

AERZEN

POSITIVE DISPLACEMENT BLOWERS

Aerzen positive displacement blower units
with three-lobe rotors and internal pulsation cancellation
intake volumes from 30 m³/hr to 15.000 m³/hr



**AERZENER MASCHINENFABRIK
GMBH**

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3000 5.2005

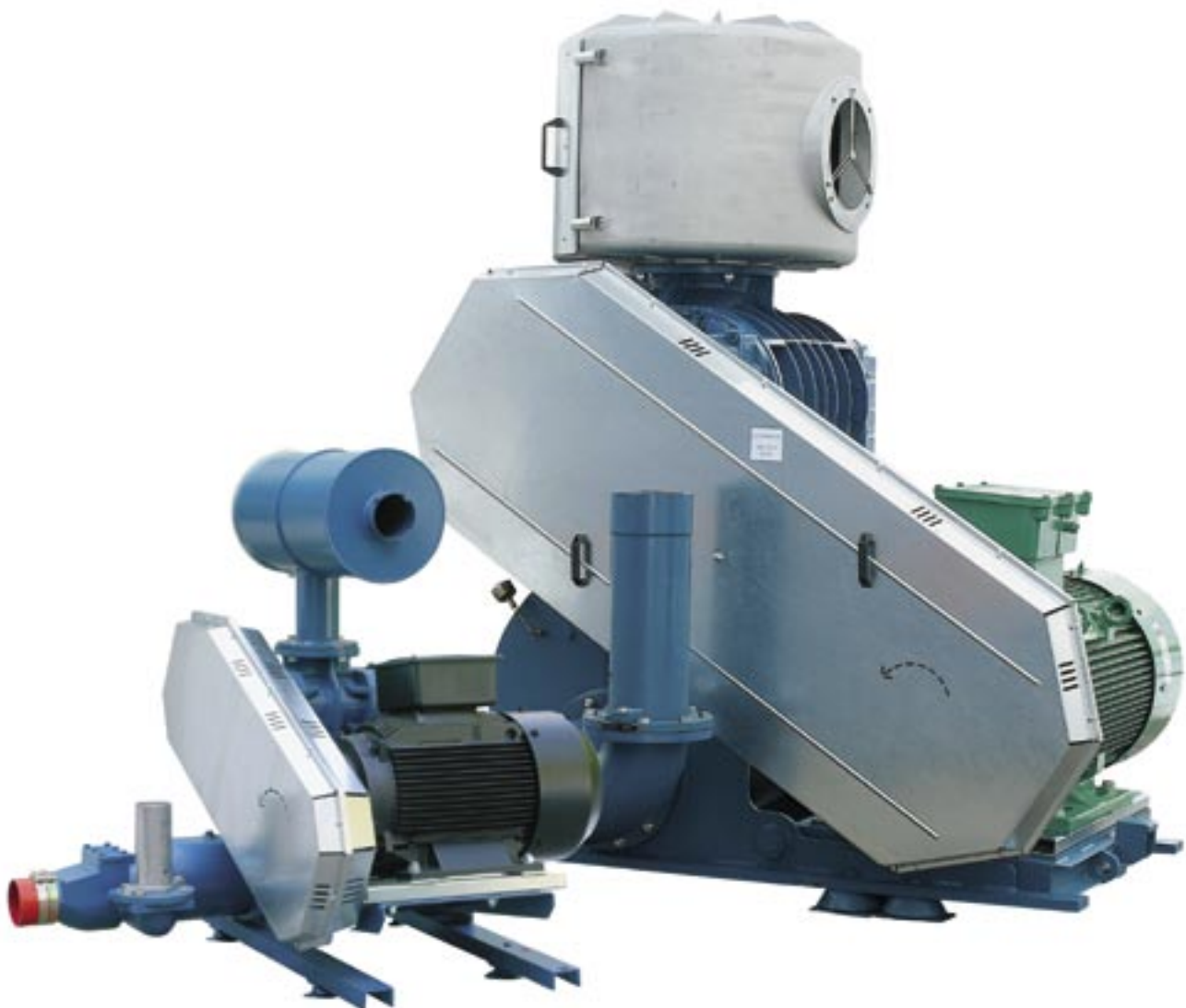
Technological advance for the future

The Aerzener Maschinenfabrik GmbH have been manufacturing Positive Displacement Blowers since 1868. They are amongst the oldest and largest manufacturers worldwide and are the Market Leader in Europe. Technical competence, an experienced work force plus a constant dialogue with the operators ensure that Aerzen and our customers stay at the forefront of technical development.

With the development of the Delta Blower Packages, the increasing demands of the market have been achieved.

Delta Blower stands for:

- Aerzen blower stages with integrated pulsation cancellation
- A concept gained from 30 years of blower packages production
- Minimal surface area required for installation
- Maintenance-free drive components
- Discharge silencers, free of absorption material
- Easy accessibility
- Quiet - low noise emission
- Energy efficient therefore environmentally friendly to use
- Quality Control certified acc. to DIN ISO 9001

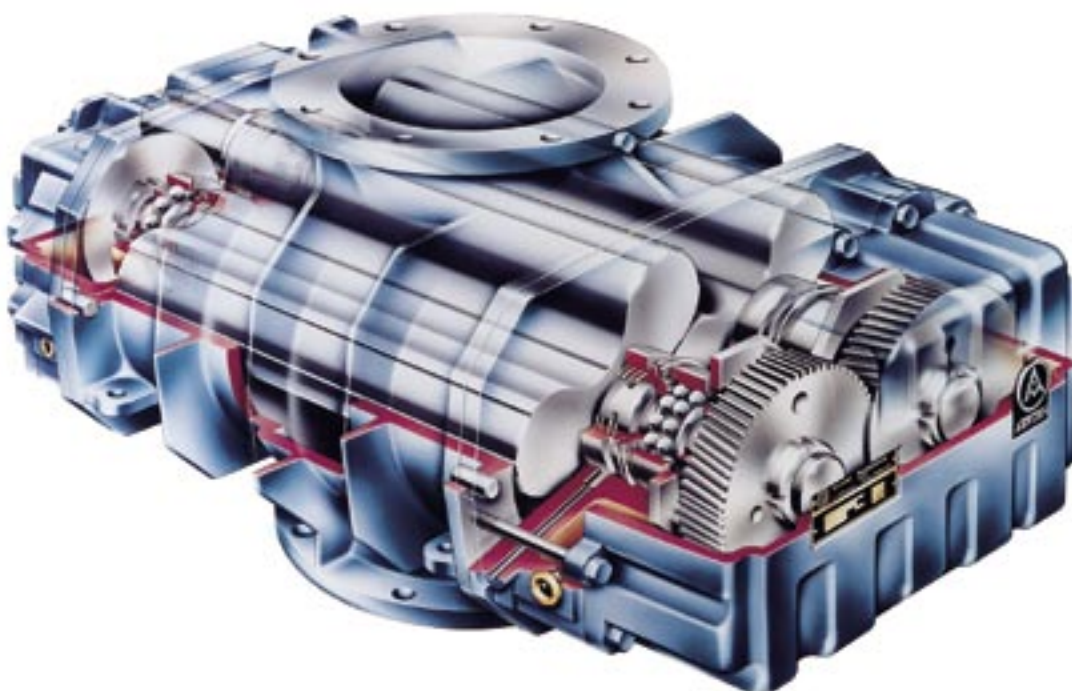
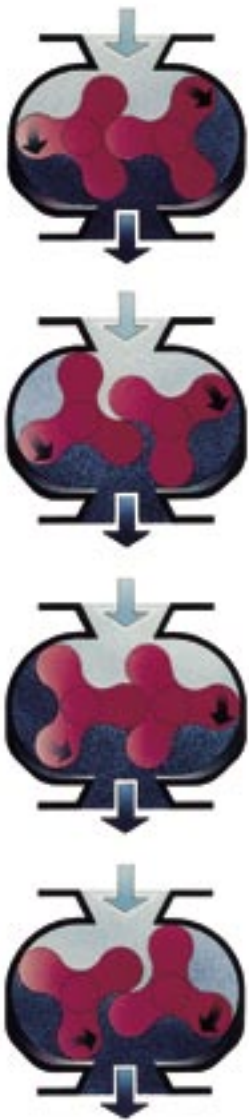


Pulsations eliminated at source

Each of the new Delta Blower units feature a blower stage with internal pulsation cancellation.

Two-Lobe Blowers operating on the Roots principle produce conveying pulsations due to their design, which can be detrimental not only to the blower itself but also to the conveying pipework.

Using a patented development by Aerzener Maschinenfabrik, these pulsations are almost eliminated at source. To achieve this the three-lobe blower has two channels cast into the cylinder wall that control the backstream of gas into the cylinder. This backstream produces sound waves which by interference cancel most of those produced by the blower.



Fields of application

The Delta Blower unit has been designed for the conveying of air and neutral gases.

The flexible modular design makes it possible to combine the accessories of one nominal flange size with corresponding blowers and motor sizes. With all the possible motor sizes and corresponding V-belt drives that can be fitted to one basic frame it is possible to match the present requirements very closely but still leave scope for future operating changes.

The blowers are available in 16 sizes for intake volumes from 30 m³/hour up to 15.000 m³/hour and discharge pressures up to 1000 mbar depending on the blower size. Higher intake volume flows on request.

Fields of application for standard design:

Water Treatment Basin Aeration, Filter Flushing

Pneumatics: Pneumatic conveying of bulk materials for example foodstuffs, granulated plastic material, cement and many other materials

Other areas of the process industry and environmental protection.

Experience in the manufacture of twin-shaft machines is backed by a Quality Control System according to DIN ISO 9001 of which Aerzener has been a certified member since 1990.

Design and fabrication of the machines are carried out in accordance with the following harmonized standards:

- EMV-directive 89/336/EC
- pressure equipment directive 97/23/EC
- low-voltage directive 73/23/EC
- EC-machine directive 98/37/EC



Construction and Manufacture

Blower

The blower has three-lobe rotors and the cylinder housing has pre-inlet channels to reduce sound emissions through pulsation cancellation.

The cylinder, end plates and covers are made of EN-GJL-200.

Rotors

Three-lobe rotors, sizes GM 3 S to GM 80 L are in one-piece-drop-forged steel of C 45 N. GM 90 S and GM 130 L rotors and shafts in one piece of EN-GJS-500-7. GM 150 S to GM 240 S out of EN-GJS-400-18-LT, shafts out of C 45 N.

Cooling

Convection cooling via the housing surface is adequate for blowers operating within their thermal range as shown in the performance tables.

Lubrication

Bearings and timing gears are splash lubricated.

Oilfree conveying (Sealing)

The conveying chamber (cylinder) is sealed from the gear case and the front cover by piston ring labyrinth seals. These seals have a central, neutral chamber which is open to the atmosphere.

Timing Gears

The helical timing gears are hardened and ground. They are fitted to the shafts by the oil expanded taper method.

The Blower Unit

By using a three-lobe blower in combination with the pre-inlet a pulsation decrease can be obtained and a completely new concept in package design is possible.

The ancillary items used to make up the complete unit are all mounted on the discharge silencer / base assembly.

This assembly contains no absorption material and is wear-resistant, it has been designed to produce



constant noise reduction over the total speed range of the blower fitted to it. This silencer corresponds to pressure equipment directive PED 97/23/EC. Additional silencers are not required under normal use.

Experience over many years with the use of V-belt drives has led us to develop them further. The drive motor is mounted on a hinged motor plate, this configuration means that the belt drive is always at its optimum tension and is retained automatically by the weight of the motor.

Each unit is delivered with all the standard items needed to operate the unit. Anti-vibration mountings are supplied as a standard, therefore, no special foundations are required.

Modified DELTA BLOWER-units for the North-American market (with NEMA-motors) can be supplied up to nominal width DN 200.

Prompt ability of application

Connect conveying pipings, fill up lube oil, effect electrical connection and the blower is ready for operation. The mounting costs are kept to a minimum with this installation.

Description of individual components

The Blower Stage (1)

Vertical conveying from top to bottom, rotation anti-clockwise looking at the drive shaft.

Base Frame / Discharge Silencer (2)

Is a distortion-free chamber made of steel.

The Intake System (3)

Is constructed as a combination of intake silencer and air intake filter. The parts are contained in a combined housing which is directly mounted to the blower intake flange. The weather-proof housing is designed to allow the filter element to be easily changed.

Standard design: Suction from the atmosphere (mass-produced). Suction via suction piping: Possible against extra costs

The Drive (4)

The blower is driven by a three-phase motor via a heavy-duty narrow V-belt drive. (5)

The Connection Housing (6)

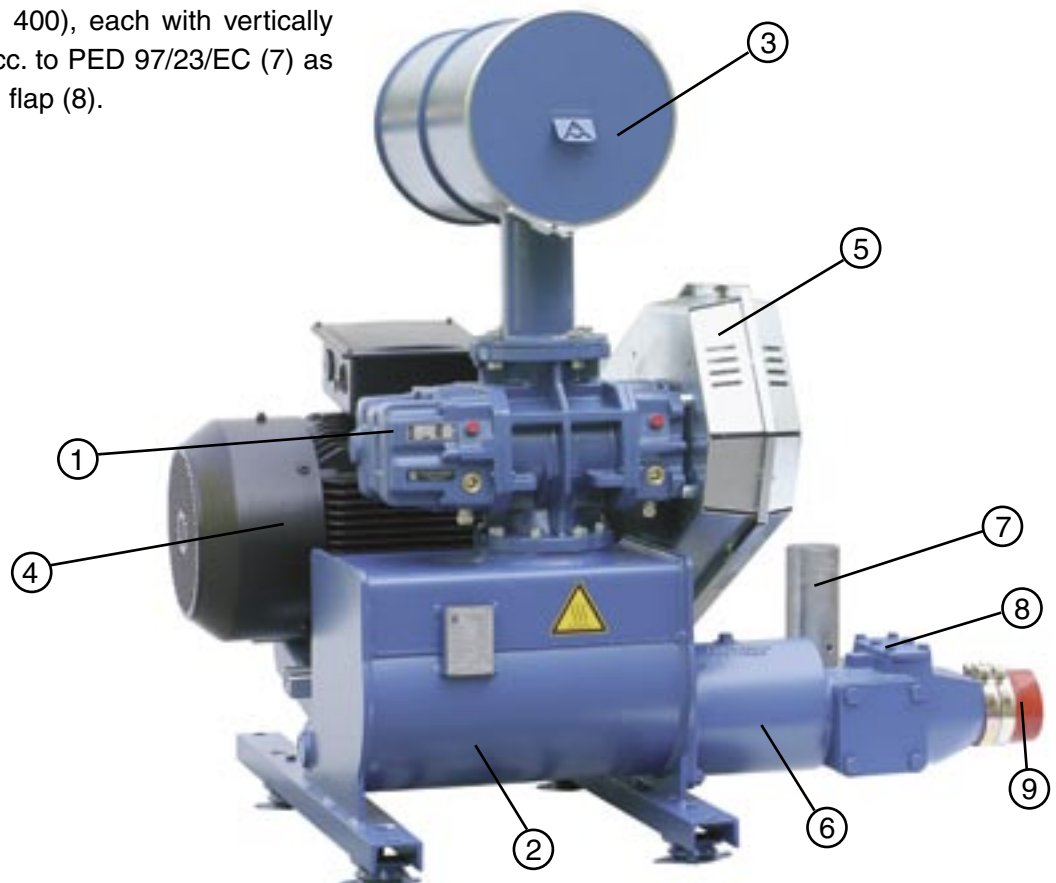
in a cast design (DN 50 up to DN 200) or in welded design (DN 250 up to DN 400), each with vertically mounted pressure valve acc. to PED 97/23/EC (7) as well as installed non-return flap (8).

Accessories (extra price)

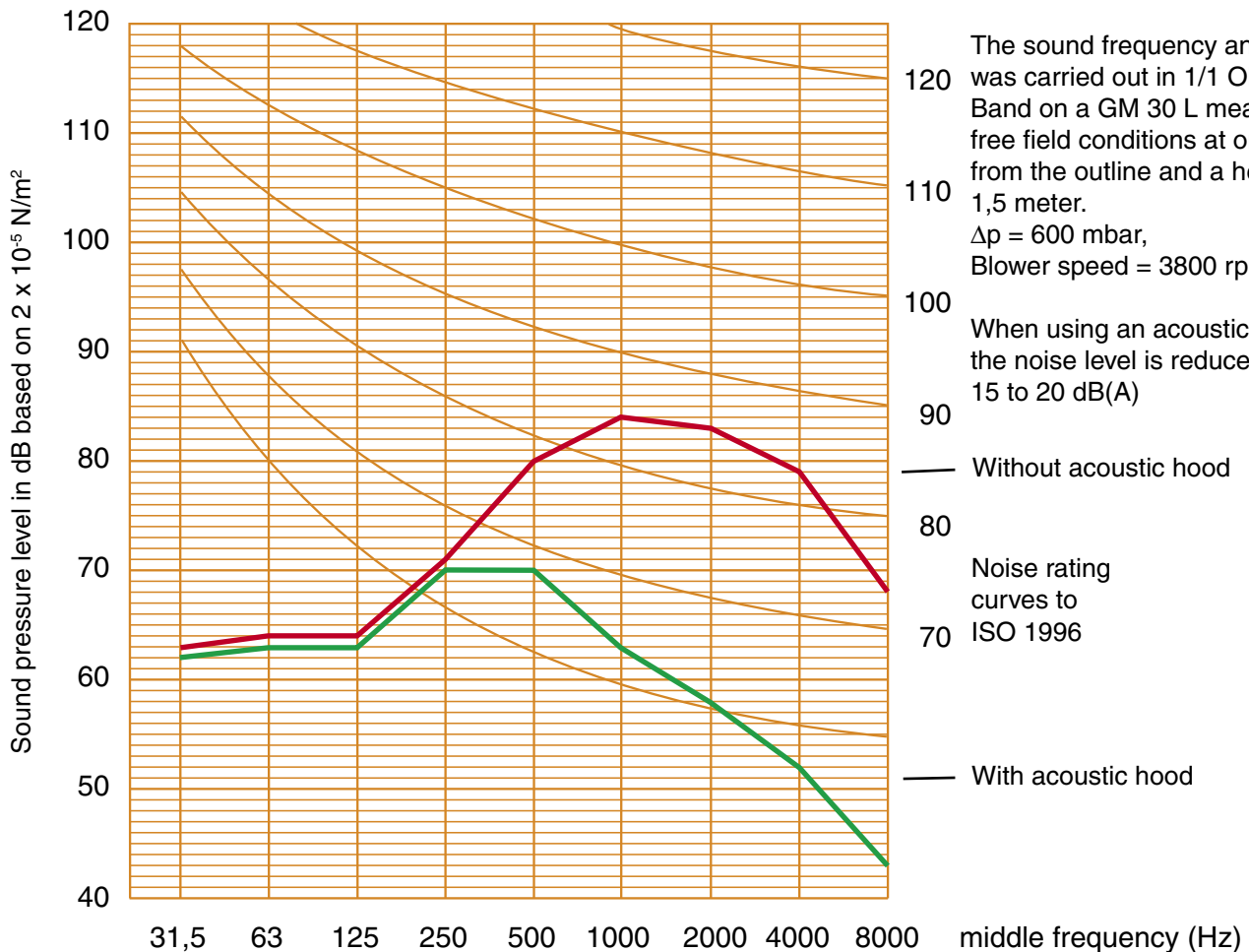
- driving motor, type of construction B3, junction box on top, suitable for belt drive, cable entry from fan side
- acoustic hood, forced ventilated by means of fan wheel on blower shaft for indoor- or outdoor installation with oil collecting sump (DN 50 up to DN 300). In case of order please advise place of installation!
- acoustic hood, forced ventilation for indoor- or outdoor installation without oil collecting sump (DN 400). In case of order please advise place of installation!
- discharge side expansion joint instead of flexible connection (9)
- start-up unloading device: required for star-delta starting of the motor
- pressure gauge for indication of the feed pressure
- maintenance indicator for monitoring of the intake filter
- switch cabinet

Further accessories on request !

Technical details can be obtained from the parent company, the technical Sales offices, agencies and representations.



Noise rating



Using the operating data sheets

Please refer to the data sheets for intake volume (\dot{V}_1), absorbed power (P_k), motor size and sound pressure levels $L_p(A)$.

The intake volumes shown correspond to operating speed increments of approximately 12% and are based on commonly available belt drive ratios.

Lower driving speeds are possible, depending on the final temperature.

Max. final temperature: $t_2 \text{ max.} = 140$ °C.

The limit temperature is also applicable at increased intake temperature t_1 up to max. 60 °C, provided that the ambient temperature corresponds to intake temperature.

Concerning data please refer to performance diagram.

Data Legend

\dot{V}_1	[m ³ /min]	intake volume
p_1	[bar abs]	intake pressure
Δp	[mbar]	differential pressure
t_1	[° C]	intake temperature
t_2	[° C]	final temperature
n_G	[r p m]	blower speed
n_M	[r p m]	motor speed
P_k	[k W]	power at blower shaft
P_{mot}	[k W]	motor power rating
$L_p(A)$ w/o.H.		sound pressure level for blower unit without hood
$L_p(A)$ w.H.		sound pressure level for blower unit with hood

Noise level guarantee

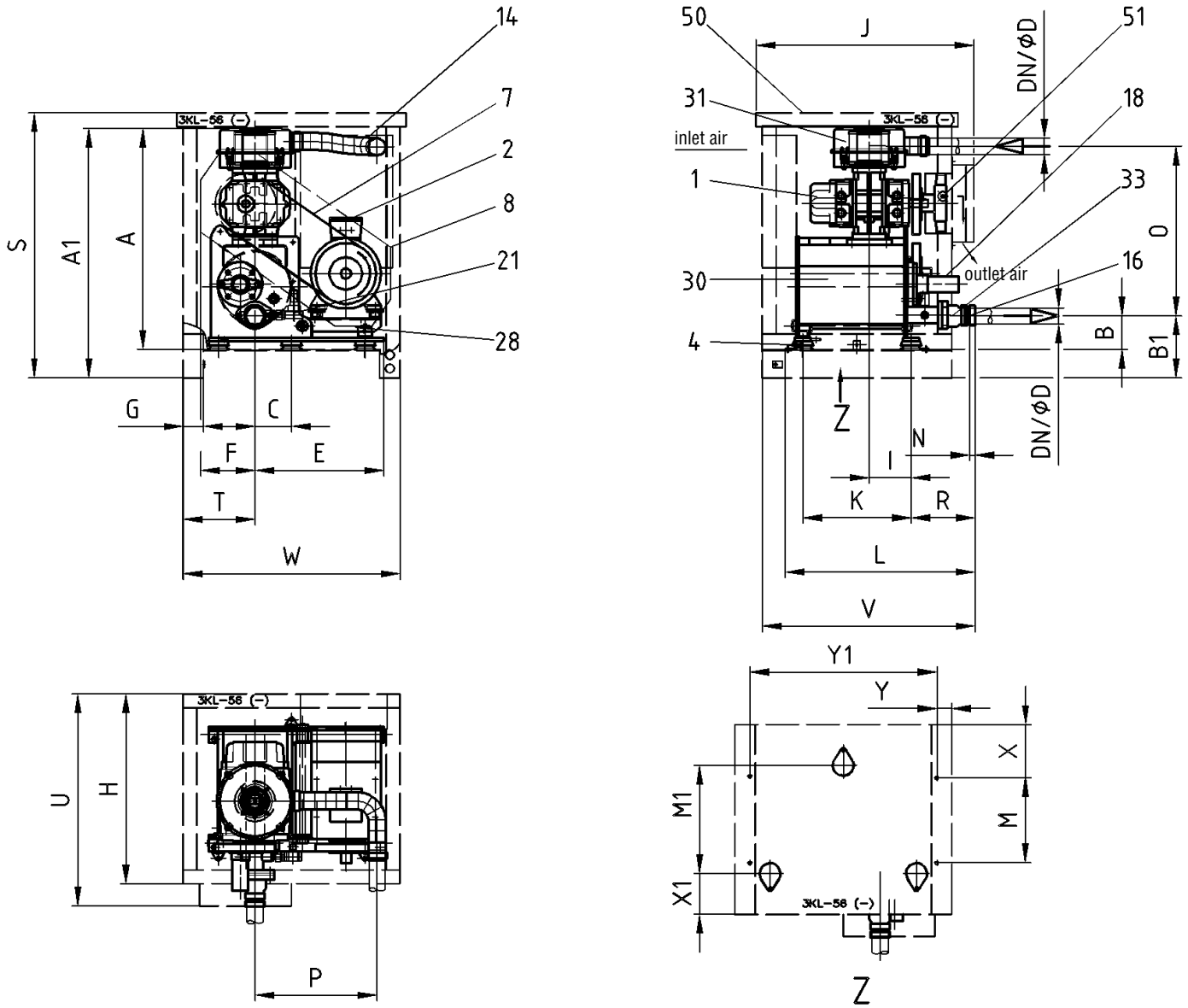
All noise data are based upon machine emitted noise pressure level $L_p(A)$ from each single blower unit. They refer to free field measurements (Tolerance ± 2 dB) as per DIN 45635 at a distance of 1 m.

Performance data for air ($p_1 = 1,0 \text{ bar}$, $t_1 = 20 \text{ °C}$, $\rho = 1,189 \text{ kg/m}^3$) overpressure

Δp [mbar]	Blower size	GM 220 L / DN 400								GM 240 S / DN 400							
300	\dot{V}_1 [m ³ /min]	104	119	133	153	177	199	215	227	112	128	146	156	167	192	213	246
	t_2 [°C]	49	49	49	48	48	47	47	47	49	49	48	48	48	47	47	47
	nG [rpm]	930	1040	1150	1300	1480	1650	1770	1860	730	820	920	980	1040	1180	1300	1485
	nM [rpm]	1480	1480	1485	1485	1480	1480	1485	1485	1480	1485	1485	1485	1485	1480	1485	1485
	Pk [kW]	67,2	77,0	87,3	102	122	141	156	168	72,6	83,5	96,4	105	113	136	157	195
	P_{mot} [kW]	75	90	110	132	160	160	200	200	90	110	110	132	132	160	200	250
	Motor size	280 S	280 M	315 S	315 M	315 M	315 M	315 M	315 M	280 M	315 S	315 S	315 M	315 M	315 M	315 M	315 L
	Lp(A)[dB]w/o.H./w.H.	94/76	95/76	96/76	97/77	100/79	102/80	103/82	104/82	97/76	97/76	97/77	98/77	97/77	98/77	99/78	101/80
400	\dot{V}_1 [m ³ /min]	102	116	130	150	175	196	212	224	109	125	143	153	164	189	210	244
	t_2 [°C]	60	59	59	58	57	57	57	57	60	59	58	58	58	57	57	56
	nG [rpm]	930	1040	1150	1300	1485	1650	1770	1860	730	820	920	980	1040	1180	1300	1490
	nM [rpm]	1485	1485	1485	1480	1485	1485	1485	1485	1485	1485	1480	1480	1480	1485	1485	1490
	Pk [kW]	87,6	99,8	112	131	155	178	195	209	94,2	108	124	134	144	171	196	241
	P_{mot} [kW]	110	110	132	160	200	200	250	250	110	132	160	160	160	200	250	315
	Motor size	315 S	315 S	315 M	315 M	315 M	315 M	315 L	315 L	315 S	315 M	315 M	315 M	315 M	315 M	315 L	315 L
	Lp(A)[dB]w/o.H./w.H.	95/76	95/77	96/77	98/78	100/80	102/81	104/82	105/83	98/77	98/77	98/78	98/78	98/78	98/78	99/79	103/81
500	\dot{V}_1 [m ³ /min]	99,1	114	128	148	172	194	210	221	106	122	140	151	162	186	208	242
	t_2 [°C]	72	70	69	68	68	67	67	66	71	70	69	68	68	67	67	66
	nG [rpm]	930	1040	1150	1300	1485	1650	1770	1860	730	820	920	980	1040	1180	1300	1490
	nM [rpm]	1485	1480	1480	1485	1485	1485	1490	1490	1485	1480	1485	1485	1485	1485	1490	1490
	Pk [kW]	108	123	138	159	187	214	234	250	116	132	151	163	175	206	234	285
	P_{mot} [kW]	132	160	160	200	250	250	315	315	132	160	200	200	200	250	315	315
	Motor size	315 M	315 M	315 M	315 M	315 L	315 L	315 L	315 L	315 M	315 M	315 M	315 M	315 M	315 L	315 L	315 L
	Lp(A)[dB]w/o.H./w.H.	96/77	96/77	97/77	98/78	100/80	102/81	104/83	106/84	98/78	98/78	99/79	99/79	98/78	98/79	100/80	104/83
600	\dot{V}_1 [m ³ /min]	96,8	111	126	146	170	192	207	219	104	120	138	149	159	184	206	239
	t_2 [°C]	83	82	80	79	78	77	76	76	83	81	80	79	78	77	76	76
	nG [rpm]	930	1040	1150	1300	1485	1650	1770	1860	730	820	920	980	1040	1180	1300	1490
	nM [rpm]	1480	1480	1485	1485	1485	1490	1490	1490	1480	1485	1485	1485	1485	1490	1490	1490
	Pk [kW]	128	145	163	188	220	250	273	290	137	156	178	192	206	241	273	329
	P_{mot} [kW]	160	160	200	250	250	315	315	355	160	200	200	250	250	315	315	400
	Motor size	315 M	315 M	315 M	315 L	315 L	315 L	315 L	355 M	315 M	315 M	315 M	315 L	315 L	315 L	315 L	355 M
	Lp(A)[dB]w/o.H./w.H.	97/77	97/78	97/77	98/78	100/80	102/81	105/83	106/85	99/79	99/79	100/80	100/80	100/80	101/80	102/81	105/84
700	\dot{V}_1 [m ³ /min]									102	118	136	147	157	182	204	237
	t_2 [°C]									94	92	90	90	89	87	87	85
	nG [rpm]									730	820	920	980	1040	1180	1300	1490
	nM [rpm]									1485	1485	1485	1485	1490	1490	1490	1490
	Pk [kW]									159	181	205	221	237	276	311	373
	P_{mot} [kW]									200	200	250	250	315	315	355	500
	Motor size									315 M	315 M	315 L	315 L	315 L	315 L	355 M	355 L
	Lp(A)[dB]w/o.H./w.H.									100/80	101/80	101/81	102/81	102/81	103/82	104/83	106/85
800	\dot{V}_1 [m ³ /min]									100	116	134	145	155	180	202	235
	t_2 [°C]									107	104	102	101	100	98	97	95
	nG [rpm]									730	820	920	980	1040	1180	1300	1490
	nM [rpm]									1485	1485	1490	1490	1490	1490	1490	1490
	Pk [kW]									181	205	233	250	268	311	350	417
	P_{mot} [kW]									200	250	315	315	315	355	400	500
	Motor size									315 M	315 L	315 L	315 L	315 L	355 M	355 M	355 L
	Lp(A)[dB]w/o.H./w.H.									100/81	102/81	103/83	103/83	104/83	105/84	106/85	107/86

**Lower differential pressures on request
Higher intake volume flows on request**

Dimensions – DELTA BLOWER – GM 3 S – LU 41.01 and LU 41.02



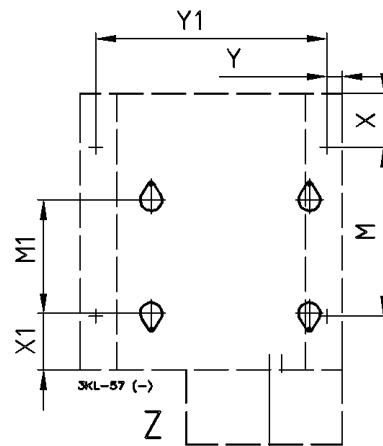
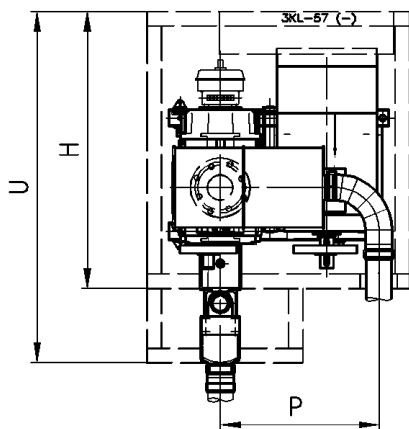
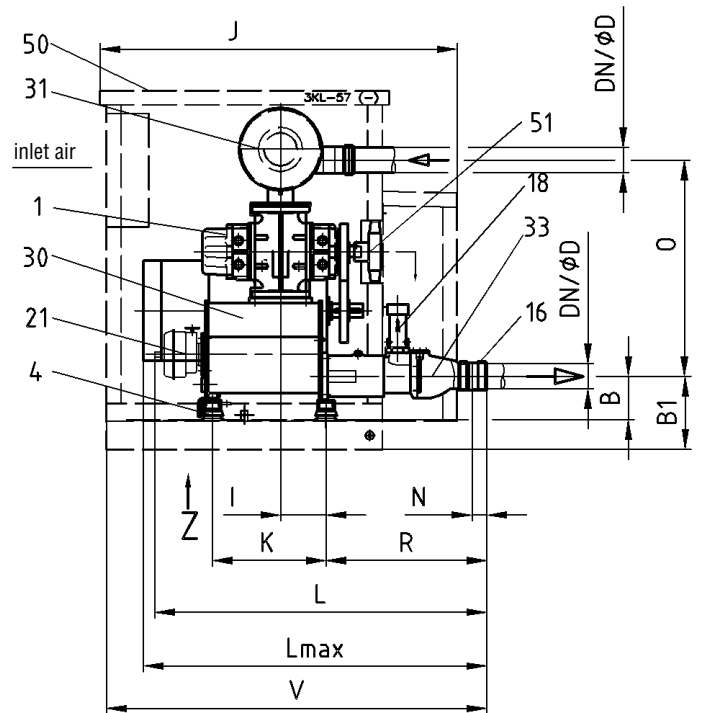
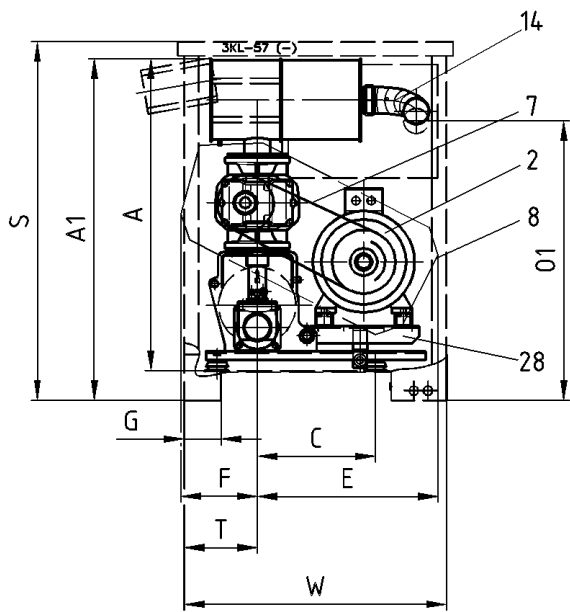
- 1 positive displacement blower
- 2 electric motor
- 4 anti-vibration mountings
- 7 belt drive
- 8 belt guard (only in case of installation without acoustic hood)
- 14 flexible pipe connection suction side (extra price)
- 16 flexible connection discharge side
- 18 pressure relief valve
- 21 start-up unloading device (accessory)
- 28 hinged motor plate
- 30 base frame
- 31 filter silencer
- 33 connection housing with integrated non-return valve
- 50 acoustic hood
- 51 fan
- 71 pressure gauge (accessory)
- 75 maintenance indicator (accessory)

type	A	A ₁	B	B ₁	C	DN / ø D	E	F	G	H	I	J	K	L	M	M ₁	N	O	P	R	S	T	V	W	U	X	X ₁	Y	Y ₁	Weight without acoustic hood	Weight with acoustic hood
3 S	815	920	123	228	135	50 / ø 60.3	475	201	75	700	155	805	400	699	320	400	20	637	450	235	978	265	785	800	782	190	150	55	690	165 kg	215 kg

Dimensions expressed (in mm), not binding

Weight without motor

Dimensions – DELTA BLOWER – GM 4 S to GM 25 S – LU 41.01 and LU 41.02



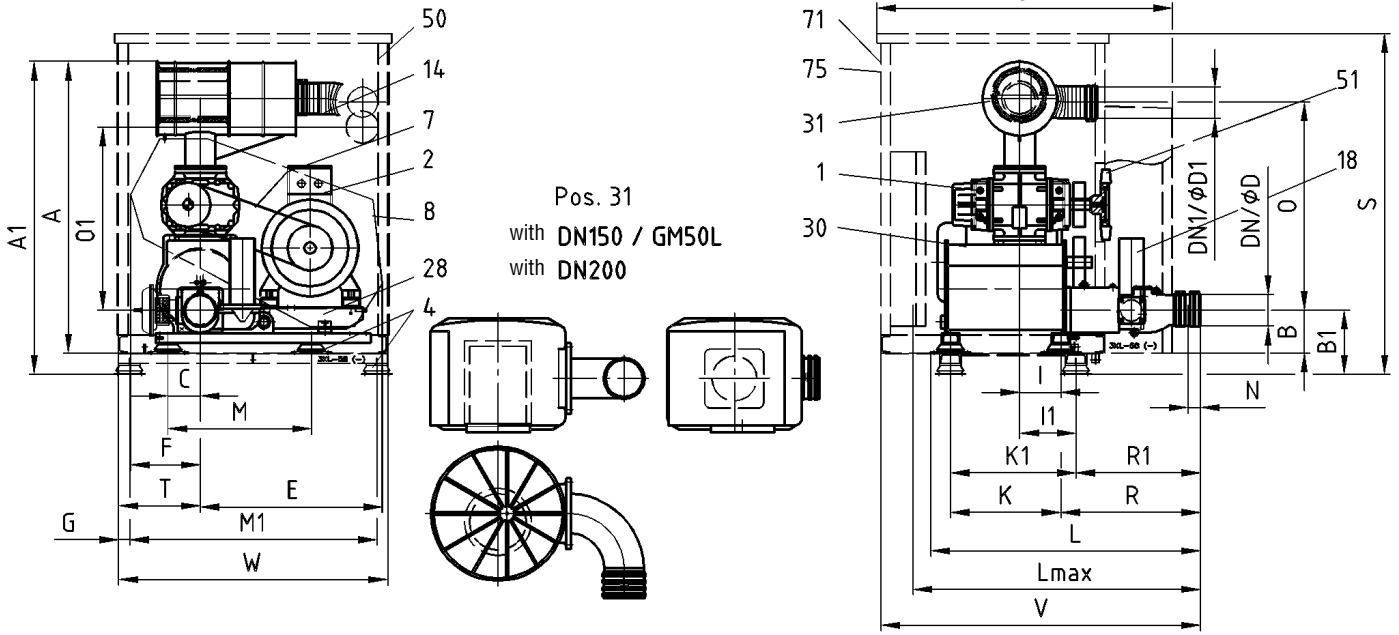
- 1 positive displacement blower
- 2 electric motor
- 4 anti-vibration mountings
- 7 belt drive
- 8 belt guard (only in case of installation without acoustic hood)
- 14 flexible pipe connection suction side (extra price)
- 16 flexible connection discharge side
- 18 pressure relief valve
- 21 start-up unloading device (accessory)
- 28 hinged motor plate
- 30 base frame
- 31 filter silencer
- 33 connection housing with integrated non-return valve
- 50 acoustic hood
- 51 fan
- 71 pressure gauge (accessory)
- 75 maintenance indicator (accessory)

type	A	A ₁	B	B ₁	C	DN / ø D	DN ₁ / ø D ₁	E	F	G	H	I	J	K	L	L _{max}	M	M ₁	N	O	O ₁	P	R	S	T	V	W	U	X	X ₁	Y	Y ₁	Weight without acoustic hood	Weight with acoustic hood
4 S	1020	1125	153	258	416	80 / ø 88.9	80 / ø 88.9	639	269	130	975	160	1260	400	1172	1211	595	400	52	762	720	559	567	1265	258	1342	925	1237	190	200	55	815	206 kg	277 kg
7 L	1020	1125	153	258	416	80 / ø 88.9	80 / ø 88.9	639	269	130	975	160	1260	400	1172	1211	595	400	52	762	720	559	567	1265	258	1342	925	1237	190	200	55	815	227 kg	316 kg
10 S	1101	1206	153	258	416	80 / ø 88.9	80 / ø 88.9	639	269	130	975	160	1260	400	1172	1211	595	400	52	762	801	559	567	1265	258	1342	925	1237	190	200	55	815	258 kg	347 kg
10 S	1333	1438	189	294	505	100 / ø 114.3	100 / ø 114.3	818	300	140	1100	185	1436	500	1204	1419	500	500	45	971	1265	650	640	1500	375	1516	1250	1412	376	224	125	1020	333 kg	556 kg
15 L	1333	1438	189	294	505	100 / ø 114.3	100 / ø 114.3	818	300	140	1100	185	1436	500	1204	1419	500	500	45	971	1265	650	640	1500	375	1516	1250	1412	376	224	125	1020	348 kg	571 kg
25 S	1322	1428	189	294	505	125 / ø 139.7	150 / ø 168.3	818	315	155	1100	185	1436	500	1204	1419	500	500	70	971	1265	650	775	1500	375	1516	1250	1412	376	224	125	1020	415 kg	638 kg

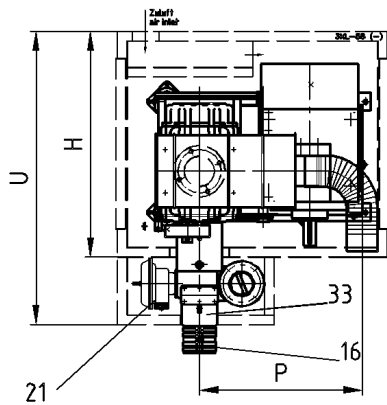
Dimensions expressed (in mm), not binding

Weight without motor

Dimensions – DELTA BLOWER – GM 30 L to GM 60 S – LU 41.01 and LU 41.02



Pos. 31
with DN150 / GM50L
with DN200



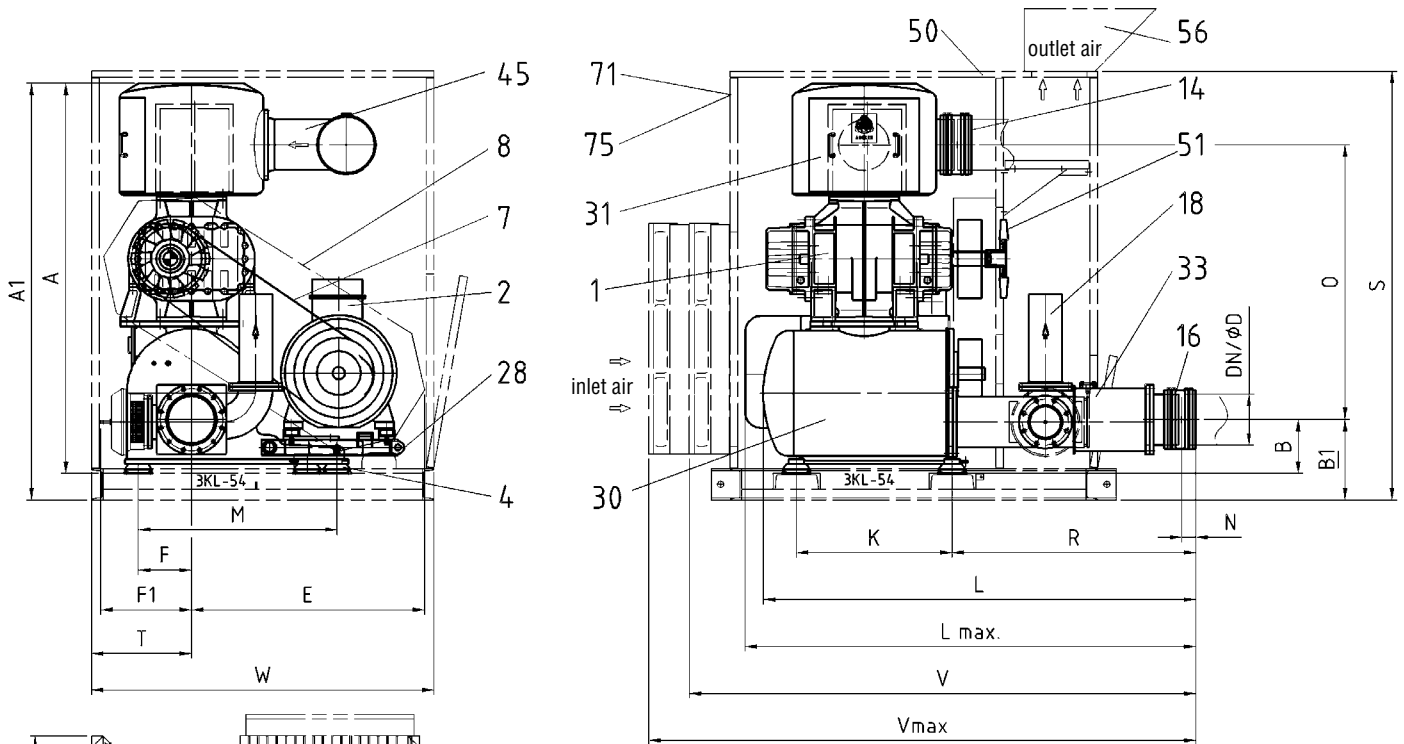
- 1 positive displacement blower
- 2 electric motor
- 4 anti-vibration mountings
- 7 belt drive
- 8 belt guard (only in case of installation without acoustic hood)
- 14 flexible pipe connection suction side (extra price)
- 16 flexible connection discharge side
- 18 pressure relief valve
- 21 start-up unloading device (accessory)
- 28 hinged motor plate
- 30 base frame
- 31 filter silencer
- 33 connection housing with integrated non-return valve
- 50 acoustic hood
- 51 fan
- 71 pressure gauge (accessory)
- 75 maintenance indicator (accessory)

type	A	A ₁	B	B ₁	C	DN / ø D	DN ₁ / ø D ₁	E	F	G	H	I	I ₁	J	K	K ₁	L	L _{max}	M	M ₁	N	O	O ₁	P	R	R ₁	S	T	V	W	U	Weight without acoustic hood	Weight with acoustic hood
30 L	1590	1708	238	356	180	150 / ø 168.3	150 / ø 168.3	1016	390	60	1250	230	314	1648	615	700	1506	1564	800	1380	70	1141	1161	905	780	695	1900	455	1783	1500	1625	611 kg	907 kg
35 S	1630	1748	238	356	180	150 / ø 168.3	150 / ø 168.3	1016	390	60	1250	230	314	1648	615	700	1506	1564	800	1380	70	1186	1161	905	780	695	1900	455	1783	1500	1625	666 kg	971 kg
50 L	1692	1810	238	356	180	150 / ø 168.3	200 / ø 219.1	1016	390	60	1250	368	341	1648	615	700	1506	1564	800	1380	70	1019	1119	703	780	695	1900	455	1783	1500	1625	770 kg	1070 kg
50 L	1615	1745	320	450	320	200 / ø 219.1	200 / ø 219.1	1035	440	60	1460	283	293	1917	731	741	1740	1921	820	1480	70	1024	1024	673	927	428	2100	493	2098	1600	1895	985 kg	1365 kg
60 S	1715	1845	320	450	320	200 / ø 219.1	200 / ø 219.1	1035	440	60	1460	283	293	1917	731	741	1740	1921	820	1480	70	1124	1117	673	927	428	2100	493	2098	1600	1895	1110 kg	1490 kg

Dimensions expressed (in mm), not binding

Weight without motor

Dimensions – DELTA BLOWER – GM 80 L to GM 150 S – LU 41.01 and LU 41.02



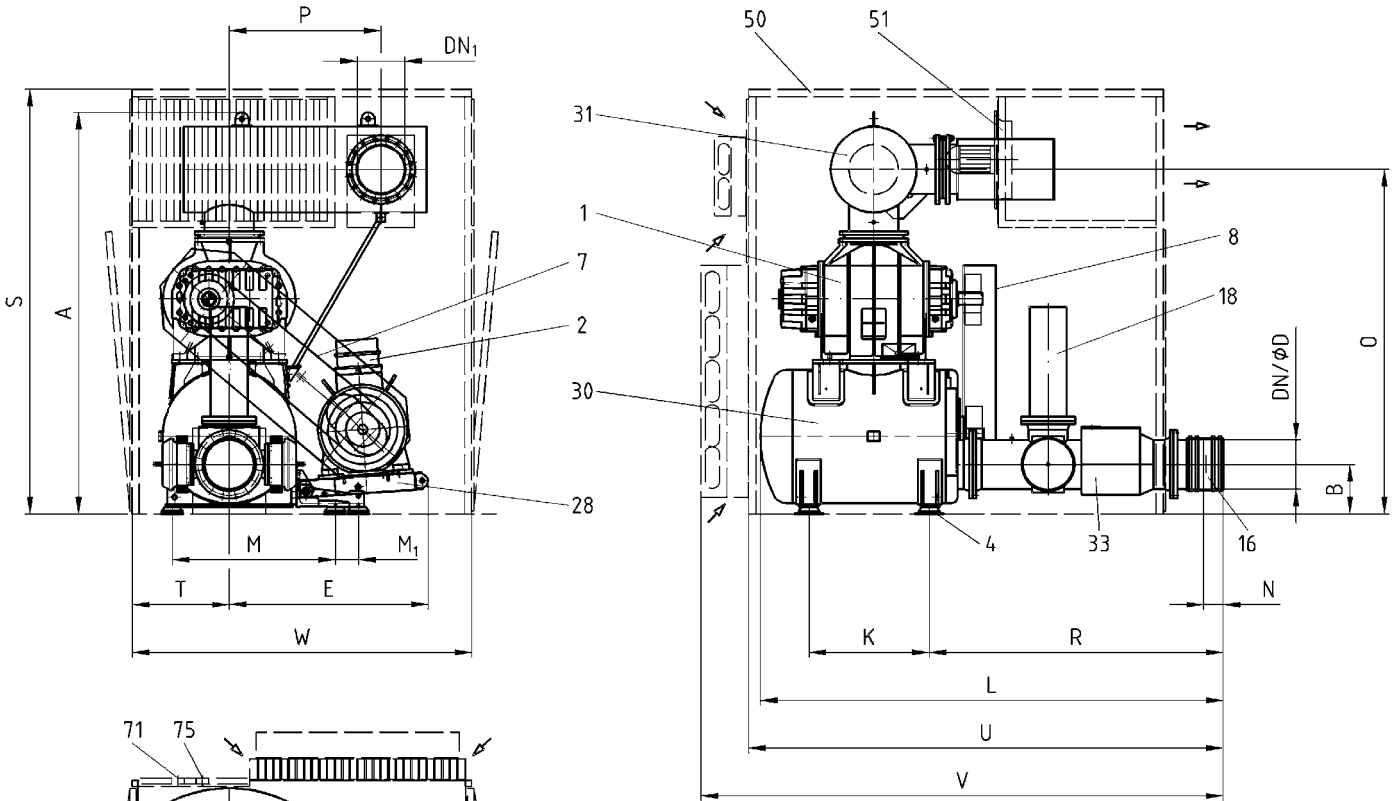
- 1 positive displacement blower
- 2 electric motor
- 4 anti-vibration mountings
- 7 belt drive
- 8 belt guard (only in case of installation without acoustic hood)
- 14 flexible pipe connection suction side (extra price)
- 16 flexible connection discharge side
- 18 pressure relief valve
- 21 start-up unloading device (accessory)
- 28 hinged motor plate
- 30 base frame
- 31 filter silencer
- 33 connection housing with integrated non-return valve
- 45 pipe connection suction side (extra price)
- 50 acoustic hood
- 51 fan
- 56 shelter (accessory)
- 71 pressure gauge (accessory)
- 75 maintenance indicator (accessory)

type	A	A ₁	B	B ₁	DN / ø D	DN ₁ / ø D ₁	E	F	F ₁	K	L	L _{max}	M	N	O	P	R	S	T	V	V _{max}	W	U	Weight without acoustic hood	Weight with acoustic hood
80 L	1885	2015	326	456	250 / ø 273	250 / ø 273	1078	330	485	741	2090	2286	880	90	1236	696	1258	2200	495	2614	2964	1600	2110	1610 kg	2395 kg
90 S	2015	2145	326	456	250 / ø 273	250 / ø 273	1087	330	485	741	2090	2286	880	90	1366	696	1258	2200	495	2614	2964	1600	2110	1750 kg	2535 kg
130 L	2335	2505	344	514	300 / ø 323.9	300 / ø 323.9	1491	340	560	995	2765	3230	1270	90	1585	990	1558	2740	640	3237	3587	2190	2590	2567 kg	4182 kg
150 S	2505	2675	344	514	300 / ø 323.9	300 / ø 323.9	1491	340	560	995	2765	3230	1270	90	1755	990	1558	2740	640	3237	3587	2190	2590	2812 kg	4427 kg

Dimensions expressed (in mm), not binding

Weight without motor

Dimensions – DELTA BLOWER – GM 220 L and GM 240 S – LU 41.01



- 1 positive displacement blower
- 2 electric motor
- 4 anti-vibration mountings
- 7 belt drive
- 8 belt guard
- 16 flexible connection discharge side
- 18 pressure relief valve
- 21 start-up unloading device (accessory)
- 28 hinged motor plate
- 30 base frame
- 31 filter silencer
- 33 connection housing with integrated non-return valve
- 50 acoustic hood
- 51 fan
- 71 pressure gauge (accessory)
- 75 maintenance indicator (accessory)

type	A	B	DN / ø D	DN ₁	E	K	L	M	M ₁	N	O	P	R	S	T	V	W	U	Weight without acoustic hood	Weight with acoustic hood
220 L	3110	410	400 / ø 406.4	400	1644	990	3813	1345	190	160	2639	1250	2421	3500	800	4304	2800	3910	4981 kg	8240 kg
240 S	3310	410	400 / ø 406.4	400	1644	990	3813	1345	190	160	2839	1250	2421	3500	800	4304	2800	3910	5371 kg	8630 kg

Dimensions expressed (in mm), not binding

Weight without motor



Aerzener Maschinenfabrik GmbH

Reherweg 28 · 31855 Aerzen / Germany – P.O. Box 1163 · 31849 Aerzen / Germany

Phone ++ 49 51 54 / 8 10 · Fax ++ 49 51 54 / 8 11 91 · <http://www.aerzener.com> · E-mail: info@aerzener.de

Aerzener Maschinenfabrik GmbH

Reherweg 28 · 31855 Aerzen / Germany – P.O. Box 1163 · 31849 Aerzen / Germany
Phone ++ 49 51 54 / 8 10 · Fax ++ 49 51 54 / 8 11 91 · <http://www.aerzener.com> · E-mail: info@aerzener.de

Aerzen Machines Ltd.

Aerzen House, Langston Road, Loughton, Essex, IG10 3SQ / United Kingdom
Phone +44 (0) 20 8502 8100 · Fax +44 (0) 20 8502 8102 · E-mail: aerzen@aerzengb.com

Aerzen USA Corporation

645 Sands Court, Suite 100, Coatesville, PA 19320 / USA
Phone (610) 380 - 02 44 · Fax (610) 380 - 02 78 · E-mail: aerzen@aerzenusa.com

Aerzen Canada Blowers Compressors Inc.

1995 Montée Labossière, Vaudreuil, Quebec, J7V 8P2 / CANADA
Phone (450) 424 - 39 66 · Fax (450) 424 - 39 85 · E-mail: info@aerzen.ca