ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A1*

Owner of the Declaration	Wildeboer Bauteile GmbH
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-WIL-20210235-ICA1-EN
Issue date	19.11.2021
Valid to	18.11.2026

VRL volume flow limiter

Wildeboer Bauteile GmbH

Institut Bauen und Umwelt e.V.

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1. General Information

Wildeboer Bauteile GmbH	VRL volume flow limiter
Programme holder IBU – Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany	**Owner of the declaration** Wildeboer Bauteile GmbH Marker Weg 11 DE-26826 Weener
Declaration number EPD-WIL-20210235-ICA1-EN	**Declared product / declared unit** 1 volume flow limiter with optional accessories
This declaration is based on the product category rules: Volume flow controllers and volume flow limiters for ventilation systems, 11.2017 (PCR checked and approved by the SVR)	**Scope:** This document relates to the manufacture, transportation, installation, operation and disposal of round volume flow limiters (VRL, DN 80) with optional accessories for ventilation and air conditioning systems. The products are produced exclusively in Germany, at the Weener plant, in which the production data for the year 2020 was gathered.
Issue date 19.11.2021	
Valid to 18.11.2026	The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences. The EPD was created according to the specifications of *EN 15804+A1*. In the following, the standard will be simplified as *EN 15804*.
	Verification The standard *EN 15804* serves as the core PCR Independent verification of the declaration and data according to *ISO 14025:2010* ☐ internally ☒ externally
Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.)	
Dr. Alexander Röder (Managing Director Institut Bauen und Umwelt e.V.))	Matthias Klingler (Independent verifier)

2. Product

2.1 Product description/Product definition

Maintenance-free **VRL volume flow limiters** are mechanical controllers which operate without an auxiliary power supply in order maintain volume flows in ventilation and air conditioning systems constant. They regulate volume flows independently of pressure with reference to preset setpoint values and keep these constant. They can be used in any installation position in ventilation ducts, for example, in spiral ducts. The setting and control mechanism of the VRL volume flow limiters is enclosed and protected from contamination from the air flow. Furthermore, the lip seals on both sides position and secure the VRL volume flow limiter in the ventilation duct so that a complete enclosure is created. The controller casing and damper blade are made from a special anti-static and microbe-resistant plastic. The smooth surfaces of the air-ducting components virtually eliminate soiling. VRL volume flow limiters thus meet the highest hygienic requirements, see also chapter 7.
VRL volume flow limiters are adjusted in the factory in all volume flow ranges, starting with at least 1 : 7. The setpoint can be set continuously variably on site using a rotary pointer on a dial which indicates volume flow and velocity between Vmin and Vmax, and then locked. The special control mechanism generally ensures a high degree of control precision with fluctuation of only ± 5 % to ± 10 % throughout the entire range of application.

Refer to the *manufacturer's documents* for further information. See also chapter 7 for information on hygiene.

The respective national regulations at the location of use apply for use of the product. In Germany, for example, the building code of the federal states and the technical conditions based on these regulations.

2.2 Application

Round volume flow limiters are used to control constant volume flow rates in ventilation and air conditioning systems, and replace conventional dampers. As a result, costly and time-consuming manual adjustment of the volumetric flow rates within a ventilation and air conditioning system is no longer necessary. The VRL is suitable for insertion in ventilation ducts.

2.3 Technical Data

The performance rating as per *DIN EN 12589:2002-01, Ventilation for buildings - Air terminal units - Aerodynamic testing and rating of constant and variable rate terminal units* is achieved and thus the requirements as per *ISO 5135, ISO 3741, ISO 5167-1 and EN 1751* are met.

Constructional data

Refer to the manufacturer's documents for further data.

Name	Value	Unit
Static Pressure range	30 - 300	Pa
Flow range	13 - 1060	m^3/h
Housing shape (circular/rectangular)	circular	-

2.4 Delivery status

Size variants: from DN 80 to DN 250, length 100 to 250 mm. Each volume flow limiter is adjusted in the factory for high and continuous control accuracy.

2.5 Base materials/Ancillary materials

Percent by weight, all specifications are approx. specifications

- Plastic: 71 % to 82 %
- Galvanized steel: 15 % to 22 %
- Stainless steel: < 1 %

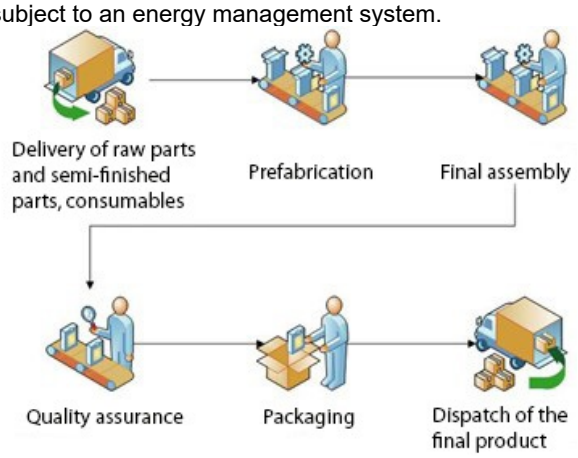
The product contains substances on the ECHA list of substances which, for approval, may be regarded as substances of very high concern (SVHC) (date 08/07/2021) in quantities of more than 0.1 mass %: no.

The product contains further CMR substances of category 1A or 1B which are not on the candidate list, in quantities of more than 0.1 mass % in at least one sub-assembly.: no.

Biocidal products have been added to the construction product or it has been treated with biocidal products (it is regarded as treated goods as per the Biocidal Products Regulation (EU) No. 528/2012): no.

2.6 Manufacture

Production is performed at a location in the factory in Weener. The necessary raw parts and semi-finished parts, auxiliary parts and consumables are supplied by suppliers and enter into production. The production of semi-finished parts is performed the standard production methods for the material. Metal parts are punched and chamfered or milled into shape. Plastic parts are produced on injection moulding machines. Pre-cut parts are optimised accordingly in order to avoid waste. Waste which is generated nevertheless is collected and recycled as far as possible by appropriate companies, or disposed of as domestic waste and burned. Lubricants are predominantly collected, treated and re-used in production. Dust and vapours are extracted and collected on site. The parts from prefabrication are installed in final assembly together with purchased part to construct the volume flow limiters, inspected, packaged and dispatched within the scope of quality assurance as per *ISO 9001*. Each volume flow limiter is adjusted in the factory for high and continuous control accuracy. Operation is subject to an energy management system.



2.7 Environment and health during manufacturing

No measures going beyond the legally stipulated occupational health and safety measures are required at any time during the entire manufacturing process. Waste is prevented, for example, using optimised pre-cut parts, lubricants are re-used by way of recycling measures.

2.8 Product processing/Installation

The *manufacturer's documents*, manuals, installation regulations and operating instructions of ***Wildeboer Bauteile GmbH*** must be observed. Moreover, the safety and processing regulations, for example those for ventilation system engineering and for electrical work, and the legal occupational health and safety regulations must be observed.

2.9 Packaging

The products are transported on reusable pallets, and packaged in polyethylene (PE) film. Alternatively, transportation is cartons made of recycled paper is possible. Disposal, with the exception of the pallets, is performed by local recycling companies. Pallets are reused within the exchange pool. Only the necessary amount of packaging material is used. Packaging is performed in an optimised manner.

2.10 Condition of use

The material composition does not change during use. This does not apply in case of exceptional effects, such as extremely salty air or chemical effects, which can result in changes.

2.11 Environment and health during use

No negative effects on the environment or health are to be expected during use. Due to the maintenance-free nature of the products, lubrication is not required during use. The permanently lubricated and enclosed control mechanism is not situated in the air flow. There are no deposits of soiling resulting from the construction. A hygiene certificate is available (see chapter 7).

2.12 Reference service life

The duration of the functionality of volume flow limiters depends on the respective construction, the materials used and the ambient conditions. If used properly, the reference service life is an average of 20 years.

2.13 Extraordinary effects

Fire
Not relevant.

Fire protection

Name	Value
Building material class	-
Burning droplets	-
Smoke gas development	-

Water
Not relevant.

Mechanical destruction
Not relevant.

2.14 Re-use phase
After use of the volume flow limiters, they can be removed and theoretically can be re-used. In accordance with the composition of the volume flow limiters, they can be used for heat reclamation. The remaining components (e.g. steel) can be recycled.

2.15 Disposal
Disposal can be classified in accordance with the reference values of the European List of Wastes Regulation as per the List of Wastes *LoW*: Steel (17 04 05), plastic (17 02 03).

2.16 Further information
www.wildeboer.de/en

3. LCA: Calculation rules

3.1 Declared Unit
The declaration relates to the manufacture of a single DN 80 volume flow limiter as per *PCR:volume flow controllers and volume flow limiters for ventilation systems*. The eco-balance results of variants or varying dimensions of the declared product can be provided by **Wildeboer Bauteile GmbH** on request.

Declared unit VRL

Name	Value	Unit
Declared unit	1	pce.
Mass reference	0.0695	kg/pce
Conversion factor to 1 kg	0.0695	-
Conversion factor [mass/declared unit]	-	-

3.2 System boundary
The system limit of the EPD of the type "cradle to the grave" follows a modular structure as per *EN 15804*. The eco-balance of the observed products takes into consideration modules A, B, C and D:

Product stage (A1-A3)
Provision of raw materials and transportation of the raw materials by truck to the factory. Production outlay including packaging material. Treatment of non-metallic production waste. Metallic production waste reaches the end of the waste property directly after generation, and is exported as per module D.

Stage of construction of the building structure (A4-A5)
Transportation by truck to the construction site (100 km). The transportation distance can be adjusted to building level as necessary (e.g. in case of an actual transportation distance of 200 km: multiplication of the eco-balance values by a factor of 2).
Module A5: Packaging treatment. Any resultant credits in module D. Power consumption for installation (any use of manual machines) has not been considered.

Stage of use (B1-B5):
No emissions are released during use of the product (B1). Servicing (B2) and repair (B3) or replacement of individual components (B4) is not relevant during the observed service life (maintenance-free). According to the manufacturer's information, renovation of the product (B5) is not necessary during the service life. Modules B1 to B5 are therefore declared as "0".

Stage of use – Operation of the building (B6-B7):
No energy is required for operation of the product.

Disposal stage (C1-C4)
Manual removal (unencumbered) and transportation by truck to waste processing location (50 km). The transportation distance can be adjusted to building level as necessary (e.g. in case of an actual transportation distance of 100 km: multiplication of the eco-balance values by a factor of 2).
Module C3: thermal treatment of raw materials with calorific value.
Module C4: Disposal of raw materials without calorific value.

Credits and debits outside the system limit (D)
Debits and credits from material recycling of metals (including processing) and credits for substituted thermal energy and electricity which has been exported from modules A1-A3, A5 and C3.

3.3 Estimates and assumptions
In the absence of suitable background data, estimates have been made for a few raw materials with a mass fraction of less than 1 % each of the overall product.

3.4 Cut-off criteria
All data from the capture of operating data, i.e. all basic materials used as per the recipe, and the electricity and water requirement were considered in the assessment. Transportation costs were taken into account for all considered inputs, with the exception of packaging material.
Thus, as per PCR Part A, material and energy flows with a fraction of < 1 % were also considered.

3.5 Background data
GaBi databases (service pack 40) were used for calculation of the eco-balance.

3.6 Data quality
The data quality can be regarded as high. The manufacture of the products has been modelled with primary data of Wildeboer Bauteile GmbH. Appropriate background datasets were available in the *GaBi database* for all the relevant primary products used. The last revision of the data used took place within the last 5 years.

3.7 Period under review
Data capture for the volume flow controller is carried out at *Wildeboer Bauteile GmbH* at the Weener (Germany) site for the year 2020.

3.8 Allocation
No by-products are generated during production. Therefore, no allocation has been used.

3.9 Comparability
Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.

The used background database has to be mentioned

4. LCA: Scenarios and additional technical information

The following technical information is the basis for the declared modules, or can be used for the development of specific scenarios in the context of building evaluation if modules are not declared (MND).

The eco-balance results of variants or varying dimensions of the declared product can be provided by **Wildeboer Bauteile GmbH** on request.

The declared products are maintenance-free. Therefore, there is no scenario data for modules B1-B5.

Transportation to the construction site (A4)

Name	Value	Unit
Transport distance	100	km
Capacity utilisation (including empty runs)	61	%

Installation in the building (A5)

Name	Value	Unit
Output substances following waste treatment on site	0.00146	kg

Reference service life

Name	Value	Unit
Reference service life	20	a

End of the service life (C1-C4)

Name	Value	Unit
Collected separately	0.0695	kg
Recycling	0.0146	kg
Energy recovery	0.0549	kg

5. LCA: Results

The following illustrates the results of the indicators of the impact assessment, of resource usage and on waste and other output flows in relation to one type VRL volume flow limiter [0.0695 kg/unit]. The data can be requested from the manufacturer for calculation (scaling) of other volumes, any accessories used and the VR controller.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A1: 1 VRL volume flow limiter with 0.0695 kg/unit

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP	[kg CO_2-Eq.]	2.42E-1	4.08E-4	3.05E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.05E-4	1.21E-1	0.00E+0	-1.03E-1
ODP	[kg CFC11-Eq.]	1.66E-10	1.35E-19	4.30E-19	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.34E-20	2.39E-17	0.00E+0	-8.77E-16
AP	[kg SO_2-Eq.]	4.06E-4	2.74E-7	2.57E-7	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.59E-7	5.13E-5	0.00E+0	-1.55E-4
EP	[kg $(PO_4)^{3-}$-Eq.]	5.98E-5	5.12E-8	5.56E-8	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.93E-8	1.31E-5	0.00E+0	-1.70E-5
POCP	[kg ethene-Eq.]	5.20E-5	-7.02E-9	2.27E-8	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-6.87E-10	3.27E-6	0.00E+0	-1.73E-5
ADPE	[kg Sb-Eq.]	3.30E-6	3.44E-11	5.32E-12	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.50E-11	3.17E-10	0.00E+0	-8.25E-8
ADPF	[MJ]	5.46E+0	5.48E-3	4.85E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.77E-3	3.24E-2	0.00E+0	-1.28E+0

Caption	GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A1: 1 VRL volume flow limiter with 0.0695 kg/unit

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	3.96E-1	3.20E-4	2.10E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.56E-4	5.43E-3	0.00E+0	-2.59E-1
PERM	[MJ]	2.09E-2	0.00E+0	-2.09E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	[MJ]	4.17E-1	3.20E-4	1.06E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.56E-4	5.43E-3	0.00E+0	-2.59E-1
PENRE	[MJ]	4.04E+0	5.49E-3	1.44E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.78E-3	1.64E+0	0.00E+0	-1.51E+0
PENRM	[MJ]	1.61E+0	0.00E+0	-1.38E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-1.60E+0	0.00E+0	0.00E+0
PENRT	[MJ]	5.65E+0	5.49E-3	5.67E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.78E-3	3.60E-2	0.00E+0	-1.51E+0
SM	[kg]	3.84E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	[m^3]	7.81E-4	2.86E-7	7.15E-6	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.81E-7	3.38E-4	0.00E+0	-3.75E-4

Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A1: 1 VRL volume flow limiter with 0.0695 kg/unit

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	9.76E-7	2.05E-10	3.93E-13	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.29E-10	5.28E-11	0.00E+0	-8.57E-10
NHWD	[kg]	2.67E-3	9.64E-7	1.88E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.25E-7	3.74E-3	0.00E+0	-1.18E-3
RWD	[kg]	7.45E-5	5.78E-9	3.26E-8	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.44E-9	1.43E-6	0.00E+0	-9.09E-5
CRU	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	[kg]	4.07E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.46E-2	0.00E+0	0.00E+0
MER	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	5.04E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.11E-1	0.00E+0	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	9.01E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.66E-1	0.00E+0	0.00E+0

Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

6. LCA: Interpretation

The two most important phases of the life cycle are the manufacturing and disposal phases.

In relation to the manufacturing phase, the upstream chain processes of a plastic component made of acrylonitrile butadiene styrene (ABS) dominate all environmental indicators. The contributions from the material ethylene propylene diene monomer rubber (EPDM) are also relevant, with the exception of the indicator ODP.

In the disposal phase, relevant combustion emissions from the thermal treatment of the plastic components occur, with the respective importance for the product system.

All other phases of the life cycle, processes and materials have low to very low relevance for the product system.

7. Requisite evidence

7.1 Hygiene

A *certificate of the hygiene conformity test for VRL* as per assessment no. W-330341-20-AB is available. The hygienic requirements as per *VDI 6022-1, VDI 3803-1, DIN 1946-4, EN 16798-3, SWKI VA105-01, SWKI VA104-01,*

ÖNORM H 6020 and ÖNORM H 6021 are met.

This includes certification on the metabolic potential, i.e. the damage to materials as a result of microorganisms, and resistance to cleaning agents and disinfectants in case of normal use.

8. References

LoW (AVV)
"Ordinance on the List of Wastes (LoW) of 10 December 2001 (BGBl. I page 3379) which was most recently amended with article 1 of the ordinance from 30 June 2020 (BGBl. I page 1533).

ISO 14025
DIN EN ISO 14025:2011-10, Environmental labels and declarations – Type III environmental declarations – Principles and procedures.

EN 15804
DIN EN 15804:2020-03, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.

DIN 1946-4
DIN 1946-4: 2018-09, Ventilation and air conditioning – Ventilation in buildings and rooms of health care

EN 1751
DIN EN 1751:2014-06, Ventilation for buildings - Air terminal devices - Aerodynamic testing of damper and valves

EN 12589
DIN EN 12589: 2002-01, Ventilation for buildings - Air terminal units - Aerodynamic testing and rating of constant and variable rate terminal units; German version EN 12589:2002-01

EN 16798-3
DIN EN 16798-3: 2017-11, Ventilation of non-residential buildings - Performance requirements for ventilation, air conditioning systems and room-cooling systems

ISO 5135
DIN EN ISO 5135: 2020-12, Acoustics - Determination of sound power levels of noise from air-terminal devices, air-terminal units, dampers and valves by measurement in a reverberation test room

ISO 3741
DIN EN ISO 3741: 2011-01, Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Precision methods for reverberation test rooms

ISO 5167-1
DIN EN ISO 5167-1: 2004-01, Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full - Part 1: General principles and requirements

ISO 9001
DIN EN ISO 9001: 2015-11, Quality management systems

H 6020
ÖNORM H 6020: 2019-06-01, Ventilation and air conditioning plants for locations for medical use - Design, construction, operation, maintenance, technical and hygiene inspections

H 6021
ÖNORM H 6021: 2016-08-15, Ventilation and air conditioning plants - Specifications keeping them clean and cleaning

VA104-01
SWKI VA104-01: 2019-01, Hygiene requirements for air conditioning systems and devices

VA105-01
SWKI VA105-01: 2015-08, Air-conditioning systems in rooms used for medical purposes

VDI 3803-1
VDI 3803-1: 2020-05, Air-conditioning - Structural and technical principles - Central air conditioning systems (VDI Ventilation Code of Practice)

VDI 6022-1
VDI 6022-1: 2018-01, Hygiene requirements for ventilation and air-conditioning systems and units

Manufacturer's documents
Manufacturer's documents on the VRL volume flow limiter in the respective current version, here:
VRL1 user manual 3.5 (2020-11)
Operating instructions VRL1 volume flow limiter (2021-05)

VRL hygiene conformity test
Certificate of the hygiene conformity test for VRL (assessment no. W-330341-20-AB), Hygieneinstitut des Ruhrgebietes Gelsenkirchen

ECHA
ECHA list: 2021-07

GaBi
GaBi: Databases (service pack 40)

IBU 2021
Institut Bauen und Umwelt e.V.: General EPD programme instructions of the Institut Bauen und Umwelt e.V. (IBU). Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021.
www.ibu-epd.com.

PCR Part A
Product category rules for building-related products and services. Part A: Calculation rules for the eco-balance and requirements of the background report, version 1.0, Institut Bauen und Umwelt e.V., www.ibu-epd.com, 2021

PCR
Volume flow controller and volume flow limiter for ventilation systems
Product category rules for building-related products and services. Part B: Requirements for EPD for volume flow controllers and volume flow limiters for ventilation systems, version 1.0, Institut Bauen und Umwelt e.V., www.ibu-epd.com, 2017

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