

B-KOOL

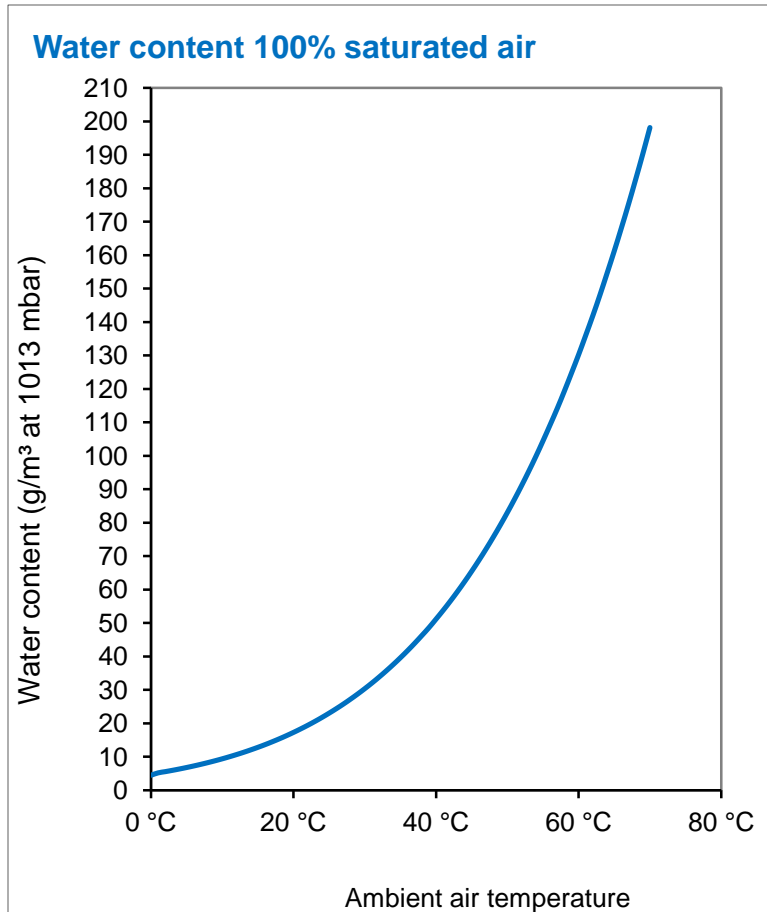
- Up to 11-times extension of the filter cartridge life



› Topic

1. Why B-KOOL?
2. How does B-KOOL work?
3. When it makes sense to use B-KOOL?
4. Technical details and variants
5. Differences to the “old“ AIRKOOL
6. Summary

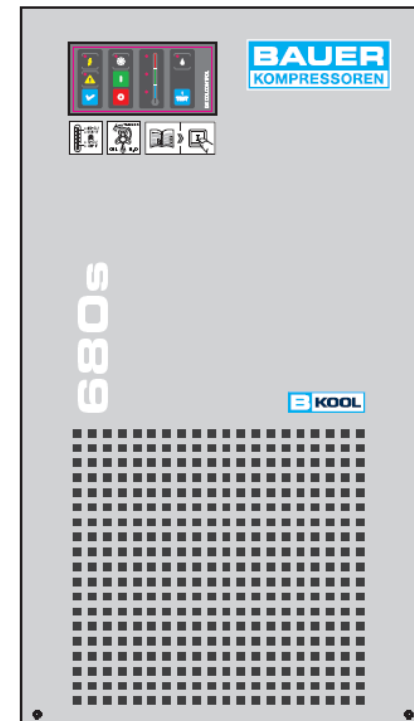
► Why B-KOOL?



- The higher the air temperature, the more humidity can be adsorbed (as vapour)
- Example: 5,95 g/Nm³ at 3°C
51,21 g/Nm³ at 40°C
- While cooling down 100% saturated air, humidity (water) will drop out. At lower temperatures, the air cannot adsorb that quantity of water compared to higher temperature.

› Why B-KOOL?

- The life time of a filter cartridge can be extended considerably by providing additional cooling of the compressed air using a B-KOOL.
- Reason:
 - Due to the cooling down of the air to approx. +3°C, the air can not adsorb that much humidity compared to higher temperature. Humidity (water) will drop out and can be separated in the final separator.
 - Hence, the filter cartridge has to adsorb less humidity.



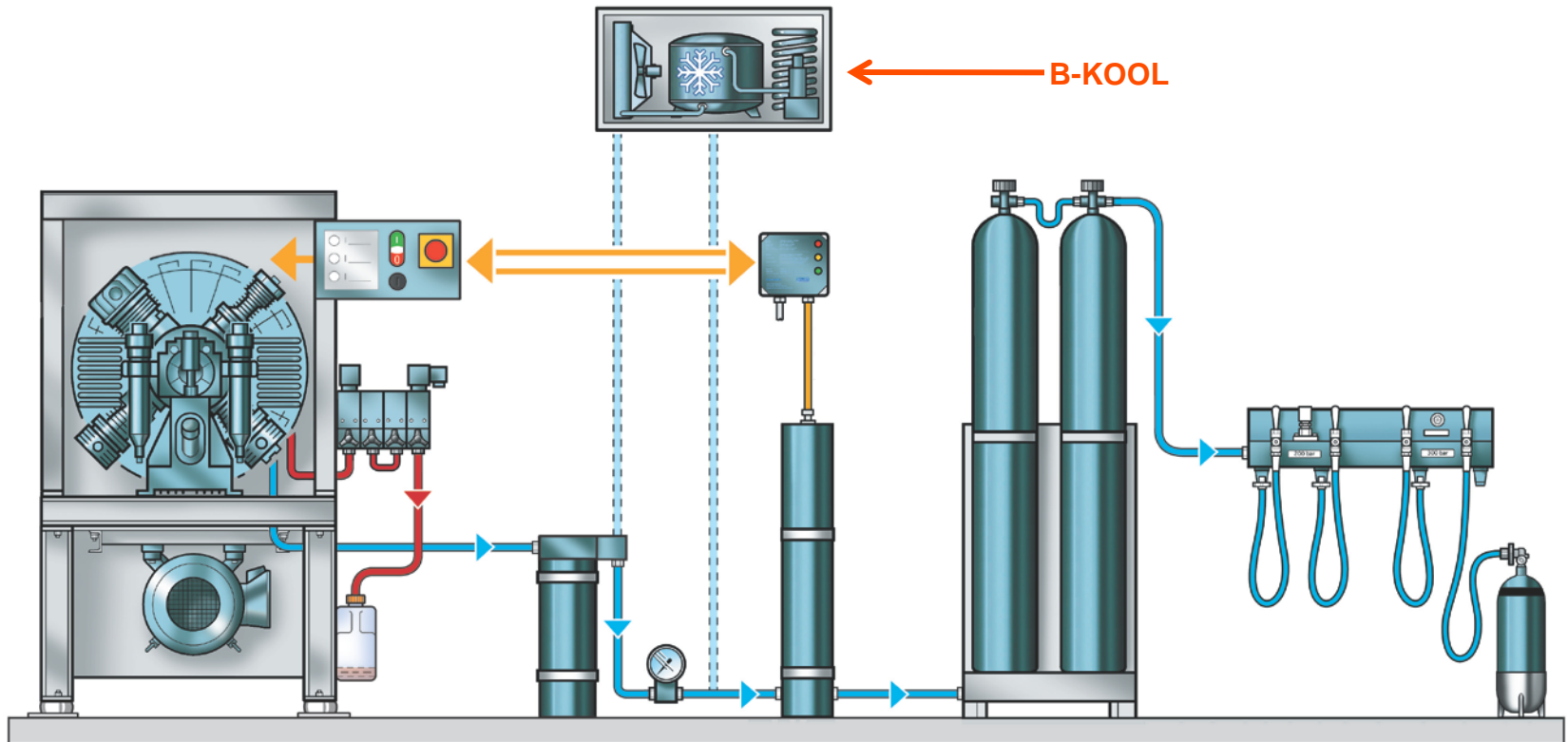
➤ Why B-KOOL?

Fast repayment of the purchasing costs especially in case of:

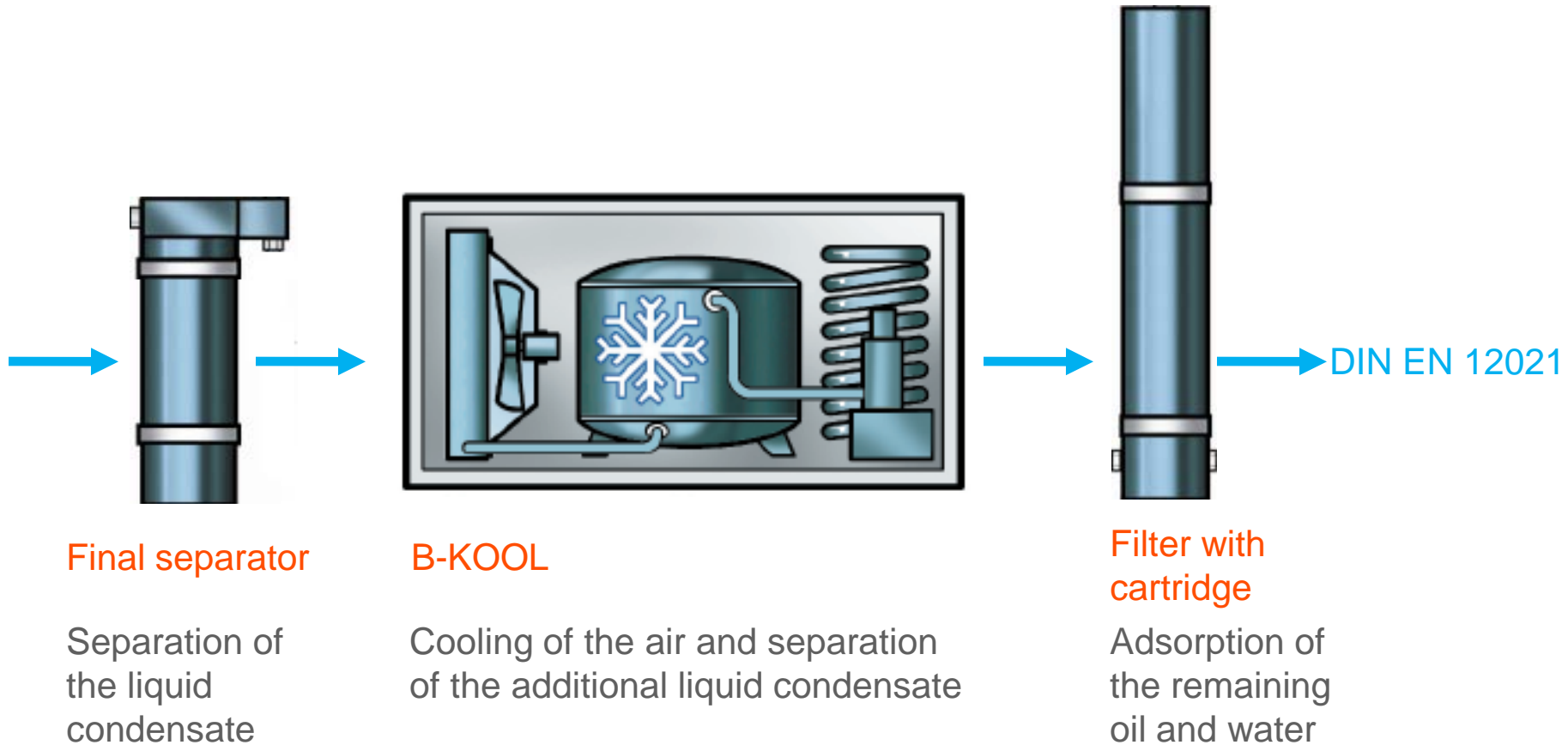
- Long operation hours
- High ambient temperatures



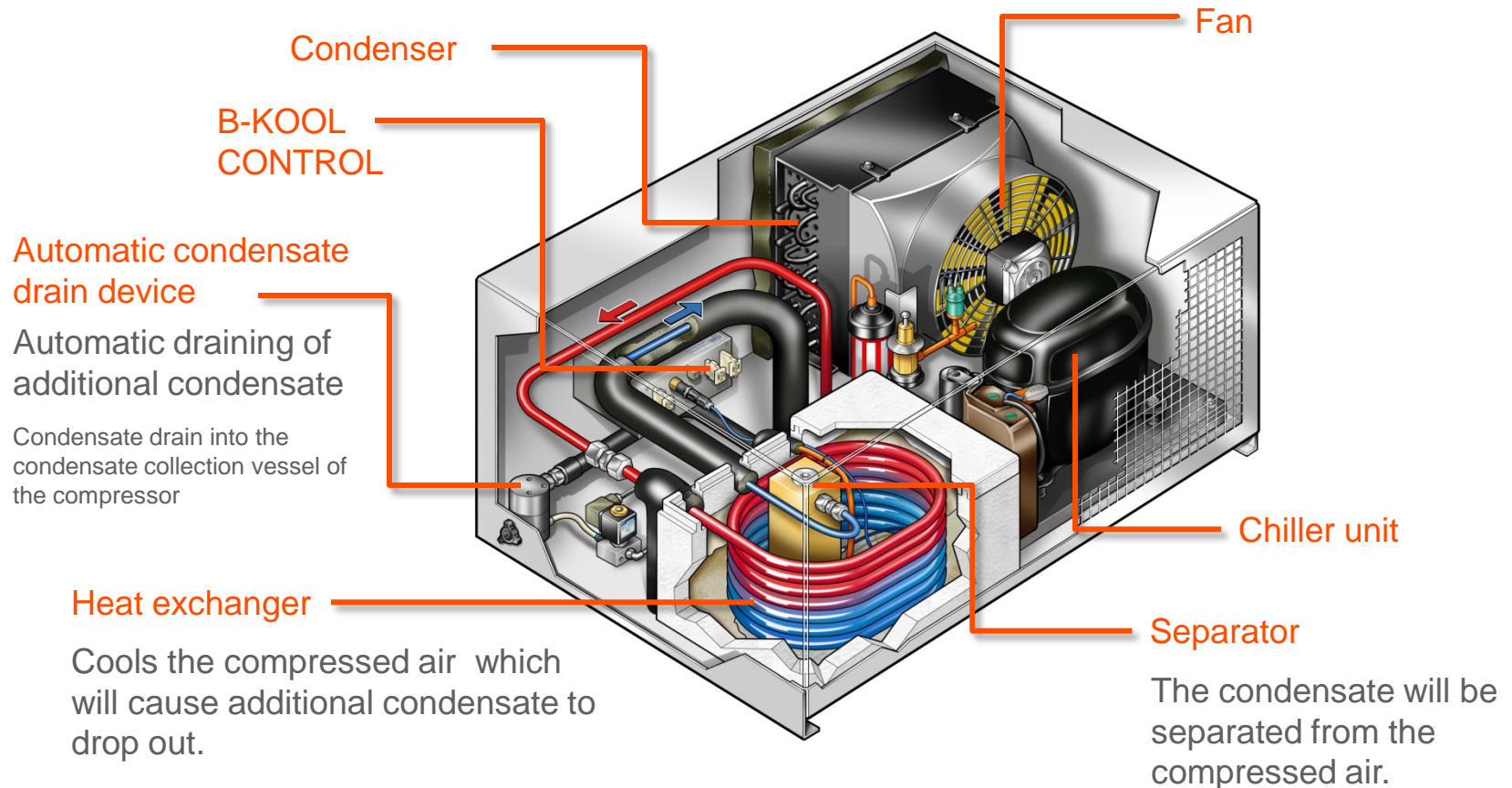
► How does B-KOOL work?



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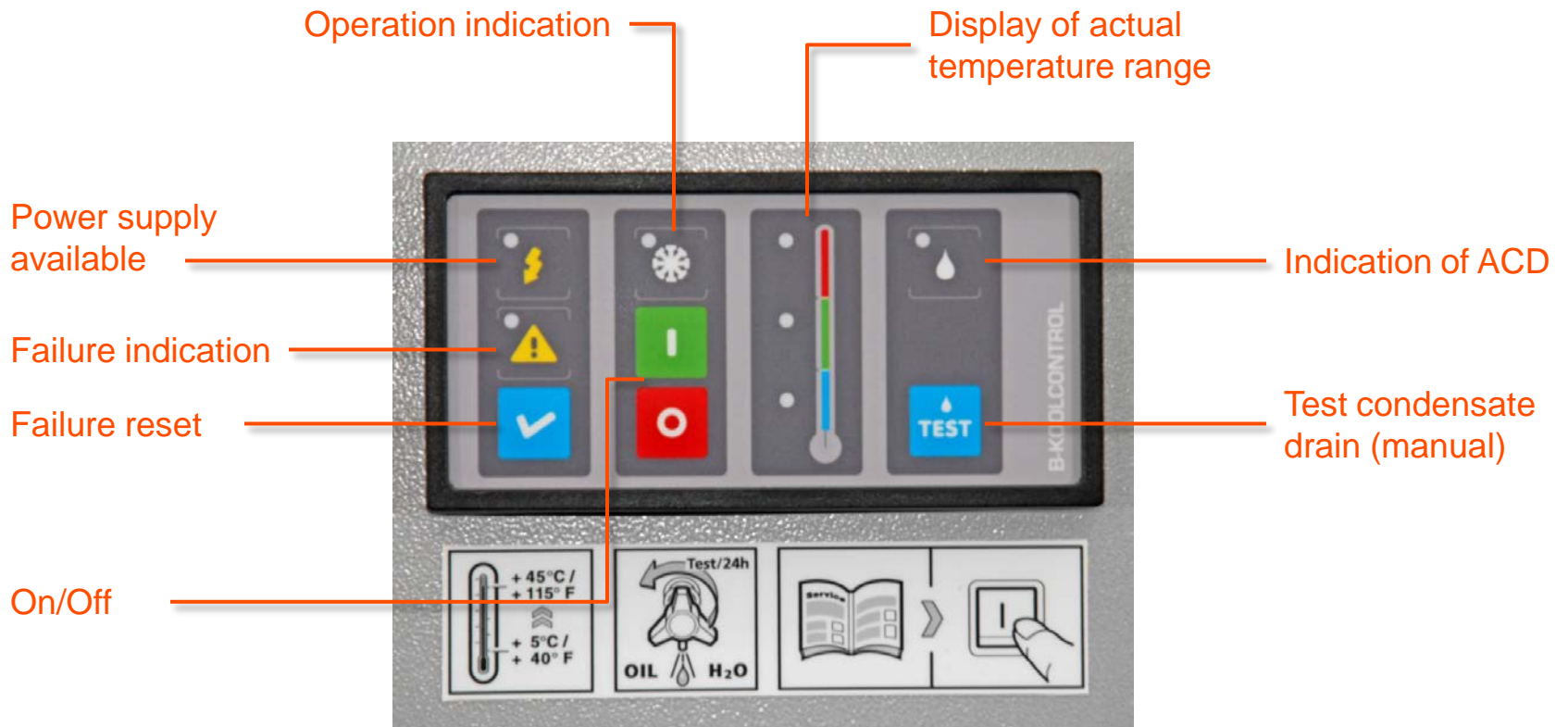


► How does B-KOOL work?

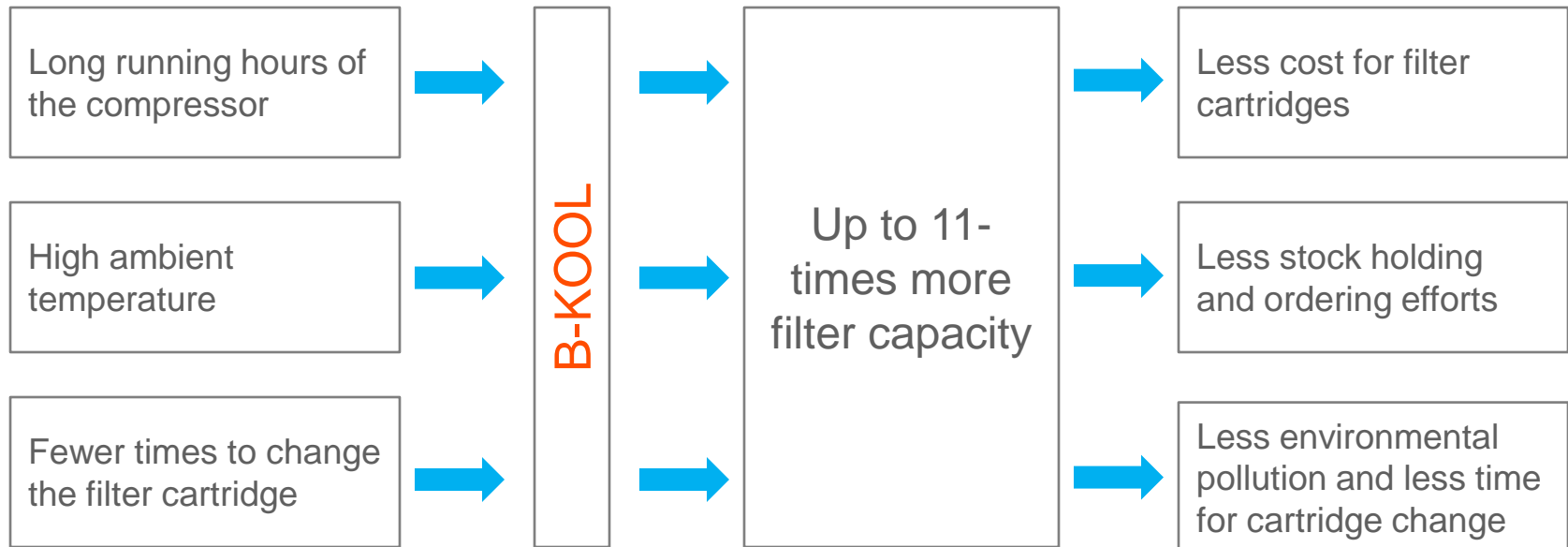


► How does B-KOOL work?

Control: B-KOOL CONTROL



› When does B-KOOL make sense?



› When does B-KOOL make sense?

General cartridge life time extension with B-KOOL (approx.)

Ambient temperature	Life time extension of filter cartridge by using B-KOOL
20°C	4,8 x
30°C	7,2 x
40°C	9,7 x
45°C	11 x

As the ambient temperature increases, B-KOOL works more efficiently.

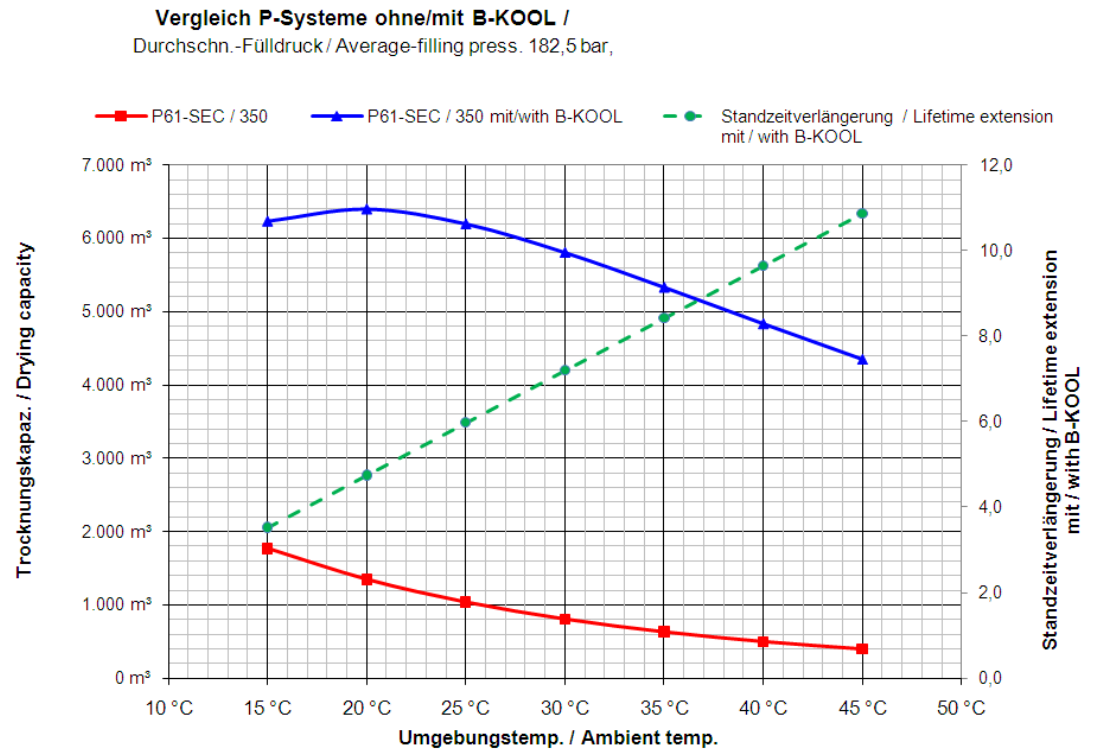
» When does B-KOOL make sense?

Example calculation:

- P61
- 40°C ambient temperature
- Average pressure 235 bar (equivalent to approx. 350 bar final pressure)
- Dive tank: 10 litre and 330 bar pressure

Result:

- W/o B-KOOL: **approx. 223** tank fillings until cartridge change
- With B-KOOL **approx. 2147** tank fillings until cartridge change



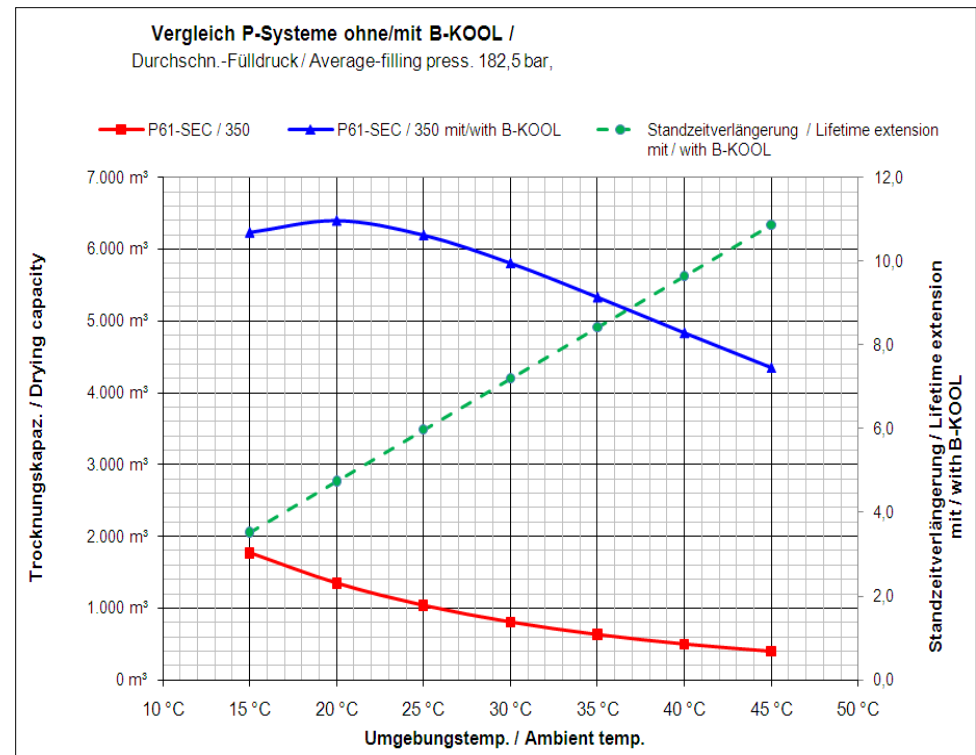
» When does B-KOOL make sense?

Example: compressor with P61 and B-KOOL

Ambient temperature	Cartridge capacity w/o B-KOOL	Cartridge capacity with B-KOOL	Cartridge life time extension
20°C	1350 m ³	6403 m ³	4,8 x
30°C	807 m ³	5807 m ³	7,2 x
40°C	501 m ³	4831 m ³	9,7 x

Remark: Cartridge capacity [m³], based on average pressure of approx. 183 bar (equivalent to 225 bar final pressure)

The cartridge life time factor is independent of pressure and purification system!



► When does B-KOOL make sense?

Example calculation:

Presumption:

- Number of bottles to fill per day approx. 25
- 250 „bottle filling“ days per year
- P61 purification system
- Cost for a filter cartridge: 110,- €
- 225 bar final pressure
- 10 litre cylinder volume
- Ambient temperature: 40°C
- Investment B-KOOL: 2.600,- €

- **Additional information:**
 - Cartridge capacity P61 at 40°C ambient temperature **w/o B-KOOL: 501m³**
 - Cartridge capacity P61 **with B-KOOL: 4831m³**

Calculation:

1. Required air quantity per year: 14.060 m³
(25 bottles x 250 days x 10 litre x 225 bar / 1.000 = 14060 m³)
2. Required filter cartridges per year
w/o B-KOOL
(14060 m³ air quantity per year / 501 m³ cartridge capacity P61 w/o B-KOOL = 28 cartridges)
3. Required filter cartridges per year
with B-KOOL
(14.060 m³ air quantity per year / 4831 m³ cartridge capacity P61 with B-KOOL = 2,9 cartridges)
4. Saving (cartridge cost) per year using B-KOOL
(28 cartridges x 110,- € – 2,9 cartridges x 110,- € = 2761,- €)
5. Payback period of B-KOOL: approx 1 year
6. Savings in 5 years:
(2761 € x 5 – 2.700 € = approx. 11.200,- €)

► Technical details and variants

Two versions available:

„Integrated“ on top of Verticus5:
B-KOOL 680i



„Stand alone“
B-KOOL 680s



► Technical details and variants

Recommendation for use of B-KOOL

- B-KOOLi on top integrated in the compressor unit*
- B-KOOLs to be placed separately alongside the compressor

COMPRESSOR	B-KOOL
PROFI-LINE	B-KOOL 680s
MV III	B-KOOL 680s
KAP	B-KOOL 680s
V5 (Super Silent)	B-KOOL 680i
PE TE/PE HE	B-KOOL 680s
PE VE open	B-KOOL 680s
PE VE Silent	B-KOOL 680i



► Technical details and variants

Limitation of the use of the B-KOOL based on purification systems:

Purification-system	B-KOOL	Comments
P11	✗	
P21	✗	
P31	✗	
P41	✓	
P42	✗*	For new units only/no retrofit possible
P60/P61	✓	
P62	✗*	For new units only/no retrofit possible
P80/P81	✓	

* Available from end of 2012

► Technical details and variants

Model	B-KOOL680i and B-KOOL680s
Medium	Air & Nitrox (max 40% O ₂)
Ambient temperature range	+5 °C to +45°C
Refrigerant	134 A
Max inlet temperature	60°C
Max working pressure	350 bar / 500 bar
Min working pressure	100 bar
Flow rate	200 – 700 l/min (charging rate, 10 litre bottle, 0-200 bar) 200 – 650 l/min (FAD, according to ISO 1217)
Power supply	100 - 127VAC 50/60Hz or 200 - 240VAC 50/60Hz depending on variant
Power consumption	max 550W at 50 Hz

*measured by filling up a dive tank from 0 - 200 bar

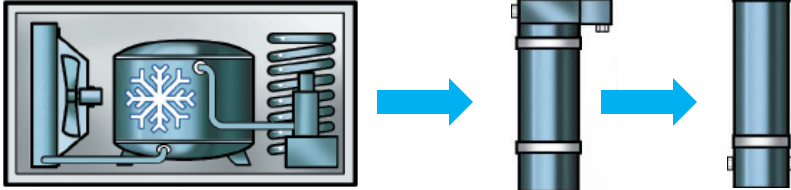
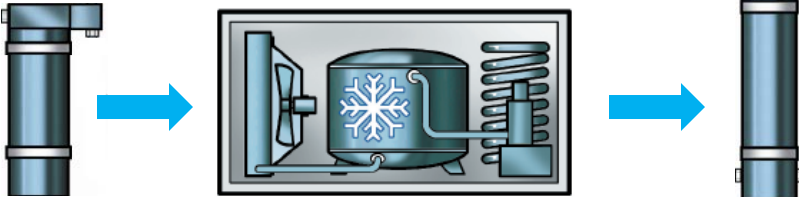
► Technical details and variants

Model	B-KOOL680i	B-KOOL680s
Dimensions (L x W x H)	760 x 346 x 535 mm	386 x 695 x 565 mm
Weight approx.	50 kg	48 kg
Air inlet connection	8S (bulkhead fitting)	8S (bulkhead fitting)
Air outlet connection	8S (bulkhead fitting)	8S (bulkhead fitting)
Condensate outlet connection	8 mm tube (outer diameter)	8 mm tube (outer diameter)

Condensate drain: every 10 min for 3 sec (not adjustable)

› Differences to the „old“ AIRKOOL

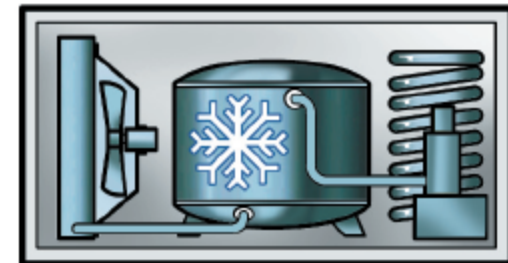
Differences to the „old“ AIRKOOL

<p>„old“ AIRKOOL</p>		<p>Position: before final separator and filter cartridge</p>
<p>B-KOOL</p>		<p>Position: between final separator and filter cartridge</p>

› Differences to the „old“ AIRKOOL

Advantages of B-KOOL compared to the „old“ AIRKOOL

- Easy installation in the piping between final separator and filter cartridge
- Easy retrofit
- No further insulation necessary because the cooling + separator is inside the B-KOOL
- Very short „cooling down time“ (< 5 min) after B-KOOL start (AIRKOOL took approx. 15 to 20 minutes).
- Better efficiency



► Installation

To install the B-KOOL, the following installation kits are necessary:

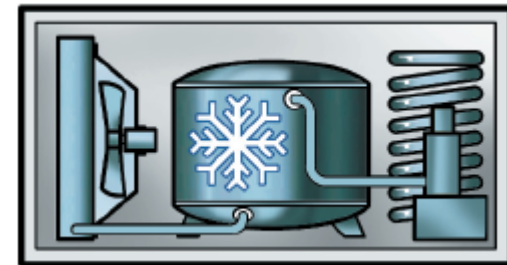
Compressor unit	Filter system	B-KOOL 680i	B-KOOL 680s
PE-VE F03	P42*	129014	129015
PE-VE F03	P61	129016	129018
PE-VE F02	P41 & P61	129016	129018
Verticus 5	P41 & P61	129016	129018
Verticus 5	P81	129017	129019
Verticus 5 500 bar	P41 & P61	129056	129060
PE-VE F03 420 bar	P41 & P61	129056	129060
PE-HE	P42*	-	129020
MiniVerticus3	P41 & P61	-	160028
Mariner320	P41	-	129021

*B-KOOL + P42 possible from end of 2012

➤ Summary

Advantages of B-KOOL

- Reduce costs
- Up to 11 times less cost for replacement filter cartridges
- Good efficiency after very short time
- Safe function only by using purification system with “SECURUS”
(Calculation of filter cartridge life time is approximate, because it depends on several factors)
- Retrofit
- Suitable for B-TROX
- 2 versions available
 - Integrated on top of the compressor „i“
 - For use next to the compressor „s“



B-KOOL

