AERZEN POSITIVE DISPLACEMENT BLOWERS

FOR CONVEYANCE AND COMPRESSION OF PROCESS GASES

Series GR/GQ, volume flows from 100 m^3/h to 100.000 m^3/h

AERZEN

AERZEN PROCESS GAS BLOWERS. ROBUST TECHNOLOGY FOR EVERY PROCESS.

AERZEN process gas blowers have proven themselves in thousands of installed units all over the world. What are the decisive factors? Extremely long service life. Sharp focus on efficiency criteria. And also this: the unusually broad portfolio of solutions, including modifications, accessories and special developments to ensure they meet the every possible process requirement.

Rightsized for the process. Design based on customer requirements as the basis for optimal energy efficiency.
AERZEN's process gas blowers are radically flow optimised. Care-fully selected transmission variants are just as important to increasing efficiency as innovative component developments. But the decisive factor in reducing energy consumption is this: every compressor and blower unit from AERZEN is tailored to the individual requirements of our customers and their processes. Rightsized and thus especially efficient.

Focus on special requirements.
AERZEN is a pioneer in compressor technology. In many areas we are the market leader. With unique technological advantages. With superior quality and high efficiency. Our product portfolio for the process gas and coolant industries? A broad spectrum of specialised blowers and compressors. High-end machines with a wide variety of designs, sizes, and special features. Configured so they meet all relevant international regulations, building codes, and specifications in a wide variety of industrial branches and certification bodies. Including ASME, API, TEMA, ANSI, Ex and DIN, the European Pressure Equipment Directive (PED), as well as safety regulations for electrical installations such as DIN, EN, NEMA, IEC und ATEX.

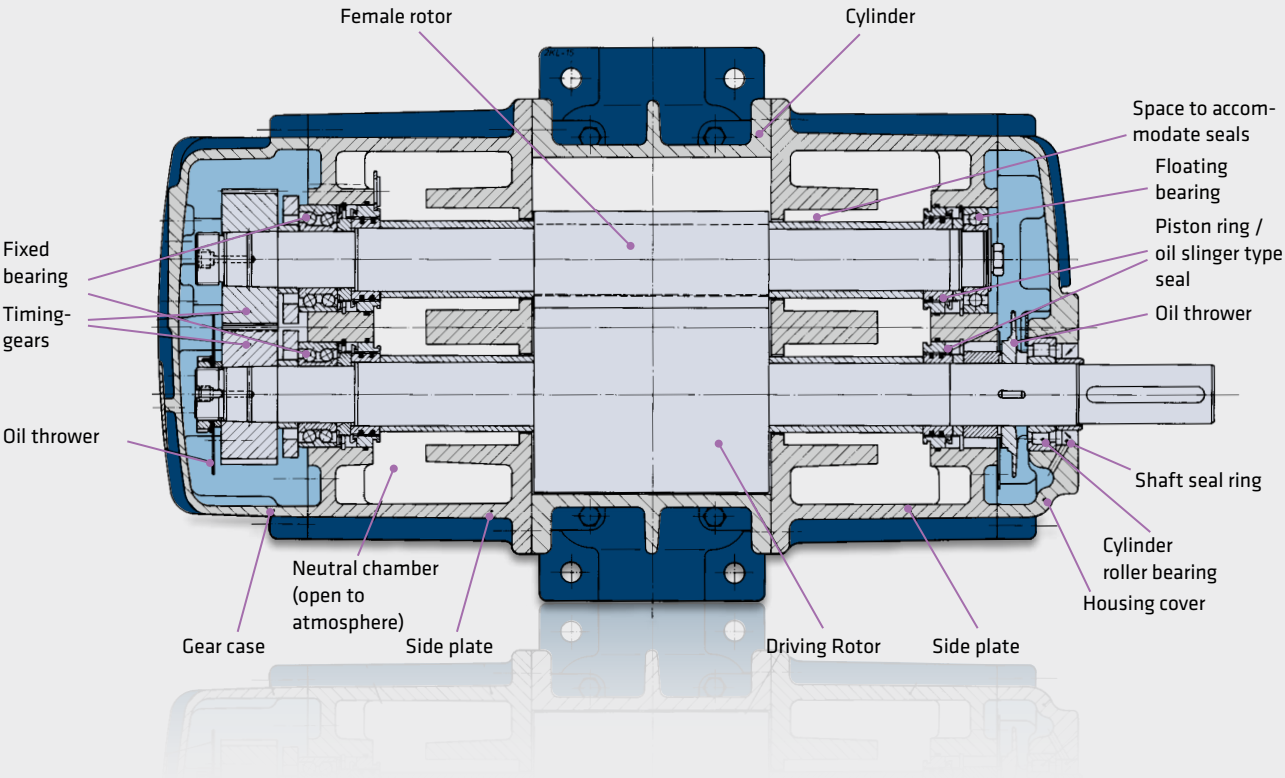
Working method and range of application
Positive Displacement principle, i.e. automatic adaptation to possibly changing operating conditions.

- Volume flows from 100 to 50000 m3/h
- Pressure difference up to 800 mbar
- Insensitive to impurities in the gas, such as particles of dust, tar and dirt or parts of liquid
- Suitable for continuous liquid injection for gas cooling or for cleaning of the conveying chamber
- Usable for nearly all technical gases and gas mixtures in all industrial ranges
- Ideal use for gases with negative intake temperature
- Optimal use at high intake temperatures up to 110 °C
- Oil-free handling (100% separation of oil chamber and rotor chamber)

Volume flows GR Q_1 (m^3/h)

TYPE GR OIL-FREE ROTOR CHAMBER. THE SEAL VARIANTS.

A variety of seal systems are used to ensure that the gas side and lube oil area remain separate. These systems are examined in detail below. Depending on the individual characteristics of the gas to be compressed, the process gas machines can be equipped with the following seal systems.



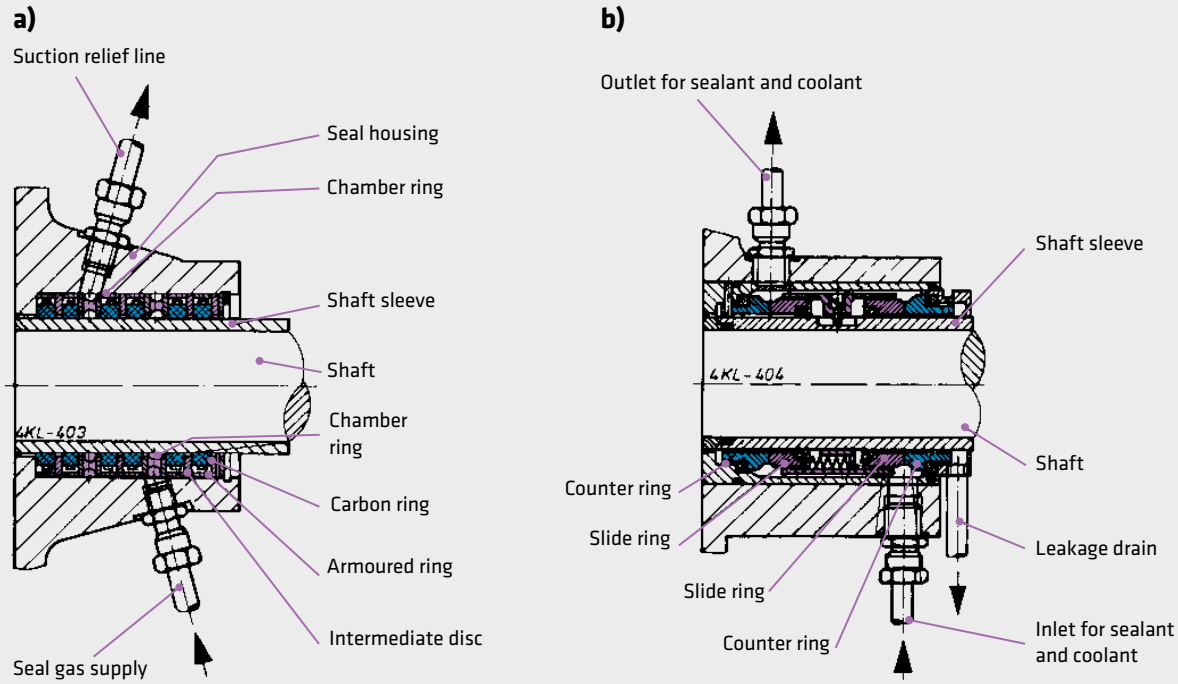
Design features:
In terms of the basic concept, the GR series represents an extension of the standard GM blower, and its most important characteristic is that the rotor chamber is designed to be completely separate from the oil chambers. This ensures that neither the lube oil in the rotor chamber nor the conveyed medium can penetrate into the oil chambers.

Timing gears:
All GR blowers are equipped with helical-toothed, hardened and ground gears. They are fastened to the shafts by means of a taper interference fit.

Bearing:
As a rule, all blower sizes are equipped with high-quality roller bearings that guarantee a maximal bearing service life.

Lubrication:
All GR blowers feature oil splash lubrication.

Direction of conveyance:
All GR blowers convey from top to bottom.



Seal on the rotor chamber:

a) Restrictive carbon ring labyrinth, dry

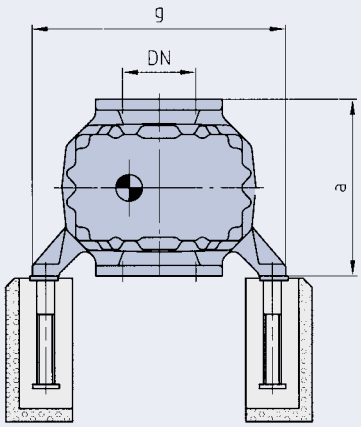
The sealing of the conveying chamber depends first and foremost on the conveyed medium and the required leak rate. For dry media free of dust and tar, restrictive carbon ring labyrinth seals with exhaust and seal gas admission flow are used, because they offer exceptionally low abrasion and allow higher speeds.

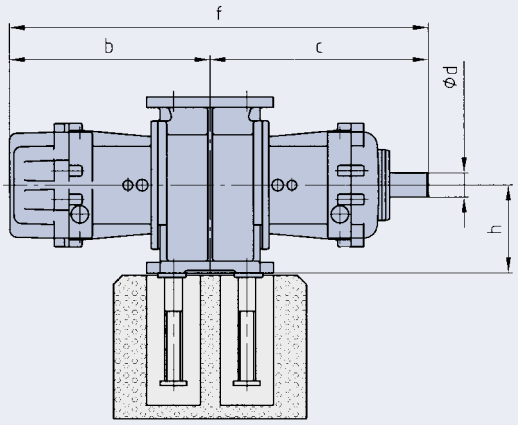
b) Double-acting mechanical seals

These seals require a locking fluid to facilitate locking and heat removal. Water and oil are the preferred locking media. For water-locked mechanical seals, existing water in the plant is used in almost all cases and is fed back into the plant's water cycle after flowing through the seals. The required quantities of locking fluid depend on various factors, such as blower size, speed, compression ratios and the selected locking medium, and have already been specified by us as an offer. One advantage of these seals is that they offer an absolutely gastight closure between the rotor chamber and the atmosphere as well as maximal permissible blower speeds.

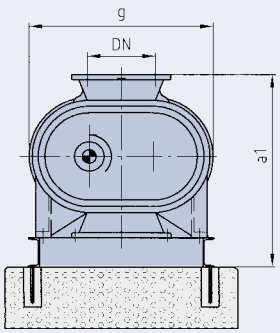
GR SERIES. DIMENSIONS AND IN-STALLATION VARIANTS.

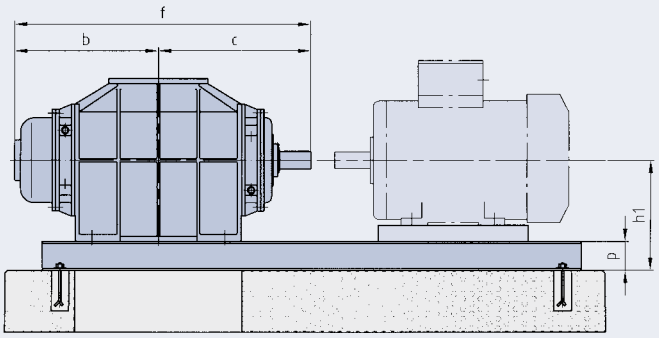
Sizes 12.4 bis 21.22 - arrangement 10





Sizes 18.16 bis 21.22 - arrangement 4



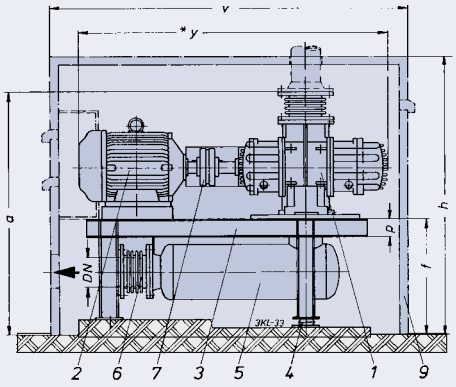


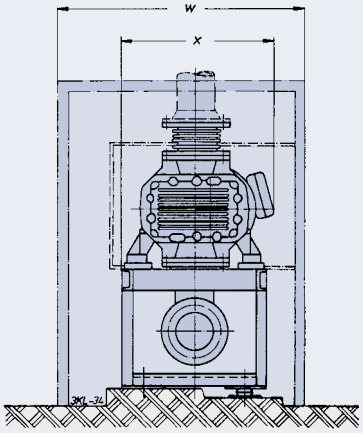
Dimensions, weights and performance data are non-binding examples!

* Weight approx. kg - without motor

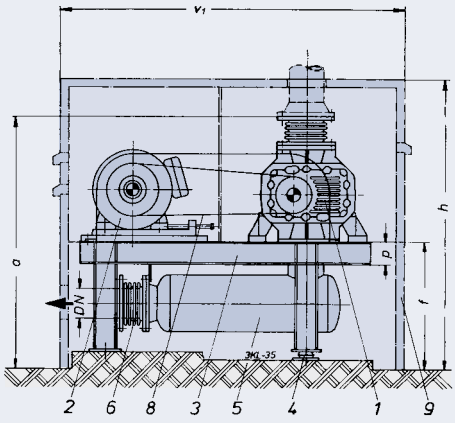
Size	DN	a	a1	b	c	ød	f	g	h	h1	p	*Weight
GRa 12.4	100	360		395	450	45	845	360	180			200
GRa 13.6	150	400		452	492	55	944	436	200			300
GRb 14.8	150	500		510	608	55	1118	538	250			400
GRb 15.10	200	630		578	652	60	1230	652	315			640
GRb 16.12	250	710		620	726	70	1346	810	355			1000
GRb 16f13	300	710		734	840	70	1574	810	355			1100
GRa 17.14	300	1000		770	940	90	1710	1005	500			1800
GRa 18.16	400	1120	1400	885	930	110	1815	1240	560	840	280	3300
GRa 18.17	500	1120	1400	1080	1130	110	2210	1240	560	840	280	5100
GR 19.18	500	1420	1700	1085	1170	115	2255	1518	710	990	280	5550
GR 20.20	700	1800	2200	1350	1400	145	2750	1879	630	1030	400	9400
GR 21.22	800	2000	2400	1680	1834	180	3514	2190	1000	1400	400	11600

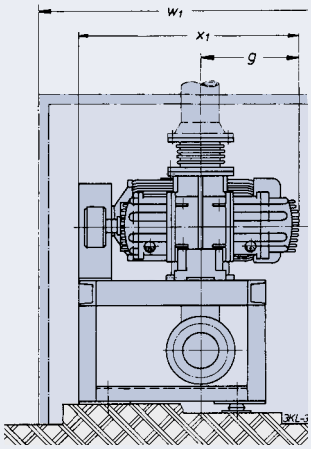
Sizes 12.4 to 17.14 in compact construction, design DA (direct drive)





Sizes 12.4 to 17.14 in compact construction, design FA (overhung drive)





* Dimensions refer to motor size

** Weight approx. kg - unit without motor

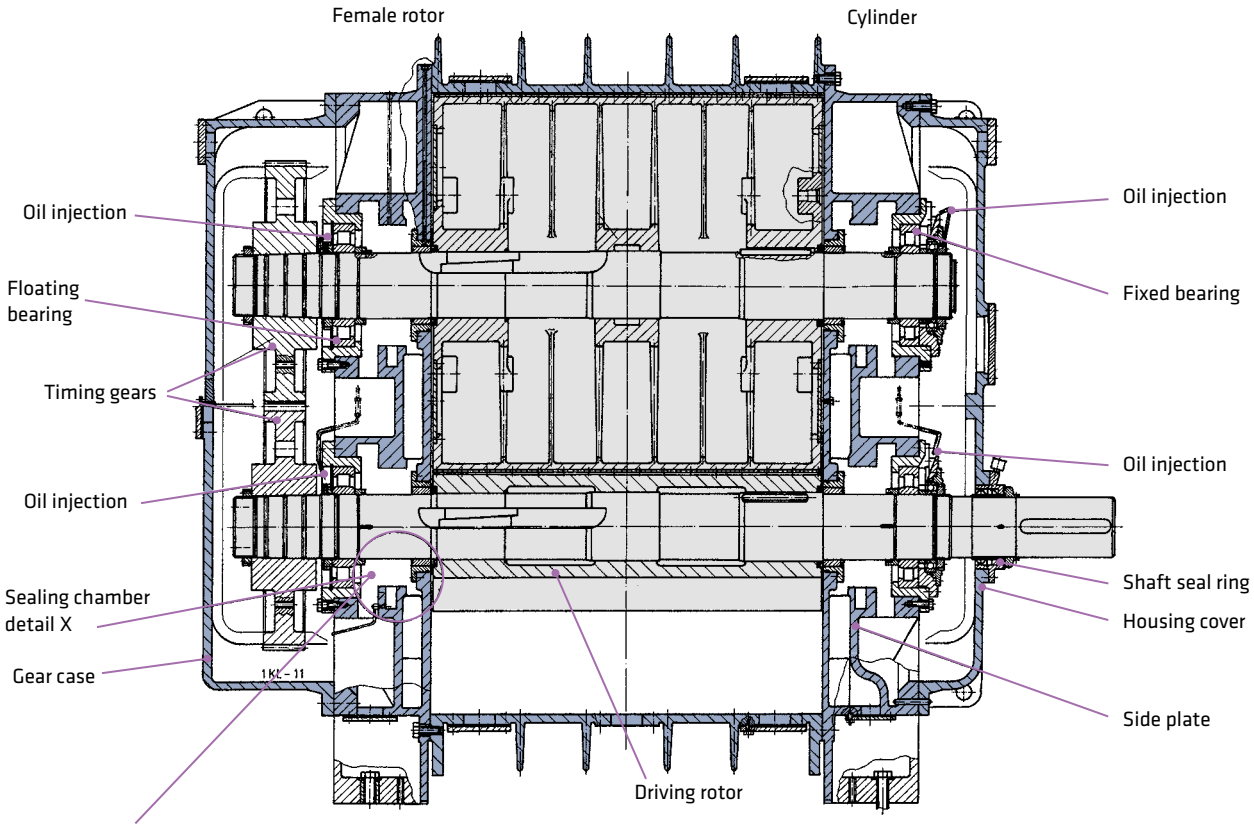
Size	DN	* Dimen-sions	a	f	g	h	P	v	v1	w	w1	x	x1	y	Weight **
GRa 12.4	100	180 L	1064	510	395	1300	80	1900	1700	1100	1400	605	885	1540	360
GRa 13.6	150	180 L	1185	580	452	1300	100	2000	1800	1300	1500	685	1002	1640	520
GRb 14.8	150	225 S	1305	580	510	1550	120	2300	2000	1300	1650	810	1145	1865	700
GRb 15.10	200	280 S	1642	775	578	1850	140	2700	2400	1400	1750	1010	1233	2230	1250
GRb 16.12	250	315 M	1810	865	620	2100	160	3000	2800	1700	1600	1160	1100	2550	1900
GRb 16f13	300	355 L	2032	1125	734	2280	160	3550	3000	1800	2200	1330	1684	3095	2100
GRa 17.14	300	355 L	2412	1185	770	2670	200	3640	2900	1950	2300	1467	1810	3103	3200

Dimensions, weights and performance data are non-binding examples!

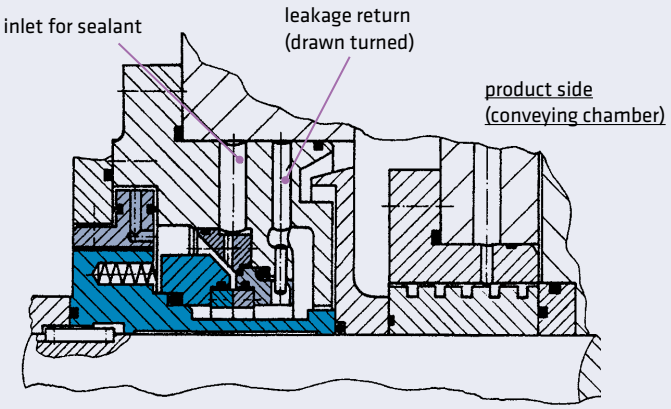
UNAFFECTED BY THE PROCESS. TYPE GQ SEALS.

GQ series for process gas conveyance
The blowers of the GQ series are similar in design to the GR series, but differ in that they feature horizontal handling and special oil-locked mechanical seals on the rotor chamber.
The labyrinth seals on the rotor chamber serve to protect the subsequent mechanical seals. On the one hand, they eliminate pulsations caused by compression, and on the other, particles of dirt contained in the gas are trapped in the labyrinths. A flushing device connected directly to the labyrinth seals ensures that the trapped particles of dirt can be removed and flushed back into the rotor chamber. In addition, there is a connection for a seal gas admission flow, so that the labyrinth can be thoroughly flushed with an inert gas if it gets too dirty.

Sectional drawing



Sealing chamber (detail „x“)



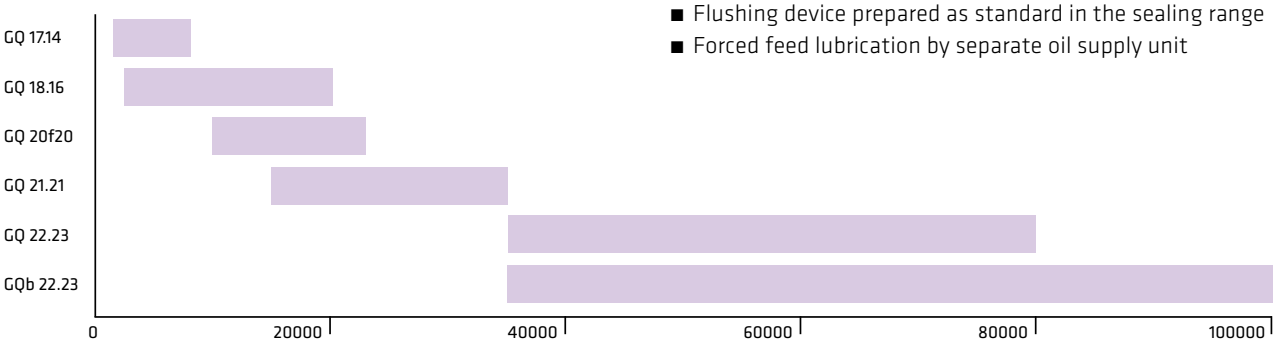
Working method and range of application

- Positive Displacement principle, i.e. automatic adaptation to possibly changing operating conditions.
- Volume flows from 15.000 to 100.000 m^3/h
- Pressure difference :
  GQ 17f14, GQ 18f16 : 1000 mbar
  GQ 22.23, GQb 22.23 : 1200 mbar
  GQ 20f20, GQ 21.21 : 1500 mbar
- Insensitive to impurities in the gas, such as particles of dust and dirt or parts of liquid
- Suitable for continuous water injection for gas cooling or for cleaning of the conveying chamber
- Ideal use in steel works for compression of process-, cooling and purge gas
- Frequent use as double-stage units for differential pressures up to 2,4 bar

Design characteristics

- Housing parts made of nodular cast iron, designed for PN 2,5 with cast-on AERSIL-chamber for reduction of sound and pulsations
- Special design with housing made of nodular cast iron, designed for PN 6 (only GQ 20f20 xz and GQ 21.21 xz)
- Gastightly closed rotary pistons made of grey cast iron, with stainless steel wearing ledges
- On choice rotary pistons made of wear resistant stainless steel
- Continuous shafts manufactured of one piece
- Fixing pistons-shafts by tangential keys
- Horizontal direction of flow, therefore simple installation and piping
- Sufficiently dimensioned roller bearings even at extreme load
- Hardened, ground, helically geared timing gears
- Fixing of gear wheels by conical press-on taper
- Optimal separation between conveying chamber and both oil- and bearing chambers
- Special conveying chamber sealing by singleacting mechanical seal with forced feed oil trap in combination with labyrinth seals and oil slingers
- Flushing device prepared as standard in the sealing range
- Forced feed lubrication by separate oil supply unit

Volume flows GQ Q_1 (m^3/h)



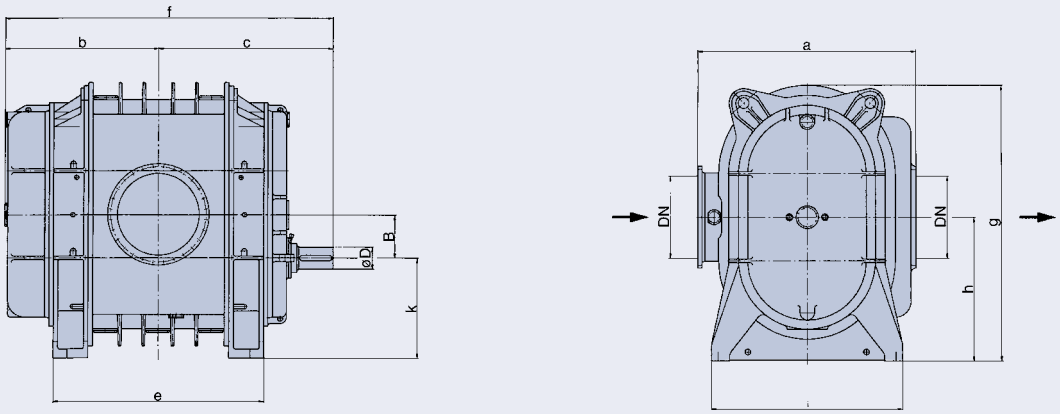
THE ACCESSORIES HIGHLIGHT DECADES OF EXPERIENCE TOO.

Right-sized is the keyword here as well, because all the auxiliary equipment is modified to suit the corresponding application and is available in a wide variety of designs. Thanks to the multitude of components, solutions can be implemented individually and efficiently based on customer requirements.

Accessories available:

- Base frames, base plates
- Flexible machinery mountings, anchor bolts, anchor bars
- Flexible couplings
- Coupling guards
- Compensators, sliding sleeves
- Starting strainers
- Injection devices
- Pipe connections
- Non-return flaps
- Silencers
- Acoustic hoods
- Driving motors
- Gearboxes
- Heat exchangers
- Washers
- Separators
- Safety relief valves
- Contact instruments
- Completely wired instrument panels
- Completely tubed oil supply units

Dimensions – Sizes 17.14 to 22.23 - arrangement 10



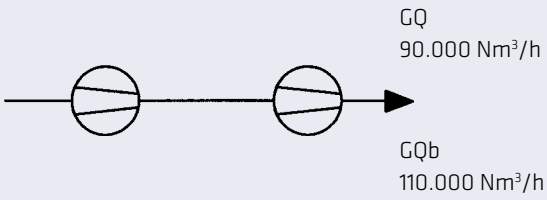
Type	DN	a	b	c	ød	e	f	g	h	i	k	B	Weight approx. kg
GQ 17.14 xz	300	1000	993	805	90	640	1798	1070	567,5	920	400	167,5	1800
GQ 18.16 xz	400	1120	1042	954	110	740	1996	1380	760	1010	550	210	3500
GQ 20f20 xz	700	1800	1160	1360	160	1600	2520	2020	1300	1500	730	320	9000
GQ 21.21 xz	700	2000	1390	1600	180	1820	2920	2500	1335	1800	945	390	14000
GQ 22.23 xz	900	2400	1682,5	1914,5	240	2300	3597	3030	1580	2100	1100	479,2	27000
GQb 22.23 xz	1200	2400	1682,5	1914,5	240	2300	3597	3030	1580	2100	1100	479,2	28000

Dimensions, weights and performance data are non-binding examples!

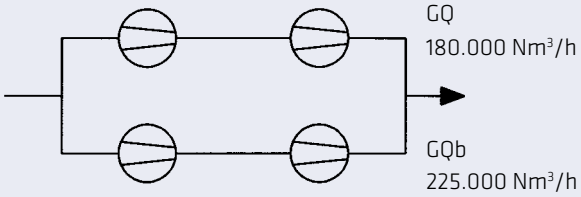
Cases of application of GQ 22.23 or GQb 22.23 - blowers in direct reduction plants

Double-stage compression of process gas with $p_1 > 1{,}3$ bar abs
$p_2 > 3{,}3$ bar abs
$t_1 > 50$ °C

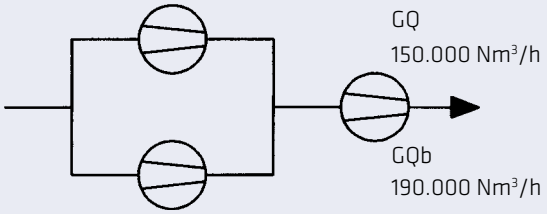
1) Arrangement 1 + 1



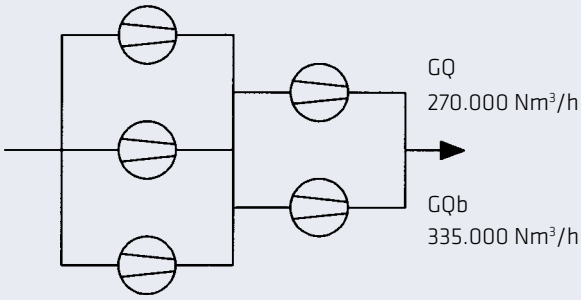
3) Arrangement 2 + 2



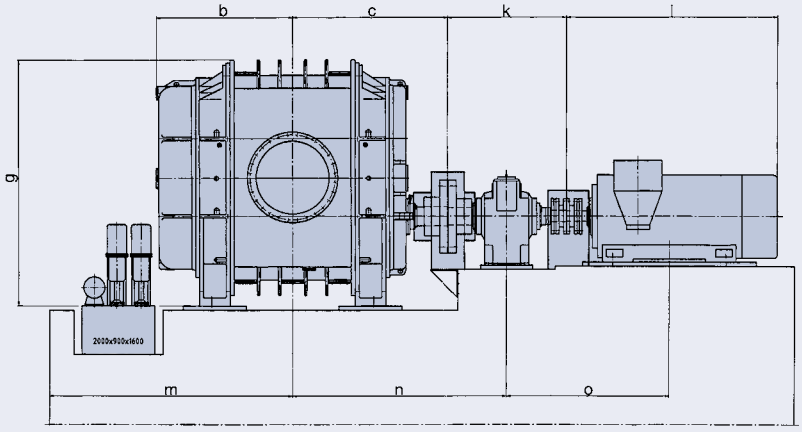
2) Arrangement 2 + 1



4) Arrangement 3 + 2



Dimensions – Sizes 17.14 to 22.23 - arrangement 6



Type	b	c	g	k	l	m	n	o	Foundation approx. Length	Width
GQ 17.14 xz	993	805	1070	940	1800	2300	1272	1370	6000	2300
GQ 18.16 xz	1042	954	1380	1020	1900	2400	1465	1460	6500	2300
GQ 20f20 xz	1160	1360	2020	1200	2000	2690	2030	1840	8100	3000
GQ 21.21 xz	1390	1530	2450	1220	2200	2700	2140	1710	7900	3500
GQ 22.23 xz	1682,5	1914,5	3030	1465	2600	3000	2642	2010	9200	3800
GQb 22.23 xz	1682,5	1914,5	3030	1465	2600	3000	2642	2010	9200	3800

Dimensions, weights and performance data are non-binding examples!

AERZEN. Compression as success principle.
AERZEN began life in 1864 as Aerzener Maschinenfabrik. In 1868 we built Europe's first rotary lobe blower. The first Turbo compressors followed in 1911, the first screw compressor in 1943, and in 2010 the world's first rotary lobe compressor unit. Innovations "made by AERZEN" keep driving the development of compressor technology forward. Today, AERZEN is among the world's oldest and most significant manufacturers of rotary lobe blowers, rotary lobe compressors, rotary lobe meters, screw compressors, and Turbo blowers. And among the undisputed market leaders in many areas of application.

More than 2,000 experienced employees in over 48 affiliates the world over are working at full speed to advance compressor technology. Their technological expertise, our international network of experts, and constant feedback from our clients form the basis for our success. Products and services from AERZEN are setting standards when it comes to reliability, lasting value, and efficiency. Go ahead: challenge us!

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EXPECT PERFORMANCE

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