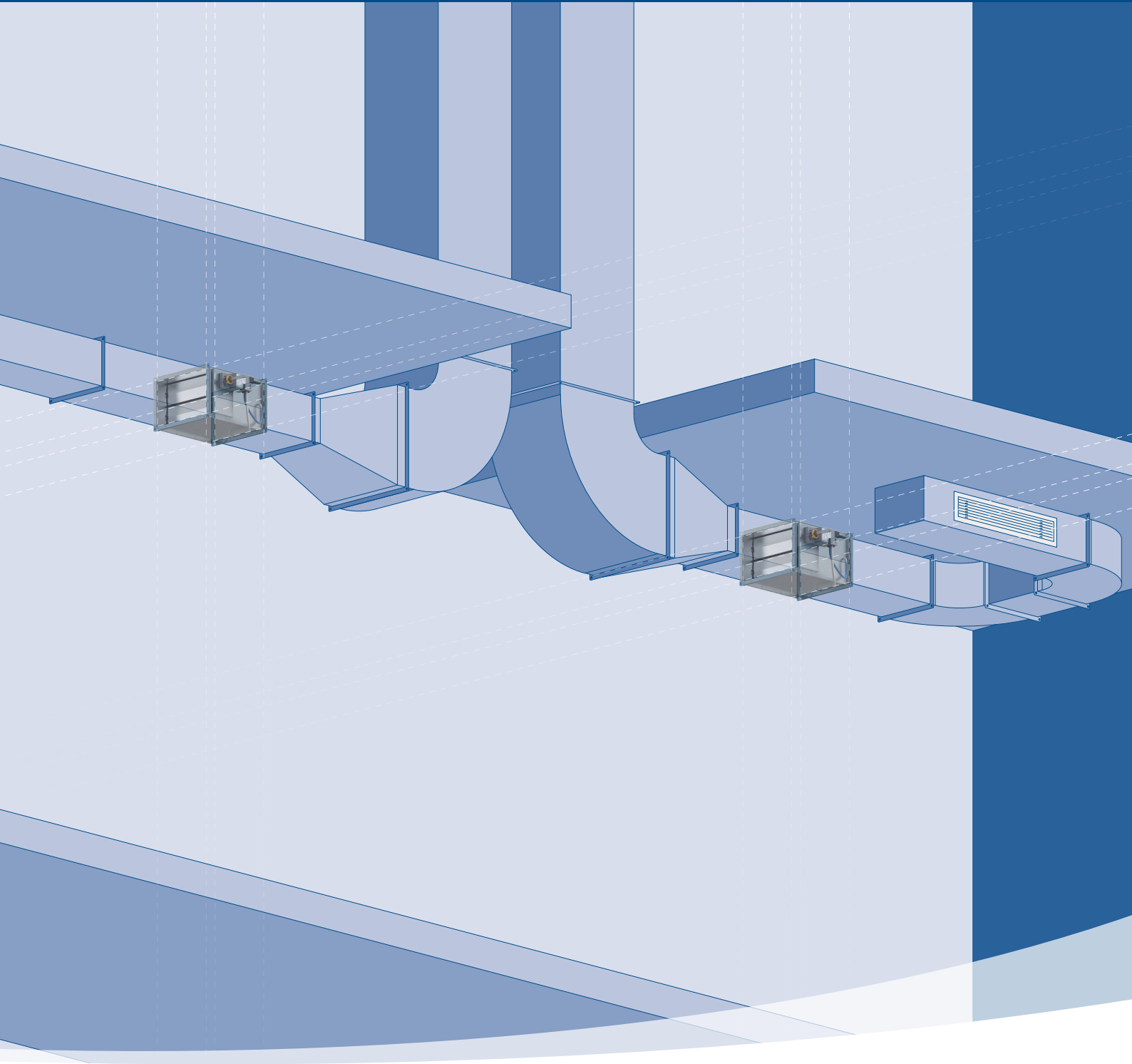


# OPTIMA-S

VAV Controller  
Data Sheet



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## Good to know

Current information on all products is available on [design.systemair.com](https://design.systemair.com)



## Description

Single or double skin circular VAV (Variable Air flow Volume) controllers are commonly used for return air applications or for supply air applications. OPTIMA-S controllers are ideal for single zone control with supply and return in Master and Slave setup such as offices, hotel rooms or meeting rooms or larger public or industrial halls where the required cooling and heating load will vary on demand.

### Highlights

- Damper tightness class 3 or 4 according to EN 1751
- Casing tightness class C according to EN 1751
- Conform with hygienic requirements according to VDI 6022
- High measurement/control accuracy of 5%
- Air volume range of 144 m<sup>3</sup>/h to 47500 m<sup>3</sup>/h
- Operating range of duct pressure up to 1000 Pa
- Double skin version OPTIMA-SI with external insulation under steel sheet cover for radiated sound reduction

### Product Types

- OPTIMA-S: Single Skin Rectangular VAV Controller
- OPTIMA-SI: Double Skin Rectangular VAV Controller with Acoustic Insulation

### List of Accessories

- ZTH-EU  
Configuration and setup tool for VAV controllers OPTIMA-...BLC...
- Belimo Assistant  
Configuration and setup NFC app. for Android smartphones for OPTIMA-...BLC1
- ZIP BT NFC  
Converter Bluetooth/NFC smartphones to configure OPTIMA-...BLC1 in Belimo Assistant app.

# Design

OPTIMA-S controllers are constructed from galvanized sheet steel casing and aluminium profile blades.

The casing contains a robust flanged mounting frame to assure the sturdiness of the controller and to facilitate the mounting to ducts. The aerofoil blades are opposed action and are made from extruded aluminium.

The blades are equipped by rubber gaskets eliminating leakage in closed position. The blade axes are sitting in self lubricating polymer bearings. The blades are linked by a cog/rod positioning mechanism. The measurement probe from aluminium is connected to the VAV controller by flexible polyurethane impulse tubing.

Available sizes (mm): 200 × 100 to 1200 × 1000 with steps of 50 mm in height and width.

The insulated version OPTIMA-SI has 19 mm thick polymer foam insulation around the casing, covered by galvanized steel protection sheet.

## Noise and Thermal Insulation Material

Base	NBR/PVC
Cellular structure	Closed
Colour	Black
Density	80 kg/m <sup>3</sup>
Water absorption	2 % < 5 %
Resistance	AIR+ U.V.-GOOD
Thermal conductivity (t. + 40°C)	< 0,039 W/m K
Fire resistance	CLASS 1 (DM 26/06/84)
	UL 94-HF1
	CLASS 0 - BS 476 part6-7 UK
	NF certificate n.38 (until mm.32) France
	B-s3,d0 (EN 13501-1) Euroclass
Marine and shipbuilding	MED B - MED D - DNV type approval
Steam diffusion	MU > 7.000
Noise reduction (DIN 4109)	UP TO 30 dB
Ecological compatibility	NO CFC - HCFC, asbest free

## Controls

The VAV controllers are as standard equipped by compact controllers/actuators with analog setpoint and feedback signals in mode DC 2 V ... 10 V or DC 0 V ... 10 V. The compact controllers are equally available with MP-BUS, MODBUS, BACnet, KNX and LON communication capability. On demand as alternative, Gateway communication units can be provided and can be connected later in time to building management systems (only possible with MP-BUS communication on board).

VAV compact controllers are factory calibrated as standard to the air volume indicated in the Tab. 4 or upon request can be adjusted to site required settings prior to dispatch on  $V_{min}$  and  $V_{max}$  range. The air volumes can also be readjusted on site with ZTH-EU hand held service tool or, for the type OPTIMA-S...GO... by dials on the controller. If specific air volumes for  $V_{min}$  and  $V_{max}$  would be required, this must be indicated prior to order of the units for adequate calibration in the factory.

More details see in the "UserManual\_OPTIMA-S" document on [Systemair DESIGN](#).

- **BLC1:** Belimo LMV-D3 compact controller with MP-BUS communication and analog 0 V ... 10 V setpoint and feedback signals. NFC communication port is available for the device configuration by the "Belimo Assistant" smartphone application.
- **BLC4:** Belimo LMV-D3 compact controller without BUS communication and with analog 0 V ... 10 V setpoint and feedback signals.
- **BLC1MOD:** Belimo LMV-D3 compact controller with selectable Modbus RTU and BACnet MS/TP bus communication, MP-BUS communication and analog 0 V ... 10 V setpoint and feedback signals.
- **BLC1LON:** Belimo LMV-D3 compact controller with LON bus communication
- **BLC1KNX:** Belimo LMV-D3 compact controller with KNX bus communication
- **GO:** Compact controller with configuration dials and display for immediate adjustment at site, with analog 0 V ... 10 V setpoint and feedback signals.
- **GOMOD:** Compact controller with parametrizing dials and display for immediate adjustment on site, communicative via Modbus-RTU and with analog 0 V ... 10 V setpoint and feedback signals.

## Tightness of the Blade and the Casing

3C in sizes of less than 400 mm in each of dimensions Width × Height

4C in sizes of 400 mm or more in each of dimensions Width × Height

The classification is done according to the standard EN 1751 for static pressure up to 1000 Pa.

## Product Parts



### Legend

1	Casing with duct connection flange
2	Opposed blade action louver damper
3	Air flow measurement probe
4	Air flow measurement impulse tubing
5	Compact air flow volume controller/damper actuator
6	Insulation with outer sheet metal mantle (OPTIMA-SI)

Fig. 1: Components of the OPTIMA-SI

## Setup Possibilities

Controller Type	Flow Volume Adjustment Analog Input	Flow Volume Adjustment via BUS Com.	Controller Parameters Setup	Hard Wired Override	Feedback Signal Type	Feedback Values (Analog Output) <sup>1)</sup>	BUS Communicated Variables	Power Supply
BLC1	DC 0 V (2 V) ... 10 V	MP-BUS	ZTH-EU, PC tool, NFC (Android), MP-BUS	Open <sup>2)</sup> , Close, $V_{min}$ , $V_{max}$	DC 0 V (2 V) ... 10 V, MP-BUS	Actual volume. Damper angle, Actual pressure	<b>Read/Write:</b> Setpoint, $V_{min}$ , $V_{max}$ Open, Close	AC 24 V, DC 24 V
BLC1MOD	10 V	MODBUS, BACnet, MP-BUS	ZTH-EU, PC tool, MODBUS, MP-BUS		MODBUS, MP-BUS, DC 2 V ... 10 V			
BLC1LON	-	LON	ZTH-EU, PC tool, LON	LON	-			
BLC1KNX	-	KNX	ZTH-EU, PC tool, KNX	$V_{max}$ <sup>2)</sup>			KNX	
BLC4	DC 0 V (2 V) ... 10 V	-	ZTH-EU, PC tool	Open <sup>2)</sup> , Close, $V_{min}$ , $V_{max}$	DC 0 V (2 V) ... 10 V	-	-	
GO		-	Dials on controller		10 V	-	-	
GOMOD		MODBUS	Dials on controller, MODBUS		MODBUS, DC 0 V (2 V) ... 10 V	Same variables as BLC1MOD	-	

Tab. 1: VAV controllers functional overview

NOTES:

1) Only one analog output available. One value type for feedback can be chosen.

2) Only available with AC 24 V power supply

# Dimensions

## OPTIMA-S Single Skin Rectangular VAV Controller

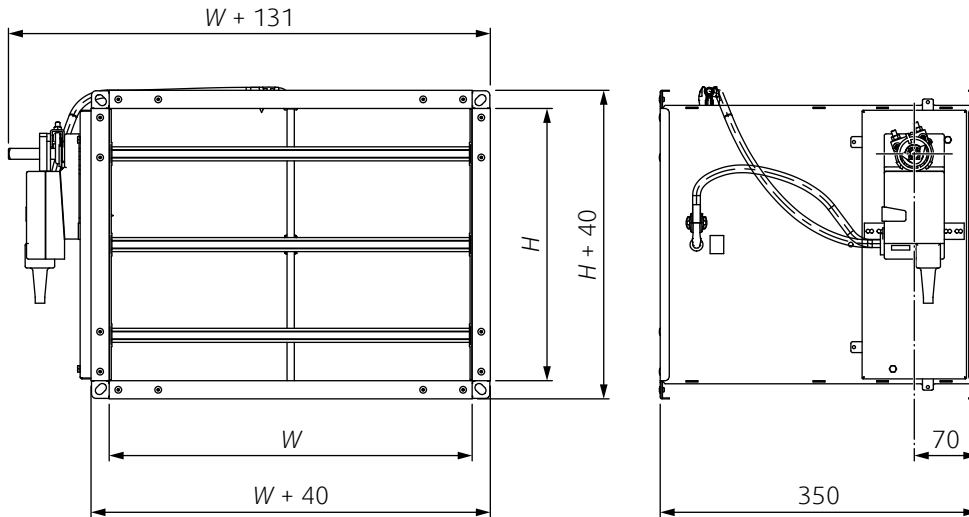


Fig. 2: Dimensions of OPTIMA-S with height  $H$  (mm) = 100, 200, 300, ... 1000

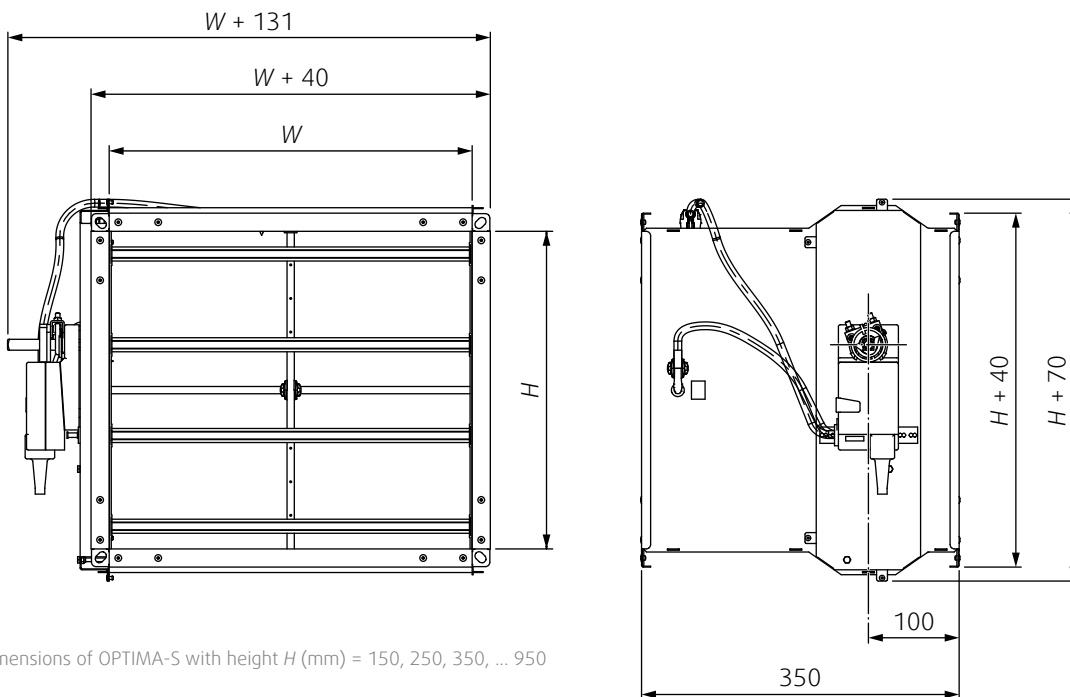



Fig. 3: Dimensions of OPTIMA-S with height  $H$  (mm) = 150, 250, 350, ... 950

Tab. 2: Dimensions (mm) and weights (kg) of OPTIMA-S

H \ W	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	
100	2	2	3	4	4	5	5	6	6													
150	4	5	5	6	6	6	7	7	8	9												
200	6	7	7	8	8	8	9	9	10	10	10	11	11	12	12							
250		7	7	9	9	9	9	9	10	10	11	12	12	13	14	14						
300		3C	8	9	10	9	9	10	10	11	12	13	14	15	19	19	21	21	22			
350			9	10	11	10	10	10	11	12	13	14	15	17	19	20	22	22	24	25		
400					12	12	11	11	12	13	14	15	17	19	20	23	25	26	27	28	29	
450		4C				12	13	13	13	14	16	17	19	21	21	24	26	27	28	29	30	
500							15	14	15	16	18	19	21	22	23	25	28	29	30	31	32	
550								16	17	18	20	21	22	24	24	26	29	30	31	32	34	
600									19	20	21	22	24	25	25	27	30	32	33	34	36	
650										22	23	24	25	27	27	29	32	33	35	36	38	
700											25	26	27	29	29	31	34	35	37	38	40	
750												27	29	30	31	33	36	37	38	40	42	
800													30	31	32	34	37	38	40	42	43	
850														32	34	35	38	39	41	43	45	
900															35	37	40	41	43	45	47	
950																39	41	43	45	47	49	
1000																	43	45	47	49	50	

Legend

m (kg)	Actuator torque 5 Nm
m (kg)	Actuator torque 10 Nm

**OPTIMA-SI** Double Skin Rectangular VAV Controller with Acoustic Insulation

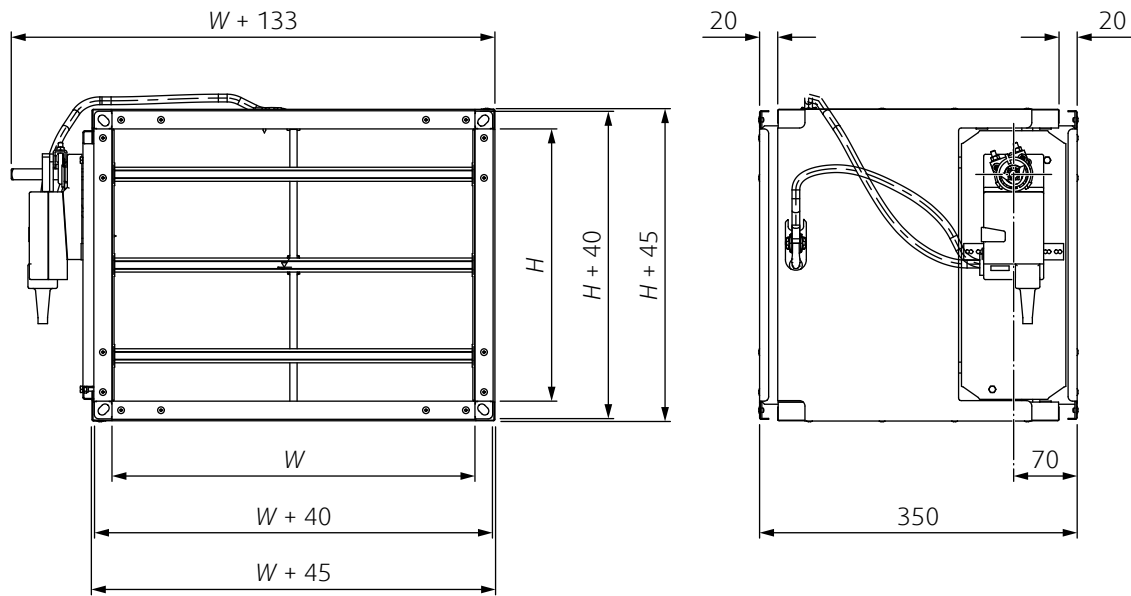


Fig. 4: Dimensions of OPTIMA-SI with height  $H$  (mm) = 100, 200, 300, ... 1000

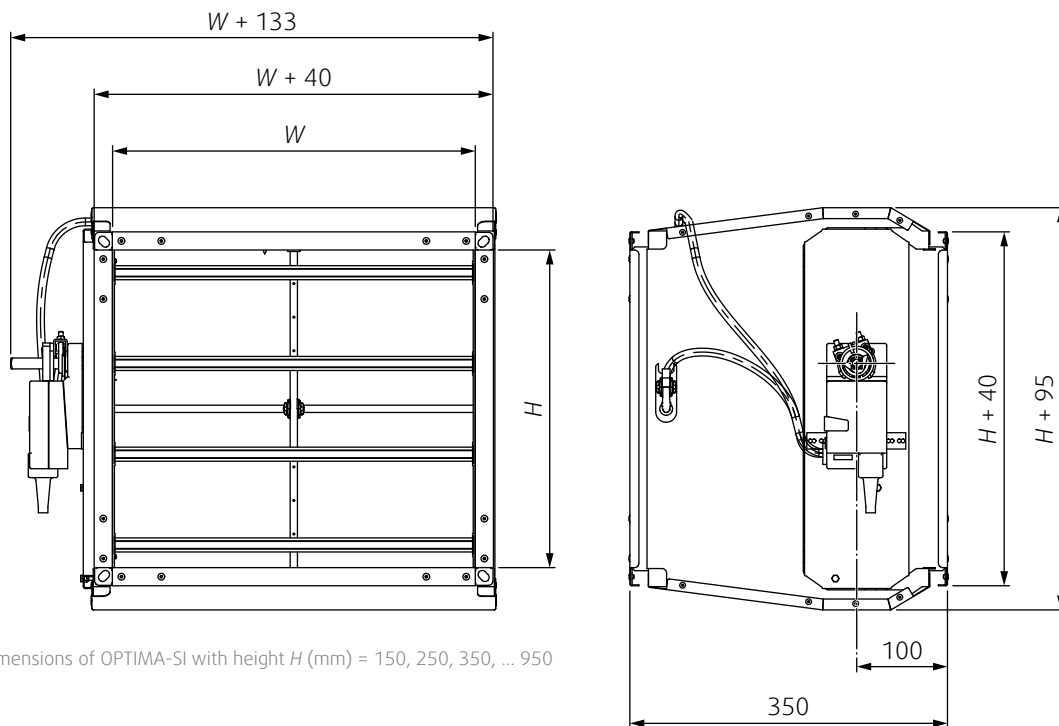



Fig. 5: Dimensions of OPTIMA-SI with height  $H$  (mm) = 150, 250, 350, ... 950



Tab. 3: Dimensions (mm) and weights (kg) of OPTIMA-SI

H \ W	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	
100	3	3	4,5	6	6	7,5	7,5	9	9													
150	6	7,5	7,5	9	9	9	10,5	10,5	12	13,5												
200	9	10,5	10,5	12	12	12	13,5	13,5	15	15	15	16,5	16,5	18	18							
250		10,5	10,5	13,5	13,5	13,5	13,5	13,5	15	15	16,5	18	18	19,5	21	21						
300		<b>3C</b>	12	13,5	15	13,5	13,5	15	15	16,5	18	19,5	21	22,5	28,5	28,5	31,5	31,5	33			
350			13,5	15	16,5	15	15	15	16,5	18	19,5	21	22,5	25,5	28,5	30	33	33	36	37,5		
400			<b>Tightness Class</b>		18	18	16,5	16,5	18	19,5	21	22,5	25,5	28,5	30	34,5	37,5	39	40,5	42	43,5	
450		<b>4C</b>				18	19,5	19,5	19,5	21	24	25,5	28,5	31,5	31,5	36	39	40,5	42	43,5	45	
500							22,5	21	22,5	24	27	28,5	31,5	33	34,5	37,5	42	43,5	45	46,5	48	
550								24	25,5	27	30	31,5	33	36	36	39	43,5	45	46,5	48	51	
600									28,5	30	31,5	33	36	37,5	37,5	40,5	45	48	49,5	51	54	
650										33	34,5	36	37,5	40,5	40,5	43,5	48	49,5	52,5	54	57	
700											37,5	39	40,5	43,5	43,5	46,5	51	52,5	55,5	57	60	
750												40,5	43,5	45	46,5	49,5	54	55,5	57	60	63	
800													45	46,5	48	51	55,5	57	60	63	64,5	
850														48	51	52,5	57	58,5	61,5	64,5	67,5	
900															52,5	55,5	60	61,5	64,5	67,5	70,5	
950																58,5	61,5	64,5	67,5	70,5	73,5	
1000																	64,5	67,5	70,5	73,5	75	

Legend

m (kg)	Actuator torque 5 Nm
m (kg)	Actuator torque 10 Nm

# Ordering Code

		OPTIMA-	[ ]	-	[ ]	x	[ ]	-	[ ]	-	[ ]	-	[ ]	-	[ ]
Single Skin Controller		S													
Double Skin Controller with Acoustic Insulation		SI													
		200													
		...													
Width	W (mm)	1200													
		100													
		...													
Height	H (mm)	1000													
		BLC1													
		BLC4													
		BLC1MOD													
		BLC1LON													
		BLC1KNX													
		GO													
Drive/Controller Type		GOMOD													
$V_{min}$	(m <sup>3</sup> /h)														
$V_{max}$	(m <sup>3</sup> /h)														
		(DC 0 V ... 10 V)													
Signal Mode		(DC 2 V ... 10 V)													
		0													
		2													

## NOTES:

If not stated in the ordering code, the default  $V_{min}$  will be adjusted corresponding to air flow velocity 2 m/s and the default  $V_{max}$  corresponding to velocity 9 m/s from factory.

If not stated in the ordering code, the signal mode default mode DC 2 V ... 10 V will be adjusted from factory.

## Example of Ordering Code

OPTIMA-S-400x200-BLC1MOD-0

Rectangular VAV controller with Modbus-RTU and BACnet MS/TP communication on board.

$V_{min} = 576 \text{ m}^3/\text{h}$   $V_{max} = 2592 \text{ m}^3/\text{h}$  (default factory adjustment corresponding to min. 2 m/s and max. 9 m/s velocities).

Signal mode DC 0 V ... 10 V.

# Accessories

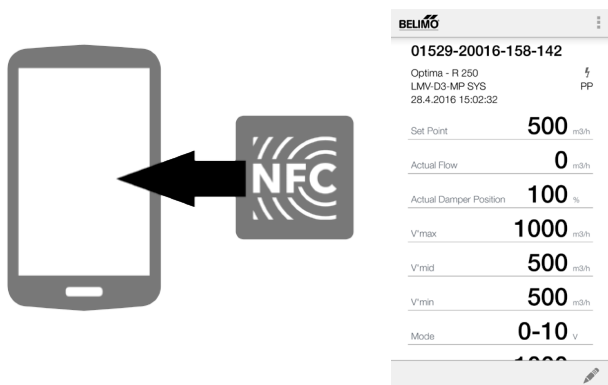
## ZTH-EU

Configuration and setup tool for VAV controllers OPTIMA-...BLC...



## Belimo Assistant

Configuration and setup NFC app. for Android smartphones for OPTIMA-...BLC1



## ZIP BT NFC

Converter Bluetooth/NFC smartphones to configure OPTIMA-...BLC1 in Belimo Assistant app.



# Quick Selection

Tab. 4: Table of default settings of air flow volume.

NOTE: The  $V_{min}$  can be adjusted between 0% and 100% of  $V_{nom}$ . The  $V_{max}$  can be adjusted between 20% and 100% of  $V_{nom}$ .

W	H	$V_{nom}$ @ 11 m/s	$V_{min}$ @ 2 m/s	$V_{max}$ @ 9 m/s
(mm)		(m <sup>3</sup> /h)		
200	100	792	144	648
	150	1188	216	972
	200	1584	288	1296
250	100	990	180	810
	150	1485	270	1215
	200	1980	360	1620
	250	2475	450	2025
300	100	1188	216	972
	150	1782	324	1458
	200	2376	432	1944
	250	2970	540	2430
	300	3564	648	2916
350	100	1386	252	1134
	150	2079	378	1701
	200	2772	504	2268
	250	3465	630	2835
	300	4158	756	3402
	350	4851	882	3969
400	100	1584	288	1296
	150	2376	432	1944
	200	3168	576	2592
	250	3960	720	3240
	300	4752	864	3888
	350	5544	1008	4536
	400	6336	1152	5184
450	100	1782	324	1458
	150	2673	486	2187
	200	3564	648	2916
	250	4455	810	3645
	300	5346	972	4374
	350	6237	1134	5103
	400	7128	1296	5832
	450	8019	1458	6561

W	H	$V_{nom}$ @ 11 m/s	$V_{min}$ @ 2 m/s	$V_{max}$ @ 9 m/s
(mm)		(m <sup>3</sup> /h)		
500	100	1980	360	1620
	150	2970	540	2430
	200	3960	720	3240
	250	4950	900	4050
	300	5940	1080	4860
	350	6930	1260	5670
	400	7920	1440	6480
550	100	2178	396	1782
	150	3267	594	2673
	200	4356	792	3564
	250	5445	990	4455
	300	6534	1188	5346
	350	7623	1386	6237
	400	8712	1584	7128
	450	9801	1782	8019
600	100	10890	1980	8910
	150	11979	2178	9801
	200	2376	432	1944
	250	3564	648	2916
	300	4752	864	3888
	350	5940	1080	4860
	400	7128	1296	5832
	450	8316	1512	6804
	500	9504	1728	7776
650	100	10692	1944	8748
	150	11880	2160	9720
	200	13068	2376	10692
	250	14256	2592	11664
	300	3861	702	3159
	350	5148	936	4212
	400	6435	1170	5265
	450	7722	1404	6318
	500	9009	1638	7371
	550	10296	1872	8424
700	100	11583	2106	9477
	150	12870	2340	10530
	200	14157	2574	11583
	250	15444	2808	12636
	300	16731	3042	13689

W	H	V <sub>nom</sub> @ 11 m/s	V <sub>min</sub> @ 2 m/s	V <sub>max</sub> @ 9 m/s
(mm)		(m <sup>3</sup> /h)		
700	200	5544	1008	4536
	250	6930	1260	5670
	300	8316	1512	6804
	350	9702	1764	7938
	400	11088	2016	9072
	450	12474	2268	10206
	500	13860	2520	11340
	550	15246	2772	12474
	600	16632	3024	13608
	650	18018	3276	14742
	700	19404	3528	15876
750	200	5940	1080	4860
	250	7425	1350	6075
	300	8910	1620	7290
	350	10395	1890	8505
	400	11880	2160	9720
	450	13365	2430	10935
	500	14850	2700	12150
	550	16335	2970	13365
	600	17820	3240	14580
	650	19305	3510	15795
	700	20790	3780	17010
750	22275	4050	18225	
800	200	6336	1152	5184
	250	7920	1440	6480
	300	9504	1728	7776
	350	11088	2016	9072
	400	12672	2304	10368
	450	14256	2592	11664
	500	15840	2880	12960
	550	17424	3168	14256
	600	19008	3456	15552
	650	20592	3744	16848
	700	22176	4032	18144
750	23760	4320	19440	
800	25344	4608	20736	

W	H	V <sub>nom</sub> @ 11 m/s	V <sub>min</sub> @ 2 m/s	V <sub>max</sub> @ 9 m/s
(mm)		(m <sup>3</sup> /h)		
850	200	6732	1224	5508
	250	8415	1530	6885
	300	10098	1836	8262
	350	11781	2142	9639
	400	13464	2448	11016
	450	15147	2754	12393
	500	16830	3060	13770
	550	18513	3366	15147
	600	20196	3672	16524
	650	21879	3978	17901
	700	23562	4284	19278
750	25245	4590	20655	
800	26928	4896	22032	
850	28611	5202	23409	
900	200	7128	1296	5832
	250	8910	1620	7290
	300	10692	1944	8748
	350	12474	2268	10206
	400	14256	2592	11664
	450	16038	2916	13122
	500	17820	3240	14580
	550	19602	3564	16038
	600	21384	3888	17496
	650	23166	4212	18954
	700	24948	4536	20412
750	26730	4860	21870	
800	28512	5184	23328	
850	30294	5508	24786	
900	32076	5832	26244	

W	H	V <sub>nom</sub> @ 11 m/s	V <sub>min</sub> @ 2 m/s	V <sub>max</sub> @ 9 m/s
(mm)		(m³/h)		
950	250	9405	1710	7695
	300	11286	2052	9234
	350	13167	2394	10773
	400	15048	2736	12312
	450	16929	3078	13851
	500	18810	3420	15390
	550	20691	3762	16929
	600	22572	4104	18468
	650	24453	4446	20007
	700	26334	4788	21546
	750	28215	5130	23085
	800	30096	5472	24624
	850	31977	5814	26163
	900	33858	6156	27702
950	35739	6498	29241	
1000	300	11880	2160	9720
	350	13860	2520	11340
	400	15840	2880	12960
	450	17820	3240	14580
	500	19800	3600	16200
	550	21780	3960	17820
	600	23760	4320	19440
	650	25740	4680	21060
	700	27720	5040	22680
	750	29700	5400	24300
	800	31680	5760	25920
	850	33660	6120	27540
	900	35640	6480	29160
	950	37620	6840	30780
1000	39600	7200	32400	
1050	300	12474	2268	10206
	350	14553	2646	11907
	400	16632	3024	13608
	450	18711	3402	15309
	500	20790	3780	17010
	550	22869	4158	18711
	600	24948	4536	20412
	650	27027	4914	22113
	700	29106	5292	23814
	750	31185	5670	25515
	800	33264	6048	27216
	850	35343	6426	28917
	900	37422	6804	30618
	950	39501	7182	32319
1000	41580	7560	34020	

W	H	V <sub>nom</sub> @ 11 m/s	V <sub>min</sub> @ 2 m/s	V <sub>max</sub> @ 9 m/s
(mm)		(m³/h)		
1100	300	13068	2376	10692
	350	15246	2772	12474
	400	17424	3168	14256
	450	19602	3564	16038
	500	21780	3960	17820
	550	23958	4356	19602
	600	26136	4752	21384
	650	28314	5148	23166
	700	30492	5544	24948
	750	32670	5940	26730
	800	34848	6336	28512
	850	37026	6732	30294
	900	39204	7128	32076
	950	41382	7524	33858
1000	43560	7920	35640	
1150	350	15939	2898	13041
	400	18216	3312	14904
	450	20493	3726	16767
	500	22770	4140	18630
	550	25047	4554	20493
	600	27324	4968	22356
	650	29601	5382	24219
	700	31878	5796	26082
	750	34155	6210	27945
	800	36432	6624	29808
	850	38709	7038	31671
	900	40986	7452	33534
	950	43263	7866	35397
	1000	45540	8280	37260
1200	400	19008	3456	15552
	450	21384	3888	17496
	500	23760	4320	19440
	550	26136	4752	21384
	600	28512	5184	23328
	650	30888	5616	25272
	700	33264	6048	27216
	750	35640	6480	29160
	800	38016	6912	31104
	850	40392	7344	33048
	900	42768	7776	34992
	950	45144	8208	36936
	1000	47520	8640	38880

# Installation, Maintenance & Operation

Information about installation, maintenance and operation is available in the "UserManual\_OPTIMA-S" document on [Systemair DESIGN](#).

## Operation

Operation temperature range: -20 °C to +70 °C in the duct, -20 °C to +50 °C on the actuator with relative humidity up to 95% non-condensing conditions.

**IMPORTANT:** In installations with higher hygienic standards like hospitals the service openings for cleaning shall be foreseen in the duct closely in front and behind the VAV unit.

## Transport & Storage

Dry indoor conditions with a temperature range of -20°C to +50°C.

## Supplement

Any deviations from the technical specifications contained herein and the terms should be discussed with the manufacturer. We reserve the right to make any changes to the product without prior notice, provided that these changes do not affect the quality of the product and the required parameters.

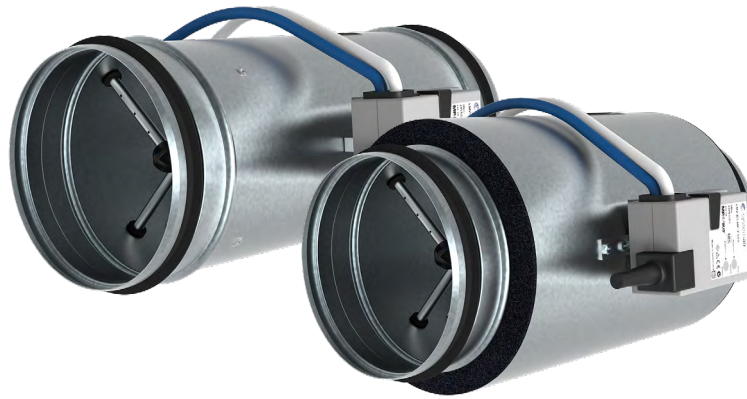
Current information on all products is available on [Systemair DESIGN](#).

## Related Products

### OPTIMA-R

VAV Controller

Product information is available within the "DataSheet\_OPTIMA-R" technical documentation on [Systemair DESIGN](#).



### OPTIMA-LV-R

VAV Controller

Product information is available within the "DataSheet\_OPTIMA-LV-R" technical documentation on [Systemair DESIGN](#).

