Environmental Visage

ADDITIONAL INFORMATION FOR APPLICATION PAN-010830

RASSAU BATTERY MANUFACTURING SITE
GS YUASA BATTERY MANUFACTURING UK LIMITED

1. Introduction

This short submission is to be read in conjunction with the Permit application number PAN-010830 which seeks to vary Environmental Permit Number BV5386IX. This additional submission to the original application provides information on a newly proposed discharge point for the Rassau Battery Manufacturing Site on Rassau Industrial Estate in Ebbw Vale, South Wales. The site is operated by GS Yuasa Battery Manufacturing UK Limited.

2. Detail of the Submission

In June 2020, GS Yuasa Battery Manufacturing UK Limited submitted an application detailing required amendments to their existing Environmental Permit in order to incorporate a new Lead Oxide mill at the Rassau Battery Manufacturing Site. At that time, it had originally been planned that the required release from a local exhaust ventilation extract serving a new cutting and brushing line, would be incorporated into A18, which is the vacuum extraction for Cutting Machines 1 – 7, similar processes to the new line now proposed.

However, it has now been determined that this extract has insufficient capacity to accept the additional loading from the new cutting and brushing lines in addition to the existing load and hence a new discharge point will be required to serve the new cutting and brushing line extract. The new discharge point will be known as A3. A3 is currently included within the Permit as serving the Casting Off-Cut Hopper in Factory 1. However, as part of the original application to vary the Permit (PAN-010830; June 2020), this redundant emission point was scheduled to be removed.

It is therefore proposed that the new discharge which will serve the new Mill 8 cutting and brushing line will take the reference number A3. An updated emission point diagram which shows the proposed Lead emission points to atmosphere is presented as Figure 1.

The technical specification of the proposed Luksal Vario 3 filter which will serve the new discharge point (A3) is provided as Appendix A. The discharge conditions and guaranteed emission limit values for the filter have been provided by Luksal as follows:

Characteristics	**Vario 3**
Diameter of the discharge stack (mm)	560
Efflux temperature of the new release (^{o}C)	± 20
Efflux velocity for the new release (m s^{-1})	11.2
Actual volumetric flowrate for the new release	10,000 m^3 h^{-1} 2.77 m^3 s^{-1}
Volumetric flowrate at STP for the new release	8,869 Nm^3 h^{-1} 2.46 Nm^3 s^{-1}
Pollutant discharge rate (g s^{-1})	0.00025
Pollutant discharge rate (mg Nm^{-3})	0.1

Additionally, the H1 assessment originally produced and subsequently revised as requested by NRW has been further updated to incorporate all current and proposed Lead discharges from the site operations. As the conservative H1 assessment tool cannot screen the estimated process contributions as insignificant, a detailed dispersion modelling assessment has been prepared to accompany this submission. Both the H1 assessment and the dispersion modelling report assume that emissions from the site occur on a continual basis (8,760 hours per year) and therefore present a worst-case scenario.

Where measured data is available, as is the case for the majority of the emission points, long-term discharge conditions within both the H1 and dispersion modelling assessments have applied measured data. In the case of the new emission points, A1 and A3, the discharges are assumed to operate at capacity and at the emission limit values which are expected to be incorporated into the revised Permit. The assessments therefore provide a realistic assessment of the impact of current emissions, coupled with a worst-case assessment of the proposed new discharges.

3. Results and Conclusion

The results of the H1 assessment cannot screen the proposed emissions as insignificant when compared against the Ambient Air Directive limit value for ambient concentrations of Lead (0.5 µg m^{-3}) and would therefore also not be considered to be insignificant when compared to the more stringent objective value specified by the UK Air Quality Strategy (0.25 µg m^{-3}). As such, a detailed dispersion modelling assessment has been prepared to support the application.

The detailed dispersion modelling assessment demonstrates that the impact of the emissions from the site operations remain within the UK Air Quality Strategy objective value of 0.25 µg m^{-3} across the entire modelled area and in most cases can be screened as insignificant. Some areas within the operational site boundary cannot be screened as insignificant, with the overall Predicted Environmental Concentrations equating to between 70 and 80 % of the AQS.

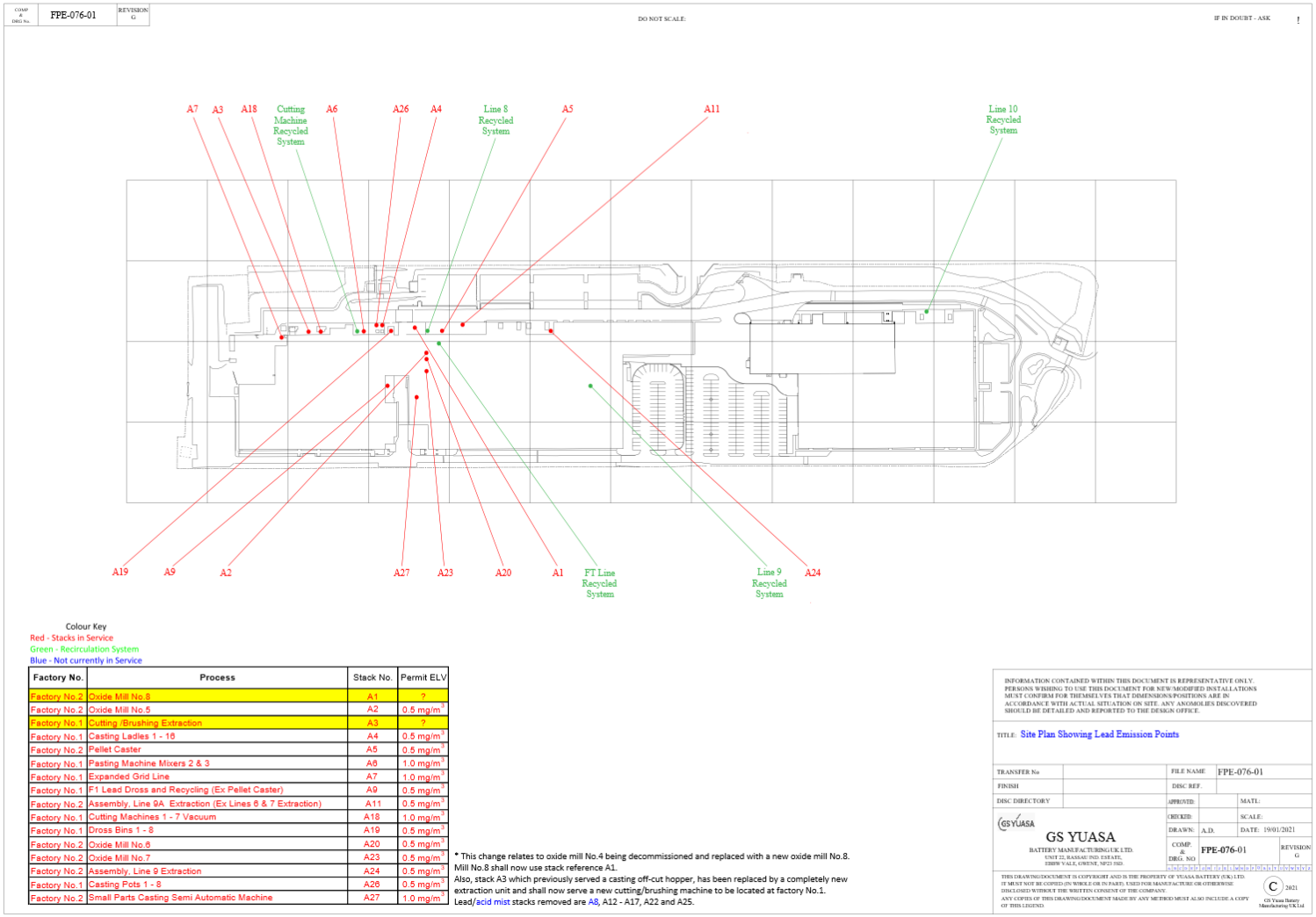
However, the installation area is not classed as a sensitive receptor, the PEC does not exceed the AQS at any point, and Lead processes across the site apply the Best Available Techniques. As such, the PEC is considered acceptable and no further assessment of these maximum contributions is required.

At the modelled discrete sensitive receptors, which include sensitive human health receptors such as schools and residential areas, sensitive environmental features such as local reservoirs and sensitive ecological sites such as designated nature sites in the local area, the impact of Lead emissions from the Rassau Battery Manufacturing Site operations screen as insignificant either at the initial or secondary assessment stage.

The potential impact of Lead deposition to open ground outside of the site boundary such as at sensitive ecological receptors, farmland, gardens or allotment plots in the local area has also been assessed and is negligible.

The results from detailed modelling therefore confirm that emissions of Lead to air from the existing and proposed operations at the site are acceptable, will not result in any exceedance of the UK Air Quality Strategy objective value, and are screened as insignificant at local sensitive receptors.

Figure 1 Site Plan Showing Lead Emission Points



Factory No.	Process	Stack No.	Permit ELV
Factory No.2	Oxide Mill No.8	A1	?
Factory No.2	Oxide Mill No.5	A2	0.5 mg/m³
Factory No.1	Cutting /Brushing Extraction	A3	?
Factory No.1	Casting Ladles 1 - 16	A4	0.5 mg/m³
Factory No.2	Pellet Caster	A5	0.5 mg/m³
Factory No.1	Pasting Machine Mixers 2 & 3	A6	1.0 mg/m³
Factory No.1	Expanded Grid Line	A7	1.0 mg/m³
Factory No.1	F1 Lead Dross and Recycling (Ex Pellet Caster)	A9	0.5 mg/m³
Factory No.2	Assembly, Line 9A Extraction (Ex Lines 6 & 7 Extraction)	A11	0.5 mg/m³
Factory No.1	Cutting Machines 1 - 7 Vacuum	A18	1.0 mg/m³
Factory No.1	Dross Bins 1 - 8	A19	0.5 mg/m³
Factory No.2	Oxide Mill No.6	A20	0.5 mg/m³
Factory No.2	Oxide Mill No.7	A23	0.5 mg/m³
Factory No.2	Assembly, Line 9 Extraction	A24	0.5 mg/m³
Factory No.1	Casting Pots 1 - 8	A26	0.5 mg/m³
Factory No.2	Small Parts Casting Semi Automatic Machine	A27	1.0 mg/m³

* This change relates to oxide mill No.4 being decommissioned and replaced with a new oxide mill No.8. Mill No.8 shall now use stack reference A1.
Also, stack A3 which previously served a casting off-cut hopper, has been replaced by a completely new extraction unit and shall now serve a new cutting/brushing machine to be located at factory No.1.
Lead/acid mist stacks removed are A8, A12 - A17, A22 and A25.

APPENDIX 1

TECHNICAL SPECIFICATION OF THE LUKSAL VARIO 3 FILTER

VARIO – Separation of fine dust particles

The VARIO series is particularly suitable for separation of fine dust.

The VARIO units are of modular construction in order to meet different requirements, such as dust characteristics or the volume of exhausted air.

Separation of fine dust

The Task

Keller Lufttechnik plans, engineers and fabricates systems to keep air clean in all industrial sectors in which air pollutants are collected, transported and separated. Innovative filter technologies and a systematic equipment design ensure optimal separation results.

The VARIO series is particularly suitable for separation of fine dust. Nearly all types of dust can be successfully separated, such as those created in metal processing, polymer processing, and in chemical, pharmaceutical and ceramic industries, as well as non-metallic minerals.

The VARIO units are of modular construction in order to meet different requirements, such as dust characteristics or the volume of exhausted air. Sturdy and low-noise units allow for reliable 24-hour operation with constant air flow.

Examples of applications

Mechanical and thermal processes during which dry, airborne dust is created.

- Turning
- Drilling
- Milling
- Grinding
- Brushing
- Welding
- Blasting
- Fettling
- Painting
- Mixing
- Weighing
- Recycling

Advantages

- Filter elements for a variety of material properties
- Compact construction
- Modular design
- Flexible installation options
- Simplified installation in hard-to-access area
- Reduced transportation costs
- Improved access for inspection
- Deflection construction at coarse dust fractions
- Reduced noise by means of an integrated noise

VARIO 6 with chip preseparation

Function

Function

The dust-laden air flows through the dirty air inlet into the filter unit. A baffle plate slows down and deflects the dust particles to protect the filter elements from direct impact. An air down-flow is created between the filter elements, allowing the dust particles to drop. A fan in the clean air chamber draws the polluted air through the filter elements, depositing the dust particles onto the filter surface. Because the filter elements are cleaned continuously by compressed air pulses during operation, the air flow remains constant. The cleaned air exits through the top of the unit and in most cases can be re-circulated into the work area or vented outdoors. The separated dust falls into the dust collector containers.

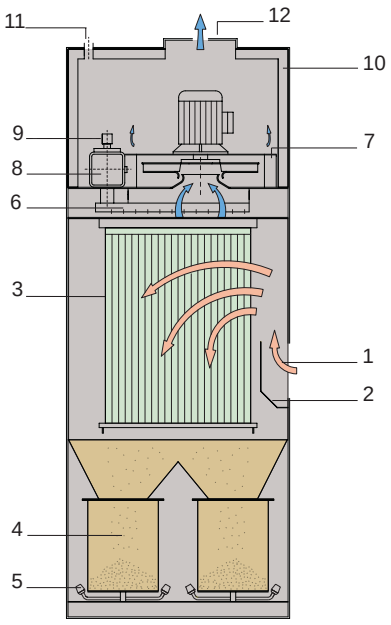
Filter elements

The filter elements are of high quality and are available in a variety of materials. Each filter element is selected depending on the specific application in order to achieve optimum filtration, separation efficiency, and length of service.

Cleaning the filter elements

The pulse cleaning cycle can be adjusted for each application by means of an integrated control unit. The air flow of the fan remains nearly constant. The cleaning operation is activated either by a differential pressure regulator while in operation, or by a programmable downtime cleaning cycle.

Features of the VARIO



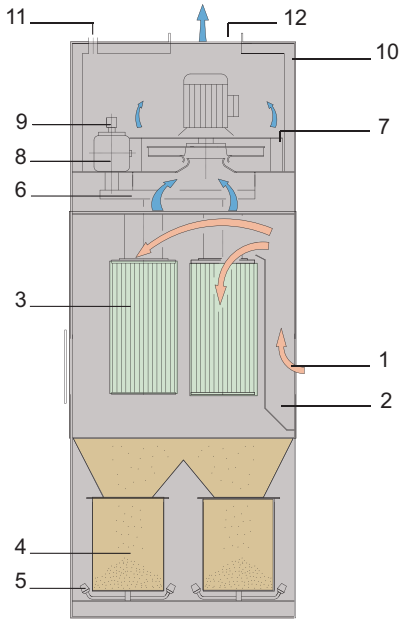


Diagram and description of VARIO

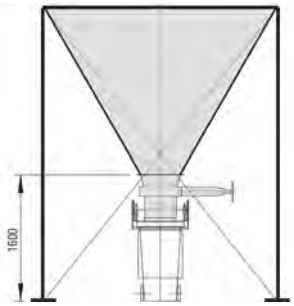
1 Dirty air inlet; on optional sides of the unit
2 Baffle plate; at the dirty air inlet
3 Filter elements
4 Waste disposal bin
5 Clamping mechanism for disposal bin
6 Jet piping to clean the filter elements
7 Radial fan (VARIO 1-3)
8 Compressed air tank
9 Diaphragm valves; electromagnetic
10 Sound-absorbing lining
11 Compressed air connection
12 Clean air outlet; pipe connection possible

Waste disposal and safety

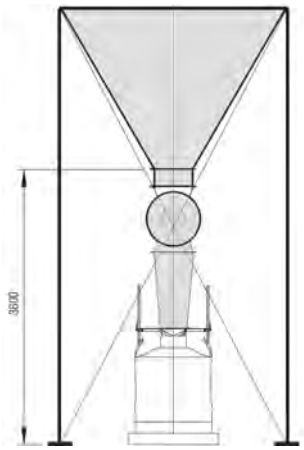
Waste disposal

Standard: The air-tight and dust-tight disposal bins are connected to the filter's hopper with a clamping device, simplifying the exchange of dust collector containers.

For larger dust volumes or in 24-hour operations, the waste disposal is continuous via rotary valves, into disposal tanks or Big Bags. Further alternatives are available.



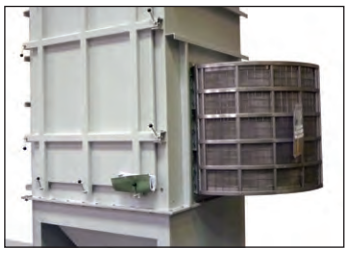
Waste disposal 1
- gate valve (optional)
- 220-liter container



Waste disposal 2
- rotary lock
- Big-Bag/container

Safety

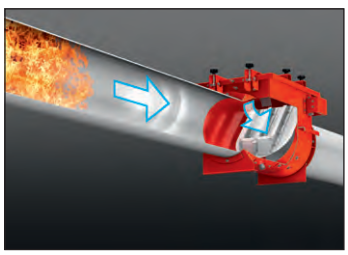
It is possible to equip the VARIO units with security technology if combustible or explosive dusts are created during the manufacturing process.



Flameless explosion pressure relief for installation inside

Burst disk for explosion pressure relief outdoors

Explosion suppression by automatic entry of extinguishing agent



ProFlap back pressure flap for explosion decoupling of clean air and dirty air pipes

Additional information regarding explosion protection see: **www.exschutz.net**

Fan section

The direct-drive radial fan is very silent. Depending on the size of the filter unit, the fan is either integrated, top-mounted or placed next to it.

Placement

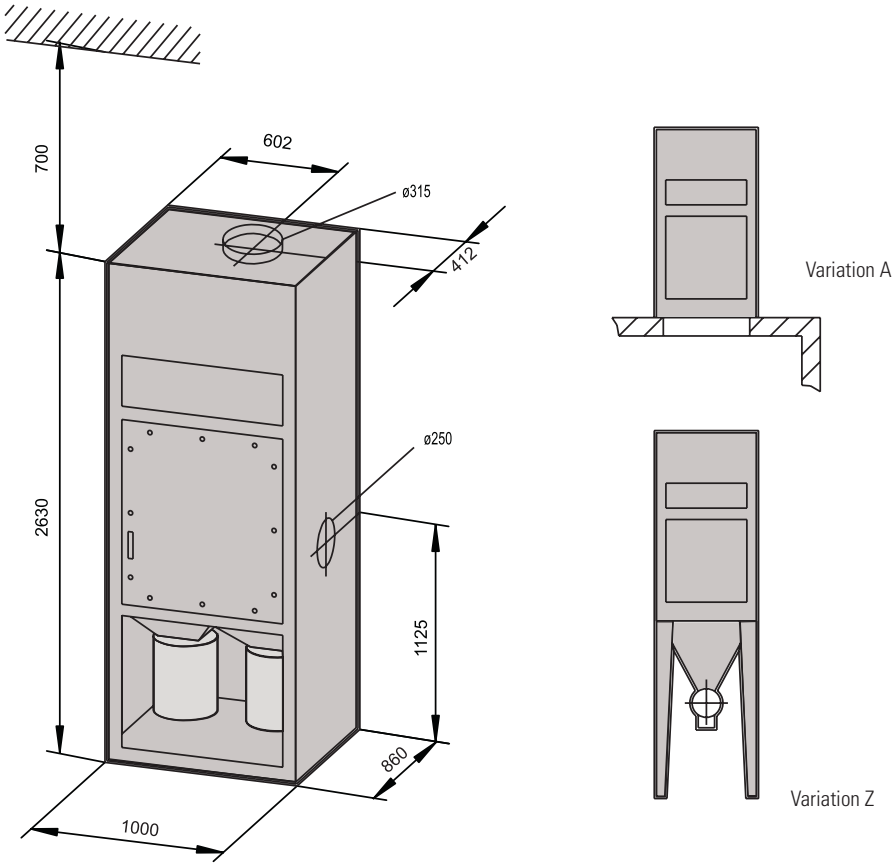
Installation outdoors is possible if weather protection is provided and is within noise limit requirements.

Venting outdoors of re-circulation

Air recirculation is often possible with the use of high-quality SINBRAN filter elements. The cleaned air can be ducted and channeled (even with heat exchangers) to the outdoors, or re-circulated back into the workplace. Alternate venting or recirculation can be accomplished by activating a switch within the exhaust duct. We will be pleased to furnish you with detailed information regarding the feasibility of a recirculation system, ensuring compliance with your local rules and regulations.

VARIO 6 with chip preseparator and fan including exhaust silencer

Technical data VARIO 1



Basic unit

Unit type			1.1	1.2	1.3	P1
Filter elements	Amount		4	6	8	4
SINBRAN®	Filtration surface m²		8	12	16	-
Multitube [5]	Filtration surface m²		8	12	16	-
Y-Filter [5]	Filtration surface m²		14	22	29	-
Cartridge [5]	Filtration surface m²		-	-	-	42
Valves	Quantity	Pcs.	4	4	4	2
Compressed air [1]	Consumption	NL/impulse	40 - 60	40 - 60	40 - 60	40
Motor [2]	Power	kW	3,3	3,3	3,3	3,3
Sound pressure level [3]		dB[A]	72	72	72	72
Exhaust noise[4]		dB[A]	82	82	82	82
Weight	Basic unit	kg	755	760	765	680
	Variation H	kg	655	660	665	-
	Variation A	kg	625	630	635	-
	Variation Z	kg	940	945	950	-

[1] 4 - 6 bar pressure according to filter elements; standard cleaning interval 3 min; volume of the compressed air tank 10,5 L

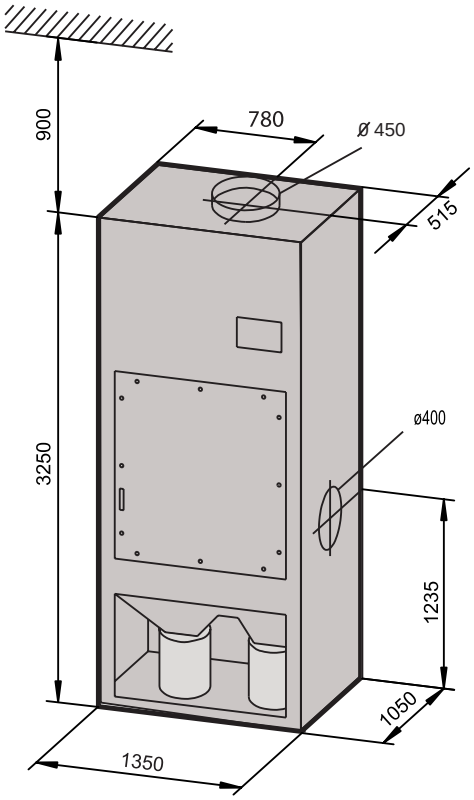
Subject to modification

[2] Voltage 400 Volt/50 Hz, Speed 3000 min^{-1}

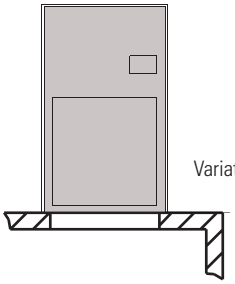
[3] 1 m in front of the door; measurement method according to DIN EN ISO 3744, with connected suction pipe.

[4] 1 m distance from the blow out 45 °, measurement method according to DIN EN ISO 3744

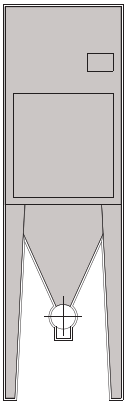
[5] different materialqualities



Basic unit



Variation A



Variation Z

Unit type			2.1	2.2	2.3	P2
Filter elements	Amount		8	10	12	6
SINBRAN®	Filtration surface m²		30	38	46	-
Multitube [5]	Filtration surface m²		30	38	46	-
Y-Filter [5]	Filtration surface m²		61	76	91	-
Cartridge [5]	Filtration surface m²		-	-	-	96
Valves	Quantity	Pcs.	6	6	6	3
Compressed air [1]	Consumption	NL/impulse	65 - 90	65 - 90	65 - 90	65
Motor [2]	Power	kW	5,5	7,5	11	7,5
Sound pressure level [3]		dB[A]	75	75	75	75
Exhaust noise[4]		dB[A]	82	82	85	82
Weight	Basic unit	kg	910	930	950	1100
	Variation H	kg	810	830	850	-
	Variation A	kg	740	760	780	-
	Variation Z	kg	1125	1145	1165	-

[1] Compressed air 4 - 6 bar je nach Filterelement; Abreinigungsintervall Standard 3 min; Volumen Compressed airtank 15 l.

Subject to modification

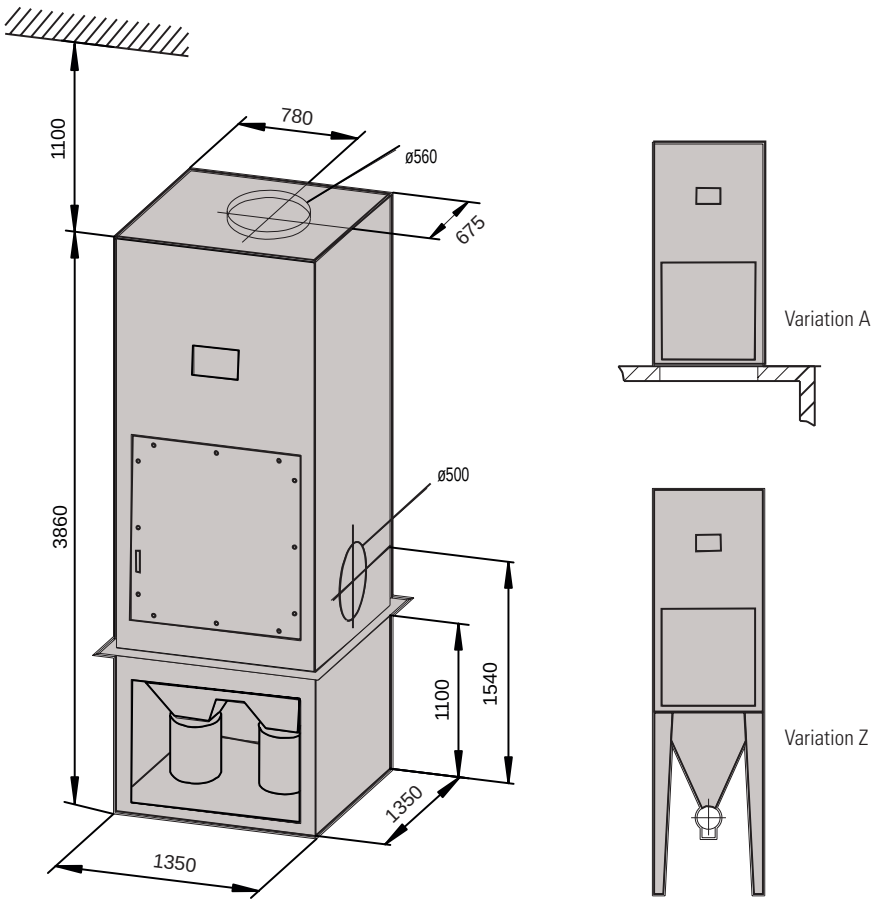
[2] Spannung 400 Volt/50 Hz, Drehzahl 3000 min^{-1}

[3] 1 Meter vor der Tür; Messverfahren nach DIN EN ISO 3744, mit angeschlossener Saugrohrleitung.

[4] 1 Meter vom Ausblas entfernt unter 45°; Messverfahren nach DIN EN ISO 3744.

[5] verschiedene Materialqualitäten

Technical data VARIO 3



Basic unit

Unit type			3.2	3.3	P3*)
Filter elements	Amount		12	14	8
SINBRAN®	Filtration surface m²		54	63	-
Multitube 5)	Filtration surface m²		54	63	-
Y-Filter 5)	Filtration surface m²		109	127	-
Cartridge 5)	Filtration surface m²		-	-	128
Valves	Quantity	Pcs.	7	7	4
Compressed air 1)	Consumption	NL/impulse	70 - 106	70 - 106	80
Motor 2)	Power	kW	12,5	15	12,5
Sound pressure level 3)		dB[A]	75	75	75
Exhaust noise4)		dB[A]	82	85	87
Weight	Basic unit	kg	1460	1510	1700
	Variation H	kg	1360	1410	-
	Variation A	kg	1180	1230	-
	Variation Z	kg	1680	1730	-

*) Different from Vario 3 Standard, the filter system is 200 mm lower (H = 3660 mm)!

Subject to modification

1) 4 - 6 bar pressure according to filter elements; standard cleaning interval 3 min; volume of the compressed air tank 17,5 L

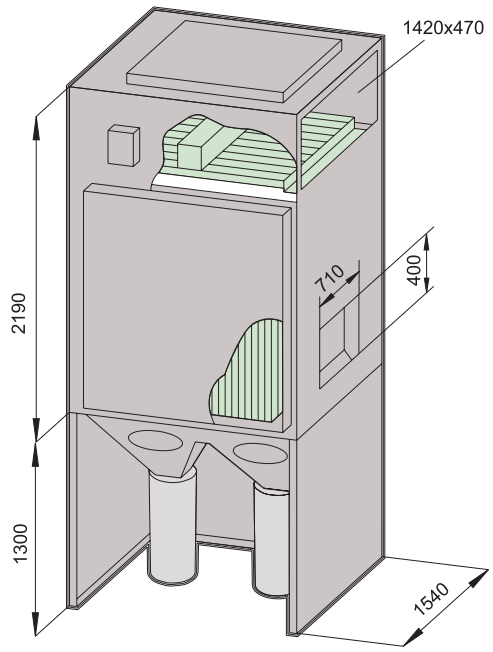
2) Voltage 400 Volt/50 Hz, Speed 3000 min^{-1}

3) 1 m in front of the door; measurement method according to DIN EN ISO 3744, with connected suction pipe.

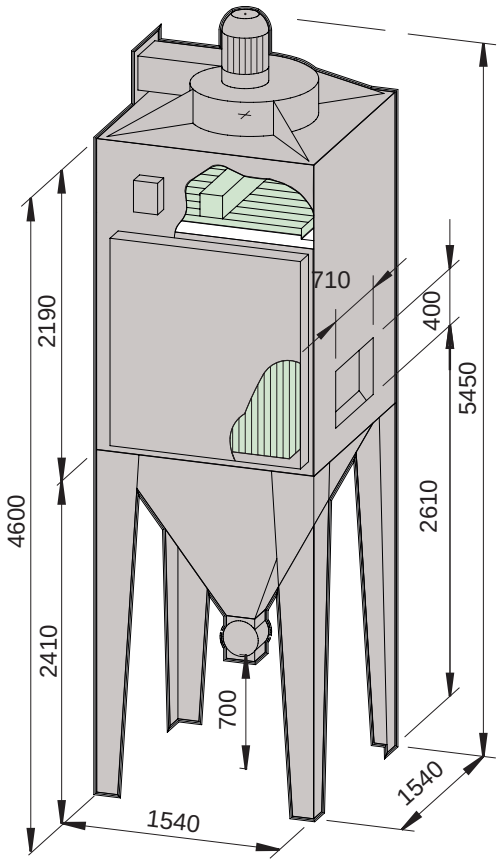
4) 1 m distance from the blow out 45 °, measurement method according to DIN EN ISO 3744

5) different materialqualities

Technical data VARIO 4



Basic unit H



Variation Z

Unit type			4.1	4.2	4.3	P4*)
Filter elements	Amount		16	18	20	12
SINBRAN®	Filtration surface m²		72	81	90	-
Multitube	Filtration surface m²		72	81	90	-
Y-Filter	Filtration surface m²		146	164	182	-
Cartridge	Filtration surface m²		-	-	-	192
Valves [1]	Quantity	Pcs.	10	10	10	6
Compressed air [2]	Consumption	NL/impulse	129	129	129	144
Motor [3]	Power	kW	15	18,5	22	-
Sound pressure level [4]		dB[A]	76	76	76	-
Exhaust noise[5]		dB[A]	96	96	96	-
Weight	Basic unit	kg	1300	1310	1320	1300
	Variation A	kg	1060	1070	1080	1060
	Variation Z	kg	1550	1560	1570	1550
	Fan section	kg	360	390	470	-

*) In derogation from VARIO 4, crude gas only possible from one side!

Subject to modification

1) 2 or 1 valve(s) is/are not connected at VARIO 4.1 and 4.2

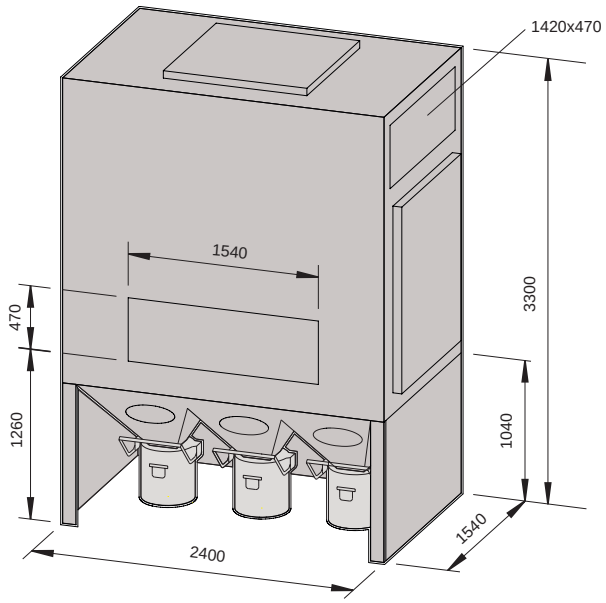
2) 6 bar pressure; standard cleaning interval 1 min; volume of the compressed air tank 21,5 L.

3) Voltage 400 Volt/50 Hz, Speed 3000 min^{-1}

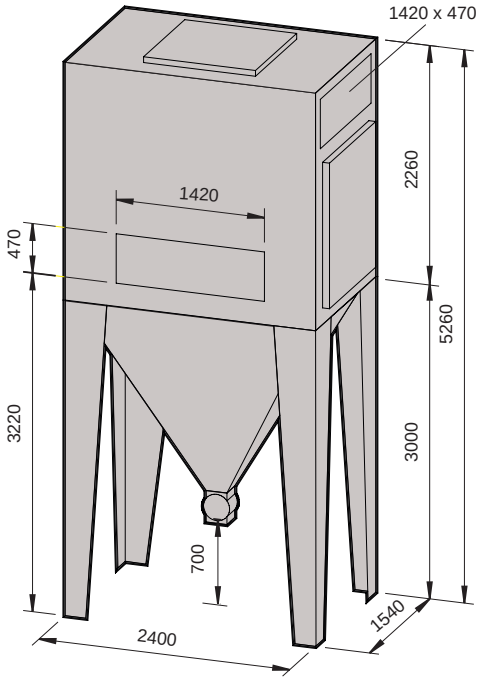
4) 1 m in front of the door; measurement method according to DIN EN ISO 3744, with connected suction pipe.

5) 1 m distance from the blow out 45 °, measurement method according to DIN EN ISO 3744

Technical data VARIO 5



Basic unit H



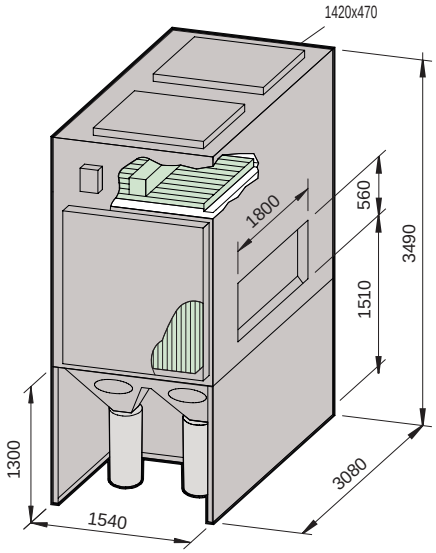
Variation H-Z

Unit type			5.1	5.2	P5
Filter elements	Amount		24	28	18
SINBRAN®	Filtration surface m²		108	126	-
Multitube	Filtration surface m²		108	126	-
Y-Filter	Filtration surface m²		218	225	-
Cartridge	Filtration surface m²		-	-	288
Valves [1]	Quantity	Pcs.	14	14	9
Compressed air [2]	Consumption	NL/impulse	183	183	144
Motor [3]	Power	kW	-	-	-
Sound pressure level [4]		dB[A]	-	-	-
Exhaust noise[5]		dB[A]	-	-	
Weight	Basic unit H	kg	2055	2075	2075
	Variation A	kg	1565	1585	1585
	Variation Z	kg	2249	2260	2260

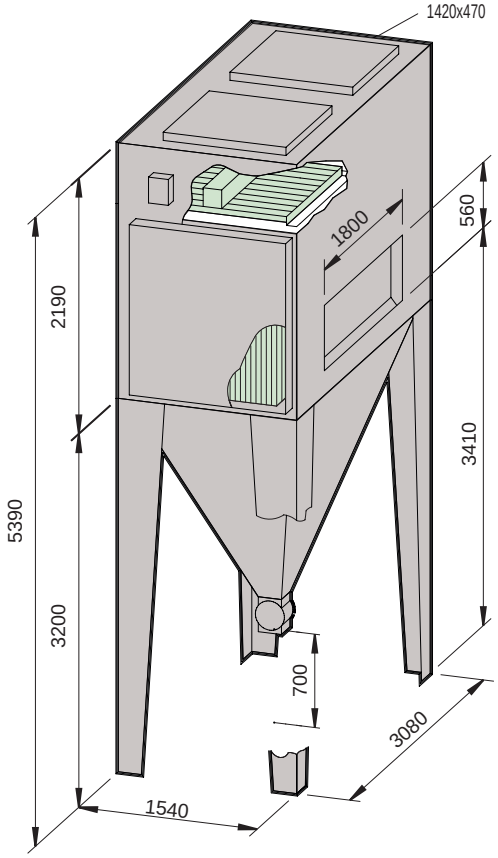
[1]) 2 valves are not connected at VARIO 5.1.
[2] 6 bar pressure; standard cleaning interval 1 min; volume of the compressed air tank 30,5 L.
[3] Voltage 400 Volt/50 Hz, Speed 3000 min^{-1}
[4] 1 m in front of the door; measurement method according to DIN EN ISO 3744, with connected suction pipe.
[5] 1 m distance from the blow out 45 °, measurement method according to DIN EN ISO 3744

Subject to modification

Technical data VARIO 6



Basic unit



Variation Z-H

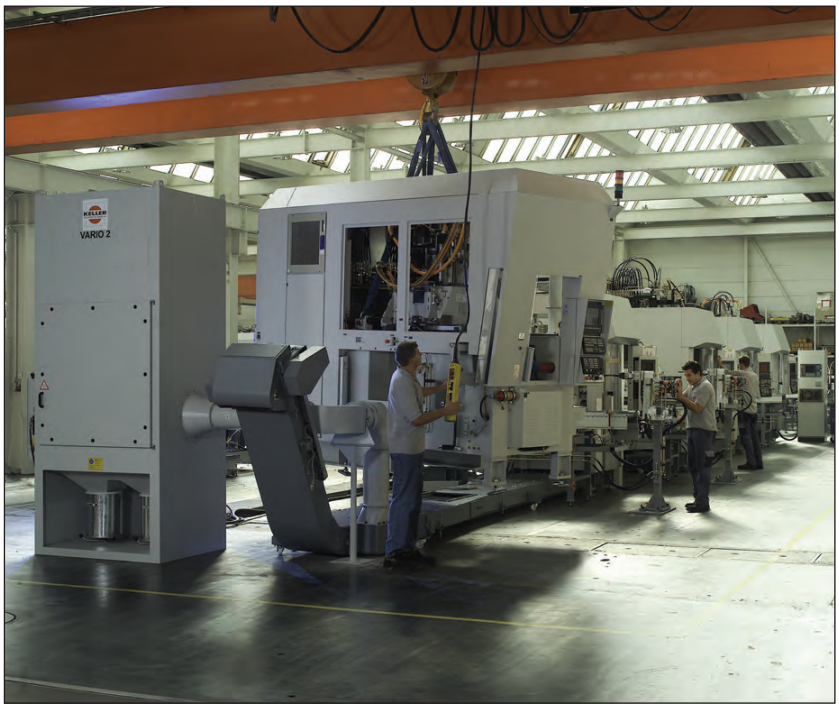
Unit type			6.1	6.2	6.3	P6
Filter elements	Amount		32	36	40	24
SINBRAN®	Filtration surface m²		144	162	180	-
Multitube	Filtration surface m²		144	162	180	-
Y-Filter	Filtration surface m²		291	328	364	-
Cartridge	Filtration surface m²		-	-	-	384
Valves [1]	Quantity	Pcs.	20	20	20	12
Compressed air [2]	Consumption	NL/impulse	129	129	129	144
Motor [3]	Power	kW	-	-	-	
Sound pressure level [4]		dB[A]	-	-	-	-
Exhaust noise[5]		dB[A]	-	-	-	-
Weight	Basic unit H	kg	2600	2620	2640	2620
	Variation A	kg	2120	2140	2180	2140
	Variation Z	kg	3100	3120	3149	3120

Subject to modification

[1] 4 or 2 valves are not connected at VARIO 6.1 and 6.2
[2] 6 bar pressure; standard cleaning interval 1 min; volume of the compressed air tank 21,5 L.
[3] Voltage 400 Volt/50 Hz, Speed 3000 min^{-1}
[4] 1 m in front of the door; measurement method according to DIN EN ISO 3744, with connected suction pipe.
[5] 1 m distance from the blow out 45 °, measurement method according to DIN EN ISO 3744

References

VARIO 1 for high pressure unit



VARIO 2 for chip extraction

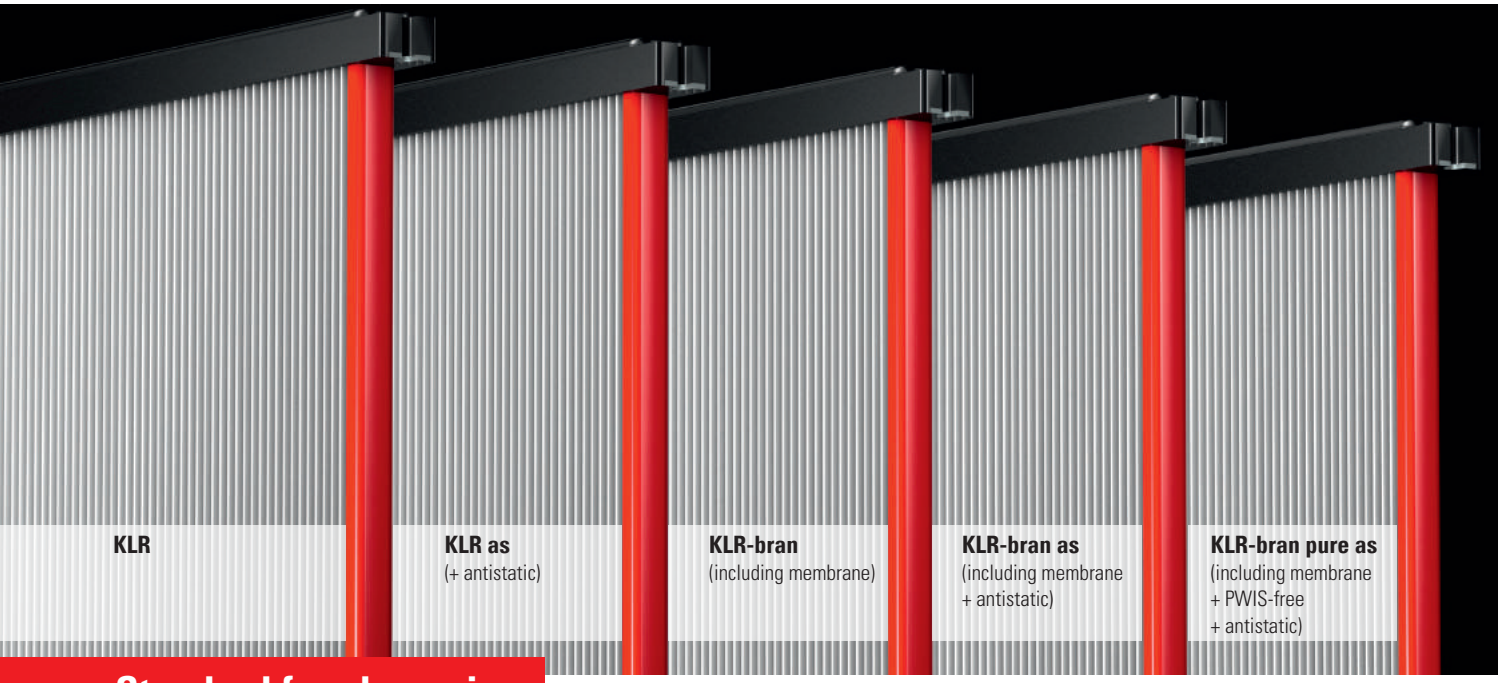
VARIO 5 with spark preseparator and heat recovery system

VARIO 3 for grinding cabin extraction

Keller Lufttechnik GmbH + Co. KG
Neue Weilheimer Str. 30
73230 Kirchheim unter Teck
Fon +49 7021 574-0 · Fax 52430
info@keller-lufttechnik.de
www.keller-lufttechnik.de

01/2014

NEW KLR®-Filter (Keller Original)



Standard for clean air

KLR®-Filter

High-performance filter elements for separating a variety of process emissions

Increased service life with reduced energy consumption

All characteristic elements of this new Keller design were optimized in comparison to typical models. The service life was increased up to 120.000 cleaning intervals - with simultaneous reduction in energy usage.

A beneficial result in all aspects!

KLR®-Filter – the new standard

KLR®-Filter stands for Keller Long Run

Keller Lufttechnik commands decades of experience in the separation and extraction of manufacturing emissions in diverse industries.

Keller developed a new generation of filters in various designs in order to meet increased demand, especially for prolonged filter service life.

The new specifications resulted from our comprehensive practical experience.

KLR®-Filter denotes Keller Long Run filter.

The pleated surface was increased

The surface of the filter was expanded using finer pleats. The pressure loss and resulting energy demand decreased by 5 % accordingly.

Flow-optimised frame construction

The wide sidebars are composed of GFC and are streamlined to optimize the inflow of dirty air, while protecting the filter from direct particle impact and excessive wear.

KLR®-Filter have a service life of up to 120.000 cleaning intervals

The original Keller KLR®-Filter set a new service life record in this filter design, with up to 120.000 cleaning intervals.

This superior quality was achieved with the choice of materials, and with our high-quality, state-of-the-art in-house manufacturing process in particular.

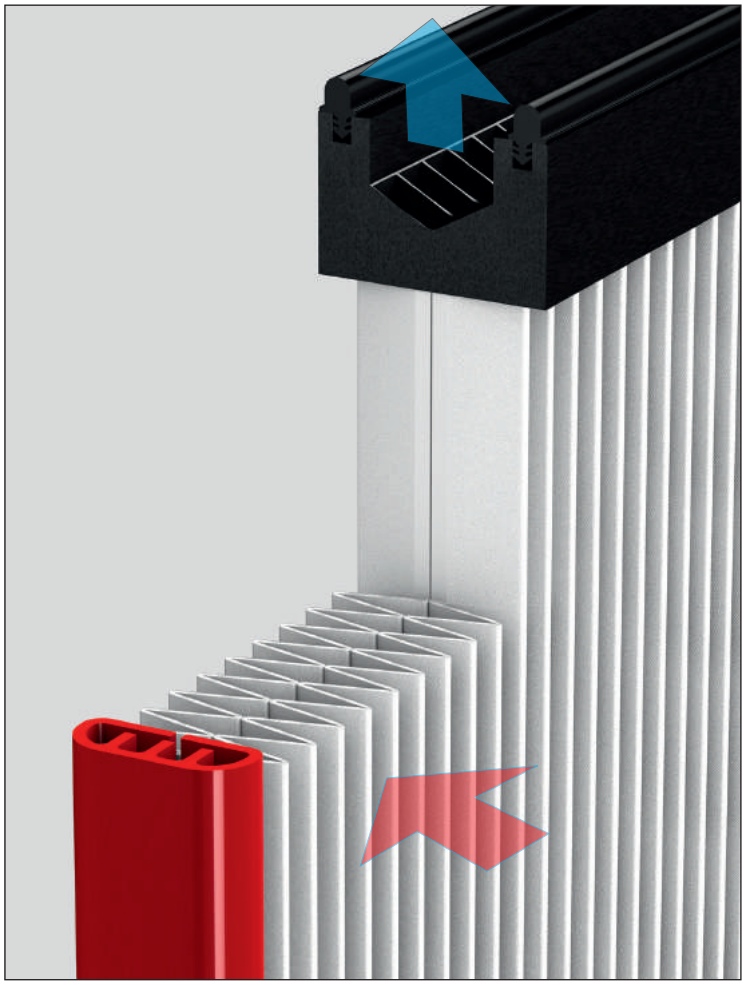
New design for energy conservation

Additional features of the KLR®-Filter are very low filter resistance and optimized dirty air flow which result in reduced energy usage.

Versatile

Due to their various characteristics, the new KLR®-Filter is suitable for many applications, ranging from thermal processes to grinding processes, to wet painting processes.

Operating temperature up to 110 °C.



This diagram illustrates the design of the original Keller KLR®-Filter.

The self-supporting filter plates present a larger number of pleats, thereby increasing the filter surface as compared to the customary filter design

Filter for exhaust air and return air operation

KLR®-Filter for exhaust air operation

KLR®-Filter without an additional membrane is suitable for numerous applications in exhaust air operation, or as an additional feature for return air operation because of its high separation efficiencyiy.

The basic operating conditions must be clarified in advance by the operator. If required, we will be pleased to provide a consultation.

① KLR®-Filter in standard design
② KLR as in antistatic design

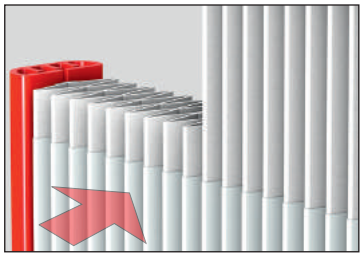
Residual dust content < 0,5 mg/m³

VARIO eco dry separator with exhaust air operation

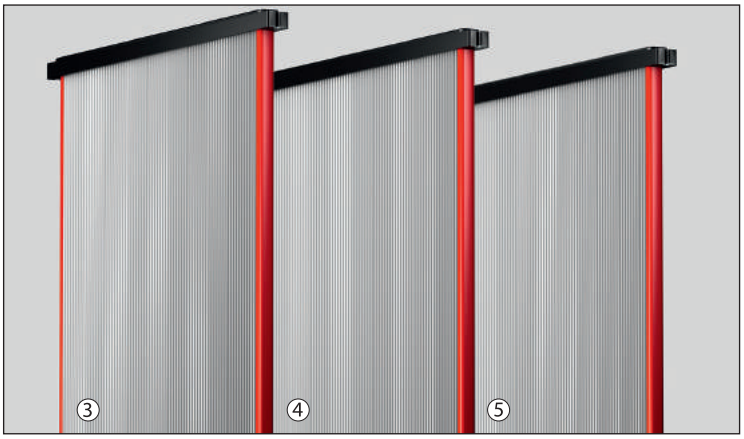
KLR-bran filters are suitable for thermal processes and painting processes - as well as for return air operation

99.99 % separation efficiency of KLR-bran filters (nearly H13 filter quality)

KLR-bran filters are equipped with a PTFE membrane to separate particulate. All configurations can be obtained with an **IFA-M-test certificate** for return air operation **according to the DIN EN 60335-2-69.**



The diagram shows a KLR-bran filter including separation membrane



KLR-bran filter in various designs
③ KLR-bran (standard, including PTFE membrane)
④ KLR-bran as (including membrane + antistatic)
⑤ KLR-bran pure as (including membrane + PWIS-free + antistatic)

Residual dust content < 0,01 mg/m³

Overview of the various versions	KLR	KLR as	KLR-bran	KLR-bran as	KLR-bran pure as
Residual dust content: < 0,5 mg/m³	●	●			
Residual dust content: < 0,01 mg/m³			●	●	●
Application temperature: up to 110 °C	●	●	●	●	●
Cleaning pressure: max. 4 bar	●	●	●	●	●
including addtitional PTFE membrane			●	●	●
in antistatic design		●		●	●
PWIS-free					●
Service life: up to 20.000 operating hours or up to 120.000 cleaning intervals; for 3 years max.*					

* with intended use according to the instruction manual

Two types of installation

KLR®-Filter for installation on the dirty air side

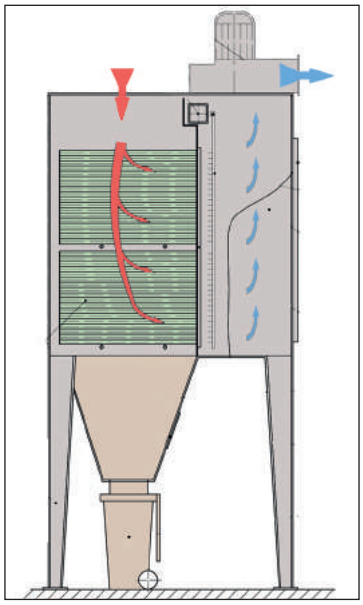
Sealing gasket for the filter plate is above the header

Keller VARIO eco dry separator

For VARIO eco dry separators, the KLR®-Filter exchange is made inside the dirty air zone.

KLR®-Filter for installation on the clean air side

The sealing gasket for the filter plate is installed below the header



Keller PT dry separator

For PT dry separators, the exchange of the KLR®-Filter (horizontal installation) is performed inside the clean air zone.

GREEN BALANCE

With GREEN BALANCE Keller Lufttechnik GmbH + Co. KG commits to reliable, far-sighted treatment of all resources – to bring into line technological progress, operational issues and social targets in order to protect the environment.

Keller Lufttechnik GmbH + Co. KG
Neue Weilheimer Straße 30
73230 Kirchheim unter Teck
Fon +49 7021 574-0
Fax +49 7021 52430
info@keller-lufttechnik.de
www.keller-lufttechnik.de