

HG compressors - HG34 e-series

Semi-hermetic compressors
in efficiency-optimised version



HG34e - At a glance

e-series

Based on our current semi-hermetic product range, with its outstanding advantages and features Bock present you the e-series. Those compressors are efficiency optimised models for all standard refrigerants. The models HG34e are available in October 2010.

Additionally, all compressors of the HG-series will be available as e-series in the course of 2011.

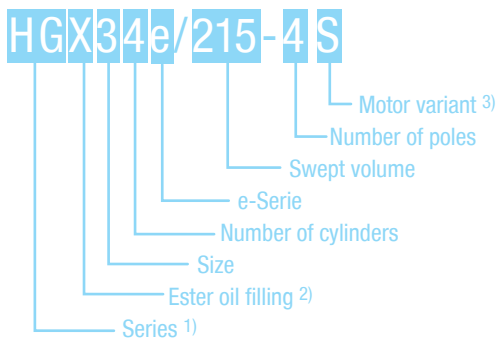
Special Features

With technical optimisations we improve the energy consumption of our compressors continuously. The compressors of the e-series set a new standard when it comes to motor-efficiency, gas flow and efficiency of the valve system. All this results in a higher capacity of the compressor.

Available models	Displacement 50 Hz (1.450 rpm)
HG34e/215-4 HG34e/215-4 S	18,8 m ³ /h
HG34e/255-4 HG34e/255-4 S	22,1 m ³ /h
HG34e/315-4 HG34e/315-4 S	27,3 m ³ /h
HG34e/380-4 HG34e/380-4 S	33,1 m ³ /h



Type key

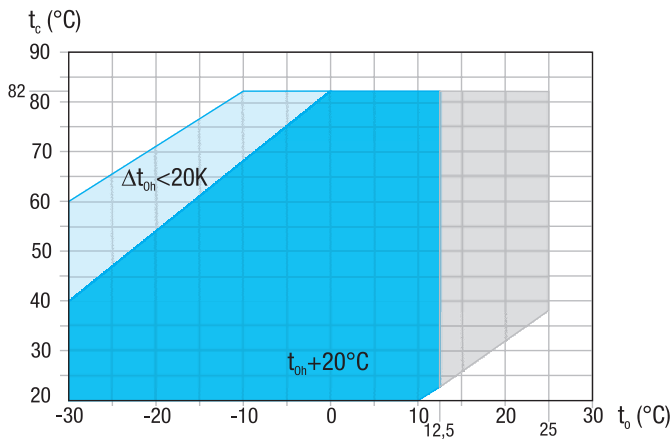


¹⁾ HG = Hermetic Gas-cooled (suction gas-cooled)

²⁾ X = Ester oil filling (HFC refrigerants e.g. R134a, R404A, R507, R407C)

³⁾ S = More powerful motor e.g. air conditioning applications

R134a Operating limits



- Unlimited application range
- Supplementary cooling or reduced suction gas temperature
- Motor version -S- (more powerful motor)

- 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

R134a Notes

Operating limits

Compressor operation is possible within the limits shown on the application diagrams. Please note the coloured areas. Compressor application limits should not be chosen for design purposes or continuous operation.

Restrictions to the operating limits may occur when using the Bock EFC (Electronic Frequency Control). The sample calculation in the Semi-hermetique Catalogue gives a more detailed explanation.

Performance data

The performance data for R134a are based on European Standard EN 12900 with a **50 Hz power supply frequency**. This signifies: **20 °C suction gas temperature without liquid subcooling**.

This leads to significant differences compared to systems with liquid subcooling and/or other suction gas temperatures.

Conversion factor for 60 Hz = 1,2

Performance data for other operating points, see Bock software.

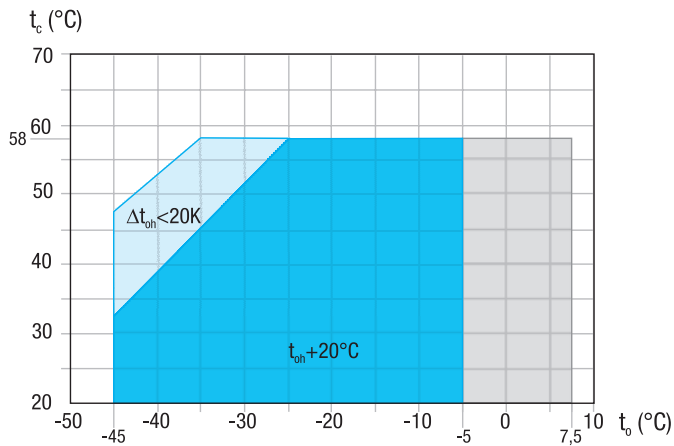
HG34e - Performance data

R134a		Performance data											50 Hz
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	-30	
HGX34e/215-4	30	Q	17200	15700	14400	13000	10600	8450	6590	5000	3670	2610	1800
		P	2,27	2,30	2,32	2,31	2,25	2,14	1,98	1,80	1,59	1,38	1,18
	40	Q	15200	13800	12600	11400	9120	7190	5530	4120	2970	2060	1400
		P	2,87	2,84	2,78	2,72	2,55	2,34	2,11	1,87	1,64	1,42	1,22
	50	Q	13000	11800	10700	9540	7590	5890	4440	3240	2270	1540	1040
P		3,38	3,27	3,16	3,03	2,76	2,47	2,18	1,90	1,64	1,42	1,24	
60	Q	10800	9690	8690	7750	6070	4620	3400	2420	1660	1120	790	
	P	3,79	3,62	3,45	3,27	2,90	2,54	2,20	1,89	1,61	1,39	1,24	
70	Q	8590	7680	6830	6040	4630	3440	2480	1730	1190			
	P	4,12	3,89	3,66	3,43	2,99	2,56	2,17	1,84	1,56			
HGX34e/255-4	30	Q	20600	18800	17200	15600	12700	10100	7800	5890	4320	3080	2190
		P	2,61	2,67	2,71	2,71	2,66	2,53	2,34	2,12	1,88	1,63	1,41
	40	Q	18100	16500	15000	13600	11000	8660	6660	4960	3570	2490	1710
		P	3,36	3,35	3,31	3,25	3,08	2,84	2,57	2,27	1,97	1,68	1,43
	50	Q	15600	14200	12900	11600	9310	7280	5540	4070	2880	1960	1330
P		4,02	3,93	3,83	3,71	3,42	3,08	2,73	2,36	2,01	1,68	1,41	
60	Q	13100	11900	10700	9610	7640	5920	4450	3220	2240	1510	1030	
	P	4,56	4,41	4,24	4,06	3,66	3,23	2,80	2,37	1,96	1,61	1,32	
70	Q	10500	9430	8480	7590	5970	4570	3380	2410	1660			
	P	4,98	4,77	4,54	4,30	3,79	3,28	2,76	2,28	1,83			
HGX34e/315-4	30	Q	25500	23300	21100	19200	15500	12400	9660	7390	5520	4040	2920
		P	3,40	3,43	3,43	3,40	3,29	3,11	2,88	2,61	2,32	2,02	1,72
	40	Q	22300	20300	18500	16700	13500	10700	8260	6260	4620	3320	2330
		P	4,22	4,17	4,10	4,01	3,78	3,49	3,16	2,80	2,43	2,07	1,73
	50	Q	19200	17400	15800	14200	11400	8950	6880	5140	3720	2600	1740
P		4,97	4,85	4,71	4,55	4,19	3,79	3,36	2,91	2,47	2,04	1,65	
60	Q	16100	14600	13100	11800	9350	7280	5520	4050	2850	1900	1170	
	P	5,63	5,44	5,22	5,00	4,51	4,00	3,46	2,93	2,41	1,92	1,47	
70	Q	13100	11800	10600	9390	7380	5660	4200	3000	2010			
	P	6,18	5,91	5,62	5,33	4,71	4,08	3,44	2,82	2,22			
HGX34e/380-4	30	Q	30700	28100	25600	23200	19000	15300	12100	9310	7060	5250	3860
		P	4,27	4,28	4,26	4,22	4,06	3,83	3,53	3,20	2,83	2,46	2,09
	40	Q	27000	24600	22400	20300	16600	13300	10400	8000	6020	4420	3180
		P	5,26	5,19	5,09	4,97	4,67	4,30	3,89	3,46	3,00	2,56	2,13
	50	Q	23200	21200	19300	17400	14100	11300	8760	6670	4940	3540	2450
P		6,17	6,01	5,83	5,63	5,18	4,69	4,16	3,62	3,07	2,55	2,06	
60	Q	19600	17800	16100	14600	11700	9240	7130	5350	3860	2650	1690	
	P	6,97	6,73	6,46	6,18	5,59	4,96	4,31	3,66	3,02	2,42	1,86	
70	Q	16000	14500	13100	11800	9340	7290	5530	4040	2800			
	P	7,65	7,31	6,97	6,60	5,86	5,09	4,32	3,56	2,83			

Relating to 20 °C suction gas temperature without liquid subcooling

 Supplementary cooling or reduced suction gas temp.

R404A/R507 Operating limits



- Unlimited application range
- Supplementary cooling or reduced suction gas temperature
- Motor version -S- (more powerful motor)

- t_o Evaporating temperature (°C)
- t_c Condensing temperature (°C)
- Δt_{0h} Suction gas superheat (K)
- t_{0h} Suction gas temperature (°C)

Max. permissible operating pressure (LP/HP)¹⁾: 19/28 bar

¹⁾ LP = low pressure HP = high pressure

R404A/R507 Notes

Operating limits

Compressor operation is possible within the limits shown on the application diagrams. Please note the coloured areas. Compressor application limits should not be chosen for design purposes or continuous operation.

Restrictions to the operating limits may occur when using the Bock EFC (Electronic Frequency Control). The sample calculation in the Semi-hermetic Catalogue gives a more detailed explanation.

Performance data

The performance data for R404A/R507 are based on European Standard EN 12900 with a **50 Hz power supply frequency**. This signifies: **20 °C suction gas temperature without liquid sub-cooling**.

This leads to significant differences compared to systems with liquid subcooling and/or other suction gas temperatures.

Performance data were compiled for R404A and R507. The base values are the data for R404A.

Conversion factor for 60 Hz = 1.2

Performance data for other operating points, see Bock software.

HG34e - Performance data

R404A/R507


Performance data

50 Hz

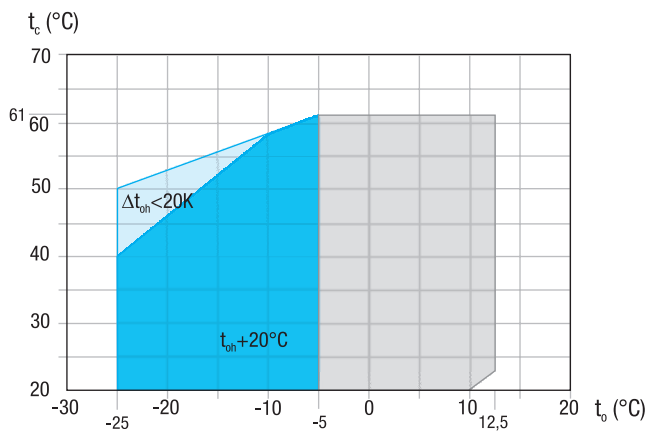
Type	Cond. temp. °C		Cooling capacity \dot{Q}_0 [W]										Power consumption P_e [kW]									
			Evaporating temperature °C																			
			7,5	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45								
HGX34e/215-4	30	Q	14600										11900									
		P	3,70										3,52									
	40	Q	12200										9840									
P		4,26										3,94										
50	Q	9770										7800										
	P	4,67										4,23										
HGX34e/215-4 S	30	Q	23900	21900	18200	15000	12200	9670	7560	5780	4280	3040	2030	1220								
		P	3,83	3,85	3,84	3,74	3,57	3,35	3,07	2,75	2,41	2,04	1,67	1,31								
	40	Q	20200	18500	15300	12500	9990	7910	6130	4640	3410	2390	1570	910								
		P	4,72	4,65	4,48	4,23	3,94	3,60	3,23	2,84	2,44	2,04	1,65	1,28								
	50	Q	16500	15000	12200	9840	7820	6110	4680	3490	2520	1740	1110									
		P	5,48	5,33	4,99	4,61	4,19	3,74	3,29	2,83	2,37	1,94	1,54									
HGX34e/255-4	30	Q	17200										14200									
		P	4,44										4,23									
	40	Q	14500										11800									
		P	5,14										4,76									
	50	Q	11700										9410									
		P	5,68										5,15									
HGX34e/255-4 S	30	Q	2800	25700	21500	17700	14400	11500	9000	6890	5140	3720	2620	1800								
		P	4,57	4,61	4,59	4,46	4,24	3,95	3,60	3,21	2,81	2,41	2,03	1,69								
	40	Q	23800	21800	18100	14800	11900	9420	7290	5510	4040	2860	1960	1300								
		P	5,64	5,58	5,38	5,08	4,71	4,28	3,81	3,33	2,84	2,37	1,94	1,57								
	50	Q	19500	17700	14600	11800	9400	7350	5610	4170	3010	2100	1410									
		P	6,55	6,40	6,02	5,57	5,05	4,50	3,93	3,36	2,80	2,28	1,81									
HGX34e/315-4	30	Q	21300										17600									
		P	5,47										5,20									
	40	Q	17900										14700									
		P	6,29										5,83									
	50	Q	14500										11800									
		P	6,97										6,34									
HGX34e/315-4 S	30	Q	33800	31000	26000	21600	17700	14300	11300	8780	6660	4900	3450	2300								
		P	5,86	5,82	5,67	5,44	5,14	4,79	4,39	3,95	3,47	2,98	2,47	1,96								
	40	Q	28700	26300	22000	18100	14800	11900	9320	7180	5370	3850	2600	1570								
		P	7,05	6,92	6,59	6,20	5,76	5,26	4,73	4,17	3,59	2,99	2,40	1,81								
	50	Q	23500	21500	17800	14600	11800	9370	7290	5530	4040	2780	1720									
		P	8,13	7,90	7,39	6,84	6,23	5,59	4,92	4,23	3,54	2,84	2,15									
HGX34e/380-4	30	Q	25800										21200									
		P	6,84										6,45									
	40	Q	21600										17700									
		P	7,84										7,25									
	50	Q	17600										14300									
		P	8,73										7,92									
HGX34e/380-4 S	30	Q	40900	37600	31700	26400	21700	17600	14100	11100	8530	6420	4680	3300								
		P	7,20	7,15	6,98	6,70	6,33	5,88	5,37	4,82	4,25	3,65	3,06	2,49								
	40	Q	34600	31800	26700	22200	18200	14800	11800	9160	6980	5150	3620	2360								
		P	8,75	8,59	8,18	7,69	7,12	6,49	5,82	5,12	4,41	3,70	3,00	2,34								
	50	Q	28400	26000	21800	18000	14700	11800	9330	7210	5390	3840	2510									
		P	10,10	9,86	9,23	8,53	7,76	6,96	6,13	5,28	4,44	3,62	2,83									

Relating to 20 °C suction gas temperature, without liquid subcooling

 Motor version -S- (more powerful motor)

 Supplementary cooling or reduced suction gas temp.

R407C Operating limits



- Unlimited application range
- Supplementary cooling or reduced suction gas temperature
- Motor version -S- (more powerful motor)

- t_o Evaporating temperature (°C)
- t_c Condensing temperature (°C)
- Δt_{0h} Suction gas superheat (K)
- t_{0h} Suction gas temperature (°C)

Max. permissible operating pressure (LP/HP)¹⁾: 19/28 bar

¹⁾ LP = low pressure HP = high pressure

R407C Notes

Operating limits

Compressor operation is possible within the limits shown on the application diagrams. Please note the coloured areas. Compressor application limits should not be chosen for design purposes or continuous operation.

Restrictions to the operating limits may occur when using the Bock EFC (Electronic Frequency Control). The sample calculation in the Semi-hermetic Catalogue gives a more detailed explanation.

Performance data

The performance data for R407C are based on European Standard EN 12900 with a **50 Hz power supply frequency**. This signifies: **20 °C suction gas temperature without liquid subcooling**.

Evaporation and condensing temperatures are based on the dew point values (saturated vapour conditions).

This results in significant differences compared to specifications with liquid undercooling and/or suction-gas temperatures.

Conversion factor for 60 Hz = 1,2

Performance data for other operating points, see Bock software.

HG34e - Performance data

R407C Performance data 50 Hz

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
HGX34e/215-4	30	Q						12200	9720	7650	5910	4480
		P						3,16	2,94	2,67	2,38	2,09
	40	Q						10400	8190	6410	4920	3700
P							3,60	3,25	2,89	2,52	2,17	
50	Q						8590	6820	5330	4100	3100	
	P						3,98	3,54	3,09	2,66	2,27	
HGX34e/215-4 S	30	Q	25600	23300	21100	19100	15600	12500	9860	7690	5890	4400
		P	3,45	3,49	3,50	3,48	3,39	3,23	3,01	2,76	2,48	2,18
	40	Q	22400	20300	18400	16600	13400	10800	8450	6570	5010	3720
P		4,38	4,33	4,26	4,17	3,94	3,66	3,34	2,99	2,64	2,30	
50	Q	19100	17300	15600	14100	11300	9000	7080	5490	4190	3110	
	P	5,19	5,06	4,91	4,75	4,39	3,99	3,57	3,15	2,74	2,35	
HGX34e/255-4	30	Q						14500	11500	9040	7030	5300
		P						3,84	3,54	3,20	2,85	2,48
	40	Q						12300	9730	7660	5940	4430
P							4,38	3,94	3,50	3,06	2,63	
50	Q						10200	8080	6420	5050	3820	
	P						4,83	4,29	3,76	3,26	2,79	
HGX34e/255-4 S	30	Q	29600	27000	24600	22300	18300	14800	11800	9240	7130	5370
		P	4,30	4,30	4,28	4,23	4,08	3,86	3,95	3,28	2,94	2,58
	40	Q	26000	23600	21500	19500	15800	12800	10100	7890	6050	4530
P		5,33	5,24	5,13	5,00	4,71	4,36	3,97	3,56	3,14	2,72	
50	Q	22200	20200	18300	16500	13400	10700	8450	6600	5070	3800	
	P	6,25	6,08	5,89	5,69	5,25	4,79	4,30	3,80	3,31	2,84	
HGX34e/315-4	30	Q						17600	14100	11100	8590	6550
		P						4,69	4,34	3,96	3,55	3,11
	40	Q						15100	12000	9420	7260	5500
P							5,33	4,85	4,33	3,80	3,27	
50	Q						12800	10200	7910	6060	4550	
	P						5,87	5,25	4,63	3,99	3,37	
HGX34e/315-4 S	30	Q	35900	32700	29800	27000	22100	17800	14200	11100	8570	6490
		P	4,95	5,00	5,01	4,99	4,86	4,63	4,32	3,96	3,56	3,14
	40	Q	31300	28500	25900	23500	19200	15400	12300	9550	7340	5520
P		6,32	6,25	6,16	6,04	5,72	5,32	4,86	4,37	3,85	3,34	
50	Q	26800	24300	22100	20000	16200	13000	10400	8070	6200	4650	
	P	7,63	7,45	7,24	7,02	6,50	5,93	5,31	4,68	4,05	3,44	
HGX34e/380-4	40	Q						21600	17500	13900	10900	8310
		P						5,84	5,38	4,91	4,42	3,90
	40	Q						18700	15100	12000	9320	7140
P							6,71	6,08	5,45	4,82	4,18	
40	Q						15800	12800	10100	7900	6070	
	P						7,49	6,69	5,91	5,13	4,36	
HGX34e/380-4 S	30	Q	43500	39600	36000	32700	26700	21600	17300	13600	10600	4940
		P	6,40	6,35	6,27	6,17	5,93	5,61	5,23	4,79	4,30	3,76
	40	Q	38000	34600	31400	28400	23200	18700	14900	11700	8990	6650
P		7,95	7,78	7,59	7,39	6,94	6,44	5,89	5,29	4,66	4,00	
50	Q	32200	29300	26500	24000	19600	15800	12600	9870	7550	5510	
	P	9,52	9,23	8,92	8,60	7,93	7,22	6,47	5,70	4,91	4,10	

Relating to 20 °C suction gas temperature, without liquid subcooling

Motor version -S- (more powerful motor)

Supplementary cooling or red. suction gas temp.

Type	Number of cylinders	Displacement 50 / 60 Hz (1450/1740 rpm) m ³ /h	Electrical data ③				Weight kg	Connections ⑤		Oil charge Ltr.
			Voltage	Max. working current	Max. power consumption	Starting current (rotor locked)		Discharge line DV	Suction line SV	
			①	②	②	A		mm inch	mm inch	
				Δ / Y	kW	A				
HG34e/215-4	4	18,80 / 22,60	④	14,4 / 8,1	4,8	87 / 50	92	22 / 7/8	28 / 1 1/8	1,4
HG34e/215-4 S	4	18,80 / 22,60	④	18,3 / 10,5	6,0	132 / 76	95	22 / 7/8	28 / 1 1/8	1,4
HG34e/255-4	4	22,10 / 26,60	④	17,0 / 9,8	6,0	87 / 50	91	22 / 7/8	28 / 1 1/8	1,4
HG34e/255-4 S	4	22,10 / 26,60	④	21,1 / 12,2	7,2	132 / 76	94	22 / 7/8	28 / 1 1/8	1,4
HG34e/315-4	4	27,30 / 32,80	④	21,1 / 12,2	7,4	111 / 64	94	22 / 7/8	28 / 1 1/8	1,4
HG34e/315-4 S	4	27,30 / 32,80	④	25,5 / 14,7	8,9	132 / 76	97	22 / 7/8	28 / 1 1/8	1,4
HG34e/380-4	4	33,10 / 39,70	④	26,1 / 15,1	9,3	111 / 64	93	22 / 7/8	28 / 1 1/8	1,4
HG34e/380-4 S	4	33,10 / 39,70	④	31,2 / 18,0	11,1	132 / 76	96	22 / 7/8	28 / 1 1/8	1,4

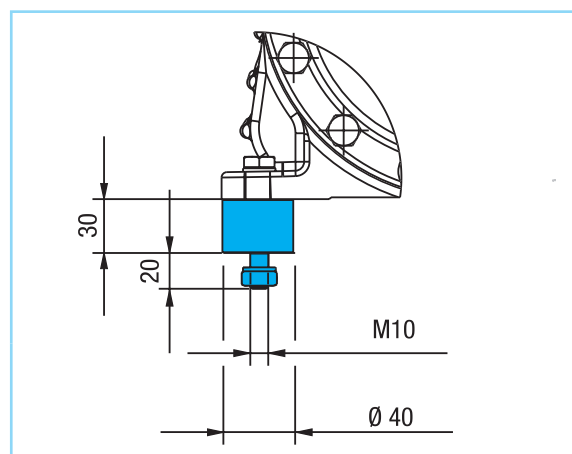
Oil sump heater 110-240 V - 1 - 50/60 Hz (option)

50-120 W, PTC heater, self-regulating, installation in housing bore

Explanations:

- ① Tolerance ($\pm 10\%$) relates to the mean value of the voltage range. Other voltages and current types on request.
- ② Take account of the max. operating current / max. power consumption when designing contactors, leads and fuses. Switches: Service category AC3
- ③ All data are based on the mean value of the voltage range.
- ④ 220-240 V Δ / 380-420 V Y - 3 - 50 Hz
265-290 V Δ / 440-480 V Y - 3 - 60 Hz
- ⑤ For soldering connections

Connections	HG34e
SV Suction line	Please refer to technical data above
DV Discharge line	
A Connection suction side, not lockable	1/8" NPTF
A1 Connection suction side, lockable	7/16" UNF
B Connection discharge side, not lockable	1/8" NPTF
B1 Connection discharge side, lockable	7/16" UNF
D1 Connection oil return from oil separator	1/4" NPTF
E Connection oil pressure gauge	1/8" NPTF
F Oil drain	M 10
H Oil charge plug	1/4" NPTF
J Oil sump heater	\varnothing 15 mm ¹⁾
K Sight glass	1 1/8" - 18 UNEF
L Connection thermal protection thermostat	1/8" NPTF
O Connection oil level regulator	1 1/8" - 18 UNEF

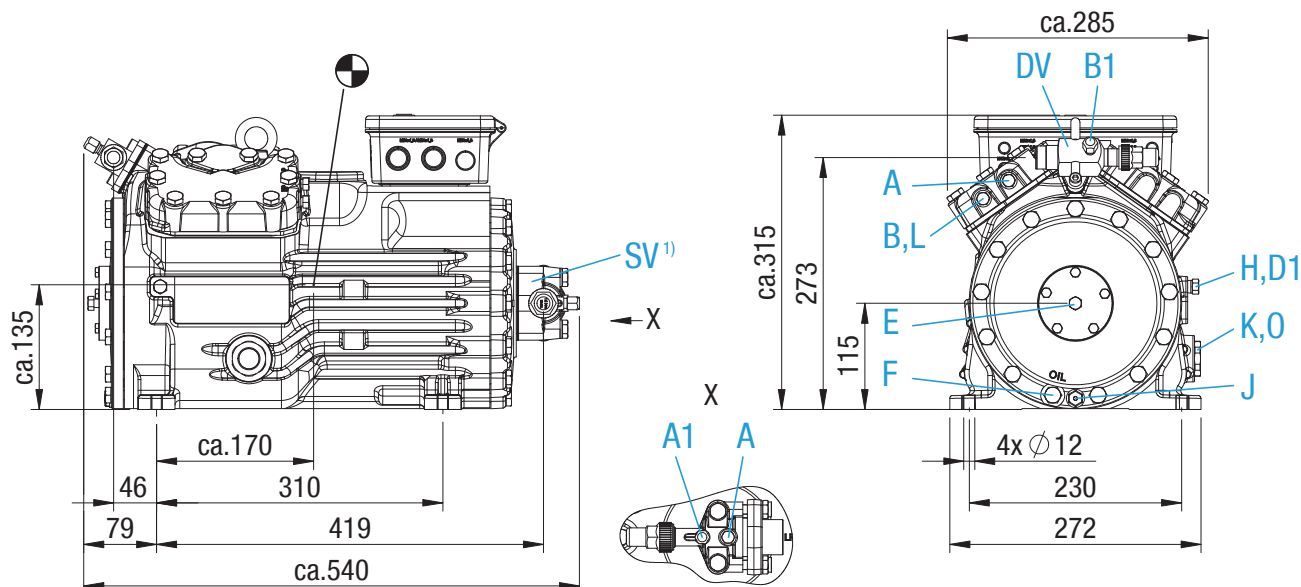
Dimensions for anti-vibration pad


Dimensions in mm

HG34e - Dimensions and connections

HG34e

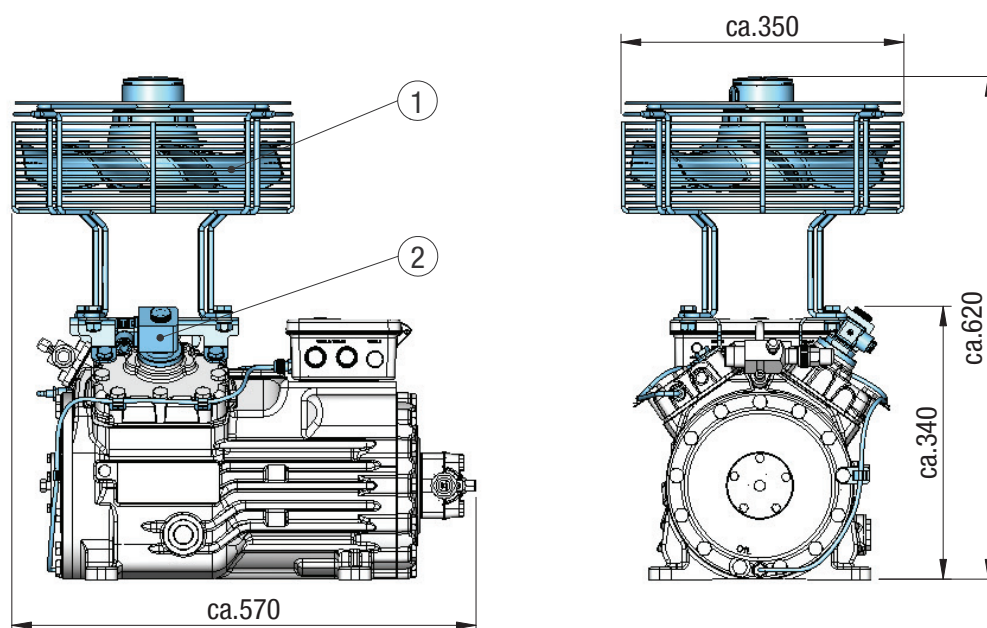
HG34e/215-4 HG34e/255-4 HG34e/315-4 HG34e/380-4
 HG34e/215-4 S HG34e/255-4 S HG34e/315-4 S HG34e/380-4 S



Dimensions in mm

- ¹⁾ SV 90° rotatable
- ☉ Centre of gravity

Dimensions with accessories



Dimensions in mm

- ① Additional fan
- ② Capacity regulator

Scope of supply

Semi-hermetic 4 cylinder reciprocating compressor with drive motor for direct start
 220-240 V Δ / 380-420 V Y - 3 - 50 Hz
 265-290 V Δ / 440-480 V Y - 3 - 60 Hz
 Single-section compressor housing with hermetically integrated electric motor

Winding protection with PTC resistor sensors and electronic triggering unit Bock MP10

Possibility to connect to oil level controllers ESK, AC+R oder CARLY

Oil charge:
 HG: FUCHS Reniso SP 46
 HGX: FUCHS Reniso Triton SE 55

Sight glass

Suction and discharge line valve

Inert gas charge

4 anti-vibration pads enclosed

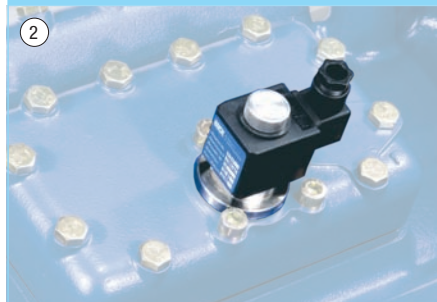
Accessories

- ① Start unloader by means of a Bock-ESS (Electronic Soft Start) IP20 (Connection clamps IP00) for installation in switch cabinet
- ② Capacity regulator 230 V - 1 - 50/60 Hz, IP65
 1 capacity regulator = 50% residual capacity
- ③ Continuously variable speed control by means of a Bock EFC (Electronic Frequency Control), compactly built onto compressor and connected ready-to-operate IP54
- ④ Cylinder cover prepared for capacity regulator
- ⑤ Oil sump heater
 110-240 V - 1 - 50/60 Hz, 50-120 W, IP65
 PTC heater self-regulating
- ⑥ Thermal protection thermostat (PTC sensor) IP67
- ⑦ Additional fan 230 V Δ / 400 V Y - 3 - 50 Hz, 120 W,
 230-265 V Δ / 400-460 V Y - 3 - 60 Hz, 190 W, IP54 enclosed
 Special voltage and/or frequency (on request)

ESS Electronic Soft Start



Capacity regulator



EFC Electronic Frequency Control



Prepared for capacity regulator



Oil sump heater



Thermal protection thermostat



Additional fan



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