
Communication	USB

Gas types	
Standard	methane
Optional	propane C3H8 (ppm / % vol.) butane C4H10 (ppm / % LEL)

Thermal conductivity sensor CxHy % vol. range	
Measuring range	0 – 100 % vol. (CH4)
Resolution	1 % vol.
Response times	t50 < 9 s, t90 < 17 s (CH4) t50 < 11 s, t90 < 22 s (C4H10)
Measuring error	3 % (as per EN 60079-29-1)
Interference	all gases with a different thermal conductivity
Lifetime, expected	5 years

Semiconductor sensor ppm range	
Measuring range	0 – 10000 ppm (CH4)
Resolution	1 ppm / 2 ppm / 20 ppm / 200 ppm
Response times	t90 < 7 s
Warm-up times	approx. 1 min
Measuring error	30 %
Interference	all flammable gases
Lifetime, expected	5 years

Electrochemical sensor oxygen O2	
Measuring range	0 – 25 % vol.
Resolution	0.1 % vol.
Response times	t90 < 15 s
Warm-up time	approx. 1 min
Measuring error	±3 % or ±0.3 % vol. (±3 digits)
Interference	none
Lifetime, expected	36 months

Gas chromatograph CH4, C2H6, C3H8	
Measuring range	0 – 12000 ppm
Resolution	1 ppm
Warm-up time	approx. 1 min
Measuring error	±30 %
Separating capacity	25 ppm
Measurement time	4 min
Lifetime, expected	5 years

106909 – 06-06-2012 – Subject to technical changes.

Technical data sheet

VARIOTEC® 480 EX

Device data	
Dimensions (W x D x H)	approx. 148 x 57 x 205 mm approx. 148 x 57 x 253 mm with supporting bracket
Weight	approx. 1000 g, depending on equipment

Certificates	
Certificate	TÜV 07 ATEX 553353 X II2G Ex d e ib IIB T4 Gb basic device without leather bag for: CH4, C3H8, C4H10, C9H20, CO II2G Ex d e ib IIC T4 Gb basic device with leather bag for: CH4, C3H8, C4H10, C9H20, CO, H2 BVS 09 ATEX G 001 X, PFG 08 G 002 X (applies to Warning LEL and Warning ExTox applications for CH4, C3H8, O2, CO).

Device elements	
Display	monochromatic graphic display, 320 x 240 pixels
Buzzer	frequency 2.4 kHz, volume 80 db (A) / 1 m
Signal light	red
Pump capacity	vacuum > 250 mbar, volume flow approx. 50 l/h
Interface	USB
Memory	8 MB
Operation	ON/OFF key, 3 function keys, jog dial

Operating conditions	
Operating temperature	-20 °C – +40 °C
Storage temperature	-25 °C – +60 °C (temperatures above 40 °C reduce the lifetime of the sensors)
Humidity	5 – 90 % r.h., non-condensing
Atmospheric pressure	800 – 1100 hPa
Protection rating	IP54

Power supply	
Power supply	NiMH rechargeable or disposable alkaline batteries, type Mignon (AA)
Operating time, typical	at least 8 h
Charging time	approx. 3 h (complete charge) depending on capacity
Charging voltage	12 V DC, max. 1 A

Data transmission	
Communication	USB

Gas types	
Standard	methane
Optional	propane C3H8 (ppm / % LEL / % vol.) butane C4H10 (ppm / % LEL)

Catalytic combustion sensor CxHy LEL range	
Measuring range	0 – 4.4 % vol. (CH4), 0 – 100 % LEL
Resolution	0.05 % vol.
Response times	t50 < 5 s, t90 < 14 s (CH4) t50 < 6 s, t90 < 11 s (C4H10)
Measuring error	±1 % LEL CH4 (short-term stability as per EN 60079-29-1) ±4 % LEL CH4 (long-term stability as per EN 60079-29-1) ±1 % LEL C3H8 (short-term stability as per EN 60079-29-1) ±2 % LEL C3H8 (long-term stability as per EN 60079-29-1)
Interference	all flammable gases
Lifetime, expected	5 years

Thermal conductivity sensor CxHy % vol. range	
Measuring range	0 – 100 % vol. (CH4)
Resolution	1 % vol.
Response times	t50 < 9 s, t90 < 17 s (CH4) t50 < 11 s, t90 < 22 s (C4H10)
Measuring error	3 % (as per EN 60079-29-1)
Interference	all gases with a different thermal conductivity
Lifetime, expected	5 years

Semiconductor sensor ppm range	
Measuring range	0 – 10000 ppm (CH4)
Resolution	1 ppm / 2 ppm / 20 ppm / 200 ppm
Response times	t90 < 7 s
Warm-up time	approx. 1 min
Measuring error	30 %
Interference	all flammable gases
Lifetime, expected	5 years

Electrochemical sensor oxygen O2	
Measuring range	0 – 25 % vol.
Resolution	0.1 % vol.
Response times	t90 < 15 s
Warm-up time	approx. 1 min
Measuring error	±3 % or ±0.3 % vol. (±3 digits)
Lifetime, expected	36 months

Electrochemical sensor carbon monoxide CO	
Measuring range	0 – 500 ppm
Resolution	1 ppm
Response times	t90 < 30 s
Warm-up time	approx. 1 min
Measuring error	±10 % or ±3 ppm (±3 digits) ±5 ppm (long-term stability as per EN 45544)
Interference	H2, NO
Lifetime, expected	36 months

Gas chromatograph CH4, C2H6, C3H8	
Measuring range	0 – 12000 ppm
Resolution	1 ppm
Warm-up time	approx. 1 min
Measuring error	±30 %
Separating capacity	25 ppm
Measurement time	4 min
Lifetime, expected	5 years

106910 – 06-06-2012 – Subject to technical changes.