

# OPTIMA-RS

## Single skin VAV units - round inlet and rectangular outlet



### Ordering codes:

		Optima-RS -	
Insulation		I	
Size (mm)	10 - 40 (øD-100 to øD-400)		
	BELIMO L(N) MV-D3, MPBUS	BLC1	
	BELIMO L(N) MV-D3	BLC4	
	BELIMO L(N) MV-D3, MODBUS	BLC1MOD	
	BELIMO L(N) MV-D3, LON	BLC1LON	
Drive / controller type	Optima-GO	GO	
	Optima-GO, MODBUS	GOMOD	
$V_{min}$ (m <sup>3</sup> /h)			
$V_{max}$ (m <sup>3</sup> /h)			
Control voltage	(DC 0 - 10 V)	0	
	(DC 2 - 10 V)	2	

### Ordering code example:

Optima-RS - 16 - BLC4 - 160 - 800

Optima-RS, inlet size 160, Belimo LMV-D3 drive/controller,  $V_{min}$  160 m<sup>3</sup>/h,  $V_{max}$  800 m<sup>3</sup>/h, control voltage DC 2-10 V

#### NOTES:

- If the air volumes are not given during the ordering process, then standard Factory setting will be applied according to table
- $V_{min}$  can also be set to 0 m<sup>3</sup>/h if required by demand upon ordering
- The setup values of  $V_{min}$  and  $V_{max}$  must be inside the range of min / max factory settings (see dimensions / volumes table)
- The standard input signal on the controller is set to 2-10 V, upon request 0-10 V can also be selected

### Description

Single skin round to square VAV terminal units is commonly used for supply air applications or for return air applications at low to medium system pressures. Optima-RS VAV terminal units are ideal for multizone control with supply and return in master and slave setup such as offices, hotel rooms or meeting rooms where the required cooling and heating load will vary on demand.

#### Highlights:

- Damper tightness class 4 according to EN 1751
- Casing tightness class C according to EN 1751
- High measuring accuracy of 5%
- Air volume range of 57 to 5881 m<sup>3</sup>/h
- Operating range of up to 1000 Pa
- 30 mm high density insulation with cleanable protection tissue cover

#### Accessories for Optima-RS:

- Attenuators Optima-ASA

Silencers are available to reduce the discharge sound power levels when required. Multi-outlet insulated terminal units are available when multi-zone application is required.

## Design

VAV unit housing constructed of galvanized steel sheet, large surface pleated for extra stiffness. Internal thermal acoustic insulation of fibre glass material, dual density insulation cover tissue is used to protect the fiberglass insulation to protect the deterioration of the insulation for air speeds of 20-25m/s.

Acoustic insulation in the housing has aerodynamic flow for extra low sound level. For even more noise attenuation in the version OPTIMA-RS-I... the double skin inlet with isolation is foreseen. Double skin low leakage damper with airtight neoprene gasket seal.

Special design of centre averaging multi-point airflow differential cross velocity pressure sensor assures an accurate air flow readings even in difficult installations. Button punch snap lock seams, lock form with airtight nylon bearings to assure low casing leakage.

Rectangular outlet with M8 riveted nuts, suited for connecting to duct flange. 12 mm aluminium shaft with nylon bearings

### Available sizes:

Inlet: from  $\varnothing$  100 to  $\varnothing$  400 mm

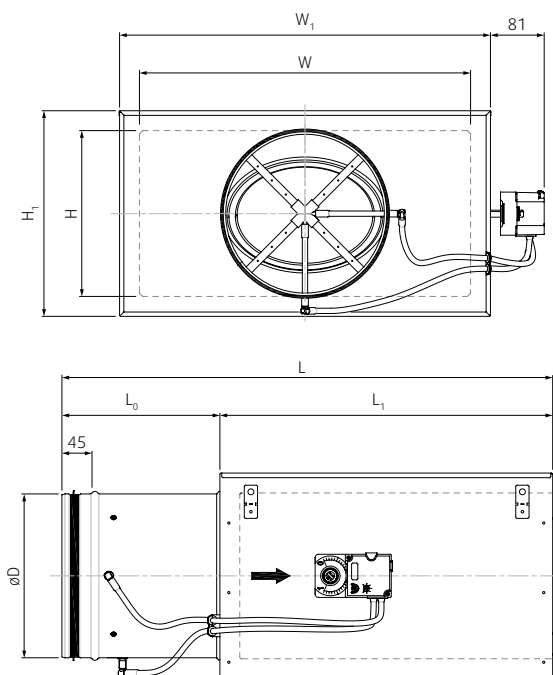


Fig. 1: Optima-RS dimensions

## Controls

The VAV terminal units are as standard equipped with BLC (Belimo compact) controllers (LMV-D3 or NMV-D3) without any MP or LON communication capability to be used as stand alone or in master and slave setting. The compact controllers are equally available with MPBus, ModBus 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 to create a zone control by creating bus-rings solutions (only possible if MP-Bus communication is installed).

VAV and Compact controllers are factory calibrated as standard to the air volume indicated in the table or upon request can be adjusted to site required settings prior to dispatch on Vmin and Vmax range. The air volumes can also be readjusted on site with ZTH-Gen hand held service tool or, for the type Optima-S-...GO... by dials on the controller. If specific air volumes for Vmin and Vmax would be required, this must be indicated prior to order of the units for adequate calibration in the factory.

- BLC1 = Belimo LMV-D3 compact controller WITH MP-Bus communication
- BLC4 = Belimo LMV-D3 compact controller WITHOUT MPBus communication
- BLC1-MOD = Belimo LMV-D3 compact controller WITH MODBUS communication
- GO = Compact controller with parametrizing dials and display for immediate adjustment at site.
- GO-MOD = Compact controller with parametrizing dials and display for immediate adjustment at site, communicative via MODBUS-RTU.

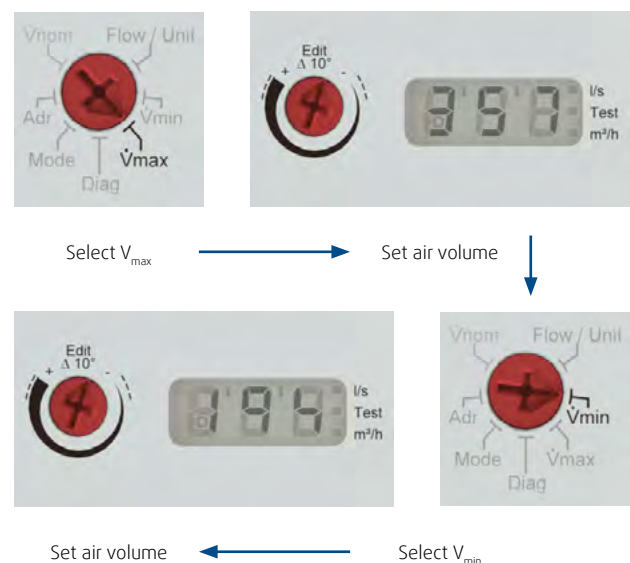


Fig. 2: Optima-RS...GO... easy parameter settings

## Dimensions

Code	DN Size	øD	L	L <sub>0</sub>	L <sub>1</sub>	W	H	W <sub>1</sub>	H <sub>1</sub>	m	- BLC1... / BLC4		- GO...	
											Air volume *(m <sup>3</sup> /h)		Air volume *(m <sup>3</sup> /h)	
											V <sub>min</sub> (@ 2 m·s <sup>-1</sup> )	V <sub>max</sub> (@ 13 m·s <sup>-1</sup> )	V <sub>min</sub> (@ 1 m·s <sup>-1</sup> )	V <sub>max</sub> (@ 9 m·s <sup>-1</sup> )
Optima-RS-10-BLC_	100	98	450	149	303	200	200	260	260	5	57	368	28	255
Optima-RS-12-BLC_	125	123	450	149	303	200	200	260	260	5	88	574	44	397
Optima-RS-16-BLC_	160	158	600	200	403	250	200	310	260	7	145	941	73	651
Optima-RS-20-BLC_	200	198	700	200	503	400	200	460	260	10	226	1470	113	1018
Optima-RS-25-BLC_	250	248	750	249	503	500	250	560	310	12	353	2297	177	1590
Optima-RS-31-BLC_	315	313	950	249	703	600	350	660	410	19	561	3647	281	2525
Optima-RS-40-BLC_	400	398	950	249	703	700	400	760	460	25	905	5881	453	4071

Tab. 1: Optima-RS table of dimensions and air volume range

\* Note = Standard factory air volume setting if not indicated upon order

10 - 20% of V<sub>max</sub> air flow rate has an accuracy error rate of: ±25%20 - 40% of V<sub>max</sub> air flow rate has an accuracy error rate of: <±10%40 - 100% of V<sub>max</sub> air flow rate has an accuracy error rate of: <±4%

## Selection tables

DN Size	Discharged			ΔPt = 100 Pa									ΔPt = 200 Pa								
	Q (l/s)	Q (m <sup>3</sup> /h)	ΔP <sub>min</sub> (Pa)	63	125	250	500	1000	2000	4000	8000	L <sub>w</sub> dB(A)	63	125	250	500	1000	2000	4000	8000	L <sub>w</sub> dB(A)
ø100	8	28	1	24	25	31	26	21	18	16	13	28	31	32	38	32	28	24	23	20	35
	24	85	2	33	35	41	35	31	27	26	23	38	40	41	48	42	38	34	33	30	45
	39	141	6	38	39	45	40	35	32	30	27	42	45	46	52	46	42	38	37	34	49
	55	198	13	41	42	48	43	38	34	33	30	45	48	49	55	49	45	41	40	37	52
ø125	79	283	26	44	45	51	46	41	38	36	33	48	51	52	58	52	48	44	43	40	55
	12	44	1	26	27	33	27	23	19	18	15	30	32	34	40	34	30	26	25	22	37
	37	133	2	35	36	42	37	32	28	27	24	39	42	43	49	43	39	35	34	31	46
	61	221	6	39	40	47	41	37	33	32	29	43	46	47	53	48	44	40	39	35	50
ø160	86	309	11	42	43	49	44	40	36	35	31	46	49	50	56	51	46	43	41	38	53
	123	442	23	45	46	52	47	43	39	38	34	49	52	53	59	54	50	46	44	41	56
	20	72	1	27	28	35	29	25	21	20	17	31	34	35	42	36	32	28	27	24	39
	60	217	2	36	37	44	38	34	30	29	26	41	43	44	51	45	41	37	36	33	48
ø200	101	362	5	40	42	48	42	38	34	33	30	45	47	49	55	49	45	41	40	37	52
	141	507	10	43	44	51	45	41	37	36	33	47	50	51	58	52	48	44	43	40	55
	201	724	21	46	47	53	48	44	40	39	35	50	53	54	61	55	51	47	46	42	57
	31	113	1	28	30	36	30	26	22	21	18	33	36	37	43	37	33	29	28	25	40
ø250	94	339	2	37	38	45	39	35	31	30	27	42	44	45	52	46	42	38	37	34	49
	157	565	5	41	42	49	43	39	35	34	31	46	48	50	56	50	46	42	41	38	53
	220	792	9	44	45	51	46	42	38	36	33	48	51	52	59	53	49	45	44	40	55
	314	1131	19	47	48	54	49	44	40	39	36	51	54	55	61	56	52	48	46	43	58
ø315	49	177	1	30	31	37	31	27	23	22	19	34	37	38	44	38	34	30	29	26	41
	147	530	2	38	39	45	40	36	32	30	27	42	45	46	53	47	43	39	38	35	50
	245	884	4	42	43	49	44	40	36	34	31	46	49	50	57	51	47	43	42	39	54
	344	1237	8	45	46	52	46	42	38	37	34	49	52	53	59	54	49	45	44	41	56
ø400	491	1767	17	47	48	55	49	45	41	40	37	52	55	56	62	56	52	48	47	44	59
	78	281	1	30	31	38	32	28	24	23	20	35	38	39	45	39	35	31	30	27	42
	234	842	1	39	40	46	40	36	32	31	28	43	46	47	53	48	44	40	38	35	50
	390	1403	4	42	44	50	44	40	36	35	32	47	50	51	57	52	47	43	42	39	54
ø400	546	1964	7	45	46	52	47	43	39	37	34	49	52	54	60	54	50	46	45	42	57
	779	2806	15	48	49	55	49	45	41	40	37	52	55	56	62	57	53	49	48	44	59
	126	452	1	31	32	38	33	29	25	23	20	35	39	40	46	40	36	32	31	28	43
	377	1357	1	39	40	46	41	37	33	31	28	43	47	48	54	48	44	40	39	36	51
ø400	628	2262	3	43	44	50	44	40	36	35	32	47	50	51	58	52	48	44	43	40	55
	880	3167	7	45	46	53	47	43	39	38	35	49	53	54	60	54	50	46	45	42	57
ø400	1257	4524	14	48	49	55	49	45	41	40	37	52	55	56	63	57	53	49	48	45	60

Tab. 2: Optima-RS discharged sound power levels

ΔP<sub>min</sub> (Pa), Min. pressure loss exerted on the system with Damper fully openL<sub>w</sub> dB(A), Discharged or Re-generated Sound Power levels in dB(A)

ΔP = 100 Pa, Sound power levels at system static pressure level Pa per Octave Hz

DN Size	Discharged			$\Delta P_t = 400 \text{ Pa}$									$\Delta P_t = 600 \text{ Pa}$								
	Q (l/s)	Q (m <sup>3</sup> /h)	$\Delta P_{min}$ (Pa)	63	125	250	500	1000	2000	4000	8000	$L_w$ dB(A)	63	125	250	500	1000	2000	4000	8000	$L_w$ dB(A)
ø100	8	28	1	37	39	45	39	35	31	30	27	42	41	43	49	43	39	35	34	31	46
	24	85	2	47	48	54	49	45	41	39	36	51	51	52	58	53	48	45	43	40	55
	39	141	6	51	53	59	53	49	45	44	41	56	55	57	63	57	53	49	48	45	60
	55	198	13	54	55	62	56	52	48	47	44	59	58	59	66	60	56	52	51	48	63
	79	283	26	58	59	65	59	55	51	50	47	62	61	63	69	63	59	55	54	51	66
ø125	12	44	1	39	40	47	41	37	33	32	29	44	43	45	51	45	41	37	36	33	48
	37	133	2	49	50	56	50	46	42	41	38	53	53	54	60	54	50	46	45	42	57
	61	221	6	53	54	60	55	51	47	45	42	57	57	58	64	59	55	51	50	46	61
	86	309	11	56	57	63	58	53	49	48	45	60	60	61	67	62	57	54	52	49	64
	123	442	23	59	60	66	61	56	52	51	48	63	63	64	70	65	60	57	55	52	67
ø160	20	72	1	41	42	49	43	39	35	34	31	46	45	46	53	47	43	39	38	35	50
	60	217	2	50	51	58	52	48	44	43	40	55	54	56	62	56	52	48	47	44	59
	101	362	5	55	56	62	56	52	48	47	44	59	59	60	66	60	56	52	51	48	63
	141	507	10	57	58	65	59	55	51	50	47	62	61	62	69	63	59	55	54	51	66
	201	724	21	60	61	68	62	58	54	53	50	64	64	65	72	66	62	58	57	54	69
ø200	31	113	1	43	44	50	44	40	36	35	32	47	47	48	54	49	44	41	39	36	51
	94	339	2	52	53	59	53	49	45	44	41	56	56	57	63	57	53	49	48	45	60
	157	565	5	56	57	63	57	53	49	48	45	60	60	61	67	61	57	53	52	49	64
	220	792	9	58	59	66	60	56	52	51	48	63	63	64	70	64	60	56	55	52	67
	314	1131	19	61	62	69	63	59	55	54	50	65	65	66	73	67	63	59	58	55	70
ø250	49	177	1	44	45	51	46	42	38	37	33	48	48	49	56	50	46	42	41	38	53
	147	530	2	53	54	60	54	50	46	45	42	57	57	58	64	59	54	50	49	46	61
	245	884	4	57	58	64	58	54	50	49	46	61	61	62	68	62	58	54	53	50	65
	344	1237	8	59	60	67	61	57	53	52	48	63	63	65	71	65	61	57	56	53	68
	491	1767	17	62	63	69	64	59	56	54	51	66	66	67	74	68	64	60	59	56	70
ø315	78	281	1	45	46	53	47	43	39	38	35	49	50	51	57	51	47	43	42	39	54
	234	842	1	53	55	61	55	51	47	46	43	58	58	59	65	59	55	51	50	47	62
	390	1403	4	57	58	65	59	55	51	50	47	62	62	63	69	63	59	55	54	51	66
	546	1964	7	60	61	67	61	57	53	52	49	64	64	65	71	66	62	58	57	53	68
	779	2806	15	63	64	70	64	60	56	55	52	67	67	68	74	69	64	60	59	56	71
ø400	126	452	1	46	47	53	48	44	40	39	35	50	51	52	58	52	48	44	43	40	55
	377	1357	1	54	55	61	56	52	48	47	43	58	59	60	66	60	56	52	51	48	63
	628	2262	3	58	59	65	59	55	51	50	47	62	62	63	70	64	60	56	55	52	67
	880	3167	7	60	61	68	62	58	54	53	50	65	65	66	72	66	62	58	57	54	69
	1257	4524	14	63	64	70	65	60	56	55	52	67	67	68	75	69	65	61	60	57	72

Tab. 3: Optima-RS discharged sound power levels

$\Delta P_{min}$  (Pa), Minimum pressure loss exerted on the system with Damper fully open

$L_w$  dB(A), Discharged or Re-generated Sound Power levels in dB(A)

$\Delta P = 100 \text{ Pa}$ , Sound power levels at system static pressure level Pa per Octave Hz

DN Size	Radiated			$\Delta P_t = 100 \text{ Pa}$								$\Delta P_t = 200 \text{ Pa}$									
	Q (l/s)	Q (m <sup>3</sup> /h)	$\Delta P_{\min}$ (Pa)	63	125	250	500	1000	2000	4000	8000	$L_w$ dB(A)	63	125	250	500	1000	2000	4000	8000	$L_w$ dB(A)
ø100	8	28	1	20	27	22	10	<5	<5	<5	<5	14	23	30	25	14	<5	<5	<5	<5	18
	24	85	2	34	41	36	25	12	4	3	7	29	37	45	39	28	15	7	6	10	32
	39	141	6	41	48	43	31	19	11	10	14	35	44	51	46	35	22	14	13	17	38
	55	198	13	45	52	47	36	23	15	14	18	40	48	56	50	39	26	18	18	21	43
	79	283	26	50	57	52	40	28	20	19	23	44	53	60	55	44	31	23	22	26	47
ø125	12	44	1	23	30	25	13	<5	<5	<5	<5	17	27	34	28	17	<5	<5	<5	<5	21
	37	133	2	36	43	38	27	14	6	5	9	31	40	47	42	31	18	10	9	13	35
	61	221	6	42	50	44	33	20	12	12	15	37	46	54	48	37	24	16	15	19	41
	86	309	11	46	54	48	37	24	17	16	20	41	50	58	52	41	28	20	20	23	45
	123	442	23	51	58	53	41	29	21	20	24	45	55	62	57	45	33	25	24	28	49
ø160	20	72	1	25	32	27	16	<5	<5	<5	<5	20	30	37	32	20	8	<5	<5	<5	24
	60	217	2	37	45	39	28	15	8	7	11	32	42	49	44	33	20	12	11	15	37
	101	362	5	43	50	45	34	21	13	12	16	38	48	55	50	39	26	18	17	21	43
	141	507	10	47	54	49	38	25	17	16	20	42	52	59	54	42	30	22	21	25	46
	201	724	21	51	58	53	42	29	21	20	24	46	56	63	58	46	34	26	25	29	50
ø200	31	113	1	26	34	28	17	<5	<5	<5	<5	21	32	39	34	22	10	<5	<5	5	26
	94	339	2	38	45	40	29	16	8	7	11	32	43	51	45	34	21	13	13	17	38
	157	565	5	43	51	45	34	21	13	12	16	38	49	56	51	39	27	19	18	22	43
	220	792	9	47	54	49	37	25	17	16	20	41	52	60	54	43	30	22	22	25	47
	314	1131	19	51	58	52	41	28	21	20	24	45	56	63	58	47	34	26	25	29	51
ø250	49	177	1	27	34	29	18	5	<5	<5	<5	22	33	41	35	24	11	<5	<5	6	28
	147	530	2	38	45	39	28	16	8	7	11	32	44	51	46	34	22	14	13	17	38
	245	884	4	43	50	44	33	20	13	12	16	37	49	56	51	39	27	19	18	22	43
	344	1237	8	46	53	48	36	24	16	15	19	40	52	59	54	43	30	22	21	25	47
	491	1767	17	49	57	51	40	27	19	19	22	44	56	63	57	46	33	26	25	29	50
ø315	78	281	1	27	34	29	17	5	<5	<5	<5	21	34	41	36	25	12	<5	<5	7	28
	234	842	1	37	44	38	27	15	7	6	10	31	44	51	45	34	22	14	13	17	38
	390	1403	4	41	48	43	32	19	11	10	14	36	48	55	50	39	26	18	17	21	43
	546	1964	7	44	51	46	35	22	14	13	17	39	51	58	53	42	29	21	20	24	46
	779	2806	15	47	55	49	38	25	17	16	20	42	54	62	56	45	32	24	23	27	49
ø400	126	452	1	26	33	28	17	<5	<5	<5	<5	21	34	41	36	24	12	<5	<5	7	28
	377	1357	1	35	42	37	25	13	<5	<5	8	29	43	50	44	33	20	13	12	16	37
	628	2262	3	39	46	41	29	17	9	8	12	33	47	54	48	37	25	17	16	20	41
	880	3167	7	41	49	43	32	19	12	11	15	36	49	57	51	40	27	19	19	22	44
	1257	4524	14	44	52	46	35	22	14	14	17	39	52	59	54	43	30	22	21	25	47

Tab. 4: Optima-RS radiated sound power levels

 $\Delta P_{\min}$  (Pa), Minimum pressure loss exerted on the system with Damper fully open $L_w$  dB(A), Discharged or Re-generated Sound Power levels in dB(A) $\Delta P = 100 \text{ Pa}$ , Sound power levels at system static pressure level Pa per Octave Hz

DN Size	Radiated			$\Delta P_t = 100 \text{ Pa}$									$\Delta P_t = 200 \text{ Pa}$								
	Q (l/s)	Q (m <sup>3</sup> /h)	$\Delta P_{min}$ (Pa)	63	125	250	500	1000	2000	4000	8000	$L_w$ dB(A)	63	125	250	500	1000	2000	4000	8000	$L_w$ dB(A)
ø100	8	28	1	16	17	24	18	14	10	9	6	21	18	19	26	20	16	12	11	8	23
	24	85	2	31	32	38	32	28	24	23	20	35	33	34	40	34	30	26	25	22	37
	39	141	6	37	38	45	39	35	31	30	27	42	39	40	47	41	37	33	32	29	43
	55	198	13	42	43	49	43	39	35	34	31	46	44	45	51	45	41	37	36	33	48
	79	283	26	46	47	54	48	44	40	39	36	51	48	49	56	50	46	42	41	38	52
ø125	12	44	1	21	22	28	22	18	14	13	10	25	23	24	30	25	21	17	16	12	27
	37	133	2	34	35	42	36	32	28	27	24	38	36	38	44	38	34	30	29	26	41
	61	221	6	40	42	48	42	38	34	33	30	45	43	44	50	44	40	36	35	32	47
	86	309	11	45	46	52	46	42	38	37	34	49	47	48	54	49	44	40	39	36	51
	123	442	23	49	50	56	51	46	43	41	38	53	51	52	59	53	49	45	44	41	55
ø160	20	72	1	25	26	32	26	22	18	17	14	29	28	29	35	29	25	21	20	17	32
	60	217	2	37	38	45	39	35	31	30	27	41	40	41	47	42	38	34	32	29	44
	101	362	5	43	44	50	45	41	37	35	32	47	46	47	53	47	43	39	38	35	50
	141	507	10	47	48	54	48	44	40	39	36	51	50	51	57	51	47	43	42	39	54
	201	724	21	51	52	58	53	48	44	43	40	55	54	55	61	55	51	47	46	43	58
ø200	31	113	1	28	29	35	29	25	21	20	17	32	31	32	38	33	28	24	23	20	35
	94	339	2	39	40	47	41	37	33	32	29	43	42	44	50	44	40	36	35	32	47
	157	565	5	45	46	52	46	42	38	37	34	49	48	49	55	49	45	41	40	37	52
	220	792	9	48	49	55	50	46	42	41	37	52	51	52	59	53	49	45	44	41	56
	314	1131	19	52	53	59	53	49	45	44	41	56	55	56	62	57	53	49	47	44	59
ø250	49	177	1	30	31	37	31	27	23	22	19	34	33	35	41	35	31	27	26	23	38
	147	530	2	40	42	48	42	38	34	33	30	45	44	45	51	46	42	38	37	33	48
	245	884	4	45	46	53	47	43	39	38	35	50	49	50	56	51	47	43	41	38	53
	344	1237	8	49	50	56	50	46	42	41	38	53	52	53	60	54	50	46	45	42	57
	491	1767	17	52	53	59	54	50	46	45	41	56	56	57	63	57	53	49	48	45	60
ø315	78	281	1	31	32	39	33	29	25	24	21	36	35	36	43	37	33	29	28	25	40
	234	842	1	41	42	48	43	38	35	33	30	45	45	46	52	47	43	39	38	34	49
	390	1403	4	45	47	53	47	43	39	38	35	50	50	51	57	51	47	43	42	39	54
	546	1964	7	48	50	56	50	46	42	41	38	53	53	54	60	54	50	46	45	42	57
	779	2806	15	52	53	59	53	49	45	44	41	56	56	57	63	57	53	49	48	45	60
ø400	126	452	1	32	33	39	34	29	26	24	21	36	37	38	44	38	34	30	29	26	41
	377	1357	1	41	42	48	42	38	34	33	30	45	45	46	53	47	43	39	38	35	50
	628	2262	3	45	46	52	46	42	38	37	34	49	49	50	57	51	47	43	42	39	54
	880	3167	7	47	49	55	49	45	41	40	37	52	52	53	59	54	50	46	44	41	56
	1257	4524	14	50	51	58	52	48	44	43	40	55	55	56	62	57	52	48	47	44	59

Tab. 5: Optima-RS radiated sound power levels

$\Delta P_{min}$  (Pa), Minimum pressure loss exerted on the system with Damper fully open

$L_w$  dB(A), Discharged or Re-generated Sound Power levels in dB(A)

$\Delta P = 100 \text{ Pa}$ , Sound power levels at system static pressure level Pa per Octave Hz

## Mounting

Measuring track length after Elbow or a T-branch etc. installations, L to be min. 3 times duct diameter. If L can not be respected, then minimum of 2× diameter with perforated equalizing grid should be installed.

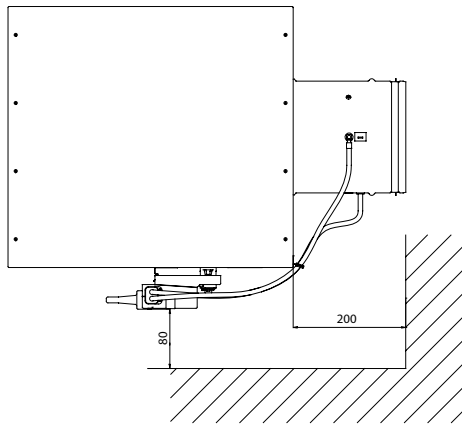


Fig. 3: Optima-RS-BLC\_installation

