Open Type Compressors GEA Bock F Series

The full range of open type compressors and units

engineering for a better world

gea.com

Advanced competence, in touch with you

In this brochure we present our current program of open type GEA Bock compressors. Always close to our customers' market and process requirements, GEA offers the right compressors for refrigeration and air conditioning in all commercial, industrial and transport sectors.

You will find our open type compressors across today's marine as well as food and beverage industries. Likewise, they support state-of-the-art refrigeration and air conditioning solutions in petrochemical, chemical, pharmaceutical and leisure facility applications.

We develop these compressors as a global refrigeration expert with almost a century of experience. All core components are developed, assembled and tested at our own facilities, always reflecting our enthusiasm for your success. Our worldwide dealer and service network is ready to show you compressors and maintenance solutions for your maximum productivity, wherever you are.

World-leading technology from GEA

GEA is one of the largest suppliers of process technology for the food industry and for a wide range of other industries. As an international technology group, the company focuses on world-leading process solutions and components for sophisticated production processes.

Long-life, energy-efficient GEA solutions ensure both economical savings and reduced ecological footprint, to help you protect the climate and your standing with customers and authorities.

Be inspired by our state-of-the-art products and the entire passion that goes into each of our components.

Overview

Open type compressors

Open type compressors
F compressor
FDK compressor units for direct drive
SFD compressor units for direct drive

Maritime applications

Fishing industry

Container ships

Ice machines

Cold stores

Process refrigeration

Further information can be found online at **gea.com/vap**

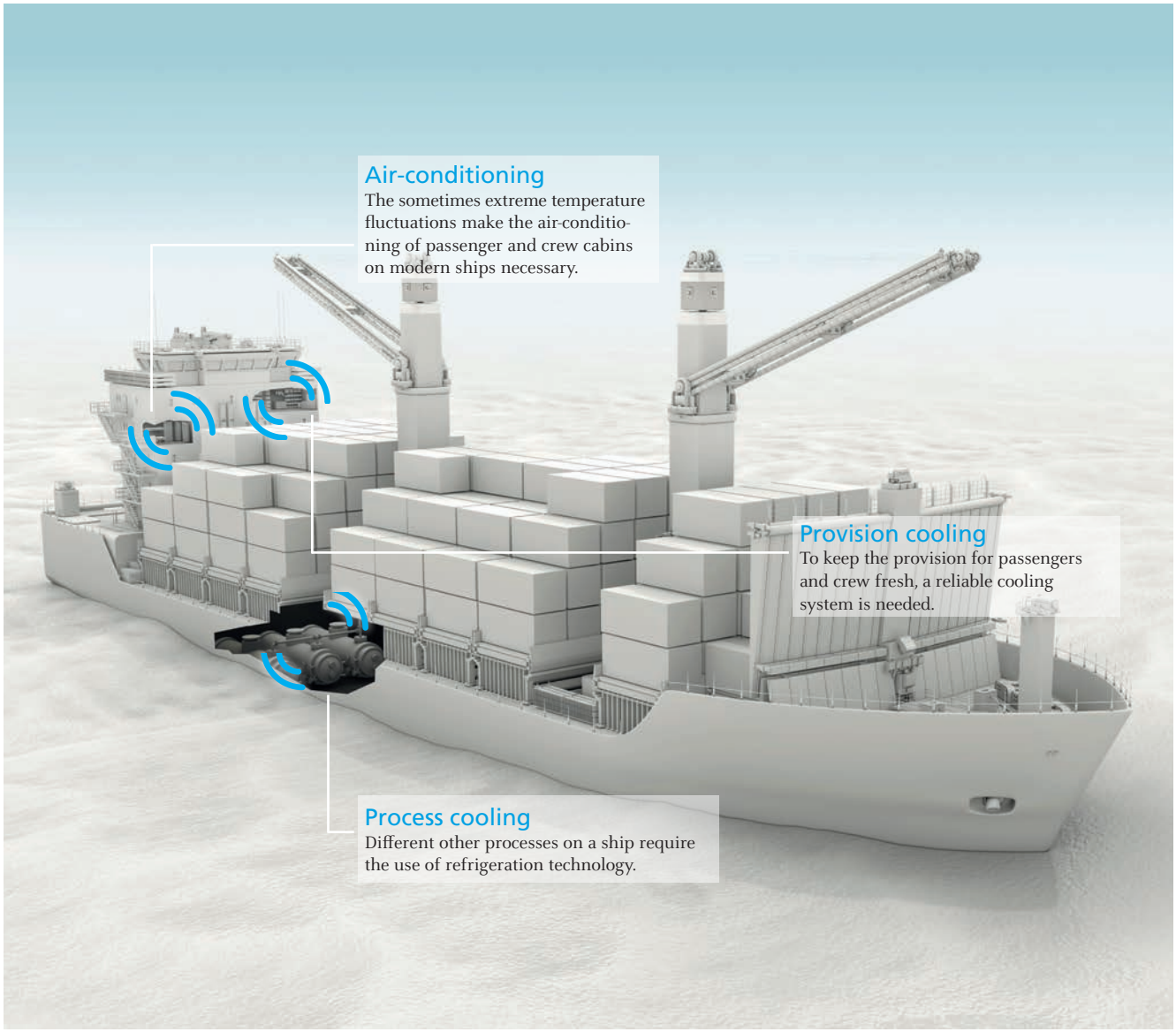
Compressor solutions for the entire ship

GEA compressors have been fulfilling the high maritime demands for many years. They help to provide a comfortable climate in cabins, keep provisions cooled and are additionally used in many other applications.

GEA compressors also work reliably on container ships, passenger ships or fishing boats.

With a broad product range of open type and semi-hermetic compressors, the GEA Bock program has the right compressor for nearly all refrigeration and maritime applications.

Together with the program of industrial piston and screw compressors, GEA offers the broadest compressor program for maritime applications.

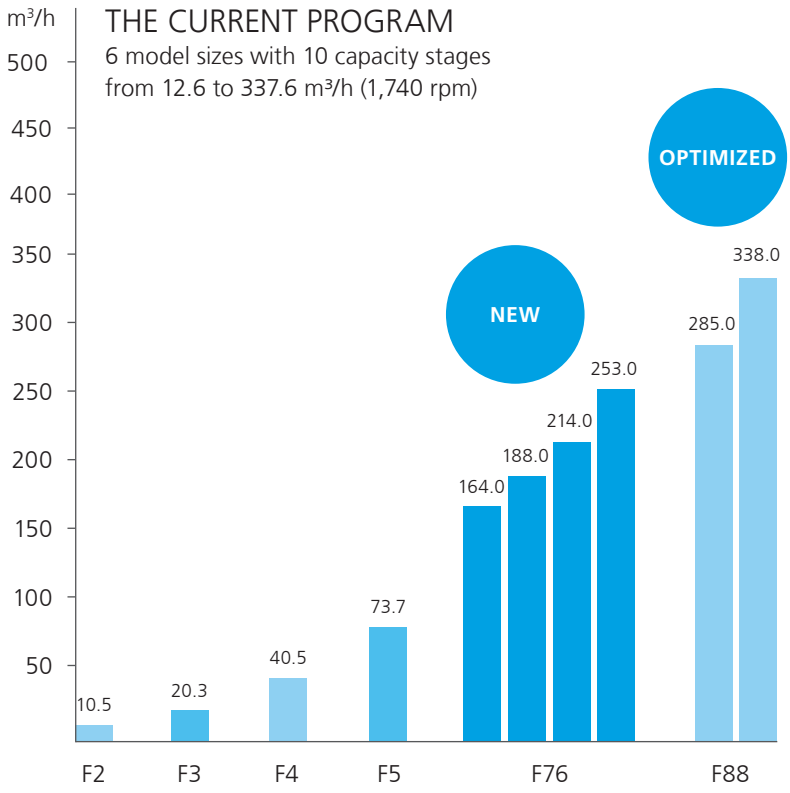


New & Improved F-Series

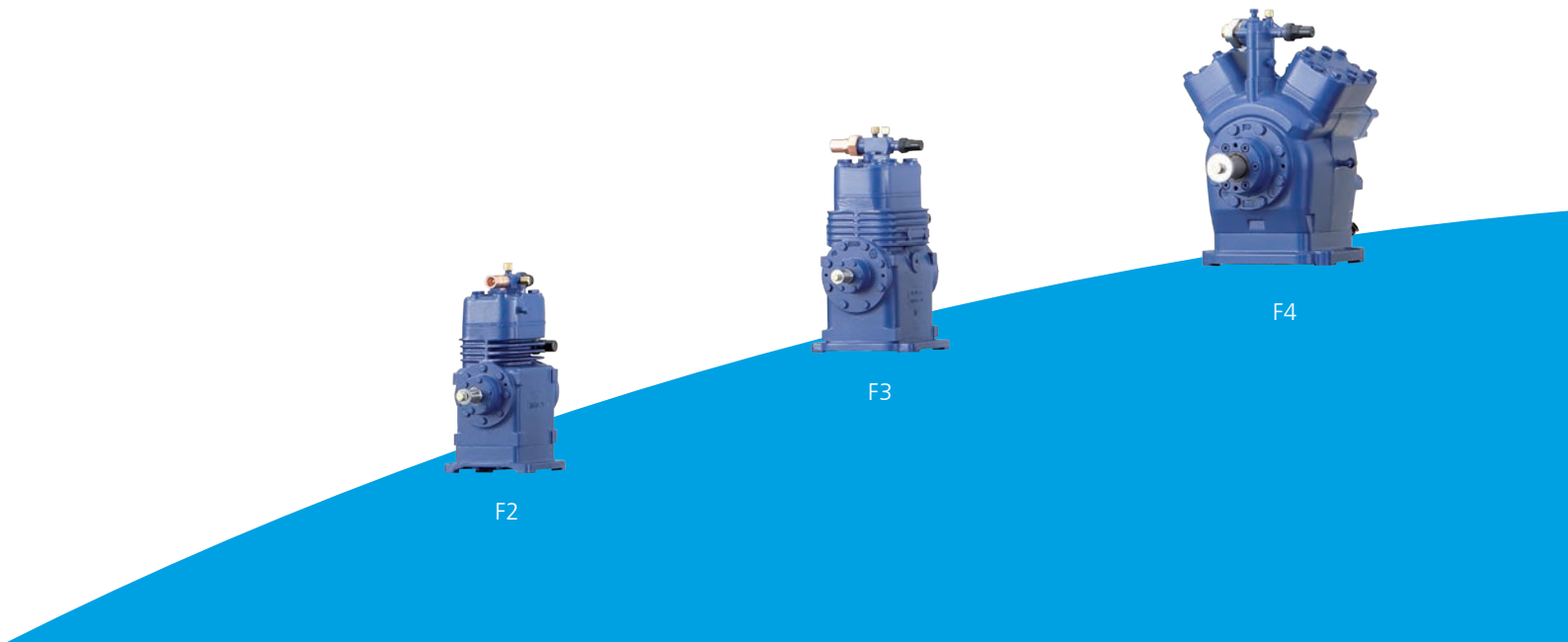
F76 and F88 series now with mexxFlow 2.0

With the development of the mexxFlow plate system, GEA has been a pioneer in the field of highly efficient valve plates for higher capacities. With the knowledge gained from practical experience over the past decade, we have consistently improved and further developed the system. The result: mexxFlow 2.0.

Already tried and proven in our large semi-hermetic compressors, the new mexxFlow 2.0 valve system is now also available for our revised F series. The second generation shows even greater resistance with a consistent high efficiency. This makes it suitable for the even toughest requirements of marine applications.

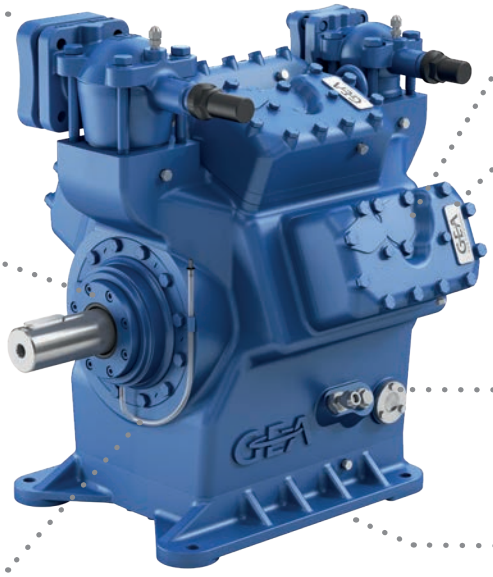


The four new models in the F76 series replace the proven F14 & F16 compressors.



F88

Light weight and most compact in its capacity range



Flexible connection

mexxFlow 2.0
New valve plate system
heavy duty marine
version

Proven and reliable
oil pump lubrication

Easy-to-change shaft
seal for maintenance
purposes

Two sight glasses
for flexible oil level
control

Practical drain-option
via freely accessible
piece of tube

Oil service valve
(optional)

F5

F76

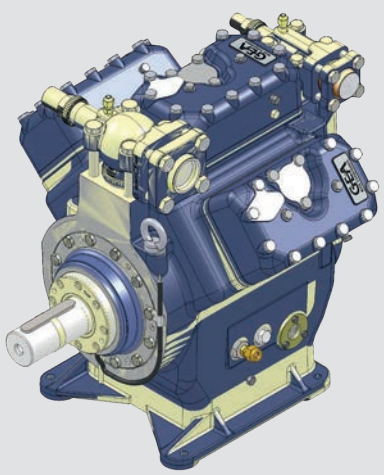
optimized mexxFlow 2.0
now integrated as
standard into F76 & F88

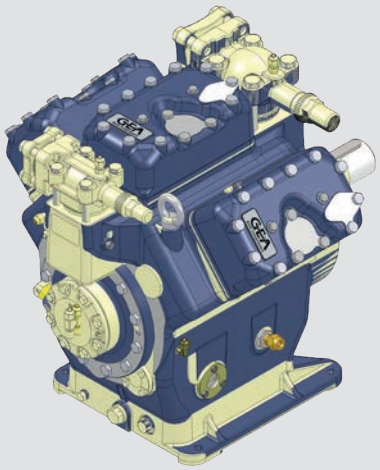
F88

New F76 – Replacement for former types

F 76		vs.	F14/F16
Types:	Displacement at 1,740 rpm:	Former types:	Displacement at 1,740 rpm:
–	–	F14/1166	121.7 m³/h
F76/1570	164.0 m³/h	F14/1366	142.8 m³/h
F76/1800	188.0 m³/h	F16/1751	182.6 m³/h
F76/2050	214.0 m³/h	F16/2051	214.1 m³/h
F76/2425	253.0 m³/h	–	–

New F76 vs F16 Dimension Comparison





● **F76**
○ **F16** (elevated baseplate version)

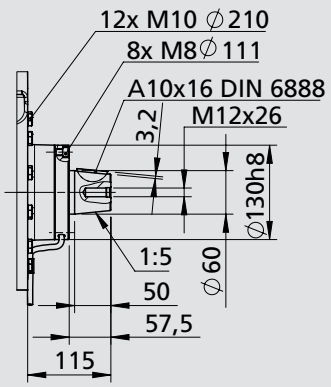
F76 vs F16 elevated baseplate version:

- No height difference crank shaft + pipe connections
- Footprint identical of both versions F(X)76 and F(X)16

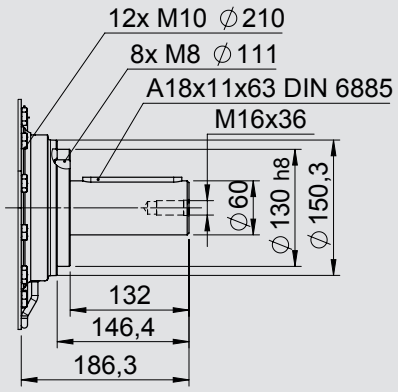
F76 vs F16 low baseplate version:

- Height difference crank shaft + pipe connections: 50 mm
- Footprint identical of both versions F(X)76 and F(X)16

Comparison crank shafts



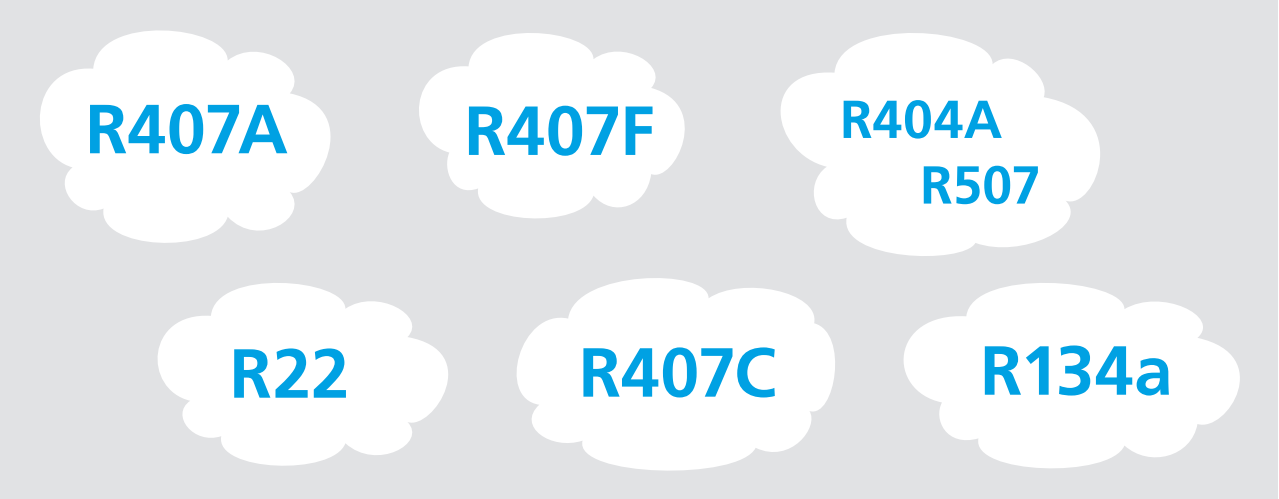
Crank shaft F16



Crank shaft F76

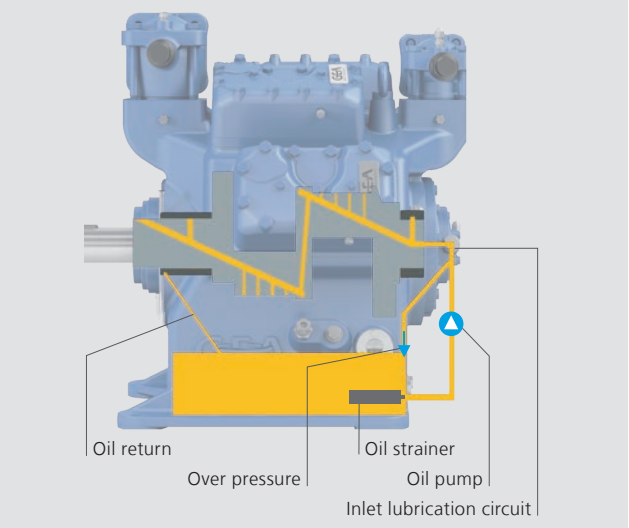
Unique features and advantages

One compressor design for all standard refrigerants



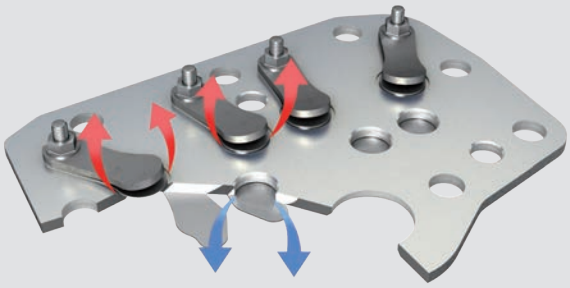
- For air-conditioning, medium and low temperature application.
- Maximum allowed operating pressure: 28 bar

Safe, reliable oil supply



- All compressors with a conventional single circuit lubricating system
- All compressors with oil pump lubrication independent of direction of rotation
- Minimized oil carry-over
- Service-friendly oil strainer
- Oil pump lubrication independent of direction of rotation
- Connection possibility for oil pressure monitoring
- Large volume oil sump
- Coupling option for oil level regulator as standard

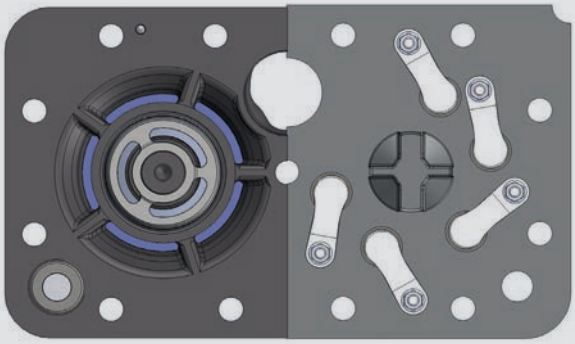
Standard valve plate design



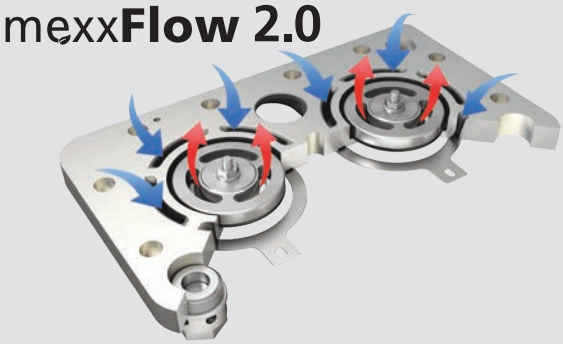
F2–F5

- Valves made of high-quality, impact-resistant spring steel
- Universally proven valve design with suction and discharge finger reed valves

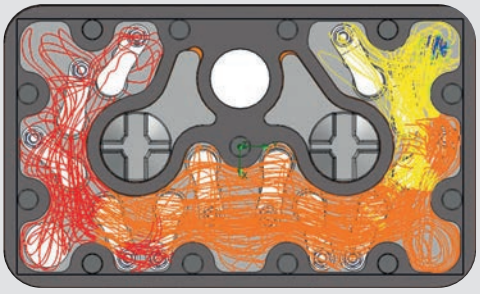
Valve plate innovation: mexxFlow, only from GEA



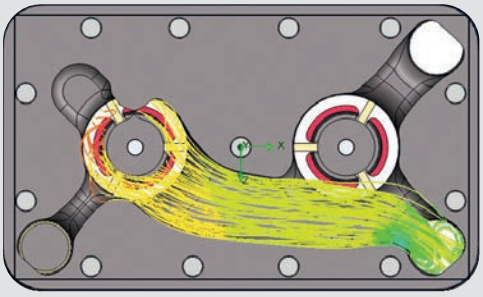
mexxFlow (left side) vs. previous design (right side)



F76 & F88



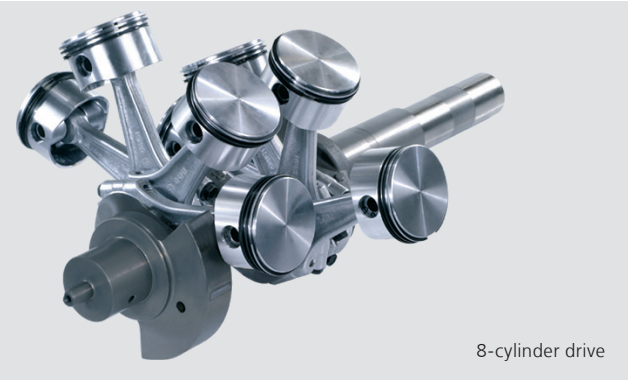
Previous cylinder cover – high pressure drops and turbulences



mexxFlow® – reduced pressure drops and improved gas flow

- With the mexxFlow® system pressure losses can be minimized thanks to a flow-optimized double ring fin construction of the valve plate, in combination with a cylinder head that is specially adapted to the valve plate. Thus, the efficiency of the compressor is increased significantly

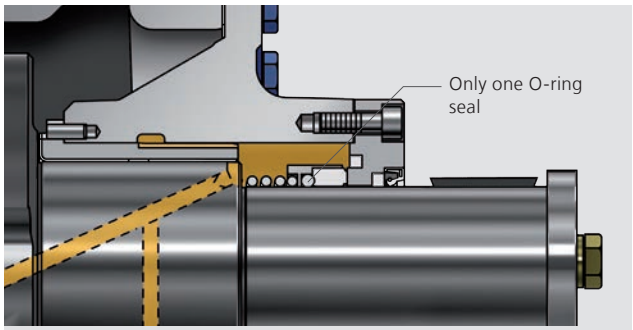
Wear-resistant durable driving gear



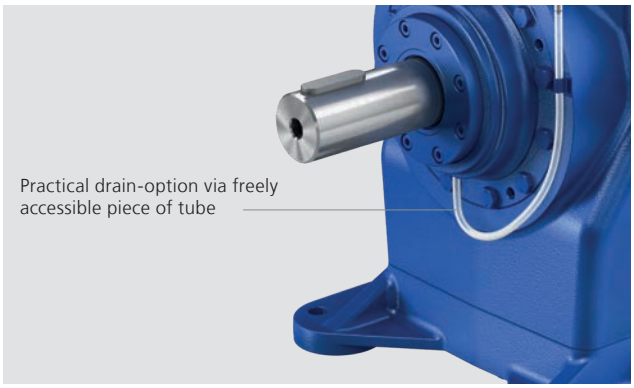
8-cylinder drive

- Solid construction and design
- Classic crankshaft construction with hardened surface
- Classic crankshaft construction with carbonated plasma-nitrite surface (F76/F88)
- Low-friction, wear-resistant plain bearings
- Aluminium pistons with two-ring assembly
- Three-ring assembly, compression ring chrome-hardened (F76/F88)
- Aluminium con-rod in divided, screwed design
- With high-strength small end bearings (F76/F88)

Simply constructed floating ring seals

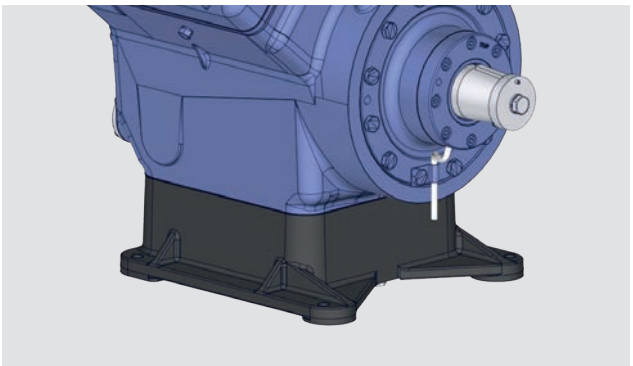


Example: assembly shaft seal



- Construction tried and tested for decades
- Only one o-ring seal, counter ring designed as the screw-on cover
- With oil washing for cooling and lubricating the whole unit
- Easy to change the shaft seal for maintenance purposes
- Design with piece of tube for controlled oil drain option (F76/F88)

Elevated base plate



- F76: 2.7 l additional oil volume
- F88: 4.6 l additional oil volume

Economical capacity regulation (accessories)

Fig. 1 Full load operation
(Principle F88 + F76)

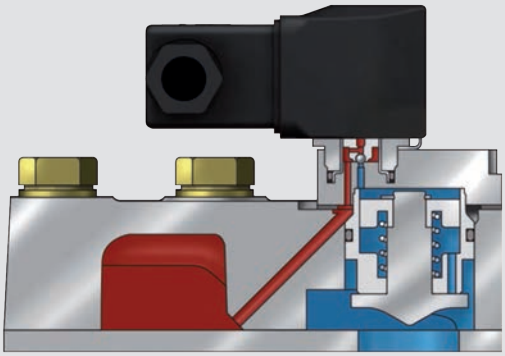
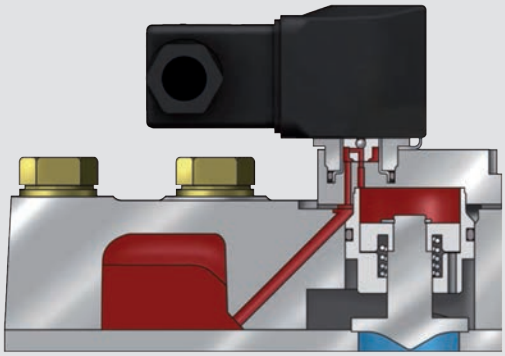
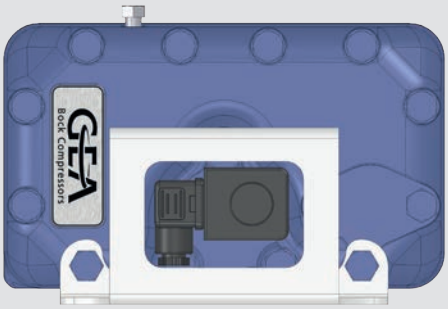


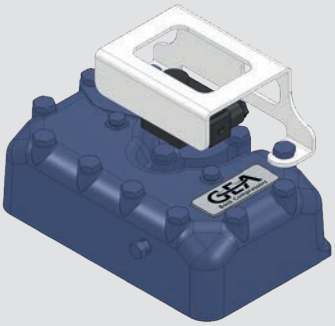
Fig. 2 Partial load operation
(Principle F88 + F76)



- Possible regulating steps:
  4-cylinder compressor: 50 %
  6-cylinder compressor: 33 % / 66 %
  8-cylinder compressor: 25 % / 50 % / 75 %
- Continuously variable speed control (up to 60 Hz) via external frequency converter possible
- Mode of operation:
  Full load: solenoid coil is not energized, suction inlets are open (fig. 1)
  Partial load: solenoid coil is energized, suction inlets are closed (fig. 2)

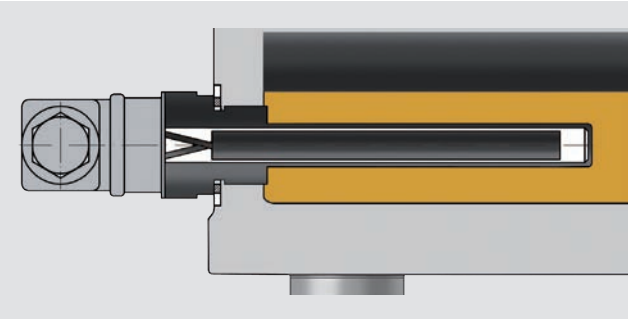
Step Protection





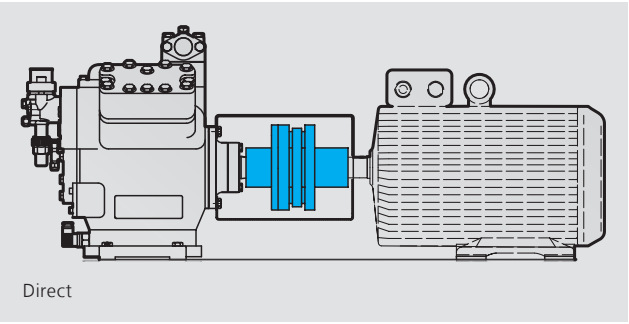
- Protection against external mechanical damage

Oil sump heater (accessories)

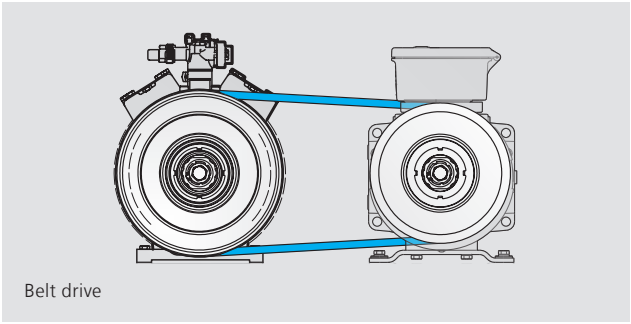


- Design with immersion sleeve
- Changes possible without intervening in the refrigeration cycle

Various drive options



Direct



Belt drive

- Conical shaft end (F2–F5) or cylindrical shaft end (F76–F88) for safe force transmission and exact installation of the drive elements
- Drive via v-belt or coupling, with all the conventional drive sources (electric motors, combustible motors, hydraulic motors, etc.)
- Coupling bell for quick and easy installation (F76/F88)

Approval by classification societies

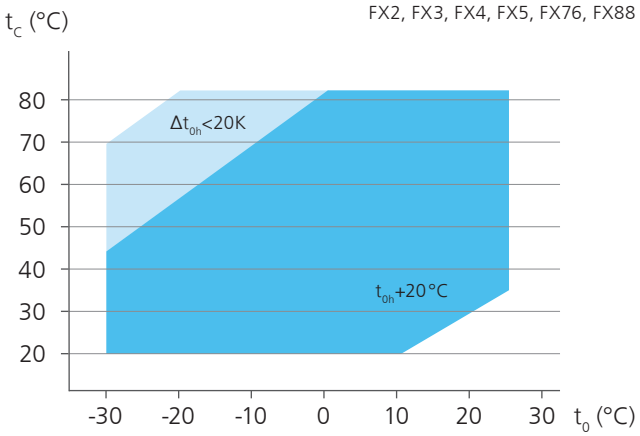
With their uncompromising quality and resistant construction, compressors are predestinated for maritime applications at sea. Proving this are numerous approvals by the leading classification societies, GEA offers approvals by classification societies on request.

Open type compressors GEA Bock F series

GEA Bock F2 – F88

OPERATING LIMITS

R134a Operating limits



t_O Evaporating temperature (°C)
t_C Condensing temperature (°C)
Δt_{Oh} Suction gas superheat (K)
t_{Oh} Suction gas temperature (°C)

Max. permissible operating pressure (LP/HP) [1]: 19/28 bar
[1] LP = low pressure, HP = high pressure

● Unlimited application range
○ Supplementary cooling or reduced suction gas temperature

NOTES

R134a Notes

Operating limits

Compressor operation is possible within the examples in the diagram showing the limitations of use. The meaning of the surfaces marked in color are to be observed. Limiting areas should not be selected for layout or continuous operating points.

Performance data

Performance specifications for the R134a are based on 20 °C suction gas temperatures without liquid subcooling. Compressor speed 1,740 rpm.

For additional technical data for other operating points see GEA Bock software.

PERFORMANCE DATA

R134a — **1,740 rpm**

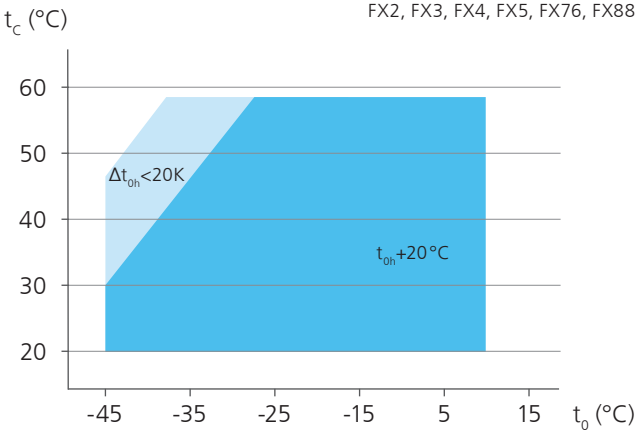
Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]									Power consumption P_e [kW]
			Evaporating temperature °C									
			12.5	10	5	0	–5	–10	–15	–20	–25	–30
FX2	30	Q	10,800	9,830	8,120	6,640	5,370	4,290	3,380	2,620	1,980	1,450
		P	1.16	1.20	1.25	1.24	1.20	1.13	1.03	0.932	0.822	0.716
	40	Q	9,600	8,730	7,190	5,850	4,710	3,740	2,920	2,230	1,650	1,150
		P	1.60	1.60	1.57	1.51	1.41	1.29	1.16	1.03	0.908	0.796
	50	Q	8,380	7,610	6,220	5,040	4,020	3,160	2,440	1,820	1,300	843
		P	1.98	1.95	1.85	1.73	1.59	1.43	1.28	1.13	0.994	0.883
FX3	30	Q	20,900	19,100	15,800	12,900	10,400	8,310	6,540	5,070	3,830	2,800
		P	2.25	2.34	2.42	2.42	2.33	2.19	2.01	1.80	1.59	1.38
	40	Q	18,600	17,000	14,000	11,400	9,120	7,240	5,650	4,310	3,190	2,230
		P	3.10	3.11	3.05	2.92	2.74	2.51	2.26	2.00	1.76	1.54
	50	Q	16,300	14,800	12,100	9,760	7,790	6,130	4,720	3,530	2,520	1,640
		P	3.85	3.78	3.60	3.36	3.08	2.78	2.48	2.19	1.92	1.71
FX4	30	Q	41,800	38,100	31,500	25,800	20,800	16,700	13,100	10,200	7,660	5,600
		P	4.51	4.68	4.85	4.84	4.67	4.39	4.02	3.61	3.18	2.77
	40	Q	37,200	33,900	27,900	22,700	18,300	14,500	11,300	8,620	6,370	4,460
		P	6.21	6.22	6.11	5.85	5.48	5.02	4.52	4.01	3.52	3.08
	50	Q	32,500	29,500	24,200	19,600	15,600	12,300	9,440	7,060	5,030	3,270
		P	7.70	7.57	7.20	6.72	6.17	5.57	4.96	4.38	3.85	3.42
FX5	30	Q	76,000	69,300	57,200	46,800	37,900	30,200	23,800	18,500	14,000	10,200
		P	8.21	8.51	8.82	8.80	8.50	7.99	7.32	6.57	5.79	5.05
	40	Q	67,600	61,600	50,700	41,300	33,200	26,400	20,600	15,700	11,600	8,100
		P	11.3	11.3	11.1	10.6	9.96	9.13	8.22	7.29	6.40	5.61
	50	Q	59,100	53,600	43,900	35,500	28,400	22,300	17,200	12,900	9,140	5,950
		P	14.0	13.7	13.1	12.2	11.2	10.1	9.02	7.96	7.01	6.23
FX76/1570	30	Q	15,1000	138,000	114,000	93,500	75,800	60,600	47,700	36,900	28,000	20,700
		P	14.4	14.9	15.5	15.5	15.0	14.1	13.0	11.6	10.1	8.68
	40	Q	135,000	124,000	102,000	83,200	67,100	53,300	41,500	31,600	23,300	16,500
		P	20.3	20.3	20.0	19.1	17.9	16.4	14.7	12.8	10.9	9.19
	50	Q	119,000	109,000	89,200	72,500	58,000	45,600	35,100	26,100	18,600	12,200
		P	25.5	25.1	23.8	22.2	20.3	18.2	16.0	13.7	11.5	9.54
FX76/1800	30	Q	173,000	158,000	131,000	108,000	87,000	69,500	54,800	42,400	32,100	23,800
		P	16.5	17.1	17.8	17.8	17.2	16.2	14.9	13.3	11.6	9.97
	40	Q	155,000	142,000	117,000	95,500	77,000	61,100	47,600	36,300	26,800	18,900
		P	23.3	23.4	22.9	22.0	20.6	18.8	16.8	14.7	12.6	10.5
	50	Q	137,000	125,000	103,000	83,200	66,600	52,400	40,300	30,000	21,300	14,000
		P	29.3	28.8	27.4	25.5	23.3	20.9	18.3	15.7	13.2	10.9
FX76/2050	30	Q	197,000	180,000	149,000	123,000	98,900	79,100	62,300	48,200	36,500	27,000
		P	18.8	19.5	20.2	20.2	19.6	18.5	17.0	15.2	13.2	11.3
	40	Q	177,000	161,000	133,000	109,000	87,600	69,500	54,200	41,300	30,500	21,500
		P	26.5	26.6	26.1	25.0	23.4	21.4	19.2	16.7	14.3	12.0
	50	Q	156,000	142,000	117,000	94,600	75,800	59,600	45,800	34,100	24,300	16,000
		P	33.3	32.7	31.2	29.1	26.6	23.8	20.9	17.9	15.1	12.4
FX76/2425	30	Q	235,000	215,000	178,000	146,000	119,000	94,500	74,400	57,600	43,600	32,300
		P	22.4	23.3	24.2	24.2	23.4	22.1	20.3	18.1	15.8	13.5
	40	Q	211,000	193,000	159,000	130,000	105,000	83,100	64,700	49,300	36,400	25,700
		P	31.7	31.8	31.2	29.9	28.0	25.6	22.9	20.0	17.1	14.3
	50	Q	186,000	170,000	140,000	114,000	90,500	71,200	54,700	40,700	29,000	19,100
		P	39.8	39.1	37.2	34.7	31.7	28.4	24.9	21.4	18.0	14.8
FX88/2735	30	Q	264,000	242,000	200,000	165,000	133,000	107,000	83,700	64,800	49,100	36,300
		P	25.4	26.3	27.4	27.4	26.5	25.0	22.9	20.5	17.9	15.3
	40	Q	237,000	217,000	179,000	147,000	118,000	93,500	72,900	55,500	40,900	28,900
		P	35.9	35.9	35.3	33.8	31.7	29.0	25.9	22.6	19.3	16.2
	50	Q	209,000	191,000	157,000	128,000	102,000	80,100	61,600	45,900	32,600	21,400
		P	45.0	44.3	42.1	39.3	35.9	32.2	28.2	24.2	20.4	16.8
FX88/3235	30	Q	315,000	288,000	239,000	196,000	159,000	128,000	100,000	77,400	58,600	43,400
		P	30.4	31.5	32.7	32.7	31.7	29.9	27.4	24.5	21.4	18.3
	40	Q	283,000	259,000	214,000	175,000	141,000	112,000	87,000	66,200	48,900	34,500
		P	42.9	42.9	42.2	40.4	37.8	34.6	31.0	27.1	23.1	19.3
	50	Q	250,000	228,000	188,000	152,000	122,000	95,700	73,500	54,800	38,900	25,600
		P	53.8	52.9	50.3	47.0	42.9	38.5	33.7	29.0	24.3	20.1

Relating to 20 °C suction gas temperature without liquid subcooling

Supplementary cooling or reduced suction gas temp.

OPERATING LIMITS

R404A/R507 Operating limits



t_O Evaporating temperature (°C)
t_C Condensing temperature (°C)
Δt_{Oh} Suction gas superheat (K)
t_{Oh} Suction gas temperature (°C)

Max. permissible operating pressure (LP/HP) [1]: 19/28 bar
[1] LP = low pressure, HP = high pressure

● Unlimited application range
○ Supplementary cooling or reduced suction gas temperature

NOTES

R404A/R507 Notes

Operating limits

Compressor operation is possible within the examples in the diagram showing the limitations of use. The meaning of the surfaces marked in color are to be observed. Limiting areas should not be selected for layout or continuous operating points.

Performance data

Performance specifications for R404A/R507 are based on 20 °C suction gas temperatures without liquid subcooling. Compressor speed 1,740 rpm.

For additional technical data for other operating points see GEA Bock software.

PERFORMANCE DATA

R404A/R507 — **1,740 rpm**

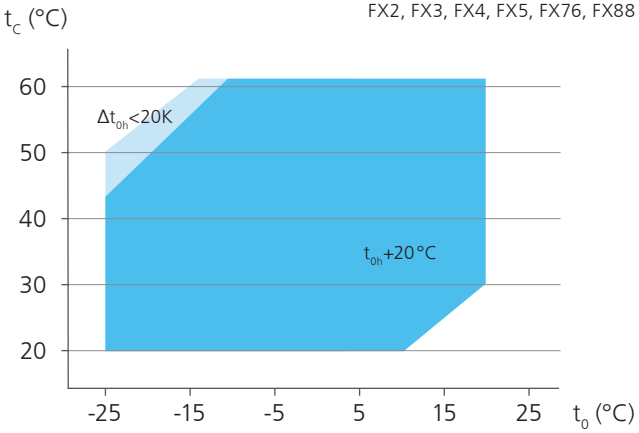
Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]											Power consumption P_e [kW]
			Evaporating temperature °C											
			10	5	0	–5	–10	–15	–20	–25	–30	–35	–40	–45
FX2	30	Q	159,00	135,00	114,00	9,460	7,790	6,330	5,060	3,970	3,050	2,280	1,660	1,160
		P	2.65	2.62	2.55	2.45	2.31	2.15	1.97	1.77	1.56	1.34	1.12	0.902
	40	Q	13,700	11,600	9,670	8,020	6,560	5,290	4,200	3,260	2,470	1,820	1,280	854
		P	3.16	3.06	2.92	2.75	2.55	2.33	2.10	1.85	1.60	1.34	1.09	0.844
	50	Q	11,400	9,570	7,960	6,550	5,310	4,240	3,320	2,550	1,900	1,370	932	
		P	3.63	3.45	3.24	3.00	2.75	2.47	2.19	1.90	1.61	1.31	1.03	
FX3	30	Q	33,500	28,500	24,100	20,100	16,600	13,500	10,900	8,550	6,620	4,990	3,650	2,570
		P	4.69	4.75	4.71	4.58	4.38	4.11	3.80	3.44	3.06	2.67	2.27	1.88
	40	Q	28,900	24,500	20,600	17,100	14,100	11,400	9,090	7,130	5,460	4,060	2,900	1,950
		P	5.95	5.81	5.58	5.28	4.92	4.51	4.07	3.60	3.13	2.65	2.18	1.74
	50	Q	24,300	20,500	17,100	14,200	11,600	9,310	7,380	5,730	4,340	3,180	2,200	
		P	7.06	6.73	6.32	5.86	5.35	4.82	4.26	3.69	3.12	2.57	2.05	
FX4	30	Q	63,600	54,100	45,500	37,900	31,200	25,200	20,100	15,700	12,000	8,920	6,460	4,560
		P	9.99	9.94	9.69	9.26	8.69	8.00	7.24	6.42	5.57	4.74	3.94	3.21
	40	Q	55,200	46,700	39,000	32,300	26,300	21,100	16,600	12,800	9,600	6,990	4,930	3,340
		P	12.0	11.6	11.1	10.3	9.55	8.64	7.68	6.69	5.72	4.78	3.92	3.15
	50	Q	46,200	38,700	32,100	26,200	21,100	16,700	13,000	9,750	7,150	5,070	3,450	
		P	13.7	12.9	12.1	11.1	10.0	8.95	7.81	6.69	5.62	4.61	3.70	
FX5	30	Q	113,000	96,500	81,700	68,300	56,200	45,500	36,000	27,900	21,000	15,300	10,800	7,360
		P	15.5	16.1	16.2	15.8	15.1	14.0	12.8	11.3	9.85	8.31	6.83	5.47
	40	Q	98,300	83,500	70,100	58,000	47,200	37,700	29,500	22,400	16,500	11,800	8,130	5,580
		P	20.2	19.9	19.2	18.1	16.8	15.2	13.5	11.7	9.93	8.21	6.62	5.25
	50	Q	83,100	69,900	58,000	47,400	38,100	29,900	23,000	17,100	12,400	8,700	6,100	
		P	24.2	23.1	21.7	20.0	18.1	16.0	13.9	11.8	9.90	8.05	6.44	
FX76/1570	30	Q	228,000	193,000	162,000	135,000	111,000	89,600	71,800	56,700	44,100	33,700	25,200	18,400
		P	30.7	31.1	30.7	29.7	28.0	25.9	23.6	21.0	18.5	16.0	13.7	11.8
	40	Q	198,000	167,000	139,000	115,000	94,100	76,100	60,800	47,800	36,900	27,900	20,600	14,600
		P	39.2	38.2	36.5	34.3	31.6	28.8	25.7	22.7	19.8	17.2	14.9	13.2
	50	Q	167,000	140,000	116,000	95,300	77,600	62,500	49,600	38,800	29,800	22,400	16,200	
		P	46.3	44.0	41.2	38.0	34.6	31.1	27.6	24.2	21.2	18.6	16.5	
FX76/1800	30	Q	262,000	222,000	186,000	155,000	127,000	103,000	82,400	65,100	50,600	38,700	28,900	21,100
		P	35.3	35.7	35.3	34.0	32.2	29.8	27.1	24.1	21.2	18.3	15.8	13.6
	40	Q	227,000	191,000	160,000	132,000	108,000	87,400	69,800	54,800	42,400	32,100	23,600	16,700
		P	45.1	43.9	41.9	39.3	36.3	33.0	29.5	26.1	22.7	19.7	17.1	15.1
	50	Q	191,000	160,000	133,000	110,000	89,100	71,700	56,900	44,500	34,200	25,700	18,600	
		P	53.2	50.5	47.3	43.6	39.7	35.7	31.7	27.8	24.3	21.3	19.0	
FX76/2050	30	Q	298,000	252,000	211,000	176,000	145,000	117,000	93,800	74,100	57,600	44,000	32,900	24,000
		P	40.1	40.7	40.2	38.7	36.6	33.9	30.8	27.5	24.1	20.9	17.9	15.5
	40	Q	258,000	218,000	182,000	151,000	123,000	99,400	79,400	62,400	48,200	36,500	26,900	19,100
		P	51.3	49.9	47.7	44.8	41.3	37.6	33.6	29.7	25.9	22.4	19.5	17.2
	50	Q	218,000	182,000	152,000	125,000	102,000	81,600	64,800	50,700	38,900	29,200	21,200	
		P	60.5	57.5	53.8	49.7	45.2	40.6	36.0	31.7	27.7	24.3	21.6	
FX76/2425	30	Q	356,000	301,000	253,000	210,000	173,000	140,000	112,000	88,500	68,800	52,500	39,300	28,700
		P	47.9	48.6	48.0	46.3	43.7	40.5	36.8	32.8	28.8	25.0	21.4	18.5
	40	Q	308,000	260,000	217,000	180,000	147,000	119,000	94,800	74,500	57,600	43,600	32,100	22,700
		P	61.3	59.6	57.0	53.5	49.4	44.9	40.2	35.4	30.9	26.8	23.3	20.6
	50	Q	260,000	218,000	181,000	149,000	122,000	97,400	77,400	60,500	46,500	34,900	25,300	
		P	72.3	68.7	64.3	59.3	54.0	48.5	43.1	37.9	33.1	29.0	25.8	
FX88/2735	30	Q	400,000	339,000	284,000	236,000	194,000	158,000	127,000	99,600	77,400	59,100	44,200	32,300
		P	54.3	55.0	54.3	52.4	49.5	45.8	41.6	37.2	32.6	28.2	24.3	20.9
	40	Q	347,000	292,000	244,000	202,000	166,000	134,000	107,000	83,900	64,800	49,000	36,100	25,600
		P	69.3	67.5	64.5	60.5	55.9	50.8	45.5	40.1	35.0	30.3	26.3	23.3
	50	Q	292,000	245,000	204,000	168,000	137,000	110,000	87,100	68,100	52,300	39,300	28,500	
		P	81.8	77.7	72.8	67.1	61.1	54.9	48.7	42.8	37.5	32.8	29.2	
FX88/3235	30	Q	478,000	405,000	339,000	282,000	232,000	188,000	151,000	119,000	92,500	70,600	52,800	38,600
		P	64.8	65.7	64.9	62.6	59.1	54.7	49.7	44.4	39.0	33.7	29.0	25.0
	40	Q	414,000	349,000	292,000	242,000	198,000	160,000	128,000	101,000	77,400	58,600	43,100	30,600
		P	82.8	80.6	77.0	72.3	66.8	60.7	54.3	47.9	41.8	36.2	31.5	27.8
	50	Q	349,000	293,000	243,000	200,000	163,000	131,000	104,000	81,400	62,500	46,900	34,000	
		P	97.8	92.9	86.9	80.2	73.0	65.6	58.2	51.2	44.8	39.2	34.9	

Relating to 20 °C suction gas temperature without liquid subcooling

Supplementary cooling or reduced suction gas temp.

OPERATING LIMITS

R407C Operating limits



t_O Evaporating temperature (°C)
t_C Condensing temperature (°C)
Δt_{Oh} Suction gas superheat (K)
t_{Oh} Suction gas temperature (°C)

Max. permissible operating pressure (LP/HP) [1]: 19/28 bar
[1] LP = low pressure, HP = high pressure

● Unlimited application range
○ Supplementary cooling or reduced suction gas temperature

NOTES

R407C Notes

Operating limits

Compressor operation is possible within the examples in the diagram showing the limitations of use. The meaning of the surfaces marked in color are to be observed. Limiting areas should not be selected for layout or continuous operating points.

Performance data

Performance specifications for R407C are based on 20 °C suction gas temperatures without liquid subcooling. Compressor speed 1,740 rpm.

For additional technical data for other operating points see GEA Bock software.

PERFORMANCE DATA

R407C — **1,740 rpm**

Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]									Power consumption P_e [kW]
			Evaporating temperature °C									
			12.5	10	7.5	5	0	–5	–10	–15	–20	–25
FX2	30	Q	15,300	14,000	12,800	11,600	9,520	7,750	6,240	4,960	3,880	2,970
		P	1.76	1.83	1.89	1.92	1.92	1.86	1.76	1.62	1.47	1.31
	40	Q	13,700	12,500	11,400	10,300	8,410	6,820	5,460	4,300	3,320	2,490
		P	2.49	2.50	2.49	2.46	2.36	2.21	2.04	1.85	1.65	1.47
	50	Q	11,900	10,900	9,820	8,900	7,260	5,850	4,650	3,620	2,750	2,000
		P	3.12	3.07	3.00	2.93	2.74	2.52	2.28	2.05	1.84	1.65
FX3	30	Q	29,600	27,000	24,600	22,400	18,400	15,000	12,100	9,580	7,490	5,740
		P	3.41	3.55	3.65	3.71	3.72	3.60	3.40	3.14	2.85	2.54
	40	Q	26,400	24,100	21,900	19,900	16,300	13,200	10,600	8,310	6,420	4,810
		P	4.82	4.84	4.81	4.76	4.56	4.28	3.94	3.57	3.20	2.86
	50	Q	23,000	21,000	19,000	17,300	14,100	11,300	8,980	7,000	5,320	3,870
		P	6.04	5.94	5.81	5.66	5.29	4.87	4.42	3.97	3.55	3.19
FX4	30	Q	59,000	53,900	49,100	44,700	36,700	29,900	24,100	19,200	15,000	11,500
		P	6.81	7.09	7.28	7.40	7.41	7.19	6.80	6.27	5.68	5.08
	40	Q	52,500	47,900	43,600	39,600	32,500	26,300	21,100	16,600	12,800	9,580
		P	9.63	9.65	9.61	9.50	9.11	8.55	7.87	7.14	6.39	5.70
	50	Q	45,900	41,800	37,900	34,400	28,000	22,600	17,900	14,000	10,600	7,710
		P	12.0	11.8	11.6	11.3	10.5	9.72	8.83	7.93	7.09	6.37
FX5	30	Q	108,000	98,000	89,400	81,300	66,800	54,400	43,800	34,800	27,200	20,900
		P	12.3	12.9	13.2	13.4	13.4	13.0	12.3	11.4	10.3	9.26
	40	Q	95,600	87,200	79,400	72,100	59,000	47,900	38,300	30,200	23,300	17,500
		P	17.5	17.5	17.4	17.2	16.5	15.5	14.3	12.9	11.6	10.3
	50	Q	83,400	75,900	69,000	62,500	50,900	41,000	32,600	25,500	19,300	14,100
		P	21.9	21.5	21.1	20.5	19.2	17.7	16.0	14.4	12.9	11.5
FX76/1570	30	Q	229,000	209,000	190,000	173,000	142,000	115,000	92,300	73,100	57,100	43,900
		P	24.6	25.4	25.9	26.1	25.8	24.6	22.8	20.7	18.4	16.1
	40	Q	204,000	186,000	169,000	153,000	125,000	101,000	80,700	63,500	49,200	37,300
		P	33.7	33.6	33.2	32.6	30.8	28.4	25.7	22.9	20.1	17.6
	50	Q	178,000	162,000	147,000	133,000	108,000	86,900	69,000	54,000	41,500	31,100
		P	41.1	40.2	39.1	37.8	34.8	31.5	28.1	24.8	21.8	19.4
FX76/1800	30	Q	263,000	240,000	219,000	199,000	163,000	132,000	106,000	83,900	65,600	50,400
		P	28.2	29.1	29.7	30.0	29.6	28.2	26.2	23.8	21.1	18.5
	40	Q	234,000	213,000	194,000	176,000	144,000	116,000	92,600	72,900	56,500	42,800
		P	38.7	38.5	38.1	37.4	35.4	32.7	29.5	26.3	23.1	20.3
	50	Q	205,000	186,000	169,000	153,000	124,000	99,700	79,200	62,000	47,700	35,700
		P	47.2	46.2	44.9	43.4	40.0	36.2	32.3	28.5	25.1	22.3
FX76/2050	30	Q	299,000	273,000	249,000	226,000	185,000	151,000	121,000	95,500	74,600	57,300
		P	32.1	33.2	33.8	34.1	33.7	32.1	29.8	27.0	24.0	21.1
	40	Q	266,000	243,000	221,000	200,000	164,000	132,000	106,000	83,000	64,300	48,700
		P	44.0	43.9	43.4	42.6	40.2	37.2	33.6	29.9	26.3	23.1
	50	Q	233,000	212,000	192,000	174,000	141,000	114,000	90,100	70,600	54,200	40,600
		P	53.7	52.5	51.0	49.4	45.5	41.2	36.7	32.4	28.5	25.4
FX76/2425	30	Q	357,000	326,000	297,000	270,000	221,000	180,000	144,000	115,000	89,100	68,400
		P	38.4	39.6	40.4	40.7	40.2	38.4	35.7	32.3	28.7	25.2
	40	Q	318,000	290,000	264,000	239,000	195,000	158,000	126,000	99,100	76,700	58,100
		P	52.6	52.4	51.8	50.9	48.1	44.4	40.2	35.7	31.4	27.6
	50	Q	278,000	253,000	229,000	208,000	169,000	136,000	108,000	84,300	64,800	48,500
		P	64.2	62.7	61.0	59.0	54.3	49.2	43.9	38.7	34.1	30.3
FX88/2735	30	Q	402,000	367,000	334,000	304,000	249,000	202,000	162,000	129,000	101,000	77,000
		P	43.4	44.8	45.7	46.1	45.5	43.5	40.4	36.6	32.5	28.5
	40	Q	358,000	326,000	297,000	269,000	220,000	178,000	142,000	112,000	86,400	65,400
		P	59.5	59.3	58.6	57.6	54.4	50.2	45.4	40.4	35.5	31.2
	50	Q	313,000	285,000	258,000	234,000	190,000	153,000	122,000	94,800	72,900	54,500
		P	72.6	71.0	69.0	66.7	61.5	55.7	49.7	43.8	38.6	34.3
FX88/3235	30	Q	480,000	438,000	399,000	363,000	298,000	242,000	194,000	154,000	120,000	92,000
		P	51.9	53.6	54.6	55.1	54.4	51.9	48.2	43.7	38.8	34.1
	40	Q	427,000	390,000	354,000	321,000	263,000	212,000	170,000	134,000	104,000	78,200
		P	71.1	70.9	70.1	68.8	65.0	60.0	54.3	48.3	42.4	37.3
	50	Q	374,000	340,000	308,000	279,000	227,000	183,000	145,000	114,000	87,100	65,100
		P	86.8	84.8	82.5	79.7	73.5	66.5	59.3	52.4	46.1	41.0

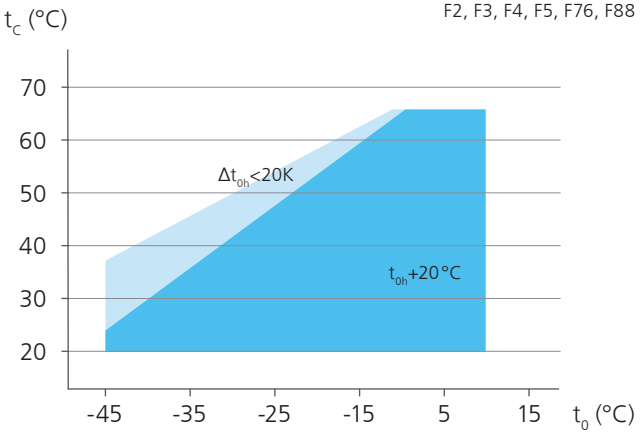
Relating to 20 °C suction gas temperature without liquid subcooling

Supplementary cooling or reduced suction gas temp.

OPERATING LIMITS

R22 Operating limits

F2, F3, F4, F5, F76, F88



t_O Evaporating temperature (°C)
t_C Condensing temperature (°C)
Δt_{Oh} Suction gas superheat (K)
t_{Oh} Suction gas temperature (°C)

Max. permissible operating pressure (LP/HP) [1]: 19/28 bar
[1] LP = low pressure, HP = high pressure

● Unlimited application range
○ Supplementary cooling or reduced suction gas temperature

NOTES

R22 Notes

Operating limits

Compressor operation is possible within the examples in the diagram showing the limitations of use. The meaning of the surfaces marked in color are to be observed. Limiting areas should not be selected for layout or continuous operating points.

Performance data

Performance specifications for R22 are based on 20 °C suction gas temperatures without liquid subcooling. Compressor speed 1,740 rpm.

For additional technical data for other operating points see GEA Bock software.

PERFORMANCE DATA

R22 — **1,740 rpm**

Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]						Power consumption P_e [kW]					
			Evaporating temperature °C											
			10	5	0	-5	–10	–15	–20	–25	–30	–35	–40	–45
F2	30	Q	14,800	12,500	10,400	8,630	7,100	5,780	4,650	3,680	2,870	2,190	1,620	1,140
		P	1.77	1.90	1.95	1.95	1.90	1.81	1.70	1.57	1.43	1.31	1.20	1.12
	40	Q	13,500	11,300	9,440	7,800	6,390	5,180	4,140	3,260	2,510	1,890	1,350	
		P	2.44	2.47	2.44	2.36	2.25	2.10	1.95	1.78	1.63	1.49	1.37	
	50	Q	12,200	10,200	8,440	6,950	5,660	4,560	3,620	2,830				
		P	3.08	3.01	2.90	2.75	2.58	2.38	2.18	1.99				
F3	30	Q	28,600	24,100	20,200	16,800	13,800	11,200	9,000	7,140	5,570	4,250	3,140	2,200
		P	3.44	3.68	3.79	3.78	3.68	3.51	3.29	3.04	2.78	2.54	2.33	2.17
	40	Q	26,100	22,000	18,300	15,200	12,400	10,100	8,020	6,310	4,870	3,650	2,620	
		P	4.74	4.79	4.74	4.58	4.36	4.08	3.78	3.46	3.16	2.89	2.67	
	50	Q	23,500	19,700	16,400	13,500	11,000	8,840	7,020	5,480				
		P	5.97	5.85	5.63	5.34	5.00	4.63	4.24	3.87				
F4	30	Q	57,100	48,200	40,400	33,500	27,600	22,400	18,000	14,300	11,200	8,490	6,270	4,400
		P	6.88	7.36	7.58	7.57	7.37	7.03	6.59	6.09	5.57	5.08	4.66	4.34
	40	Q	52,100	43,900	36,600	30,300	24,800	20,100	16,100	12,700	9,730	7,300	5,240	
		P	9.48	9.59	9.48	9.17	8.73	8.17	7.56	6.93	6.32	5.78	5.34	
	50	Q	47,000	39,400	32,800	27,000	22,000	17,700	14,100	11,000				
		P	11.9	11.7	11.2	10.6	10.0	9.26	8.49	7.74				
F5	30	Q	104,000	87,600	73,300	60,900	50,100	40,700	32,800	26,000	20,300	15,500	11,400	8,000
		P	12.5	13.3	13.7	13.7	13.4	12.7	11.9	11.0	10.1	9.24	8.47	7.89
	40	Q	94,700	79,700	66,500	55,000	45,100	36,500	29,200	23,000	17,700	13,300	9,520	
		P	17.2	17.4	17.2	16.6	15.8	14.8	13.7	12.6	11.5	10.5	9.71	
	50	Q	85,400	71,600	59,500	49,000	39,900	32,200	25,600	20,000				
		P	21.7	21.2	20.4	19.4	18.1	16.8	15.4	14.0				
F76/1570	30	Q	206,000	174,000	145,000	121,000	98,700	80,100	64,200	50,700	39,200	29,600	21,400	14,500
		P	23.3	24.7	25.2	24.9	24.0	22.6	20.7	18.6	16.4	14.1	11.9	10.0
	40	Q	188,000	158,000	132,000	109,000	88,900	71,800	57,100	44,600	34,000	25,000	17,300	
		P	32.2	32.2	31.4	29.9	28.0	25.7	23.1	20.4	17.7	15.2	12.9	
	50	Q	170,000	142,000	118,000	96,800	78,700	63,100	49,800	38,400				
		P	40.1	38.7	36.7	34.3	31.4	28.4	25.2	22.1				
F76/1800	30	Q	236,000	199,000	167,000	138,000	114,000	92,000	73,700	58,200	45,000	33,900	24,600	16,700
		P	26.8	28.4	28.9	28.6	27.6	25.9	23.8	21.4	18.8	16.2	13.7	11.5
	40	Q	216,000	182,000	152,000	125,000	102,000	82,400	65,500	51,200	39,000	28,700	19,800	
		P	37.0	36.9	36.0	34.4	32.2	29.5	26.6	23.5	20.4	17.4	14.8	
	50	Q	195,000	163,000	136,000	112,000	90,300	72,500	57,200	44,100				
		P	46.0	44.4	42.2	39.3	36.1	32.6	29.0	25.4				
F76/2050	30	Q	269,000	227,000	190,000	157,000	129,000	105,000	83,900	66,200	51,200	38,600	28,000	18,900
		P	30.5	32.3	32.9	32.6	31.4	29.5	27.1	24.3	21.4	18.4	15.6	13.0
	40	Q	245,000	207,000	172,000	142,000	117,000	93,700	74,600	58,300	44,400	32,600	22,600	
		P	42.1	42.0	41.0	39.1	36.6	33.6	30.2	26.7	23.2	19.8	16.8	
	50	Q	221,000	186,000	154,000	127,000	103,000	82,400	65,000	50,200				
		P	52.4	50.6	48.0	44.8	41.1	37.1	33.0	28.9				
F76/2425	30	Q	321,000	271,000	227,000	188,000	154,000	125,000	101,000	79,100	61,200	46,100	33,400	22,600
		P	36.4	38.6	39.3	38.9	37.5	35.2	32.4	29.1	25.6	22.0	18.6	15.6
	40	Q	293,000	247,000	206,000	170,000	139,000	112,000	89,100	69,600	53,000	39,000	26,900	
		P	50.3	50.2	49.0	46.7	43.7	40.1	36.1	31.9	27.7	23.7	20.1	
	50	Q	264,000	222,000	184,000	151,000	123,000	98,500	77,700	60,000				
		P	62.6	60.4	57.3	53.5	49.1	44.3	39.4	34.5				
F88/2735	30	Q	361,000	305,000	255,000	212,000	174,000	141,000	113,000	89,000	68,900	51,900	37,600	25,500
		P	41.2	43.6	44.5	44.0	42.4	39.9	36.6	32.9	28.9	24.9	21.1	17.7
	40	Q	330,000	278,000	232,000	191,000	156,000	126,000	101,000	78,300	59,700	43,900	30,300	
		P	57.0	56.8	55.4	52.9	49.5	45.4	40.9	36.1	31.4	26.8	22.7	
	50	Q	298,000	249,000	207,000	170,000	139,000	111,000	87,400	67,500				
		P	70.8	68.4	64.9	60.5	55.5	50.2	44.6	39.0				
F88/3235	30	Q	431,000	364,000	305,000	253,000	207,000	169,000	135,000	107,000	82,200	62,000	44,900	30,400
		P	49.2	52.1	53.2	52.6	50.7	47.6	43.8	39.3	34.6	29.8	25.2	21.1
	40	Q	394,000	331,000	277,000	229,000	187,000	151,000	120,000	93,500	71,300	52,400	36,200	
		P	68.0	67.9	66.2	63.2	59.1	54.2	48.8	43.2	37.5	32.1	27.2	
	50	Q	355,000	298,000	247,000	204,000	166,000	133,000	105,000	80,600				
		P	84.6	81.7	77.5	72.3	66.4	59.9	53.3	46.7				

Relating to 20 °C suction gas temperature without liquid subcooling

Supplementary cooling or reduced suction gas temp.

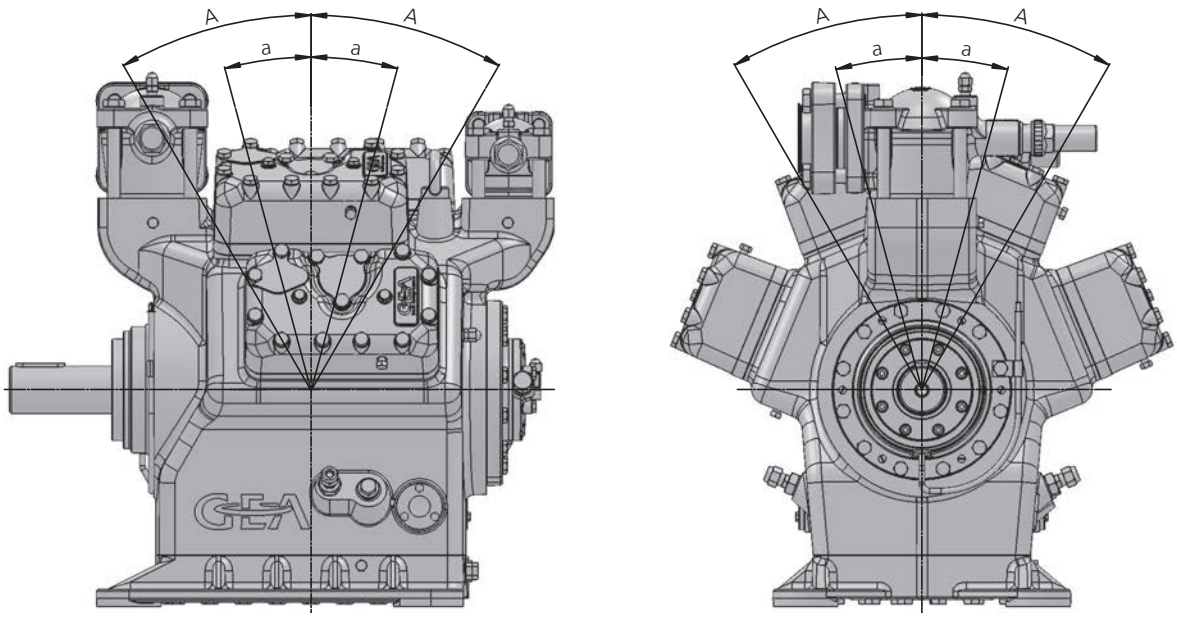
TECHNICAL DATA

F

Type	Number of cylinders	Displacement 50 / 60 Hz (1,450 rpm / 1,740 rpm)	Weight[2]	Connections[1]		Oil charge	Speed range
				Discharge line DV	Suction line SV		
		m³/h	kg	mm | inch	mm | inch	Ltr.	rpm
F2	2	10.5 / 12.6	18.0	16 I 5/8	16 I 5/8	0.8	960 – 1,800
F3	2	20.3 / 24.3	28.0	22 I 7/8	28 I 1 1/8	1.5	960 – 1,800
F4	4	40.5 / 48.6	51.0	28 I 1 1/8	35 I 1 3/8	2.6	500 – 1,800
F5	4	73.7 / 88.4	85.0	35 I 1 3/8	2 × 35 I 2 × 1 3/8	3.8	500 – 1,800
F76/1570	6	136.2 / 163.9	220.0	42 I 1 5/8	54 I 2 1/8	5.3	500 – 1,800
F76/1800	6	156.8 / 188.2	217.0	42 I 1 5/8	54 I 2 1/8	5.3	500 – 1,800
F76/2050	6	178.4 / 214.1	213.0	42 I 1 5/8	54 I 2 1/8	5.3	500 – 1,800
F76/2425	6	211.0 / 253.2	209.0	42 I 1 5/8	54 I 2 1/8	5.3	500 – 1,800
F88/2735	8	237.9 / 285.5	312.0	54 I 2 1/8	76 I 3 1/8	8.6	500 – 1,800
F88/3235	8	281.4 / 337.7	306.0	54 I 2 1/8	76 I 3 1/8	8.6	500 – 1,800

[1] for soldering connections [2] version with accessoires

Maximum permissible inclination



A: max. 30°, max. 2 minutes
a: max. 15°, continuous operation

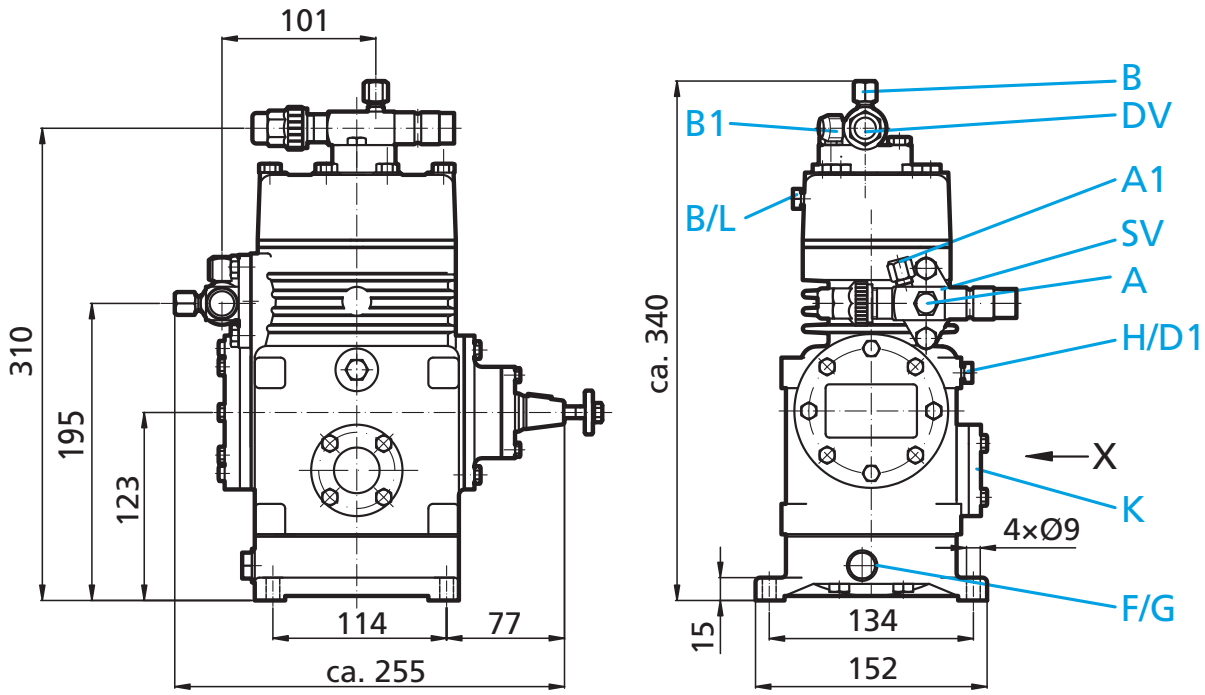
F

Type	Oil sump heater	Compressor flywheel	Shaft coupling
	Watt	Ø	WK
F2	40	165 × SPA	42.22
F3	60	210 × SPA	42.22
F4	80	210 × SPA	70.40
F5	80	230 × SPA	70.40
F76/1570	140	407 × SPB[3] + 322 × SPB	80–225
F76/1800			
F76/2050		322 × SPB	
F76/2425			
F88/2735 **F88/3235**	200	407.9 × SPB	80–225

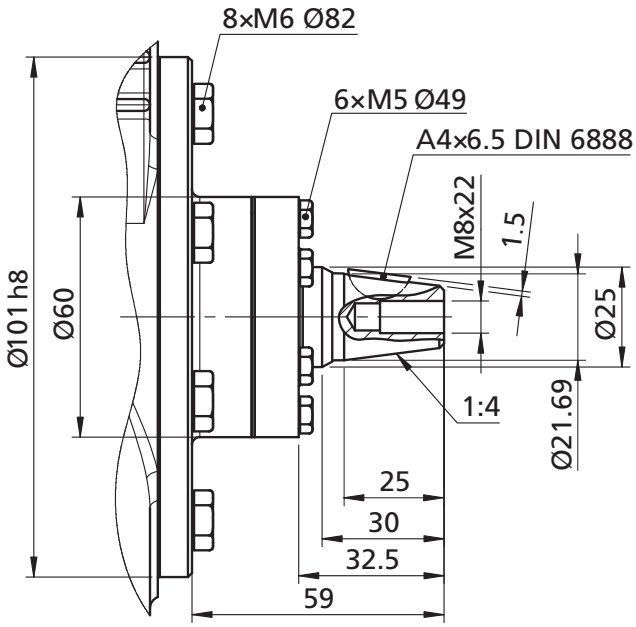
[3] only valid for F76/1570

DIMENSIONS AND CONNECTIONS

F2



Shaft end

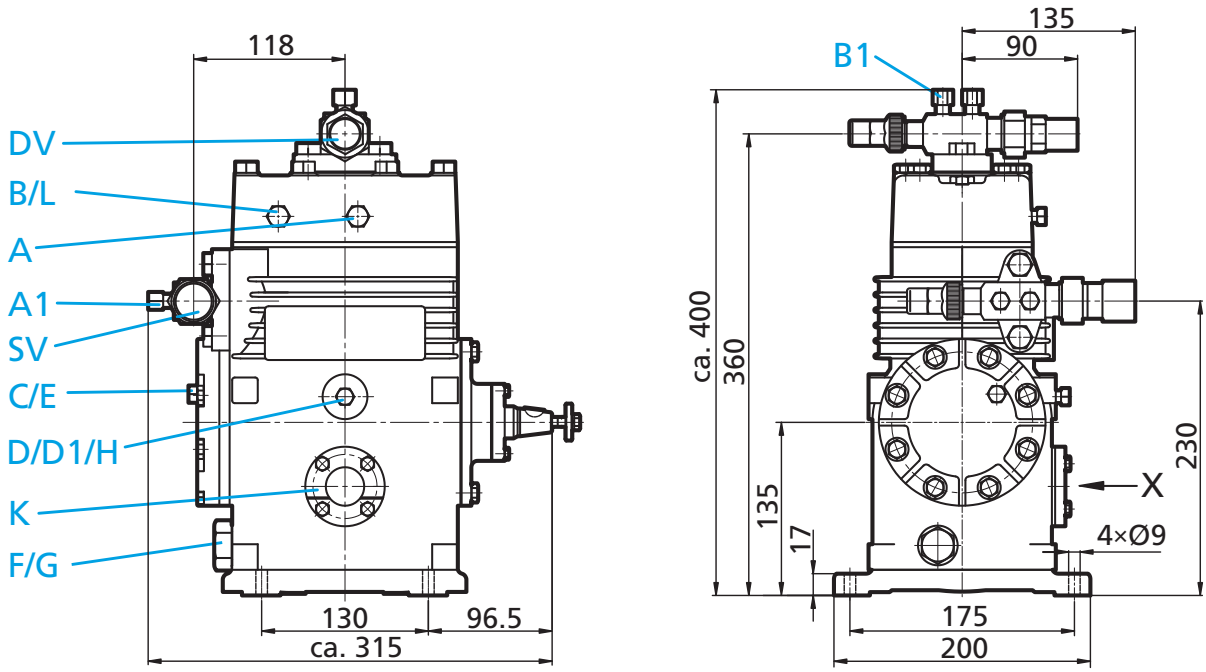


Dimensions in mm
Centre of gravity

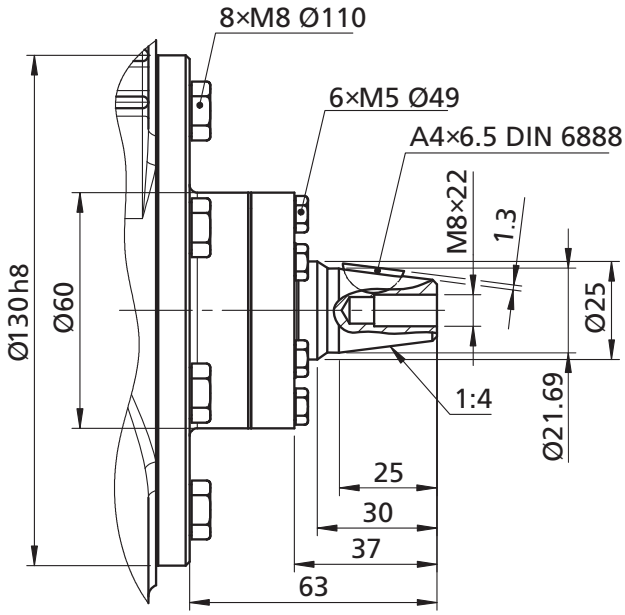
Connections see page 33
Dimensions for view X see page 32

DIMENSIONS AND CONNECTIONS

F3



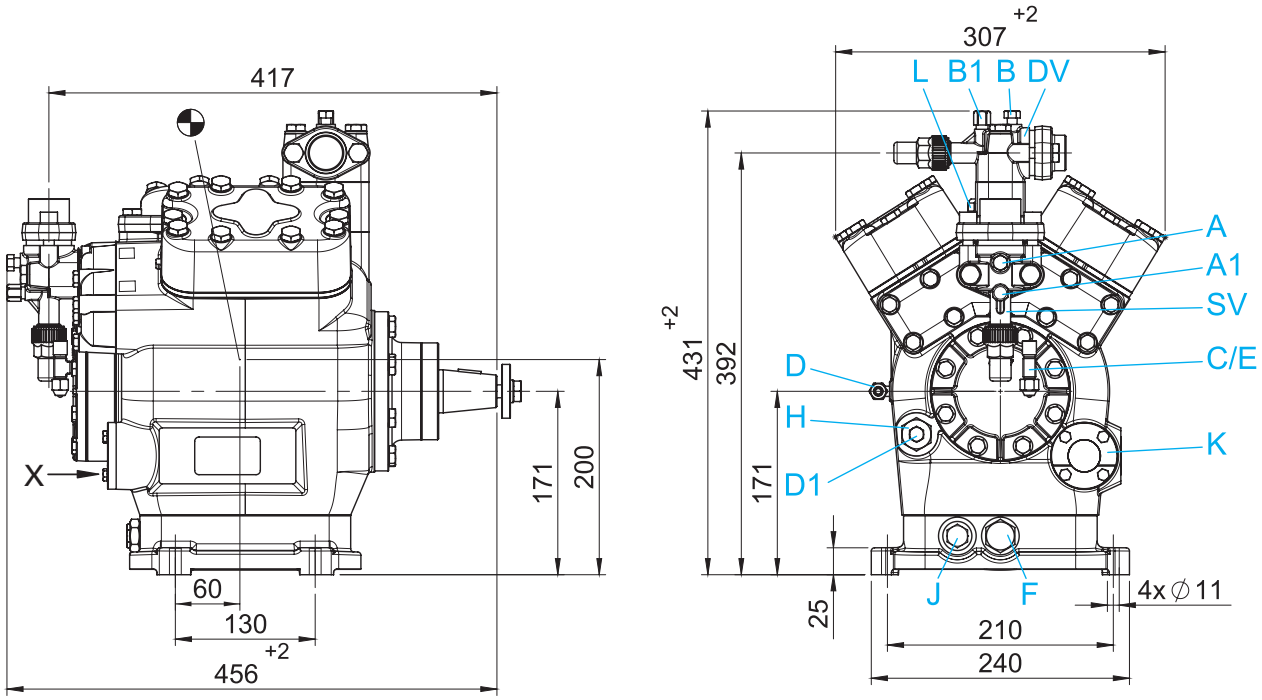
Shaft end



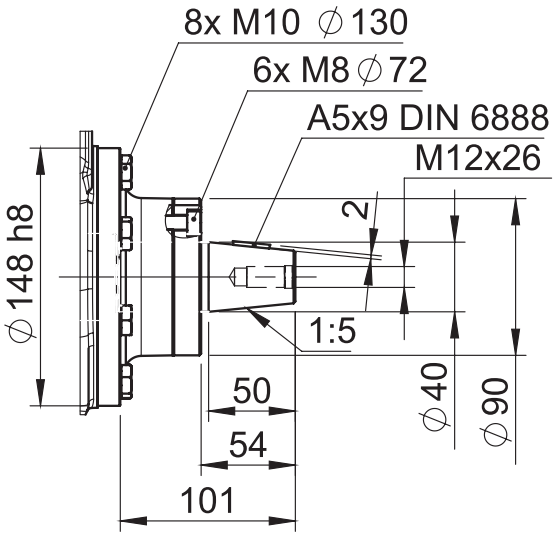
Dimensions in mm
◔ Centre of gravity

Connections see page 33
Dimensions for view X see page 32

F4



Shaft end

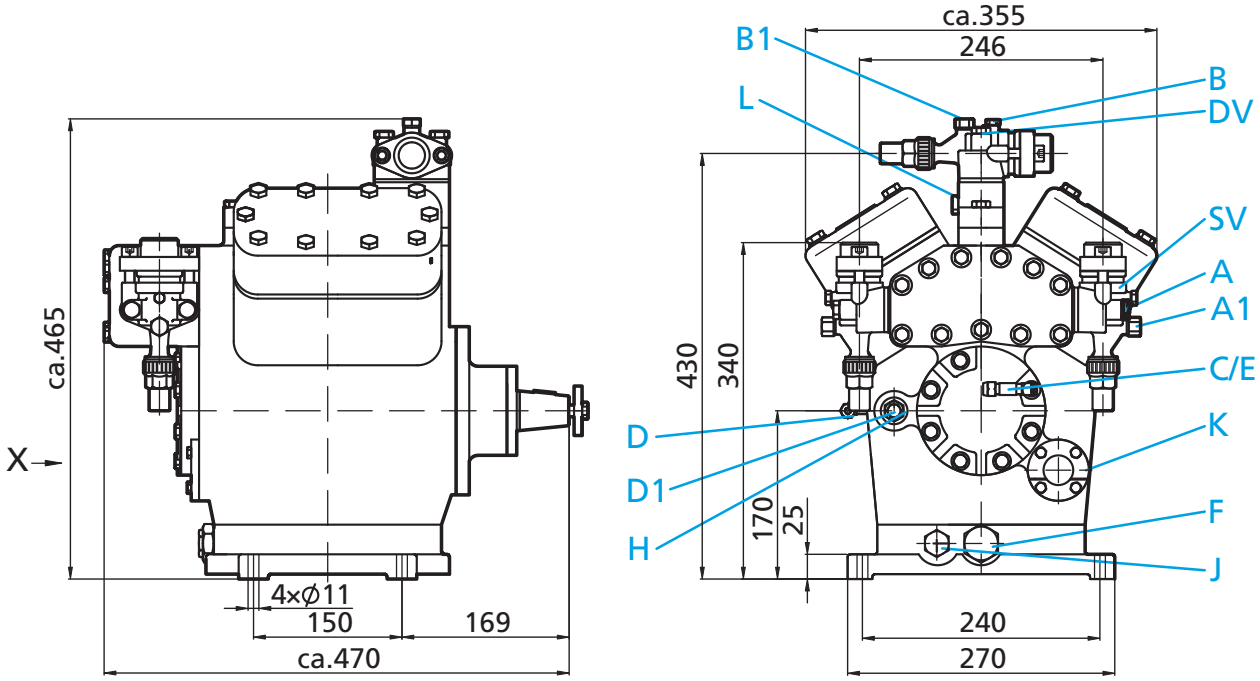


Dimensions in mm
Centre of gravity

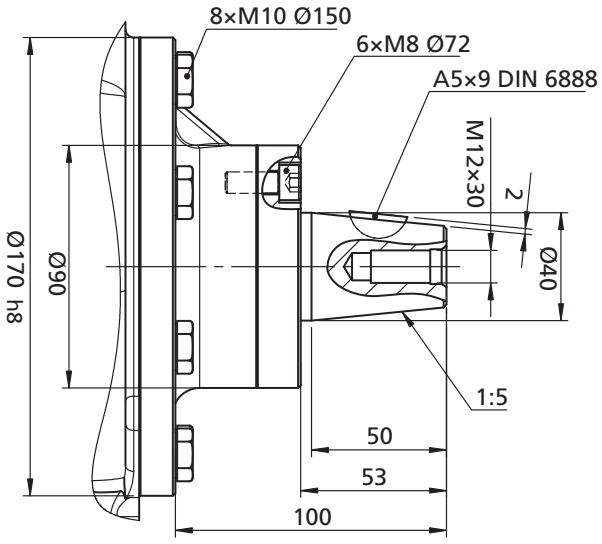
Connections see page 33
Dimensions for view X see page 32

DIMENSIONS AND CONNECTIONS

F5



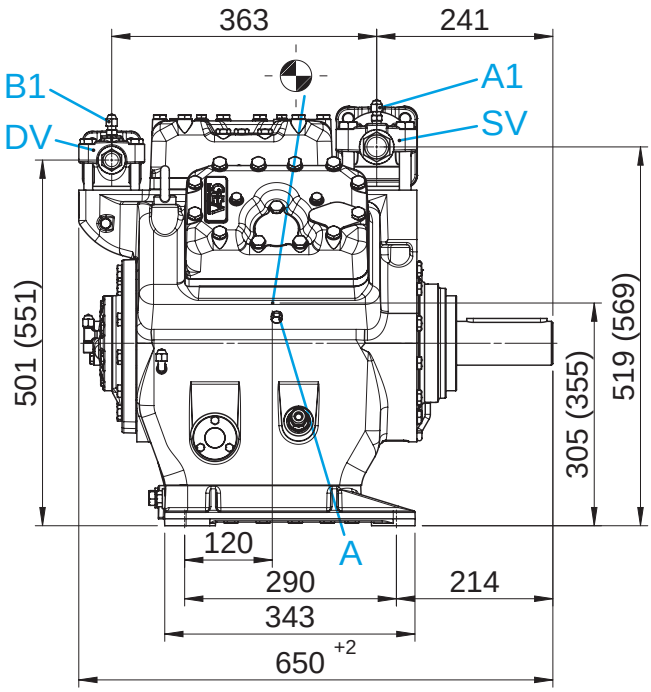
Shaft end

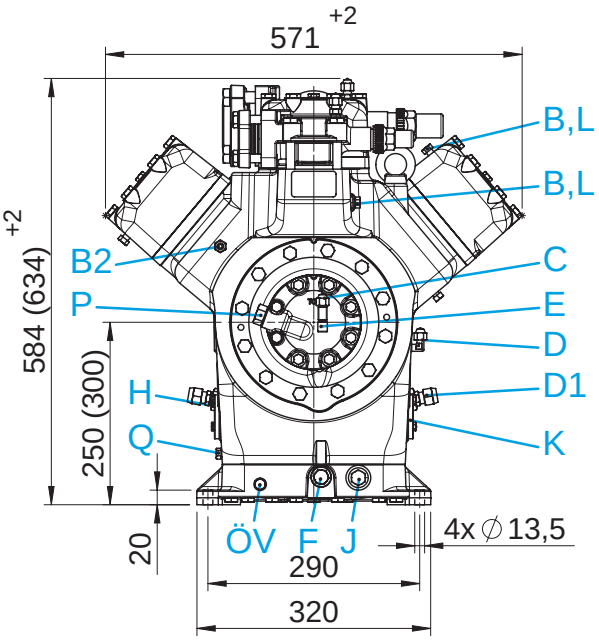


Dimensions in mm
Centre of gravity

Connections see page 33
Dimensions for view X see page 32

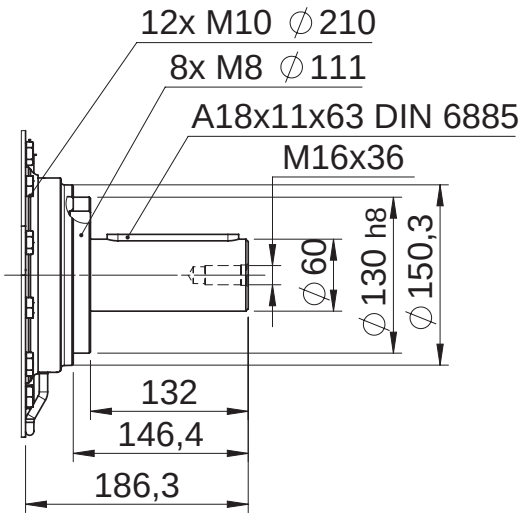
F76





( ) Dimensions with elevated base plate

Shaft end

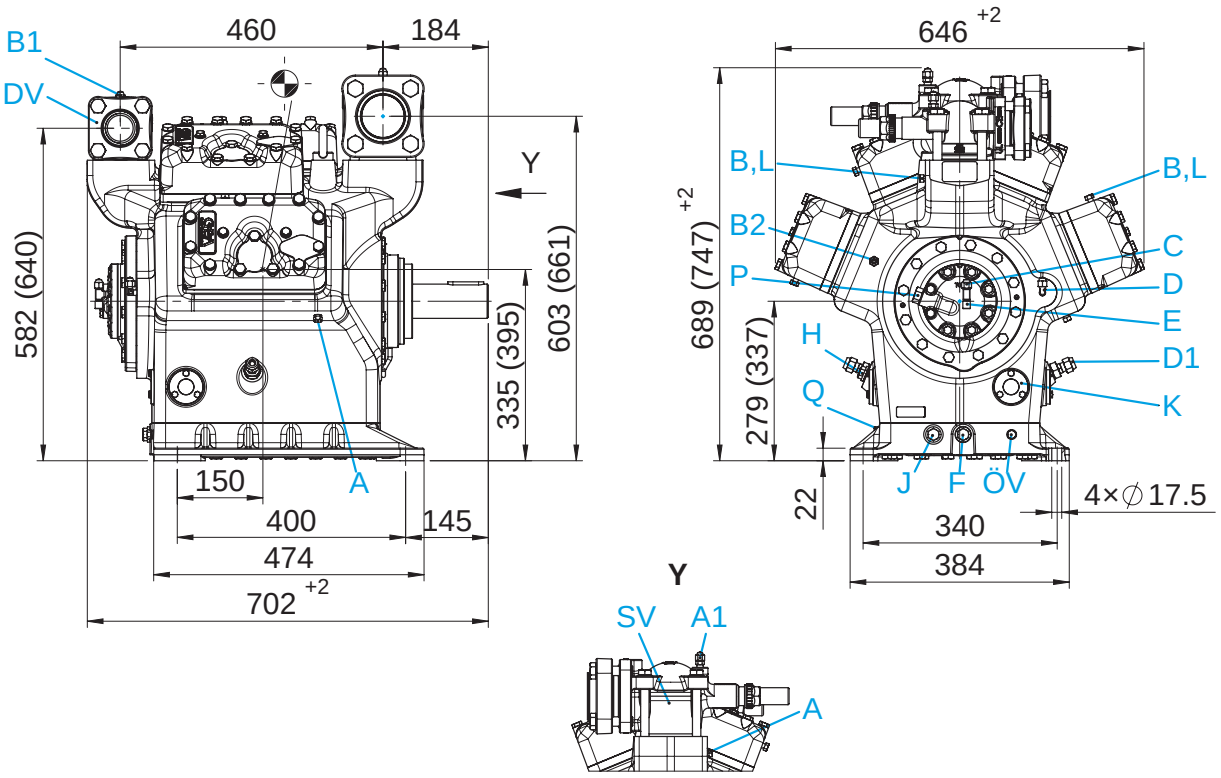


Dimensions in mm
Centre of gravity

Connections see page 33
Dimensions for view X see page 32

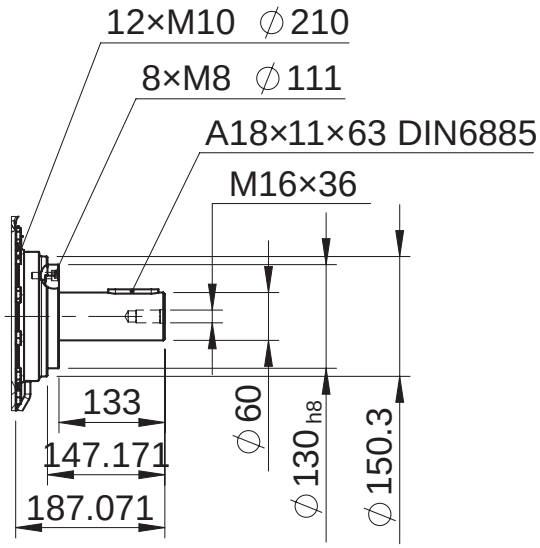
DIMENSIONS AND CONNECTIONS

F88



( ) Dimensions with elevated base plate

Shaft end

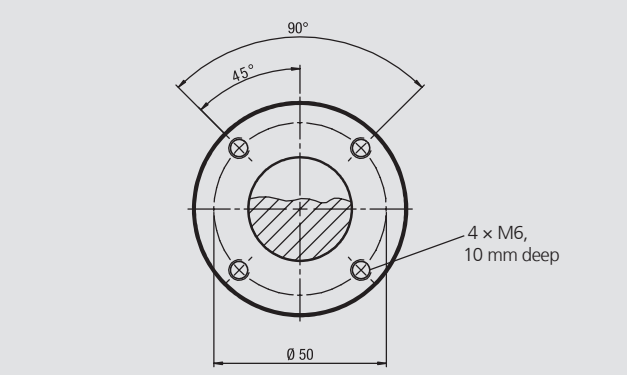


Dimensions in mm
Centre of gravity

Connections see page 33
Dimensions for view X see page 32

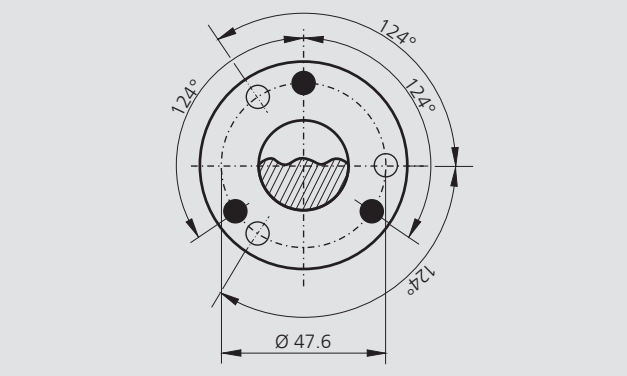
DIMENSIONS AND CONNECTIONS

View X



- Oil sight glass
- Connection facility for parallel operation

Position view X:
F2, F3, F4, F5
Four-hole oil sight glass



Position view X:
F76, F88
Possibility to connect to oil level regulator

● Three-hole connection for oil level regulator of brand ESK, AC+R, Carly (3 × M6, 10 deep)
○ Three-hole connection for oil level regulator of brand TraxOil (3 × M6, 10 deep)

Dimensions in mm

Connections		F2	F3	F4	F5	F76	F88
SV	Suction line	Please refer to technical data, page 24					
DV	Discharge line						
A	Connection suction side, not lockable	7/16" UNF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF
A1	Connection suction side, lockable	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF
B	Connection discharge side, not lockable	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF
B1	Connection discharge side, lockable	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF
B2	Connection discharge side, not lockable	–	–	–	–	7/16" UNF	7/16" UNF
C	Connection oil pressure safety switch HP	–	1/8" NPTF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF
D	Connection oil pressure safety switch LP	–	1/8" NPTF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF
D1	Connection oil return from oil separator	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	5/8" UNF	5/8" UNF
E	Connection oil pressure gauge	–	–	–	–	7/16" UNF	7/16" UNF
F	Oil drain plug	R 3/8"	M22 × 1.5	M22 × 1.5	M22 × 1.5	M22 × 1.5	M22 × 1.5
G	Oil sump heater plug	R 3/8"	M22 x 1.5	–	–	–	–
H	Oil charge plug	1/8" NPTF	1/8" NPTF	M22 × 1.5	M22 × 1.5	M22 × 1.5	M22 × 1.5
J	Connection oil sump heater	–	–	M22 × 1.5	M22 × 1.5	M22 × 1.5	M22 × 1.5
K	Sight glass	4 hole M 6	4 hole M 6	4 hole M 6	4 hole M 6	3 hole M 6	3 hole M 6
L	Connection thermal protection thermostat	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF
ÖV	Connection oil service valve	–	–	–	–	1/8" NPTF	1/4" NPTF
P	Connection oil pressure differential sensor	–	–	–	–	M20 × 1.5	M20 × 1.5
Q	Connection oil temperature sensor	–	–	–	–	1/8" NPTF	1/8" NPTF

SCOPE OF SUPPLY & ACCESSORIES

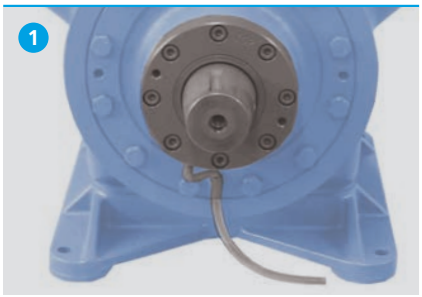
	Scope of supply & accessories		F2	F3	F4	F5	F76	F88
	Open Type reciprocating compressor with suction and discharge shut-off valves		●	●	●	●	–	–
	Two-cylinder, cylinder arrangement in row		●	●	–	–	–	–
	Four-cylinder, cylinder arrangement in V		–	–	●	●	–	–
	Six-cylinder, cylinder arrangement in W		–	–	–	–	●	–
	Eight-cylinder, cylinder arrangement in VV		–	–	–	–	–	●
1	Shaft seal with piece of tube for controlled oil collection		–	–	–	–	●	●
2	Thermal protection thermostat (PTC)		–	–	–	–	○ 2)	○ 2)
3	Thermal protection thermostat (bimetal-sensor)		○	○	○	○	○	○
	Oil pump		●	●	●	●	●	●
	Oil pump cover with screw-in option for oil pressure differential sensor (Δp-switch by Kriwan)		–	–	–	–	○	○
	Oil charge: F: FUCHS Reniso SP46; FX: FUCHS Reniso Triton SE55		●	●	●	●	●	●
	Internal Safety valve		–	–	●	●	●	●
	Inert gas charge		●	●	●	●	●	●
	Sight glasses	One	●	●	●	●	–	–
		Two	–	–	–	–	●	–
		Three	–	–	–	–	–	●
4	Oil sump heater 220-240 V - 1 - 50/60 Hz		○ 2)	○ 2)	○ 2)	○ 2)	○ 2)	○ 2)
5	Oil differential pressure sensor (Δp-switch by Kriwan) 220-240 V - 1 - 50/60 Hz		–	–	–	–	○ 1)	○ 1)
6	Oil pressure safety switch MP 54 230 V - 1 - 50/60 Hz, IP20		–	○ 1)	○ 1)	○ 1)	○ 1)	○ 1)
7	Oil service valve		–	–	–	–	○ 2)	○ 2)
8	Capacity regulator	1 capacity regulator = 50 % residual capacity	–	–	○ 2)	○ 2)	–	–
		1–2 capacity regulators = 66/33 % residual capacity	–	–	–	–	○ 2)	–
		1–3 capacity regulators = 75/50/25 % residual capacity	–	–	–	–	–	○ 2)
	Oil temperature sensor (Pt1000)		–	–	–	–	○ 2)	○ 2)
	Electronic motor protection unit INT69G for installation in switch cabinet		–	–	–	–	○ 1)	○ 1)
	Start unloader 230 V - 1 - 50/60 Hz, IP65, without check valve, including thermal protection thermostat (bimetal sensor)		–	○ 2)	○ 2)	○ 2)	–	–
	Connection possibility for oil level regulators make ESK, AC+R or Carly		● 4)	● 4)	● 4)	● 4)	●	●
	Connection possibility for oil level regulators make TraxOil		–	–	–	–	●	●
9	Compressor flywheel (see page 24)		○ 1)	○ 1)	○ 1)	○ 1)	○ 1)	○ 1)
10	Shaft coupling for direct drive		○ 1), 3)	○ 1), 3)	○ 1), 3)	○ 1), 3)	○ 1), 3)	○ 1), 3)
11	Step protection		–	–	–	–	○ 1)	○ 1)
	Coupling bell for motor adjustment. For B5/B35 IEC motors, flange centering diameter ø 450		–	–	–	–	○ 1)	○ 1)
12	Elevated base plate (F76: 2.7 l, F88: 4.6 l additional oil volume)		–	–	–	–	○ 2)	○ 2)
13	Additional fan		–	○ 1)	○ 1)	○ 1)	○ 1)	○ 1)

● Scope of Supply (standard)
○ Accessories
– Not available

1) Enclosure
2) Mounted
3) Please state motor Ø and features key groove dimensions when ordering shaft coupling
4) Only possible with additional adapter

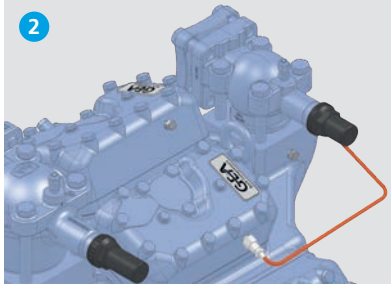
Shaft seal with piece of tube

1



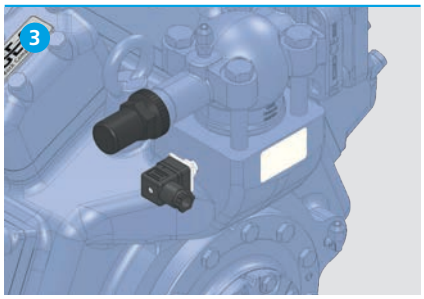
Thermal protection thermostat (PTC)

2



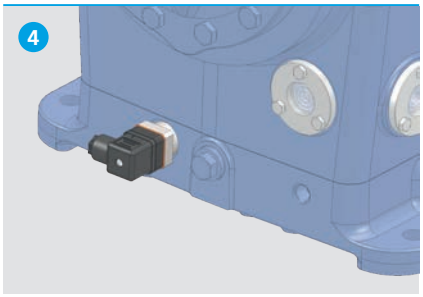
Thermal protection thermostat (bimetal-sensor)

3



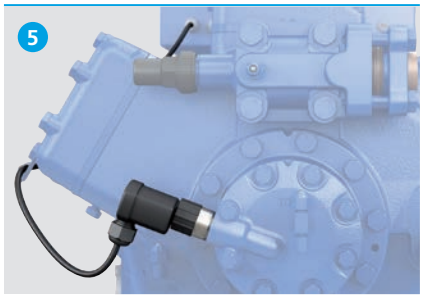
Oil sump heater

4



Oil pressure differential sensor

5

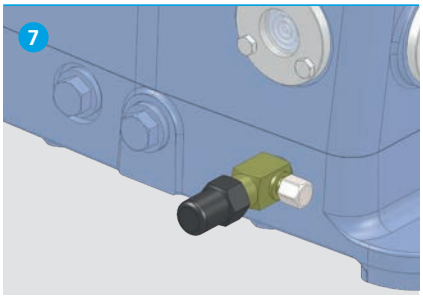


Oil pressure safety switch

6

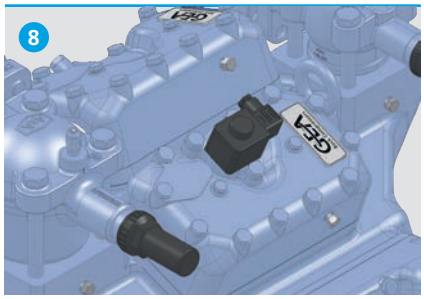
Oil service valve

7



Capacity regulator

8



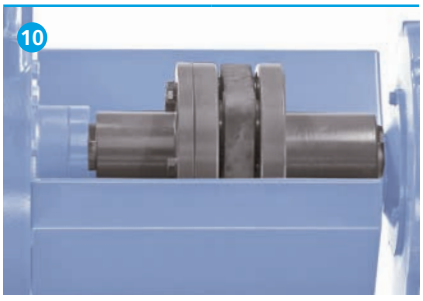
Compressor flywheel

9

see page 24

Shaft coupling

10

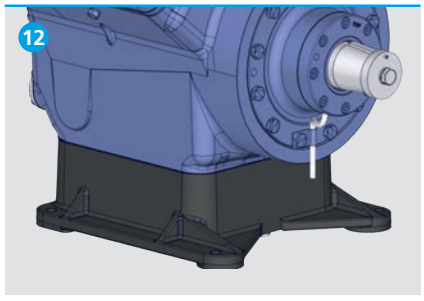


Step protection

11

Elevated base plate

12



Additional fan

13

GEA Bock compressor unit for directive drive

GEA Bock FDK3 – FDK88, SFD88

FDK COMPRESSOR UNITS

Based on the F compressor series with its many designs and application options, a selection of compressor units with compact construction is available for use with direct drive. Compressor with flexible shaft coupling for direct drive mounted on a profile base frame: The power transmission from motor to compressor occurs via an elastic flexible shaft coupling, ICE standard motors of type IM B3 are used as drive motors (option).

The special features

Designed for optimum running comfort
- Simple and robust construction
- Use of standard motors
- Optimum power transmission via direct coupling

Service-friendly
- Flexible shaft coupling can be separated in its installed state, which enables maintenance work to be carried out on the compressor and motor, without having to dismantle them from the base frame.

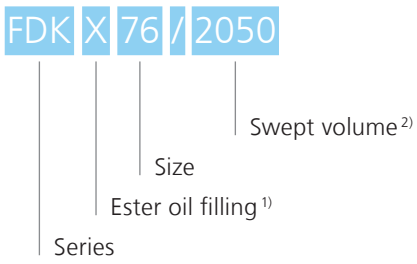
SFD COMPRESSOR UNITS

Compressor with flexible shaft coupling for direct drive mounted on a profile base frame: Power transmission from motor to compressor occurs via an elastic flexible shaft coupling. The automatic self-aligning of motor and compressor is achieved using coupling bell. ICE standard motors of type IM B5 are used as drive motors (option).

The special features

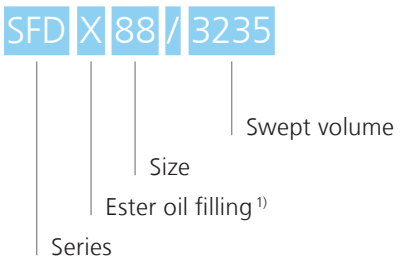
Designed for optimum running comfort
- Simple and robust construction
- Use of standard motors
- Optimum power transmission via direct coupling
- Optimum alignment of motor and compressor via coupling bell

TYPE KEY



1) X = Ester oil filling (HFC refrigerant, e.g. R134a, R407C)

2) Indication only at FDK76 + FDK88

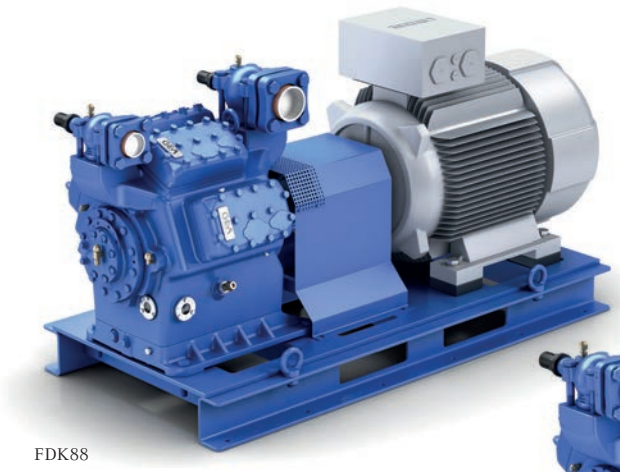


1) X = Ester oil filling (HFC refrigerant, e.g. R134a, R407C)

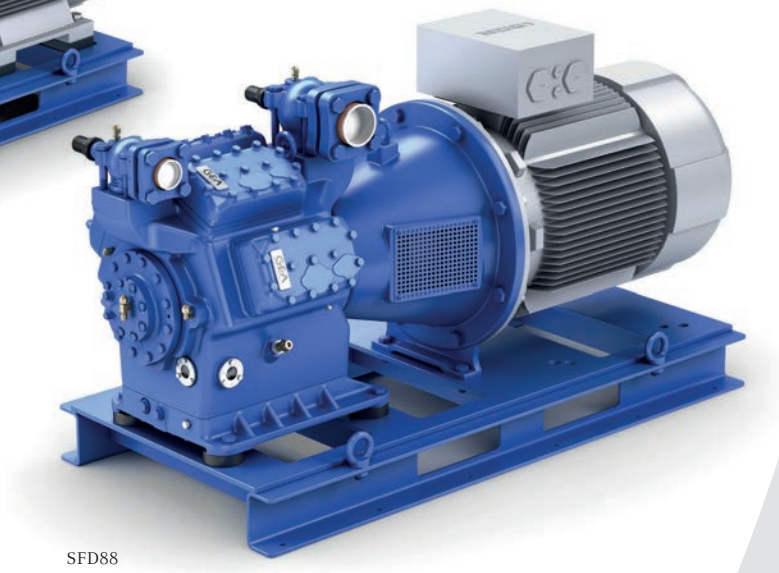
THE CURRENT PROGRAM

5 model sizes with 9 capacity stages from 24.3 to 337.7 m³/h

Models available	Displacement 1,450 rpm	Displacement 1,740 rpm
FDK 3	20.3	24.3
FDK 4	40.5	48.6
FDK 5	73.7	88.4
FDK 76	136.2 / 156.8 / 178.4 / 211.0	163.9 / 188.2 / 214.1 / 253.2
FDK 88	237.9 / 281.4	285.5 / 337.7
SFD 88	237.9 / 281.4	285.5 / 337.7



FDK88

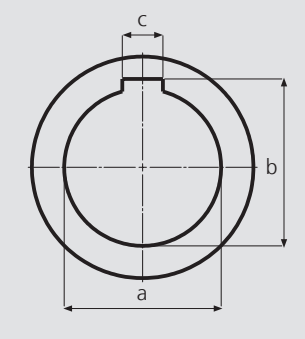


SFD88

SCOPE OF SUPPLY & ACCESSORIES

Scope of supply FDK

- Open type F compressors for direct drive
- Mounted on a profile base frame
- With shaft coupling and coupling protection
- Hub on the motor side of the shaft coupling manufactured according to customer specifications
- Required dimensions, see fig. (otherwise only one pilot hole)
- Without drive motor
- 4 rubber sheets as an extra item



You will find further information on the scope of supply for the individual basic compressors in the chapter entitled "Open type compressors GA Bock F Series" from page 34 onwards.

Scope of supply SFD

- Open type F compressors for direct drive
- Mounted on a profile base frame
- With shaft coupling and coupling bell
- Without drive motor
- 4 rubber sheets as an extra item

You will find further information on the scope of supply for the individual basic ompressors in the chapter entitled "Open type compressors GA Bock F Series" from page 34 onwards.

Accessories

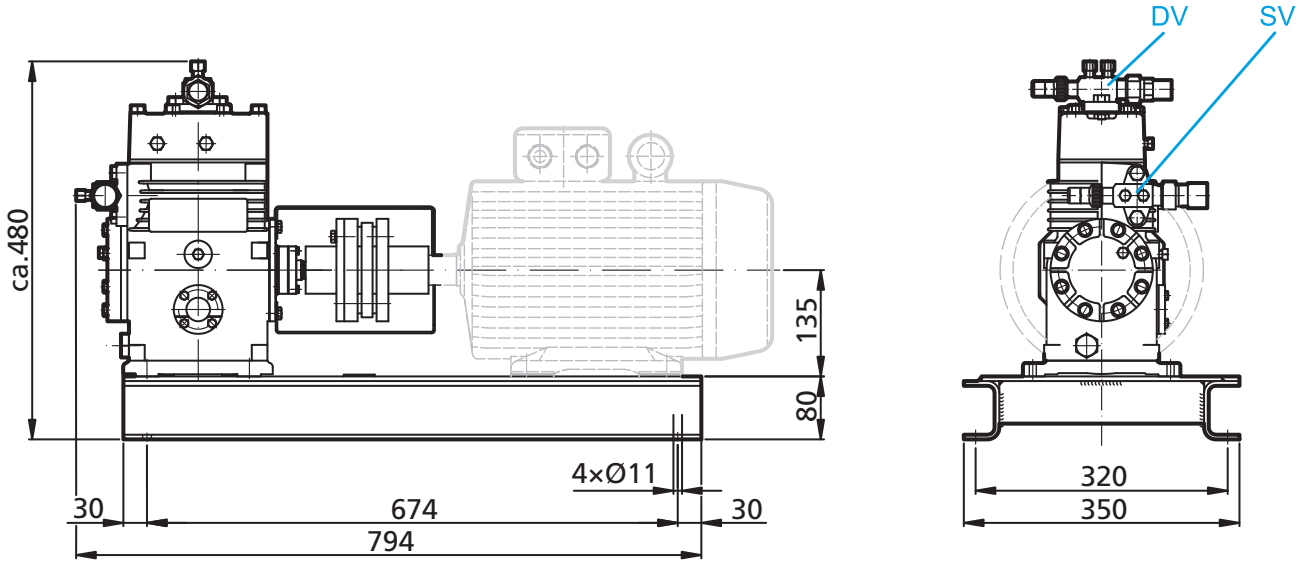
- Drive motors 4 to 90 KW, mounted and aligned, IP55
  FDK3 to FDK88: design IMB3
  SFD88: design IMB5
- Instrument panel can be equipped with:
  HP-, LP switch and pressure gauge, oil pressure gauge, oil differential pressure switch*
- Elevated base plate not possible

You will find the accessories for the various compressors in the chapter entitled "Open type compressors GA Bock F Series" from page 34 onwards.

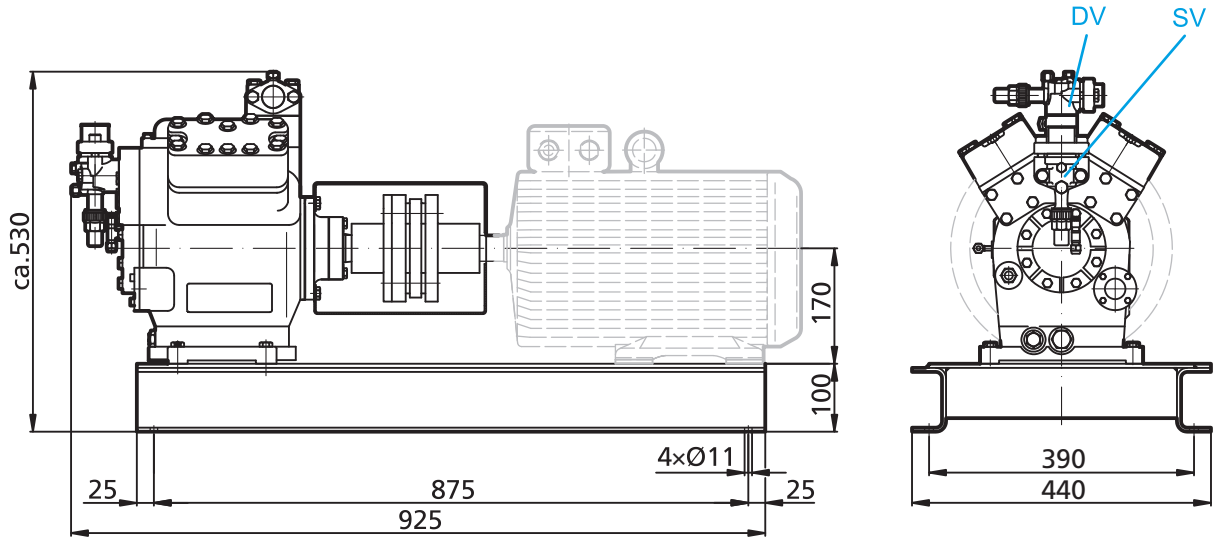
*FDK76 only oil differential pressure sensor

DIMENSIONS AND CONNECTIONS

FDK3



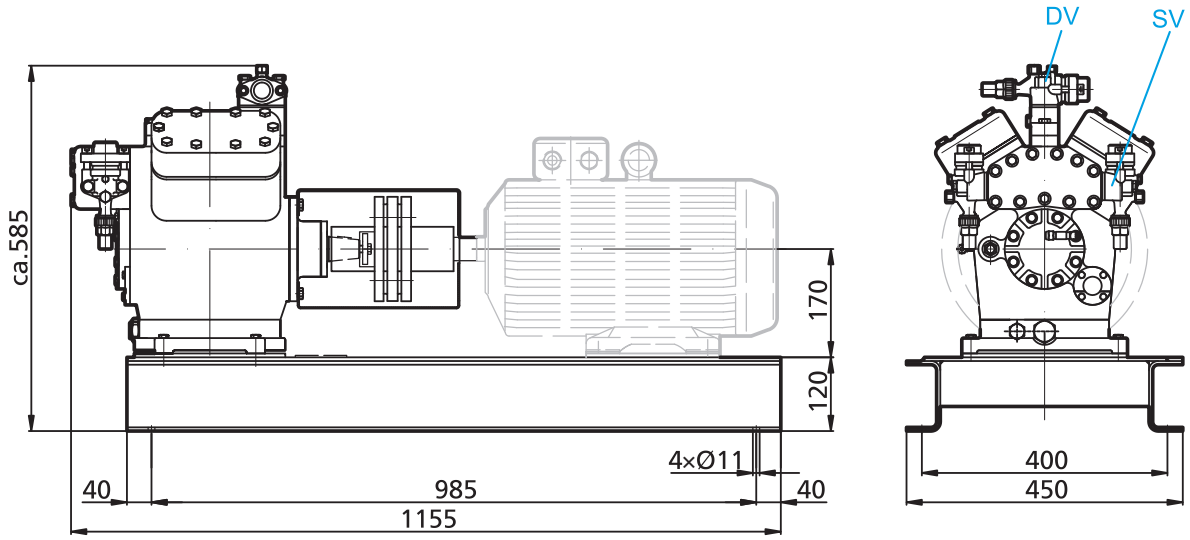
FDK4



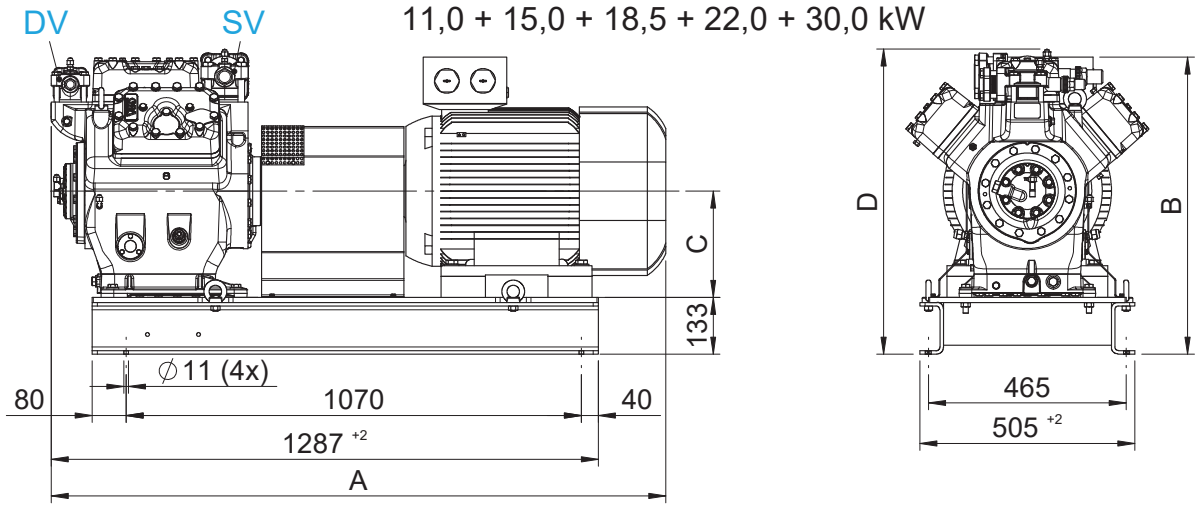
Dimensions in mm
Motor accessories

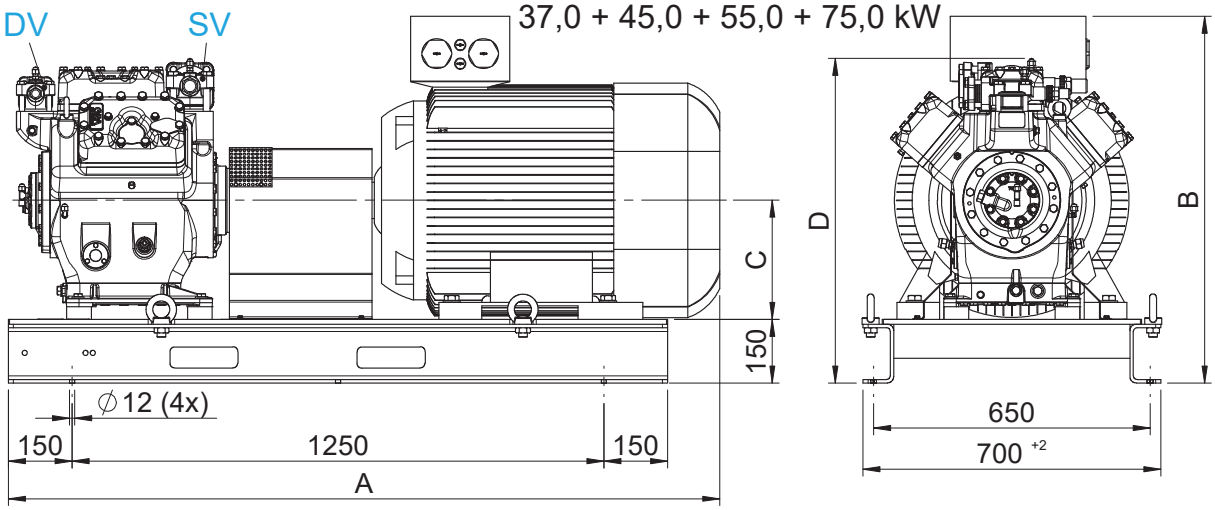
DIMENSIONS AND CONNECTIONS

FDK5



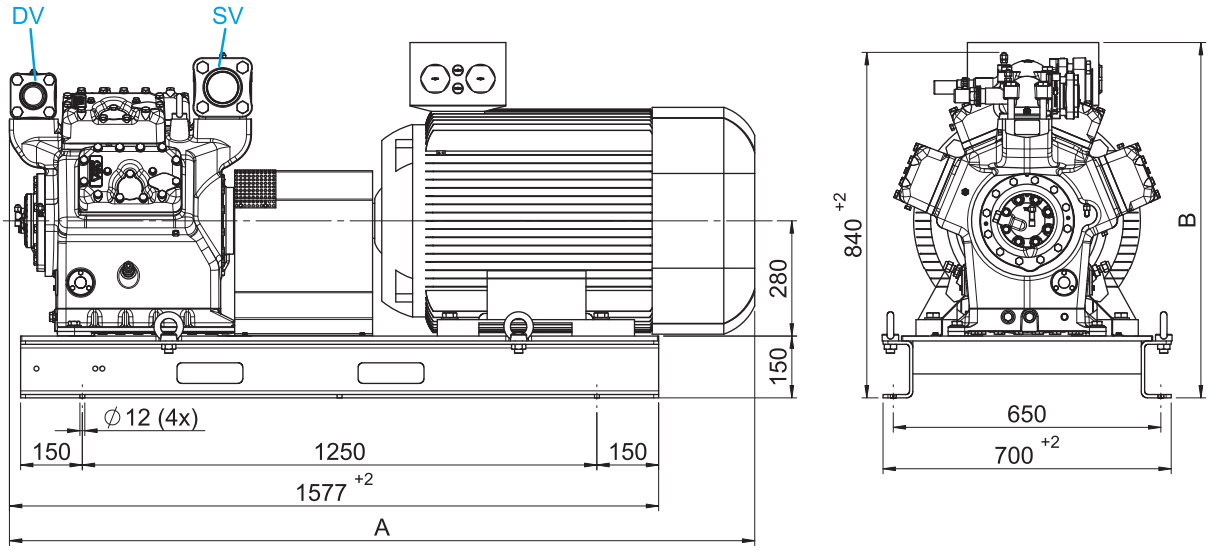
FDK76



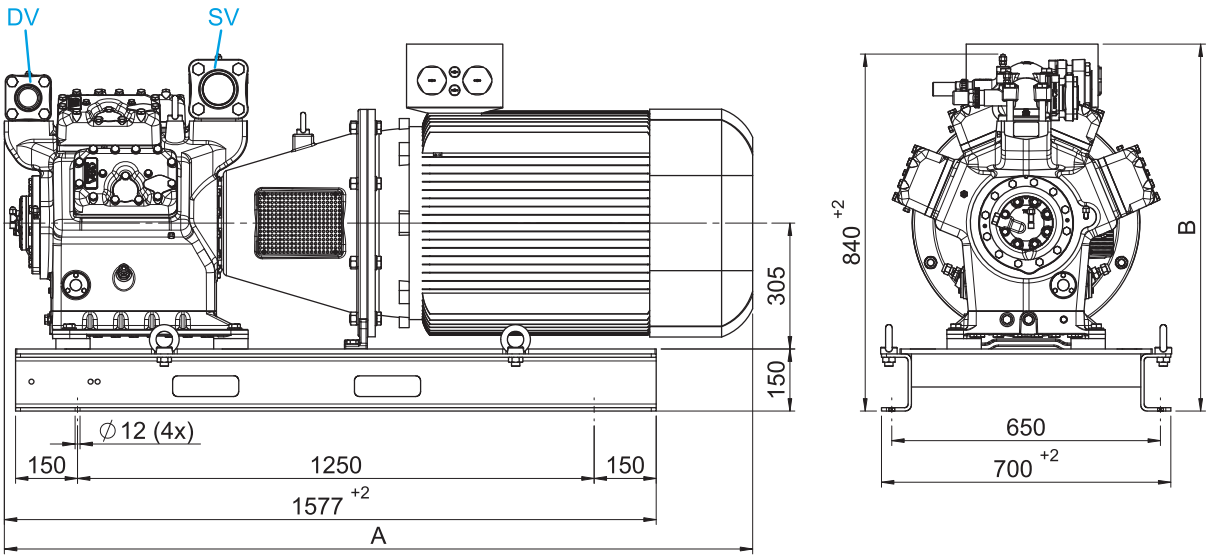


Dimensions in mm
Motor accessories

FDK88 **FDK88/2735** **FDK88/3235**



SFD88 **SFD88/2735** **SFD88/3235**



Dimensions in mm
Motor accessories


Übungs-
verdichter
10
Übungs-
verdichter
29

GEA Bock Training – Because you never stop learning

GEA Bock training and workshops for commercial compressors

For many years, GEA has intensified its commitment in the area of customer training.
We offer a comprehensive array of attractive training events, from two-day practitioners' workshops in Frickenhausen to after-work workshops throughout Germany, regardless of the type of training you are interested in.

GEA Bock trainings are characterized by various special features, e.g.:

- The captivating way the training director Frank Alisch carries out the events
- The strong practice orientation of the training events

Overview of training events offered:

- GEA Bock Practitioners' Workshop
- Training tailored to your individual needs
- Training for your entire staff
- Training on your premises

For additional questions or advice, please contact our training director:

Frank Alisch
Telephone: +49 7022 9454-158
Fax: +49 7022 9454-137
E-Mail: frank.alisch@gea.com

GEA Bock compressors online

VAP Stationary Applications

VAP Mobile Applications

VAP Compressor selection program

The GEA Bock compressor selection software supports you in searching the suitable compressor or condensing unit for your application. On the basis of the entered refrigerating capacity and operating conditions (refrigerant, evaporation and condensing temperature) suitable compressors will be found. Furthermore, the software provides additional information on the chosen compressor:

- Operating limits
- Technical data
- Performance data
- Scope of supply and accessories
- Dimensions and connections
- Product image
- Spare part list, drawings, 3D model etc.

The compressor selection program is available as a web-based online version as an well as offline version for installation on the computer.

- Find suitable compressors quickly
- Software update on a daily basis
- For stationary and mobile applications
- All compressors in one version

Here is the direct way to the online version:

- GEA Bock HG compressors
- GEA Bock F compressors
- GEA Bock FK compressors

- GEA Bock CO_2 T(ool) for CO_2 Booster System calculation on request

Further information can be found online at **gea.com/vap**

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Get connected on LinkedIn.
www.linkedin.com/groups/GEA-Food-4225307

Facebook
Please contact us and stay updated with all the latest news in the transportation industry.
www.facebook.com/GEAgroup

YouTube
You can find product videos and animations from GEA on YouTube.
www.youtube.com/user/theGEAgroup

Twitter
Follow us on Twitter and be always up to date.
www.twitter.com/GEA_Events

Notes

engineering for
a better world

We live our values.

Excellence • Passion • Integrity • Responsibility • GEA-versity

GEA is one of the largest technology suppliers for food processing and a wide range of other industries. The global group specializes in machinery, plants, as well as process technology and components. GEA provides sustainable solutions for sophisticated production processes in diverse end-user markets and offers a comprehensive service portfolio.

The company is listed on the German MDAX (G1A. WKN 660 200), the STOXX® Europe 600 Index and selected MSCI Global Sustainability Indexes.

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