

OPTIMA-R

Single or double skin circular VAV units



Ordering codes:

		OPTIMA-R -							
Double skin isolated version		I							
Size		code 08 - 63 (øD 80 - 630 mm)							
	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} (m³/h)									
V_{max} (m³/h)									
	(DC 0 - 10 V)	0							
Control voltage	(DC 2 - 10 V)	2							

Ordering code example:

OPTIMA-R - 10 - BLC1 - 50 - 110 - 0

OPTIMA-R size 100, not isolated, with LMV-D3 MP-bus communicative controller/drive, $V_{min} = 50 \text{ m}^3/\text{h}$, $V_{max} = 110 \text{ m}^3/\text{h}$, control voltage DC 0-10V.

NOTES:

1. If the air volumes are not given during the ordering process, then standard Factory setting will be applied according to table
2. V_{min} can also be set to 0 m³/h if required by demand upon ordering
3. The setup values of V_{min} and V_{max} must be inside the range of min / max factory settings (see dimensions / volumes table)
4. The standard input signal on the controller is set to 2-10 V, upon request 0-10 V can also be selected

Description

Single or double skin circular VAV terminal units are commonly used for return air applications or for supply applications at low system pressures. Optima terminal units are ideal for single zone 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
- ILH Hygienic certification VDI 6022 & VDI 3803 for Standard Ventilation & Clean room application
- High measuring accuracy of 5 %
- Air volume range of 36 to 14589 m³/h
- Operating range of up to 1000 Pa
- Double skinn version OPTIMA-R-I with external 50mm noise & thermal isolation under steel sheet cover

Accessories for OPTIMA-R:

- Attenuators THP

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 is constructed from galvanized sheet steel. Special design of multi-point averaging cross flow sensor assures an accurate air flow readings even in difficult installations.

Available sizes:

Inlet / outlet: from $\varnothing 80$ to $\varnothing 630$ mm

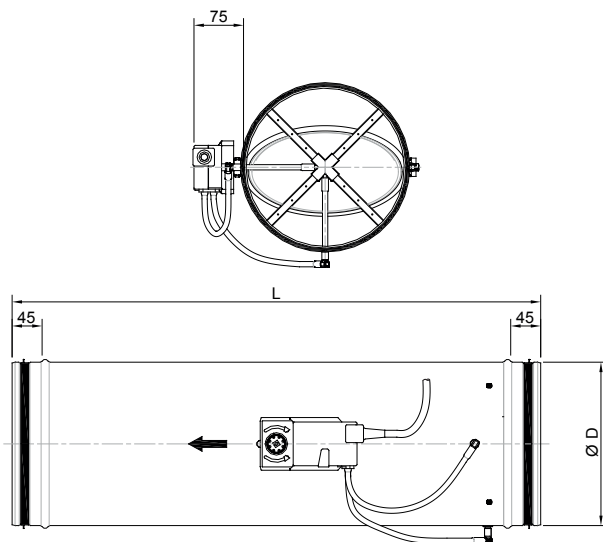


Fig. 1: OPTIMA-R dimensions

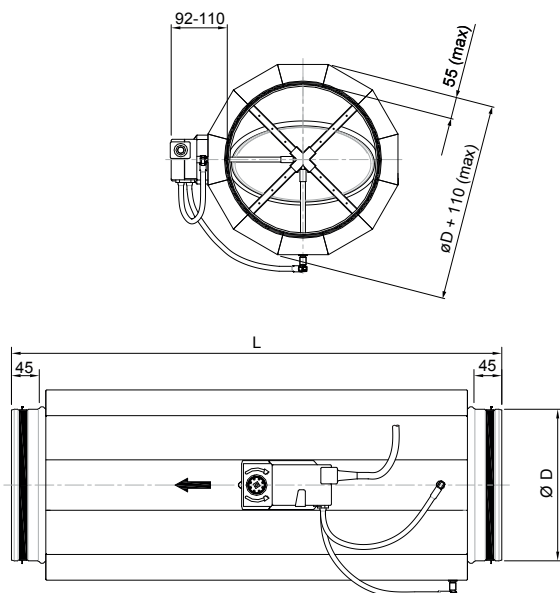


Fig. 2: OPTIMA-R-I dimensions

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.

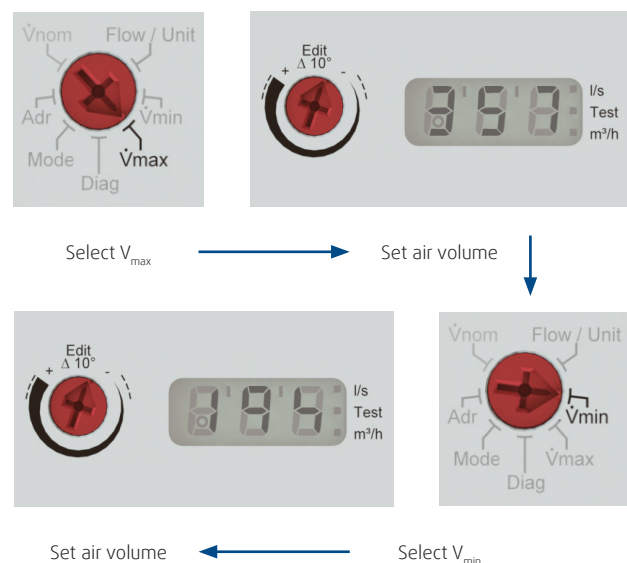


Fig. 3: OPTIMA-R...GO... easy parameter settings

Dimensions

Code	Size	øD (mm)	L (mm)	Air volume *(m³/h)		Air volume *(l/s)		OPTIMA-R	OPTIMA-R-I
				V _{min}	V _{max}	V _{min}	V _{max}		
OPTIMA-R-x-08-xxx_	80	78	400	36	235	10	65	1,30	2,09
OPTIMA-R-x-10-xxx_	100	98	400	57w	368	16	102	1,50	2,42
OPTIMA-R-x-12-xxx_	125	123	400	88	574	25	160	1,90	3,06
OPTIMA-R-x-16-xxx_	160	158	400	145	941	40	261	4,46	7,18
OPTIMA-R-x-20-xxx_	200	198	600	226	1470	63	408	5,57	8,97
OPTIMA-R-x-25-xxx_	250	248	800	353	2297	98	638	6,97	11,22
OPTIMA-R-x-31-xxx_	315	313	800	561	3647	156	1013	8,80	14,17
OPTIMA-R-x-40-xxx_	400	398	800	905	5881	251	1634	11,15	17,95
OPTIMA-R-x-50-xxx_	500	498	1000	1414	9189	393	2553	13,95	22,45
OPTIMA-R-x-63-xxx_	630	623	1000	2244	14589	623	4052	17,57	28,29

Tab. 1: OPTIMA-R table of dimensions and air volume range

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

10 - 20% of V_{max} air flow rate has an accuracy error rate of: ±25%

20 - 40% of V_{max} air flow rate has an accuracy error rate of: <±10%

40 - 100% of V_{max} air flow rate has an accuracy error rate of: <±4%

Quick selection

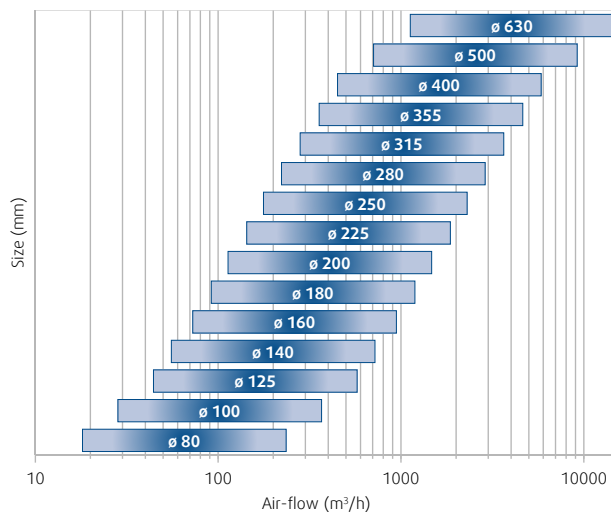


Fig. 4: OPTIMA-R quick selection diagram

Technical details

Size	Air Volume			ΔPt = 100 Pa								ΔPt = 200 Pa									
	Q (l/s)	Q (m³/h)	ΔP _{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)
ø80	5	18	1	18	26	29	28	26	20	16	11	30	24	32	35	33	31	26	22	16	36
	15	54	6	29	37	40	39	37	31	27	22	41	35	43	46	45	43	37	33	28	47
	25	90	17	35	43	45	44	42	37	33	27	46	41	48	51	50	48	42	38	33	52
	35	127	34	38	46	49	47	45	40	36	30	50	44	52	55	53	51	46	42	36	55
	50	181	69	42	50	52	51	49	44	40	34	53	48	55	58	57	55	49	45	40	59
ø100	8	28	1	22	29	32	31	29	23	19	14	33	27	35	38	37	35	29	25	20	39
	24	85	6	32	40	43	42	39	34	30	25	44	38	46	49	47	45	40	36	30	50
	39	141	16	37	45	48	47	44	39	35	30	49	43	51	54	52	50	45	41	35	55
	55	198	31	41	48	51	50	48	42	38	33	52	46	54	57	56	54	48	44	39	58
ø125	79	283	63	44	52	55	53	51	46	42	36	56	50	58	61	59	57	52	48	42	61
	12	44	1	24	32	35	34	32	26	22	17	36	30	38	41	40	37	32	28	23	42
	37	133	5	35	42	45	44	42	36	32	27	46	41	48	51	50	48	42	38	33	52
	61	221	14	39	47	50	49	47	41	37	32	51	45	53	56	55	53	47	43	38	57
	86	309	28	43	50	53	52	50	44	40	35	54	48	56	59	58	56	50	46	41	60
ø160	123	442	56	46	54	57	55	53	48	44	38	57	52	60	62	61	59	54	50	44	63
	20	72	1	27	35	38	36	34	29	25	19	39	33	41	44	42	40	35	31	25	45
	60	217	4	37	45	47	46	44	39	35	29	48	43	51	53	52	50	45	41	35	54
	101	362	12	41	49	52	51	49	43	39	34	53	47	55	58	57	54	49	45	40	59
	141	507	24	44	52	55	54	52	46	42	37	56	50	58	61	60	57	52	48	43	62
ø200	201	724	49	47	55	58	57	55	49	45	40	59	53	61	64	63	61	55	51	46	65
	31	113	1	30	34	33	30	27	24	22	14	33	35	40	38	36	33	29	28	20	38
	94	339	4	41	46	44	42	39	35	33	26	44	46	51	50	47	44	41	39	31	50
	157	565	11	46	51	49	47	44	40	39	31	49	52	57	55	53	50	46	44	36	55
	220	792	21	50	55	53	50	48	44	42	34	53	55	60	58	56	53	49	48	40	58
ø250	314	1131	42	53	58	56	54	51	48	46	38	57	59	64	62	60	57	53	51	44	62
	49	177	1	34	38	37	34	31	28	26	18	37	39	44	43	40	37	34	32	24	43
	147	530	3	44	49	47	45	42	38	36	29	47	50	55	53	51	48	44	42	34	53
	245	884	9	49	54	52	49	47	43	41	33	52	55	59	58	55	52	49	47	39	58
	344	1237	17	52	57	55	53	50	46	44	36	55	58	63	61	58	56	52	50	42	61
ø315	491	1767	36	55	60	58	56	53	49	48	40	58	61	66	64	62	59	55	53	46	64
	78	281	1	37	42	40	38	35	31	29	22	40	43	48	46	44	41	37	35	28	46
	234	842	3	46	51	49	47	44	40	39	31	49	52	57	55	53	50	47	45	37	56
	390	1403	7	50	55	54	51	48	45	43	35	54	57	61	60	57	54	51	49	41	60
	546	1964	14	53	58	56	54	51	47	46	38	56	59	64	62	60	57	54	52	44	63
ø400	779	2806	29	56	61	59	57	54	50	49	41	59	62	67	65	63	60	57	55	47	66
	126	452	1	39	44	42	40	37	34	32	24	43	46	51	49	47	44	40	38	30	49
	377	1357	2	47	52	51	48	45	42	40	32	51	54	59	57	55	52	48	46	38	57
	628	2262	5	51	56	54	52	49	45	44	36	54	58	62	61	58	55	52	50	42	61
	880	3167	11	54	58	57	54	51	48	46	38	57	60	65	63	61	58	54	53	45	63
ø500	1257	4524	22	56	61	59	57	54	51	49	41	59	63	68	66	63	61	57	55	47	66
	196	707	1	41	46	44	42	39	35	33	25	44	47	52	51	48	45	42	40	32	51
	589	2121	2	48	53	51	49	46	42	40	32	51	54	59	58	55	52	49	47	39	58
	982	3534	5	51	56	54	52	49	45	43	36	54	58	63	61	59	56	52	50	42	61
	1374	4948	11	53	58	56	54	51	47	46	38	56	60	65	63	61	58	54	52	45	63
ø630	2356	8482	31	57	61	60	57	54	51	49	41	60	63	68	66	64	61	58	56	48	67
	312	1122	1	41	46	44	42	39	36	34	26	45	48	53	51	49	46	43	41	33	52
	935	3367	2	47	52	50	48	45	41	40	32	50	54	59	57	55	52	48	47	39	57
	1559	5611	5	50	55	53	51	48	44	42	35	53	57	62	60	58	55	51	49	42	60
	2182	7855	11	52	57	55	52	50	46	44	36	55	59	64	62	60	57	53	51	43	62
ø800	3117	11222	22	54	58	57	54	51	48	46	38	57	61	66	64	61	59	55	53	45	64

Tab. 2: OPTIMA-R-I 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

Size	Air Volume			$\Delta P_t = 100 \text{ Pa}$									$\Delta P_t = 200 \text{ Pa}$								
	Q (l/s)	Q (m³/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)
ø80	5	18	1	30	38	41	39	37	32	28	22	41	33	41	44	43	40	35	31	26	45
	15	54	6	41	49	52	50	48	43	39	33	53	44	52	55	54	52	46	42	37	56
	25	90	17	46	54	57	56	54	48	44	39	58	50	58	60	59	57	52	47	42	61
	35	127	34	50	58	60	59	57	52	48	42	61	53	61	64	62	60	55	51	45	65
	50	181	69	53	61	64	63	61	55	51	46	65	57	65	67	66	64	59	55	49	68
ø100	8	28	1	33	41	44	43	40	35	31	26	45	37	44	47	46	44	38	34	29	48
	24	85	6	44	52	55	53	51	46	42	36	55	47	55	58	57	55	49	45	40	59
	39	141	16	49	57	60	58	56	51	47	41	60	52	60	63	62	60	54	50	45	64
	55	198	31	52	60	63	62	59	54	50	45	64	56	63	66	65	63	57	53	48	67
	79	283	63	56	64	66	65	63	58	54	48	67	59	67	70	68	66	61	57	51	71
ø125	12	44	1	36	44	47	45	43	38	34	28	48	40	47	50	49	47	41	37	32	51
	37	133	5	46	54	57	56	54	48	44	39	58	50	58	61	59	57	52	48	42	61
	61	221	14	51	59	62	60	58	53	49	44	63	55	62	65	64	62	56	52	47	66
	86	309	28	54	62	65	64	62	56	52	47	66	58	66	68	67	65	60	56	50	69
	123	442	56	58	65	68	67	65	59	55	50	69	61	69	72	70	68	63	59	53	73
ø160	20	72	1	39	47	50	48	46	41	37	31	50	42	50	53	52	50	44	40	35	54
	60	217	4	49	57	59	58	56	51	46	41	60	52	60	63	61	59	54	50	45	64
	101	362	12	53	61	64	63	60	55	51	46	65	57	65	67	66	64	59	55	49	68
	141	507	24	56	64	67	66	63	58	54	49	68	60	68	70	69	67	62	57	52	71
	201	724	49	59	67	70	69	67	61	57	52	71	63	71	74	72	70	65	61	55	74
ø200	31	113	1	41	45	44	41	38	35	33	25	44	44	49	47	45	42	38	36	28	47
	94	339	4	52	57	55	53	50	46	44	37	55	55	60	58	56	53	49	48	40	58
	157	565	11	57	62	60	58	55	52	50	42	61	60	65	64	61	58	55	53	45	64
	220	792	21	61	66	64	62	59	55	53	45	64	64	69	67	65	62	58	56	49	67
	314	1131	42	64	69	68	65	62	59	57	49	68	68	72	71	68	65	62	60	52	71
ø250	49	177	1	45	50	48	46	43	40	38	30	49	49	54	52	49	47	43	41	33	52
	147	530	3	56	60	59	56	53	50	48	40	59	59	64	62	60	57	53	51	44	62
	245	884	9	60	65	63	61	58	55	53	45	64	64	69	67	65	62	58	56	48	67
	344	1237	17	64	68	67	64	61	58	56	48	67	67	72	70	68	65	61	59	52	70
	491	1767	36	67	72	70	68	65	61	59	51	70	70	75	73	71	68	65	63	55	74
ø315	78	281	1	49	54	52	50	47	43	42	34	52	53	58	56	54	51	47	45	37	56
	234	842	3	58	63	61	59	56	53	51	43	62	62	67	65	63	60	56	54	47	65
	390	1403	7	63	67	66	63	60	57	55	47	66	66	71	69	67	64	61	59	51	69
	546	1964	14	65	70	69	66	63	60	58	50	69	69	74	72	70	67	63	61	54	72
	779	2806	29	68	73	72	69	66	63	61	53	72	72	77	75	73	70	66	64	57	75
ø400	126	452	1	52	57	55	53	50	47	45	37	56	56	61	59	57	54	50	48	41	59
	377	1357	2	60	65	63	61	58	55	53	45	64	64	69	67	65	62	58	57	49	67
	628	2262	5	64	69	67	65	62	58	56	49	67	68	73	71	69	66	62	60	52	71
	880	3167	11	67	71	70	67	64	61	59	51	70	70	75	73	71	68	65	63	55	74
	1257	4524	22	69	74	72	70	67	63	62	54	72	73	78	76	74	71	67	65	58	76
ø500	196	707	1	54	59	57	55	52	49	47	39	57	58	63	61	59	56	52	51	43	61
	589	2121	2	61	66	64	62	59	56	54	46	64	65	70	68	66	63	59	58	50	68
	982	3534	5	64	69	68	65	62	59	57	49	68	68	73	72	69	66	63	61	53	72
	1374	4948	11	67	71	70	67	64	61	59	51	70	71	75	74	71	68	65	63	55	74
	2356	8482	31	70	75	73	71	68	64	62	55	73	74	79	77	75	72	68	66	59	77
ø630	312	1122	1	55	60	58	56	53	50	48	40	59	59	64	63	60	57	54	52	44	63
	935	3367	2	61	66	64	62	59	56	54	46	65	65	70	69	66	63	60	58	50	69
	1559	5611	5	64	69	67	65	62	58	56	49	67	68	73	71	69	66	62	61	53	71
	2182	7855	11	66	71	69	67	64	60	58	50	69	70	75	73	71	68	64	62	55	73
	3117	11222	22	68	73	71	69	66	62	60	52	71	72	77	75	73	70	66	64	56	75

Tab. 3: OPTIMA-R 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

Size	Air Volume			ΔPt = 100 Pa								ΔPt = 200 Pa									
	Q (l/s)	Q (m³/h)	ΔP _{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)
ø80	5	18	1	3	5	3	6	0	0	0	0	<20	7	10	8	10	5	2	0	2	<20
	15	54	6	14	17	15	18	12	9	8	10	<20	19	21	19	22	16	14	12	14	23
	25	90	17	20	22	20	23	17	15	13	15	24	24	27	25	27	22	19	17	19	28
	35	127	34	23	26	24	27	21	18	17	19	28	28	30	28	31	25	23	21	23	32
	50	181	69	27	30	28	30	25	22	20	22	32	32	34	32	35	29	26	25	27	36
ø100	8	28	1	5	7	5	8	2	0	0	0	<20	9	11	9	12	6	4	2	4	<20
	24	85	6	17	19	17	20	14	12	10	12	21	21	23	21	24	18	15	14	16	25
	39	141	16	22	25	23	25	20	17	16	17	27	26	28	26	29	23	21	19	21	30
	55	198	31	26	28	26	29	23	21	19	21	30	30	32	30	33	27	24	23	25	34
	79	283	63	30	32	30	33	27	25	23	25	34	33	36	34	37	31	28	27	29	38
ø125	12	44	1	7	10	8	10	5	2	0	2	<20	10	13	11	14	8	5	4	6	<20
	37	133	5	19	22	20	22	17	14	12	14	24	22	25	23	26	20	17	16	18	27
	61	221	14	25	27	25	28	22	20	18	20	29	28	30	28	31	25	23	21	23	32
	86	309	28	28	31	29	32	26	23	22	24	33	32	34	32	35	29	26	25	27	36
	123	442	56	32	35	33	35	30	27	26	27	37	35	38	36	39	33	30	29	31	40
ø160	20	72	1	14	12	10	9	7	5	3	0	<20	20	17	16	14	13	10	8	2	<20
	60	217	4	25	23	21	20	19	16	14	8	24	31	28	27	25	24	21	19	13	29
	101	362	12	30	28	26	25	24	21	19	13	29	36	33	32	30	29	26	24	18	34
	141	507	24	34	31	30	28	27	24	22	16	32	39	37	35	33	32	30	28	22	37
	201	724	49	37	35	33	32	31	28	26	20	36	43	40	39	37	36	33	31	25	41
ø200	31	113	1	19	17	15	13	12	9	8	1	<20	25	22	21	19	18	15	13	7	23
	94	339	4	29	27	25	23	22	20	18	11	27	35	32	31	29	28	25	23	17	33
	157	565	11	34	31	30	28	27	24	22	16	32	39	37	36	34	33	30	28	22	38
	220	792	21	37	35	33	31	30	27	25	19	35	43	40	39	37	36	33	31	25	41
	314	1131	42	40	38	36	34	33	31	29	23	38	46	43	42	40	39	36	34	28	44
ø250	49	177	1	23	21	19	17	16	13	12	5	21	29	27	25	23	22	19	18	11	27
	147	530	3	32	30	28	26	25	23	21	15	30	38	36	34	32	31	29	27	21	36
	245	884	9	36	34	33	31	30	27	25	19	35	42	40	38	37	36	33	31	25	41
	344	1237	17	39	37	35	34	32	30	28	22	37	45	43	41	39	38	36	34	28	43
	491	1767	36	42	40	38	36	35	33	31	25	40	48	46	44	42	41	39	37	31	46
ø315	78	281	1	26	24	22	21	20	17	15	9	25	33	30	29	27	26	23	21	15	31
	234	842	3	34	32	31	29	28	25	23	17	33	41	38	37	35	34	31	29	23	39
	390	1403	7	38	36	34	33	32	29	27	21	37	45	42	41	39	38	35	33	27	43
	546	1964	14	41	39	37	35	34	31	29	23	39	47	45	43	41	40	38	36	29	45
	779	2806	29	43	41	40	38	37	34	32	26	42	50	47	46	44	43	40	38	32	48
ø400	126	452	1	29	27	25	23	22	19	18	11	27	35	33	32	30	29	26	24	18	34
	377	1357	2	36	34	32	30	29	27	25	18	34	43	40	39	37	36	33	31	25	41
	628	2262	5	39	37	36	34	33	30	28	22	38	46	44	42	40	39	37	35	28	44
	880	3167	11	42	39	38	36	35	32	30	24	40	48	46	44	43	42	39	37	31	46
	1257	4524	22	44	42	40	38	37	34	33	26	42	51	48	47	45	44	41	39	33	49
ø500	196	707	1	31	28	27	25	24	21	19	13	29	37	35	34	32	31	28	26	20	36
	589	2121	2	37	34	33	31	30	27	25	19	35	44	41	40	38	37	34	32	26	42
	982	3534	5	40	37	36	34	33	30	28	22	38	47	44	43	41	40	37	35	29	45
	1374	4948	11	42	39	38	36	35	32	30	24	40	48	46	45	43	42	39	37	31	47
	2356	8482	31	45	42	41	39	38	35	33	27	43	52	49	48	46	45	42	40	34	50
ø630	312	1122	1	31	29	28	26	25	22	20	14	30	39	36	35	33	32	29	27	21	37
	935	3367	2	37	34	33	31	30	27	25	19	35	44	42	40	38	37	34	32	26	42
	1559	5611	5	39	37	35	33	32	30	28	22	37	46	44	42	41	40	37	35	29	45
	2182	7855	11	41	38	37	35	34	31	29	23	39	48	46	44	42	41	38	37	30	46
	3117	11222	22	42	40	39	37	36	33	31	25	41	50	47	46	44	43	40	38	32	48

Tab. 4: OPTIMA-R-I 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

Size	Air Volume			$\Delta P_t = 100 \text{ Pa}$								$\Delta P_t = 200 \text{ Pa}$									
	Q (l/s)	Q (m³/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)
ø80	5	18	1	11	14	12	15	9	6	5	7	<20	14	16	14	17	11	9	7	9	Ø
	15	54	6	23	26	24	26	21	18	16	18	27	26	28	26	29	23	20	19	21	30
	25	90	17	28	31	29	32	26	23	22	24	33	31	33	31	34	28	26	24	26	35
	35	127	34	32	35	33	35	30	27	25	27	36	35	37	35	38	32	29	28	30	39
	50	181	69	36	38	36	39	33	31	29	31	40	38	41	39	41	36	33	32	33	43
ø100	8	28	1	12	15	13	16	10	7	6	8	<20	15	17	15	18	12	9	8	10	<20
	24	85	6	24	27	25	27	22	19	17	19	29	26	29	27	30	24	21	20	22	31
	39	141	16	30	32	30	33	27	25	23	25	34	32	34	32	35	29	27	25	27	36
	55	198	31	33	36	34	36	31	28	27	28	38	35	38	36	39	33	30	29	31	40
	79	283	63	37	40	38	40	35	32	30	32	41	39	42	40	42	37	34	33	34	44
ø125	12	44	1	14	16	14	17	11	8	7	9	<20	15	18	16	18	13	10	9	10	<20
	37	133	5	26	28	26	29	23	20	19	21	30	27	30	28	30	25	22	21	22	32
	61	221	14	31	34	32	34	29	26	24	26	35	33	35	33	36	30	28	26	28	37
	86	309	28	35	37	35	38	32	30	28	30	39	37	39	37	40	34	31	30	32	41
	123	442	56	39	41	39	42	36	34	32	34	43	40	43	41	44	38	35	34	36	45
ø160	20	72	1	25	23	21	19	18	15	14	7	23	28	26	24	22	21	19	17	11	26
	60	217	4	36	34	32	30	29	27	25	18	34	39	37	35	34	32	30	28	22	37
	101	362	12	41	39	37	35	34	32	30	24	39	44	42	40	39	38	35	33	27	43
	141	507	24	45	42	41	39	38	35	33	27	43	48	45	44	42	41	38	36	30	46
	201	724	49	48	46	44	42	41	39	37	31	46	51	49	47	46	45	42	40	34	50
ø200	31	113	1	30	28	26	25	24	21	19	13	29	34	31	30	28	27	24	22	16	32
	94	339	4	40	38	37	35	34	31	29	23	39	44	41	40	38	37	34	32	26	42
	157	565	11	45	43	41	39	38	36	34	28	43	48	46	45	43	42	39	37	31	47
	220	792	21	48	46	44	43	42	39	37	31	46	52	49	48	46	45	42	40	34	50
	314	1131	42	51	49	48	46	45	42	40	34	50	55	53	51	49	48	45	43	37	53
ø250	49	177	1	35	33	31	29	28	25	24	17	33	38	36	35	33	32	29	27	21	37
	147	530	3	44	42	40	38	37	35	33	26	42	48	45	44	42	41	38	36	30	46
	245	884	9	48	46	44	43	42	39	37	31	47	52	50	48	46	45	42	40	34	50
	344	1237	17	51	49	47	45	44	42	40	34	49	55	52	51	49	48	45	43	37	53
	491	1767	36	54	52	50	48	47	45	43	37	52	58	55	54	52	51	48	46	40	56
ø315	78	281	1	39	37	35	33	32	29	27	21	37	43	40	39	37	36	33	31	25	41
	234	842	3	47	45	43	41	40	38	36	29	45	51	48	47	45	44	41	39	33	49
	390	1403	7	51	49	47	45	44	41	39	33	49	55	52	51	49	48	45	43	37	53
	546	1964	14	53	51	49	48	47	44	42	36	52	57	55	53	51	50	48	46	39	55
	779	2806	29	56	54	52	50	49	47	45	38	54	60	57	56	54	53	50	48	42	58
ø400	126	452	1	42	40	38	36	35	33	31	24	40	46	44	42	40	39	36	35	28	44
	377	1357	2	49	47	45	44	43	40	38	32	48	53	51	49	47	46	44	42	35	51
	628	2262	5	53	50	49	47	46	43	41	35	51	56	54	53	51	50	47	45	39	55
	880	3167	11	55	52	51	49	48	45	43	37	53	59	56	55	53	52	49	47	41	57
	1257	4524	22	57	55	53	51	50	48	46	40	55	61	59	57	55	54	51	50	43	59
ø500	196	707	1	44	42	40	39	38	35	33	27	43	48	46	44	43	42	39	37	31	47
	589	2121	2	51	48	47	45	44	41	39	33	49	55	52	51	49	48	45	43	37	53
	982	3534	5	53	51	50	48	47	44	42	36	52	57	55	54	52	51	48	46	40	56
	1374	4948	11	55	53	51	50	49	46	44	38	54	59	57	55	54	53	50	48	42	58
	2356	8482	31	58	56	55	53	52	49	47	41	57	62	60	59	57	56	53	51	45	61
ø630	312	1122	1	46	43	42	40	39	36	34	28	44	50	48	46	44	43	40	39	32	48
	935	3367	2	51	49	47	45	44	42	40	33	49	55	53	51	50	49	46	44	38	53
	1559	5611	5	53	51	50	48	47	44	42	36	52	58	55	54	52	51	48	46	40	56
	2182	7855	11	55	53	51	49	48	46	44	37	53	59	57	55	54	53	50	48	42	58
	3117	11222	22	57	54	53	51	50	47	45	39	55	61	59	57	55	54	51	50	43	59

Tab. 5: OPTIMA-R 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 $2 \times$ diameter with perforated equalizing grid should be installed.

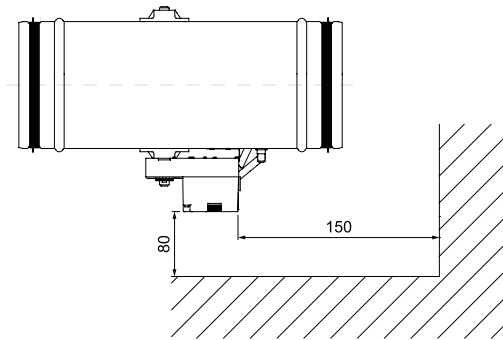


Fig. 5: OPTIMA-R-BLC_ installation

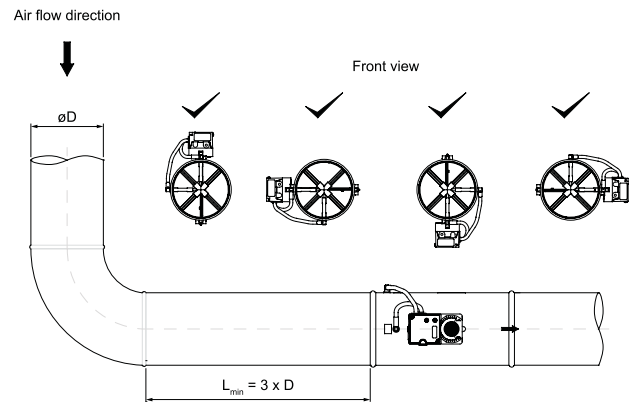


Fig. 6: OPTIMA-R positioning and definition of measuring track length