Technical data sheet

Series:

(MINI-)VERTICUS-OX

Stationary High Pressure Compressor for Breathing Air and Nitrox Compression

Types:

MV260-OX | MV320-OX | V450-OX

Production status: F01

VERTICUS-OX in Super Silent version

General	
Medium	Air / Nitrox up to 40% O_2
Intake pressure	Atmospheric
Filling pressure	PN200
Pressure setting, final pressure SIV	225 bar
Pressure setting, pressure sensor	220 bar
Permissible ambient temperature range	+5...+40°C
Permissible altitude	0...1500 m ü. NN
Max. permissible tilt	5°
System type	Open / Super Silent
Protection class	IP 55
Standard operating voltage	400 V; 50 Hz
Other operating voltage	On request
Compressor oil, standard	Synthetic
Oil change interval	Synthetic: 1x annually / 1000 h
Finish	RAL 7024, RAL 9006

Status: 02/05/2017

Compressor system	MV260-OX	MV320-OX	V450-OX
Charging rate [1]	260 l/min	320 l/min	450 l/min
Purification system	P41	P41	P61
Sound pressure level [2] (Super Silent version)	67 dB(A)	70 dB(A)	70 dB(A)
Weight (open model) [3]	349 kg	356 kg	408 kg
Weight (Super Silent) [3]	399 kg	406 kg	472 kg
Dimensions in mm (LxWxH) open[3]	127.5 x 79 x 137.5	127.5 x 79 x 137.5	127.5 x 79 x 152.5
Dimensions in mm (LxWxH) Super Silent[3]	138 x 79 x 137.5[4]	138 x 79 x 137.5[4]	153 x 79 x 137.5[4]

1 Measured during cylinder filling from 0-200 bar tolerance +/- 5% at + 20°C ambient temperature.
2 According to ISO 3744.
3 Standard model. Weight and dimensions may vary depending on accessories.
4 Width without removable doors, width including doors: 802 mm.

Prime Mover (Three-phase)	MV260-OX	MV320-OX	V450-OX
Power	5.5 kW	7.5 kW	11 kW
Model	112M	A132S	160
Type of construction	B3	B3	B3
Type [1]	Squirrel cage rotor 400 V, 50 Hz[2]	Squirrel cage rotor 400 V, 50 Hz[2]	Squirrel cage rotor 400 V, 50 Hz[3]
Rated current	10.3 A (at 400 V/50 Hz)	14.2 A (at 400 V/50 Hz)	20.8 A (at 400 V/50 Hz)
Speed	Approx. 1,185 1/min	Approx. 1,450 1/min	Approx. 1,320 1/min
Protection class	IP55 (TEFC)	IP55 (TEFC)	IP55 (TEFC)

1 Different voltage / different frequency available at extra charge on request.
2 Plug dimension: 16 A
3 Plug dimension: 32 A

Status: 02/05/2017

Compressor block, suitable for nitrox

STANDARD SCOPE OF SUPPLY:

- Oil pump for forced-feed lubrication
- Micronic intake filter: 10 µm
- Intermediate coolers, air cooled, stainless steel
- Aftercooler, air cooled, outlet temperature approx. 10-15 °C above cooling air temperature
- Intermediate separators after each stage (except 1st stage)
- Sealed safety valves after each stage
- TÜV approved final pressure safety valve
- Pressure maintaining and check valve after the final stage

Compressor block	MV260-OX	MV320-OX	V450-OX
Charging rate [1]	260 l/min	320 l/min	450 l/min
Speed	1185 1/min	1450 1/min	1320 1/min
Number of stages	4	4	4
Number of cylinders	3	4	4
Cylinder bore 1st stage	105 mm	120 mm	130 mm
Cylinder bore 2nd stage	88 mm	60 mm	60 mm
Cylinder bore 3rd stage	28 mm	32 mm	32 mm
Cylinder bore 4th stage	12 mm	14 mm	14 mm
Stroke	40 mm	50 mm	50 mm
Direction of rotation (from flywheel side)	Left	Left	Left
Drive type	V-belt	V-belt	V-belt
Intermediate pressure 1st stage	4,2 bar	4,2 bar	5,5 bar
Intermediate pressure 2nd stage	18 bar	18 bar	24 bar
Intermediate pressure 3rd stage	85 bar	85 bar	80 bar
Compressor block oil volume	2,8 l	2,8 l	ca. 5,0 l
Oil pressure	4.5 bar ± 1.5 bar	4.5 bar ± 1.5 bar	4.5 bar ± 1.5 bar
Intake pressure / Inlet pressure	1.0 bar_a	1.0 bar_a	1.0 bar_a

1 Measured during cylinder filling from 0-200 bar tolerance +/- 5% at + 20°C ambient temperature.

Status: 02/05/2017

P41 Purification System - Filter with separate oil and water separator (MINI-VERTICUS-OX)

SCOPE OF DELIVERY:

- 1x filter housing with long-life filter cartridge
- Separator unit with final pressure safety valve
- Check valve between separator and micro filter
- Micro filter
- Air bleeder valve with manometer
- Pressurizer / check valve
- Filter key for cartridge renewal

P41 purification system (picture similar)

Air quality as per DIN/EN 12021:2014 for Nitrox:

Contamination	Maximum content as per DIN EN 12021:2014	Air quality by BAUER
H_2O	25 mg/m³	≤ 10 mg/m³
CO	5 ppm(v)	Depending on filter cartridge [1]
CO_2	500 ppm(v)	Depending on intake air [2]
Oil	0.1 mg/m³	≤ 0.1 mg/m³

1 Only with BAUER special filter cartridge with hopcalite up to a maximum concentration of 25 ppm CO in intake air. The compressed clean breathing air then contains a maximum of 5 ppm CO.

2 Where the intake air exceeds the maximum permissible level of CO_2 as per DIN EN 12021:2014, use of a BAUER AERO-GUARD system is **urgently recommended!**

Purification system	P41
Operating pressure (Standard)	PN200 / PN300
Operating pressure max (PS)	350 bar
Pressure dew point	< -20 °C, equivalent to 3 mg/m³ at 300 bar
Piping connections	G 3/8“ (condensate drain G ¼“)
Filter housing volume	2,1 l
DGRL 2014/68/EU	Vessel category II
Air purification capacity (at ambient temperature 20°C and 300 bar)[1]	1.595 m³

1 When using a BAUER P61/350 filter cartridge without hopcalite. When using a cartridge with CO-, the air purification capacity is reduced by ca. 8 %. Different values for SECURUS cartridges.

Status: 02/05/2017

P61 Purification System - Filter with separate final oil and water separator (VERTICUS-OX)

SCOPE OF DELIVERY:

- 1x filter housing with long-life filter cartridge
- Separator unit with final pressure safety valve
- Check valve between separator and micro filter
- Micro filter
- Air bleeder valve with manometer
- Pressurizer / check valve
- Filter key for cartridge renewal

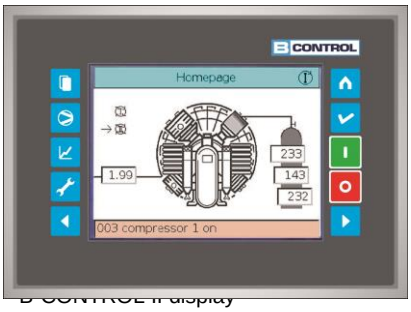
P61 purification system (picture similar)

Air quality as per DIN/EN 12021:2014 for Nitrox (see above)

Purification system	P61
Operating pressure (Standard)	PN200 / PN300
Operating pressure max (PS)	350 bar
Pressure dew point	< -20 °C, equivalent to 3 mg/m³ at 300 bar
Piping connections	G 3/8“ (condensate drain G ¼“)
Filter housing volume	2.85l
DGRL 2014/68/EU	Vessel category II
Air purification capacity (at ambient temperature 20°C and 300 bar)[1]	2.200 m³

1 When using a BAUER P61/350 filter cartridge without hopcalite. When using a cartridge with CO-, the air purification capacity is reduced by ca. 10 %. Different values for SECURUS cartridges.

B-CONTROL II Compressor Control Unit



B-CONTROL II display

BAUER B-CONTROL II is the advanced version of the B-CONTROL MICRO basic compressor control unit. It features a touch screen display:

- Fully automatic operation in line with customer-specific parameters
- Monitors all relevant operating data
- Shuts down the system in the case of deviation from defined operating parameters
- Displays operating data, maintenance information, fault messages and trends
  Can be used as a master control unit

Compressor control unit	B-CONTROL II

Status: 02/05/2017

Motor drive	Star delta starter
Output	7.5 kW
Control voltage	24 V DC
Type	Semi-automatic
Operating elements	5.7'' TFT colour display 240 x 320 pixels; touch screen plus 10 function buttons, clear text display
Standard features	▪ 5.7“ TFT colour touch screen display with clear text ▪ Fully automatic monitoring of relevant parameters; compressor shutdown if values exceed permissible ranges ▪ Choice of languages ▪ Oil pressure monitoring protects against incorrect rotation direction ▪ Maintenance information shown in display ▪ Log stores incident history ▪ Password protection for various menu levels ▪ Base load cycle and interconnected operation for up to 4 connected compressors ▪ Integrated data logger ▪ Cycle counter records load cycles of final separator stage ▪ Interface: USB 2.0, Ethernet 10/100, CAN bus Layer 2, Modbus RTU RS485, Profibus DP slave (optional) ▪ Remote On/Off (galvanically isolated) ▪ Centralised alarm (galvanically isolated) ▪ Simple software update via CF card or USB ▪ External connections for: B-SECURUS, SECCANT, B-KOOL, external display, external operating panel, fill level, gas balloon, gas measurement systems ▪ Measurement and control of O_2 content in the intake air (mixing section)

Status: 02/05/2017

Automatic condensate drain system B-DRAIN


B-DRAIN

The automatic condensate drain automatically removes the condensate that forms during compression (water/oil mixture) from the intermediate separators and the final separator and collects it in a condensate vessel, which is integrated in the compressor.
The newly developed and patented B-DRAIN automatic condensate drain uses individually controlled solenoid valves to ensure reliable, automatic condensate removal from the compressor separators.

Automatic condensate drain system	
Control voltage	24 V DC
Solenoid valve	normally open (NO)
Condensate collector capacity	approx. 14 l

OPTIONS:

SUPER SILENT housing


VERTICUS-OX with SUPER SILENT housing

Super Silent compressor housing is fully noise-insulated with optimised cooling air intake. The Super Silent soundproofed housing is recommended for applications where reduced noise is a priority, e.g. work environments.

- Closed design features targeted cooling air intake.
- Housing parts are easy to remove, ensuring fast access for maintenance.
- An exhaust air duct is easy to fit.
- Reduces acoustic pressure to:
  - 67 -70 dB(A) ± 2 dB(A) (ISO 3744) according to compressor version
- The Super Silent housing can be retrofitted.

Status: 02/05/2017

P61 Purification System - Filter with separate oil and water separator (MINI-VERTICUS-OX)

SCOPE OF DELIVERY:

- 1x filter housing with long-life filter cartridge
- Separator unit with final pressure safety valve
- Check valve between separator and micro filter
- Micro filter
- Air bleeder valve with manometer
- Pressurizer / check valve
- key for cartridge renewal´

(picture similar)

Air quality as per DIN/EN 12021:2014 for Nitrox
(see purification system in standard scope of delivery)

Purification system	**P61**
Operating pressure (Standard)	PN200 / PN300
Operating pressure max (PS)	350 bar
Pressure dew point	< -20 °C, equivalent to 3 mg/m³ at 300 bar
Piping connections	G 3/8“ (condensate drain G ¼“)
Filter housing volume	2,85l
DGRL 2014/68/EU	Vessel category II
Air purification capacity (at ambient temperature 20°C and 300 bar)[1]	2.200 m³

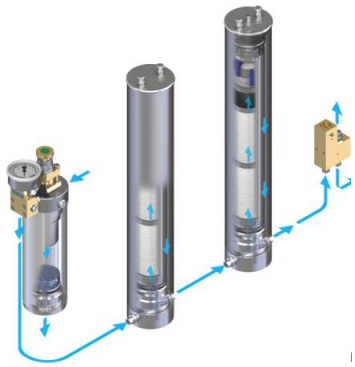
1 When using a BAUER P61/350 filter cartridge without hopcalite. When using a cartridge with CO-, the air purification capacity is reduced by ca. 10 %. Different values for SECURUS cartridges.

Status: 02/05/2017

P81 Purification System - Filter with separate oil and water separator (VERTICUS-OX)

SCOPE OF DELIVERY:

- Separator with final pressure safety valve
- Check valve between separator and micro filters
- Two micro filters
- Air bleeder valve with manometer
- Pressuriser / check valve



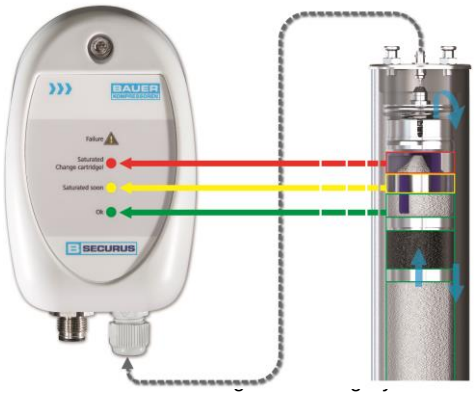
(picture similar)

Air quality as per DIN/EN 12021:2014 for Nitrox
(see purification system in standard scope of delivery)

Purification system	**P81/350**
Operating pressure (standard)	PN200 / PN300
Operating pressure max (PS)	350 bar
Pressure dew point	< -20 °C, equivalent to 3 mg/m³ at 300 bar
Piping connections	G 3/8“ (condensate drain G ¼“)
Filter housing volume	2 x 2.85 l
DGRL 2014/68/EU	Vessel category II
Air purification capacity (at ambient temperature 20°C and 300 bar)[1]	5,325 m³

1 When using a BAUER P81/350 filter cartridge without hopcalite. When using a cartridge with CO-removal, the air purification capacity is reduced by approx. 1.5 %. Different values for SECURUS cartridges.

B-SECURUS filter cartridge monitoring system



The B-SECURUS System continuously monitors filter cartridge saturation levels by measuring the moisture in the molecular filter and showing a warning in the display of the B-CONTROL MICRO unit when it is time to change the cartridge. When the dryer cartridge is 100% saturated the B-SECURUS automatically shuts down the system.

The B-CONTROL unit displays the following warnings:

- Green segment: Filter cartridge OK
- Yellow segment: Cartridge nearing saturation
- Red segment: Cartridge saturated or contact fault. Compressor is shut down

Filter cartridge monitoring unit	**B-SECURUS**
Supply voltage	24 V DC
Power consumption	3 VA
Protection class	IP 65

Status: 02/05/2017

Integrated B-DETECTION PLUS i gas measurement system

The online gas measurement system B-DETECTION PLUS monitors the quality of the compressed air: Measurement of CO, CO_2, O_2 as well as optional absolute humidity (as option) and VOC (as option). By means of the B-CONTROL control, you can at any time observe compliance with the limit values of the breathing air standard DIN EN 12021:2014. In the case of an exceedance of the limit, the control system will shows an alarm on the display by means of an optical warning signal and switch off the system before air contaminated with pollutants enters the breathing air bottles.

An automatic flush valve (optional) ensures that the contaminated air is directed into the open air without interrupting the operation of the system if short-term limit values are exceeded.

VERTICUS with integrated B-DETECTION PLUS i

PN200 filling device for nitrox

Filling Device	4xPN200 (Nitrox)
Nominal pressure (PN)	200 bar
Valve type	4 filling valves
Filling hose	4 Unimam high pressure filling hose, 1 m length
Pressure display	1 Manometer, as well as on the B-CONTROL display
Threaded connection	M26x2
Corresponding standard	DIN 144-3

External filling panels with nitrox devices

These external filling panels can be wall-mounted as separate panels and are suitable for remote operation for installation in a separate room.

Particle filter

In combination with the P41, P61 and P81 purification systems, an optional integrated particulate filter is available for effective protection against fine dust and other solid particles. This permits the reliable removal of particles in accordance with ISO 8573 class 2.

Status: 02/05/2017

Additional interstage separator after 1st stage

In operation in regions with high humidity, e.g. tropical regions, we recommend installing an interstage separator after the first compression stage. This can lengthen the service life of the system and reduce maintenance costs.

Inters

Interstage manometer set

The interstage pressure manometers display the operating pressure for the individual compression stages. This pressure information enables the sealing tightness of the valves (intake and outlet) of each stage to be checked and potential fault sources to be rapidly identified. The interstage pressure manometers are mounted in the compressor housing.

Interstage manometer

Exhaust air duct

- Exhaust air duct for cooling air flow outlet at top, with connection option for exhaust air channel
- For mounting on the compressor housing

Note: The exhaust air duct can only be mounted on the Super Silent housing!

Standard exhaust air duct

Exhaust air duct with ventilating shutters

An exhaust air duct with ventilating shutters is used with compressors installed in a container or compressor room to regulate ambient temperature. At low ambient temperatures (e.g. < +5 °C) the heated cooling air heats the room; at high ambient temperatures the heated cooling air is directed outdoors.

SCOPE OF DELIVERY

- Exhaust air duct with canvas flange for exhaust channel (to be supplied on site)
- Louvers for circulating air control
- Actuating drive for louvers
- Electronic high - low action control system incl. temperature sensor (mounted in compressor air intake duct; set value +18 ± 4°C)
- Mounted on compressor housing incl. electric installation

Exhaust air duct with ventilating shutters mounted on a VERTICUS 5

Important: If the pressure drop is exceeded by 5 mmWS = 0.5 mbar (e.g. when the exhaust air duct is very long), an additional fan has to be provided on site.
The system can be mounted on the top or rear of the compressor (please state requirements when ordering).

Note: The exhaust air duct can only be mounted on the Super Silent housing!

Status: 02/05/2017

Condensate collection system 60 l

- 60-litre PVC tank, capacity approx. 40 litres
- Exhaust air is filtered by a soundproofed active charcoal filter
- Filling level display with visual warning when the collector requires emptying (optionally with signal for B-CONTROL)
- Drain tap for condensate, connector thread G ½“
- Dimensions: ∅ 400 mm x 1.000 mm, weight approx. 15 kg

60 l Condensate collection system

B-KOOL II 680i UND 680s refrigeration dryer

The B-KOOL refrigeration dryer cools the compressed air and thus extends the service life of filter cartridges many times over.
The B-KOOL cools the hot saturated air in the compressor to approx. +3 °C, enabling the final separator to extract significantly higher volumes of condensate and thus extending the service life of the downstream filter cartridges. Depending on the ambient temperature, the life of the filter cartridges can be extended by up to 11 times. The higher the ambient temperature, the longer the lifespan of the filter cartridges when the B-KOOL is used.

B-KOOL II 680i

TYPES

- B-KOOL II 680i, integrated (mounted on a (MINI-)VERTICUS with Super Silent housing)
- B-KOOL 680s standalone positioned next to the compressor

Model	B-KOOL II 680i and B-KOOL 680s
Ambient temperature	+5 °C to +45°C
Refrigerant	R 134 a
Intake temperature of pressurised air	max. 60°C
Max. operating pressure, pressurised air	350 bar / 500 bar
Min. operating pressure, pressurised air	100 bar
Permissible compressor charging rate	200 – 700 l/min (10 l cylinder filling from 0-200 bar)
Power supply	100 – 127 VAC 50 Hz or 200 – 240 VAC 50/60 Hz
Power consumption	max. 550 W at 50 Hz, 610 W at 60 Hz

DIMENSIONS; WEIGHT AND CONNECTIONS

Model	B-KOOL II 680i	B-KOOL 680s
Dimensions (L x W x H)	760 x 346 x 535 mm	386 x 695 x 565 mm
Weight approx.	50 kg	48 kg

Status: 02/05/2017

AERO-GUARD CO_2 Absorber

AERO-GUARD

Efficient removal of CO_2 from breathing air: A sophisticated bypass system feeds the compressor intake air through the AERO-GUARD. Only around two-thirds of the air passes through the filter cartridge that absorbs the CO_2 from the air. This process reduces the CO_2 content to one-third of that of the intake air.

NITROX VERSION: An ingenious bypass system passes the NITROX generated by the NITROX membrane system through the AERO-GUARD-OX. Only about four fifths of the air flow through the filter cartridge, which absorbs the CO2 contained in the NITROX. This reduces the CO2 content to around 20% of the value at the membrane outlet.

SCOPE OF DELIVERY, AERO-GUARD:

- Intake pipe (order connections separately)
- Water barrel, 60 l (for AERO-GUARD DUO – 2 × water barrels each 60 l)
- Filter cartridge; filling: 9 kg special carbon dioxide absorber

MODELS:

Type / Size	Suitable for charging rate [1]	Dimensions (W x D x H)	Operating weight [2]
	l/min	cm	
Aero-Guard-S	100 – 150	50 x 46 x 72	26 kg
Aero-Guard-M	160 – 230		
Aero-Guard-L	240 – 320		
Aero-Guard-XL	330 – 450		
Aero-Guard-XXL	460 – 700		
Aero-Guard Duo 1000	650 – 1000	85 x 62.5 x 87	54 kg
Aero-Guard-OX-L	260 – 320	50 × 46 × 72	26 kg
Aero-Guard-OX-XL	330 – 450	50 × 46 × 72	26 kg

1 Charging rate of the connected compressor measured with cylinder filling from 0 – 200 bar ± 5%.

2 Includes filter cartridge and 10-litre water ballast.

Status: 02/05/2017

TECHNICAL OPERATING DATA:

Model	AERO-GUARD S-XXL	AERO-GUARD DUO 1000	AERO-GUARD-OX L-XL
Medium	Pressurised air		NITROX (max. 40 Vol% O_2), Pressurised air
Ambient temperature	+5 to +45°C		
Intake air temperature	+5 to +45 °C		
Rel. humidity of intake air	10 to 100 %		10 to 60 %
CO_2 intake air concentration	max. 1000 ppm_v CO_2		max. 2000 ppm_v CO_2
CO_2 output air concentration	1/3 of intake concentration = max. 330 ppm_v CO_2 at 1,000 ppm_v intake concentration CO_2		1/5 of intake concentration = approx. 400 ppmv CO_2 at 2000 ppmv intake concentration CO_2
Designed for compressor charging rate	100 – 700 l/min	650 – 1,000 l/min	260 – 450 l/min
Service life	Min. 43 operating hours (at 700 l/min output and intake concentration of 1000 ppm CO_2). Cartridge must be changed after max. one year even if the maximum service life is not reached.	Min. 60 operating hours (at 1000 l/min output and intake concentration of 1000 ppm CO_2). Cartridge must be changed after max. one year even if the maximum service life is not reached.	Approx. 37 operating hours (at 450 l/min output and intake concentration of 1000 ppm CO_2). Cartridge must be changed after max. one year even if the maximum service life is not reached.
Maximum daily operating time:	5 h		
Cartridge filling:	Approx. 9 kg special carbon dioxide absorber per cartridge		
Pressure loss	Approx.20 mbar		
Max. permissible tilt	15°		
Permissible altitude	0 - 2000 m AMSL		
Finish	Container blue, cover black/silver, PVC pipes grey RAL7011		

Status: 02/05/2017

Relevant EC Directives (where applicable)

- EC Machinery Directive (2006/42/EC)
- EC Pressure Equipment Directive (2014/68/EU)
- EC Low Voltage Directive 2006/95/EC
- EC Electromagnetic Compatibility (EMC) 2004/108/EC

Applied national standards and technical specifications, in particular

- Betriebssicherheitsverordnung (German Industrial Safety Regulation) of 2015
- AD 2000
- Technische Regeln Druckgase (TRG; **Technical Regulations for Compressed Gases**):TRG 400, 401, 402 (w/o permanent premises) and TRG 790
- Unfallverhütungsvorschrift (BGR; German Accident Prevention Regulations) BGR 500
- All BAUER filter housings are designed, manufactured and tested in line with Accident Prevention Regulations and regulations under AD-2000 provisions and DGRL2014/68EU.

Documentation:	1x operating manual and parts list with exploded view drawing on DVD
Design:	In line with the state of the art according to DIN, VDE, TÜV and Accident Prevention regulations
Testing:	In line with Bauer Standard as per DIN EN 10204 - 3.1

Otherwise the **General Terms and Conditions of** BAUER KOMPRESSOREN (AGB) in the version valid at the time of contract conclusion apply. These Terms & Conditions can be viewed and downloaded at the website www.bauer-kompressoren.com, or sent by BAUER on request.

All information is given without assumption of liability and subject to technical changes.

Status: 02/05/2017