THE HEART OF FRESHNESS

R410A // HERMETIC

SCROLL COMPRESSORS

ORBIT SERIES

Improved Performance

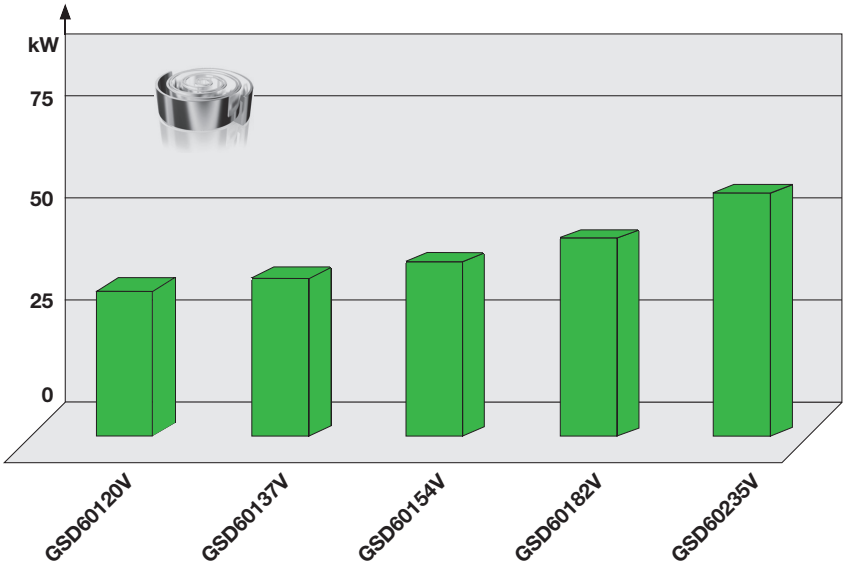
50 Hz // ESP-130-7

The ORBIT Series

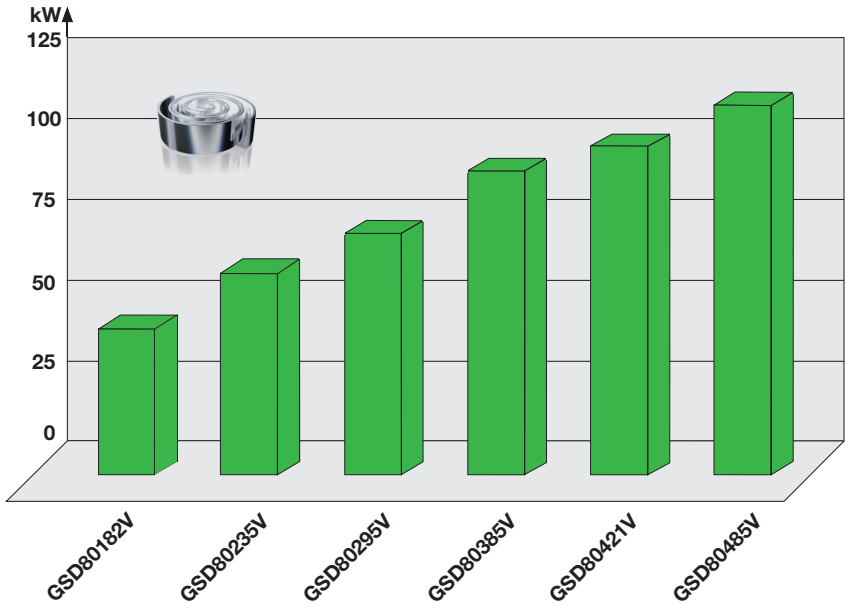
The scroll compressors of the ORBIT series for R410A have been developed especially for both air conditioning and reversible heat pumps. They are characterized by high efficiency, smooth running and reliability. With respect to the typical seasonal operating mode of A/C applications – primarily in part load operation – special focus has been put on low energy consumption also at reduced condensing temperatures.

Moreover the compressor design has been optimized for low sound emissions, achieving the lowest level in its class. The ORBIT series also weighs less than the competitive models, as the diameter is more than 2 cm less. Nevertheless, the ORBIT series geometry, as it relates to fitting locations and mounting configuration, matches the competitors' layout.

The ORBIT 6 capacity range*



The ORBIT 8 capacity range*



* based on EN 12900 conditions (+5/50°C)

Energy efficiency and part load behaviour

With respect to the efficiency requirements of different applications, two compressor families with identical displacements have been developed:

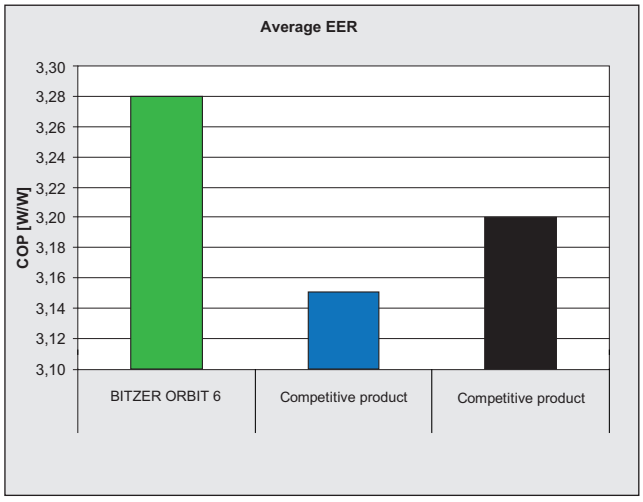
“BITZER ORBIT 8” standard series – optimized for operation at medium to high condensing temperatures, e. g. for systems with air-cooled condenser and for heat pumps.

“BITZER ORBIT 8 Boreal” series – optimized for operation at low to medium condensing temperatures. This generally affects systems with water-cooled condenser or evaporatively cooled, and air-cooled systems in cooler climates.

BITZER sets a new standard in scroll compressors with optimization technology that results in superior ESEER in both air-cooled and water-cooled applications. Up to 15% better than competitive models.

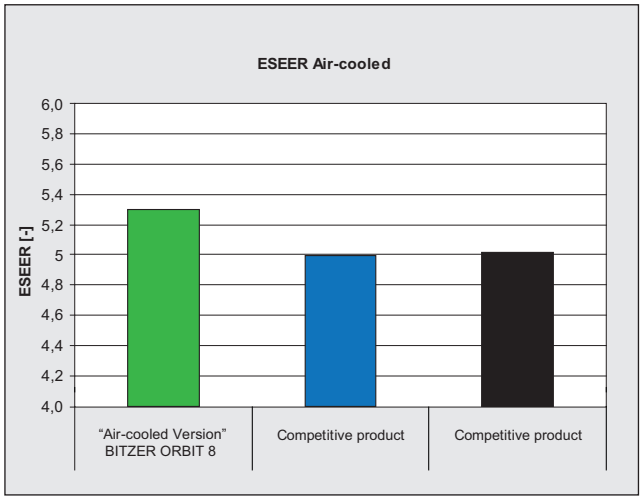
“BITZER ORBIT 6” series – optimized for smaller capacity systems at medium to high condensing temperatures. Ideal for unitary heat pumps and air conditioning, or as part of an uneven tandem with larger ORBIT 8 compressors in chillers and/or reversible systems.

ORBIT 6: Up to 3% higher full-load efficiency



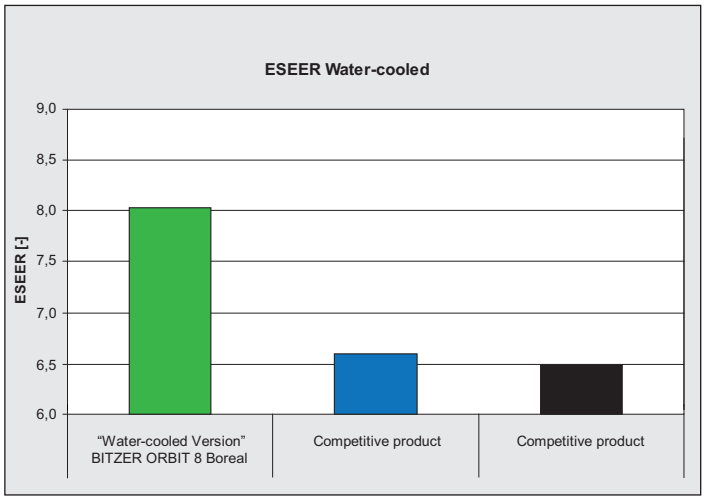
According to EN 12900

ORBIT 8: Up to 5% better ESEER



ESEER: European Seasonal Energy Efficiency Ratio

ORBIT 8 Boreal: Up to 15% better ESEER



ESEER: European Seasonal Energy Efficiency Ratio

Calculation based on multi compressor compound

The unique technical features

- ❑ Large standard application diagram
  Ideally suited to both air conditioning and heat-pumps
  - Expanded to higher evaporation temperatures for telecom and data center applications
- ❑ High energy efficiency at part and full load
  - Optimized for lowest annual operating costs
  - Especially high EER, ESEER/ IPLV and SCOP values
- ❑ Low sound levels
  - Optimized design for lowest sound levels in its capacity class
- ❑ Isolated sump design enables BITZER Advanced Header Technology (BAHT) piping and unique compounding options like fixed and variable speed tandems
- ❑ Especially low oil carry over rate
- ❑ Very efficient high power factor motors
  Significantly lower operating amps than with common motor design
- ❑ Integrated PTC motor protection
- ❑ Expanded capability
  - Direct rail mounting (no spacers required)
  - Even and uneven Tandems with common piping (no restrictor washers required)*
- ❑ Operation with frequency inverter from 35 to 75 Hz**
  - Customer selectable drive

Scope of standard delivery

Built-in motor (for voltages see “Technical data”), electronic motor protection, stub tubes for brazed connections (or threaded connections for Rotalock valves and adaptors for GSD8 series), integrated discharge check valve, oil sight glass, oil service port, terminal box with enclosure class IP54, polyvinyl ether oil charge, nitrogen holding charge.

Accessories (optional)

Band type crankcase heater, discharge gas temperature switch, anti-vibration mountings with sleeves, Rotalock adaptors, Rotalock shut-off valves, Rotalock pipe adapters, BITZER Advanced Header Technology piping packages.

Maximum Applied Pressure Limits

ORBIT 6:

Low pressure side:	33.3 bar
High pressure side:	45 bar

ORBIT 8:

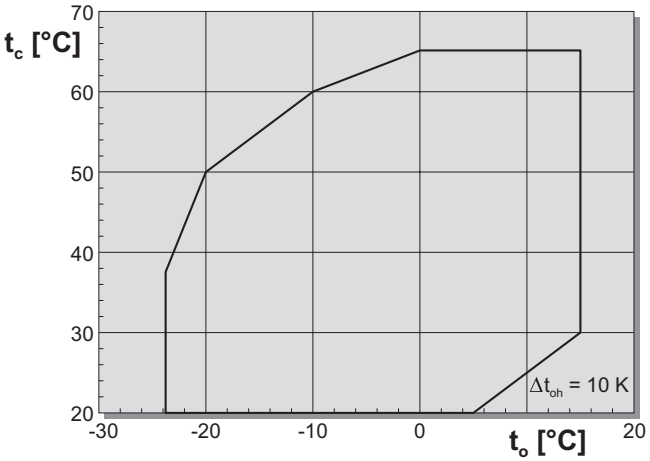
Low pressure side:	31 bar
High pressure side:	45 bar

* when used with BITZER Advanced Header Technology

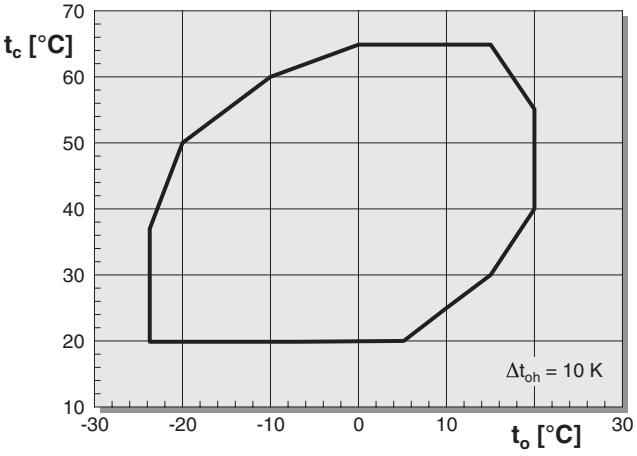
** varies by size, contact BITZER for application guidance

Application limits

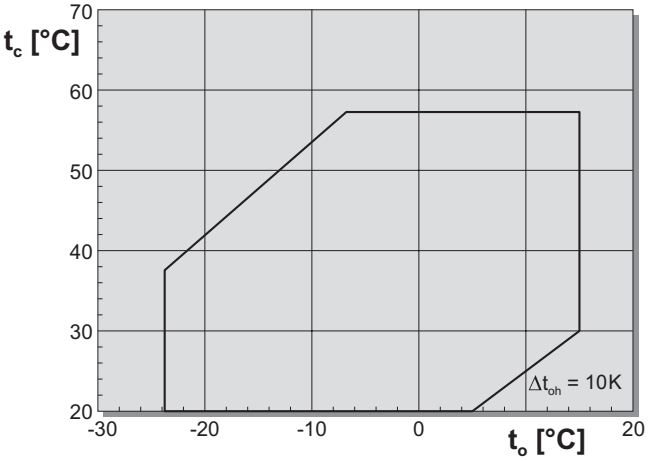
ORBIT 6
ORBIT 8: GSD80182 & GSD80235
for air-cooled systems and reversible chillers



ORBIT 8: GSD80295 .. GSD80485



ORBIT 8
Boreal for systems with low condensing temperature



t_o Evaporating temperature [°C]
t_c Condensing temperature [°C]
Δt_{oh} Suction gas superheat [K]

Explanation of model designation

Example

G S D 8 0 1 8 2 V A B 4

Scroll series

G S **D** 8 0 1 8 2 V A B 4

D for R410A

G S D **8** 0 1 8 2 V A B 4

Family

G S D 8 **0 1 8 2** V A B 4

Cooling capacity in kBtu/h according to ARI 540

G S D 8 0 1 8 2 **V** A B 4

Polyvinyl ether oil charge

G S D 8 0 1 8 2 V **A** B 4

A = for air-cooled systems
W = for water-cooled systems

G S D 8 0 1 8 2 V A **B** 4

B = Direct brazing connections
R = Rotalock connections

G S D 8 0 1 8 2 V A B **4**

Motorkennung
2 = 200 V/3/50 Hz, 208/230 V/3/60 Hz
3 = 380 V/3/60 Hz
4 = 400 V/3/50 Hz, 460 V/3/60 Hz
5 = 500 V/3/50 Hz, 575 V/3/60 Hz
6 = 380 V/3/50 Hz

Performance data

Performance data are based on the European Standard EN 12900 and 50 Hz operation – running-in period 72 hours.

All data do **not** include liquid subcooling. Based on EN 12900 the rated cooling capacity and efficiency (COP) show therefore lower values in comparison to data based on 5 or 8.3 K subcooling. For further information see Refrigerant Report (A-501).

ORBIT 6

Performance data 50 Hz
based on 10 K suction gas superheat, without liquid subcooling.

Compressor type	Cond. temp.		Cooling capacity Q_o [Watt] / Power consumption P_e [kW] — Saturated suction temperature °C										
		↓	15,0	12,5	10,0	7,5	5,0	2,5	0,0	-5,0	-10,0	-15,0	-20,0
GSD60120VAB	20	Q					36300	33400	30700	25750	21400	17610	14270
		P					4,58	4,49	4,42	4,33	4,29	4,27	4,24
	30	Q	46850	43250	39900	36800	33800	31050	28450	23750	19610	15970	12750
		P	6,09	5,90	5,75	5,62	5,52	5,45	5,39	5,33	5,30	5,28	5,24
	40	Q	42600	39350	36250	33300	30600	28050	25650	21250	17420	14030	11030
		P	7,18	7,02	6,88	6,78	6,70	6,64	6,59	6,54	6,52	6,49	6,42
	50	Q	37500	34550	31800	29200	26750	24450	22300	18390	14950	11910	9230
		P	8,61	8,47	8,36	8,27	8,20	8,15	8,11	8,07	8,03	7,98	7,89
	60	Q	31400	28850	26500	24300	22200	20300	18450	15130	12210		
		P	10,49	10,37	10,27	10,19	10,13	10,08	10,05	10,00	9,95		
GSD60137VAB	20	Q					41750	38400	35250	29600	24650	20300	16550
		P					5,32	5,23	5,15	5,02	4,92	4,84	4,74
	30	Q	52900	48900	45100	41600	38250	35150	32250	27000	22400	18390	14900
		P	6,81	6,65	6,50	6,38	6,28	6,19	6,12	6,01	5,93	5,85	5,76
	40	Q	47700	44050	40600	37400	34350	31550	28900	24100	19910	16270	13120
		P	8,02	7,87	7,74	7,63	7,54	7,47	7,41	7,32	7,25	7,19	7,12
	50	Q	41900	38600	35550	32700	30000	27500	25150	20900	17190	13980	11210
		P	9,61	9,48	9,37	9,28	9,20	9,14	9,09	9,03	8,98	8,94	8,89
	60	Q	35150	32350	29750	27300	25000	22850	20850	17250	14120		
		P	11,68	11,56	11,47	11,40	11,34	11,30	11,27	11,23	11,21		
GSD60154VAB	20	Q					46950	43150	39600	33200	27600	22750	18560
		P					5,95	5,84	5,75	5,60	5,49	5,40	5,30
	30	Q	59800	55200	50900	46900	43100	39600	36300	30300	25100	20600	16740
		P	7,66	7,46	7,29	7,14	7,02	6,92	6,84	6,71	6,62	6,54	6,44
	40	Q	54000	49850	45900	42200	38800	35550	32550	27100	22400	18290	14770
		P	8,99	8,81	8,66	8,53	8,43	8,34	8,27	8,18	8,10	8,04	7,95
	50	Q	47550	43800	40300	37000	33950	31100	28400	23600	19400	15790	12690
		P	10,76	10,60	10,47	10,36	10,27	10,21	10,16	10,08	10,04	9,99	9,92
	60	Q	40050	36850	33850	31050	28450	26000	23700	19630	16090		
		P	13,05	12,92	12,81	12,73	12,66	12,61	12,58	12,54	12,52		
GSD60182VAB	20	Q					55400	50900	46800	39250	32650	26850	21750
		P					6,71	6,58	6,48	6,34	6,26	6,20	6,13
	30	Q	69900	64600	59700	55000	50600	46550	42700	35750	29600	24200	19400
		P	8,84	8,60	8,39	8,22	8,09	7,98	7,89	7,77	7,69	7,62	7,52
	40	Q	63000	58200	53700	49500	45500	41800	38300	32000	26400	21500	17080
		P	10,42	10,22	10,05	9,91	9,80	9,71	9,64	9,55	9,48	9,40	9,27
	50	Q	55300	51100	47050	43300	39800	36500	33400	27750	22800	18380	14440
		P	12,46	12,30	12,17	12,06	11,98	11,92	11,87	11,80	11,75	11,67	11,52
	60	Q	46350	42700	39300	36050	33050	30200	27550	22700	18430		
		P	15,11	14,98	14,89	14,82	14,77	14,74	14,71	14,68	14,65		
GSD60235VAB	20	Q					71100	65400	60100	50500	42050	34700	28300
		P					9,32	9,08	8,89	8,64	8,49	8,38	8,22
	30	Q	90300	83400	77000	71000	65300	60000	55100	46100	38300	31450	25500
		P	12,38	11,91	11,51	11,19	10,94	10,75	10,60	10,41	10,31	10,21	10,05
	40	Q	81500	75300	69400	63900	58700	53900	49400	41200	34050	27850	22450
		P	14,27	13,86	13,53	13,27	13,07	12,92	12,81	12,68	12,61	12,52	12,34
	50	Q	71600	66000	60800	55900	51300	47000	42950	35700	29400	23900	19170
		P	16,85	16,51	16,24	16,03	15,88	15,76	15,69	15,61	15,56	15,47	15,26
	60	Q	60100	55300	50800	46600	42700	39050	35650	29500	24150		
		P	20,29	20,01	19,79	19,63	19,52	19,45	19,40	19,36	19,32		

Tentative data

Part load performance data and performance data for individual input data and 60 Hz operation see BITZER Software.

ORBIT 8 ①

Performance data 50 Hz
based on 10 K suction gas superheat, without liquid subcooling.

Compressor type	Cond. temp.		Cooling capacity Q_o [Watt] Saturated suction temperature °C				Power consumption P_e [kW] Saturated suction temperature °C			
		↓	12,5	10	7,5	5	2,5	0	-5	-10
R410A			optimized for air-cooled systems and reversible chillers							
GSD80182VA	30	Q	65100	59900	55100	50600	46300	42400	35300	29200
		P	7,86	7,91	7,97	8,01	8,06	8,10	8,16	8,22
	40	Q	57000	52700	48600	44800	41200	37850	31700	26200
		P	10,00	10,08	10,16	10,22	10,28	10,33	10,41	10,47
	50	Q	49300	45700	42300	39000	35900	32900	27300	21950
		P	12,84	12,93	13,01	13,08	13,14	13,18	13,25	13,27
GSD80235VA	30	Q	86700	79800	73300	67300	61700	56400	47000	38900
		P	10,46	10,53	10,60	10,67	10,72	10,78	10,87	10,94
	40	Q	75900	70100	64700	59700	54900	50400	42200	34900
		P	13,31	13,42	13,52	13,61	13,69	13,75	13,86	13,93
	50	Q	65600	60800	56300	52000	47800	43800	36300	29200
		P	17,08	17,21	17,31	17,41	17,49	17,55	17,64	17,67
GSD80295VA	30	Q	109400	100800	92700	85200	78200	71600	59800	49600
		P	13,58	13,44	13,33	13,24	13,17	13,12	13,06	13,04
	40	Q	97500	89700	82400	75600	69200	63300	52700	43550
		P	16,55	16,46	16,40	16,35	16,33	16,32	16,32	16,34
	50	Q	84100	77300	70900	64900	59400	54200	45000	37000
		P	20,56	20,52	20,50	20,50	20,51	20,53	20,58	20,63
GSD80385VA	30	Q	142300	131200	120800	111100	102000	93600	78300	65100
		P	18,16	17,90	17,70	17,53	17,41	17,31	17,19	17,15
	40	Q	127300	117300	107900	99100	90900	83300	69500	57600
		P	21,88	21,76	21,66	21,59	21,55	21,52	21,50	21,50
	50	Q	110400	101600	93300	85600	78500	71800	59700	49350
		P	27,04	27,00	26,98	26,97	26,97	26,97	26,97	26,93
GSD80421VA	30	Q	153800	141700	130300	119700	109800	100600	83900	69500
		P	19,40	19,07	18,80	18,60	18,45	18,34	18,24	18,24
	40	Q	137300	126300	116100	106500	97500	89100	74100	61100
		P	23,29	23,13	23,03	22,96	22,93	22,93	22,98	23,05
	50	Q	118500	108900	99800	91400	83600	76300	63200	51900
		P	28,93	28,89	28,89	28,91	28,95	29,00	29,09	29,13
GSD80485VA	30	Q	174500	161000	148400	136500	125400	115100	96300	80000
		P	22,04	21,67	21,37	21,13	20,95	20,81	20,64	20,58
	40	Q	155700	143500	132100	121400	111400	102000	85100	70500
		P	26,45	26,27	26,13	26,04	25,98	25,95	25,94	25,96
	50	Q	134400	123700	113700	104400	95600	87400	72700	59900
		P	32,76	32,70	32,67	32,67	32,67	32,69	32,72	32,71

① optimized for air-cooled systems and reversible chillers

Part load performance data and performance data for individual input data and 60 Hz operation see BITZER Software.

ORBIT 8 Boreal ②

Performance data 50 Hz
based on 10 K suction gas superheat, without liquid subcooling.

Compressor type	Cond. temp.		Cooling capacity Q_o [Watt] Saturated suction temperature °C				Power consumption P_e [kW] Saturated suction temperature °C			
		↓	12,5	10	7,5	5	2,5	0	-5	-10
R410A			**optimized for systems with low condensing temperature**							
GSD80235VW	30	Q	88800	81900	75400	69300	63600	58300	48600	40150
		P	9,65	9,82	9,99	10,16	10,32	10,48	10,77	11,04
	40	Q	79300	73000	67100	61500	56400	51500	42750	35100
		P	12,88	13,08	13,27	13,46	13,64	13,82	14,14	14,42
	50	Q	68800	63200	57900	53000	48450	44200	36400	29700
		P	17,05	17,28	17,50	17,72	17,92	18,12	18,47	18,78
GSD80295VW	30	Q	107600	99100	91100	83700	76700	70200	58500	48400
		P	11,48	11,68	11,89	12,09	12,30	12,50	12,88	13,22
	40	Q	96000	88200	81000	74200	67800	61900	51300	42100
		P	15,47	15,73	15,99	16,24	16,49	16,72	17,15	17,51
	50	Q	82800	75900	69500	63400	57800	52500	43150	35000
		P	20,75	21,06	21,36	21,65	21,93	22,19	22,65	23,02
GSD80385VW	30	Q	137300	126600	116600	107200	98400	90200	75300	62200
		P	15,12	15,32	15,51	15,71	15,91	16,10	16,49	16,85
	40	Q	122000	112400	103300	94800	86900	79500	66000	54300
		P	20,08	20,33	20,58	20,82	21,05	21,28	21,70	22,07
	50	Q	105200	96700	88800	81300	74300	67800	55900	45600
		P	26,53	26,84	27,14	27,43	27,70	27,96	28,43	28,82
GSD80421VW	30	Q	151700	139900	128800	118400	108700	99600	83100	68600
		P	17,17	17,39	17,61	17,83	18,04	18,25	18,65	19,00
	40	Q	134800	124200	114200	104900	96200	88000	73100	60100
		P	22,53	22,79	23,05	23,31	23,55	23,79	24,25	24,66
	50	Q	116900	107500	98700	90400	82600	75400	62200	50500
		P	29,44	29,77	30,09	30,40	30,71	31,01	31,58	32,09
GSD80485VW	30	Q	173300	159800	147100	135300	124100	113700	94900	78400
		P	19,60	19,86	20,11	20,36	20,60	20,84	21,29	21,70
	40	Q	153900	141800	130500	119800	109800	100500	83500	68600
		P	25,73	26,03	26,33	26,61	26,90	27,17	27,69	28,16
	50	Q	133500	122700	112700	103200	94400	86100	71000	57700
		P	33,62	33,99	34,36	34,72	35,07	35,41	36,06	36,65

② optimized for systems with low condensing temperature

Part load performance data and performance data for individual input data and 60 Hz operation see BITZER Software.

ORBIT 6 Technical data

Compressor type	Displacement 50 Hz	Oil charge ①	Weight	Pipe connections DL Discharge line		SL Suction line		Motor connection	Electrical data max. operat. amps (MOA)	max. power consumption	Starting current LRA
	m^3/h	dm^3	kg	mm	inch	mm	inch	②	Amp. ③	kW ③	Amp. ④
GSD60120VAB	19,8	2,7	88,5	22	7/8	35	1 3/8	380..420 V/3/50 Hz 440..480 V/3/60 Hz	21,3	12,3	123
GSD60137VAB	22,2	2,7	88,5	22	7/8	35	1 3/8		24,1	13,9	138
GSD60154VAB	24,8	2,7	88,5	22	7/8	35	1 3/8		25,7	15,5	145
GSD60182VAB	29,2	2,7	88,5	22	7/8	35	1 3/8		30,2	17,9	172
GSD60235VAB	37,6	2,7	89,8	22	7/8	35	1 3/8		39,9	24,0	202

① Charged with polyvinyl ether BVC32.

② Other voltages and electrical supplies upon request.

③ For the selection of contactors, cables and fuses the max. operating amps (MOA) and the max. power consumption must be considered (“Electrical data”).
Contactors: operational category AC3.

④ Data based on mean value
400 V/3/50 Hz.
Conversion factors:
380 V = 0,95x 420 V = 1,05x
See also ③.

GSD60120VAB .. GSD60235VAB:
Oil heater (option)
90 W, 115 V/230 V/460 V/575 V.

ORBIT 8 Technical data

Compressor type ③	Displacement 50 Hz m³/h	Oil charge ① dm³	Weight ② kg	Pipe connections ODS Version "B" ③ DL Discharge line mm	DL Discharge line inch	SL Suction line mm	SL Suction line inch	Connection thread Version "R" ③ DL Discharge line inch	SL Suction line inch	Electrical data Motor connection ④	max. operat. amps (MOA) Amp. ⑤	max. power consumption kW ⑤	Starting current LRA Amp. ⑥
optimized for air-cooled systems and reversible chillers													
GSD80182VA(B/R)	29,0	5,5	145	35	1 3/8	42	1 5/8	1 3/4 – 12 UNF	2 1/4 – 12 UNF	380..420 V/3/50 Hz 440..480 V/3/60 Hz	33	20	154
GSD80235VA(B/R)	38,6	5,5	148	35	1 3/8	42	1 5/8	1 3/4 – 12 UNF	2 1/4 – 12 UNF		44	26	210
GSD80295VA(B/R)	48,3	5,5	142	35	1 3/8	42	1 5/8	1 3/4 – 12 UNF	2 1/4 – 12 UNF		53	32	210
GSD80385VA(B/R)	61,8	5,5	144	35	1 3/8	42	1 5/8	1 3/4 – 12 UNF	2 1/4 – 12 UNF		66	39	287
GSD80421VA(B/R)	67,6	5,5	143	35	1 3/8	42	1 5/8	1 3/4 – 12 UNF	2 1/4 – 12 UNF		76	44	267
GSD80485VA(B/R)	77,2	5,5	160	35	1 3/8	42	1 5/8	1 3/4 – 12 UNF	2 1/4 – 12 UNF		81	49	295
optimized for systems with low condensing temperature													
GSD80235VW(B/R)	38,6	5,5	148	35	1 3/8	42	1 5/8	1 3/4 – 12 UNF	2 1/4 – 12 UNF	380..420 V/3/50 Hz 440..480 V/3/60 Hz	38	22	210
GSD80295VW(B/R)	48,3	5,5	151	35	1 3/8	42	1 5/8	1 3/4 – 12 UNF	2 1/4 – 12 UNF		46	28	210
GSD80385VW(B/R)	61,8	5,5	153	35	1 3/8	42	1 5/8	1 3/4 – 12 UNF	2 1/4 – 12 UNF		58	34	230
GSD80421VW(B/R)	67,6	5,5	152	35	1 3/8	42	1 5/8	1 3/4 – 12 UNF	2 1/4 – 12 UNF		67	39	267
GSD80485VW(B/R)	77,2	5,5	153	35	1 3/8	42	1 5/8	1 3/4 – 12 UNF	2 1/4 – 12 UNF		75	44	287

① Charged with polyvinyl ether BVC32.

② Weight without shut-off valves.

③ B = Direct brazing connections
R = Rotalock connections

④ Other voltages and electrical supplies upon request.

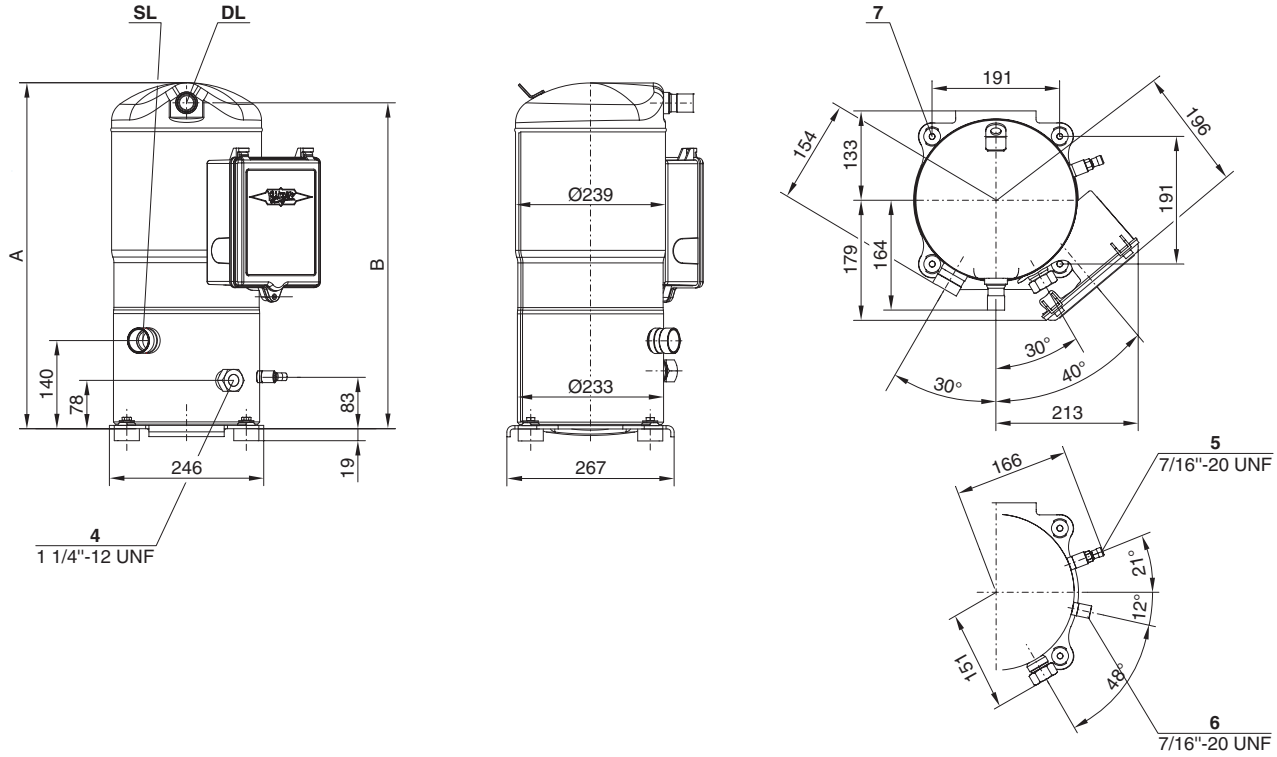
⑤ For the selection of contactors, cables and fuses the max. operating amps (MOA) and the max. power consumption must be considered ("Electrical data").
Contactors: operational category AC3.

⑥ Data based on mean value
400 V/3/50 Hz.
Conversion factors:
380 V = 0.95x 420 V = 1.05x
See also ⑤.

GSD80182V..GSD80485V:
Oil heater (option)
140 W, 115 V/230 V/460 V/575 V.

Dimensional drawings

ORBIT 6



Connection positions

4 Sight glass
5 Oil service connection (Schrader)
6 Connection for oil equalisation (parallel operation)
7 Mounting position for vibration dampers

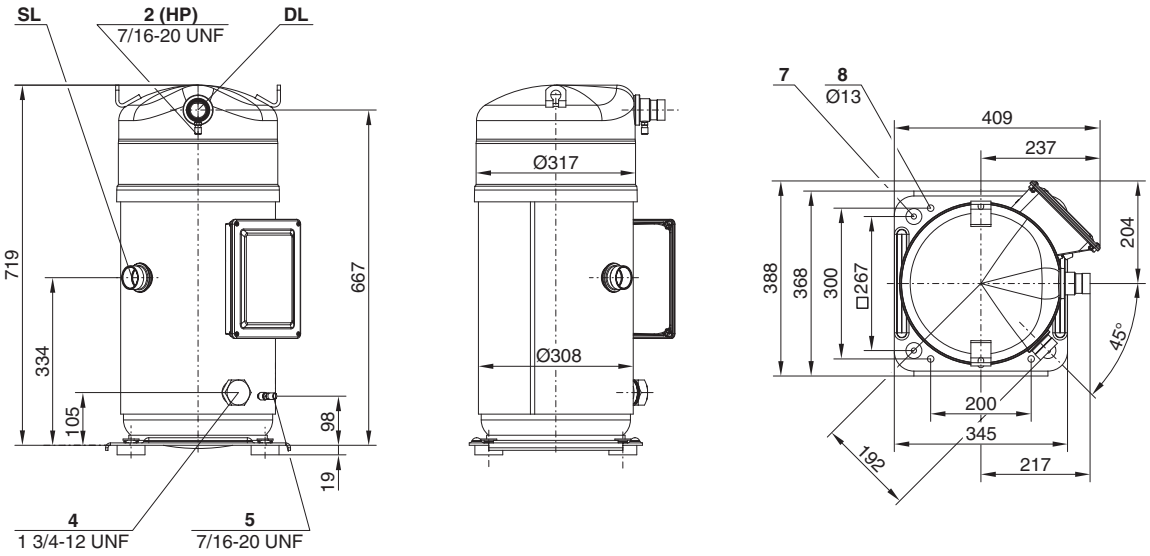
SL Suction gas line
DL Discharge gas line

	A mm	**B** mm
GSD60120VAB .. GSD60182VAB	552	520
GSD60235VAB	558	526

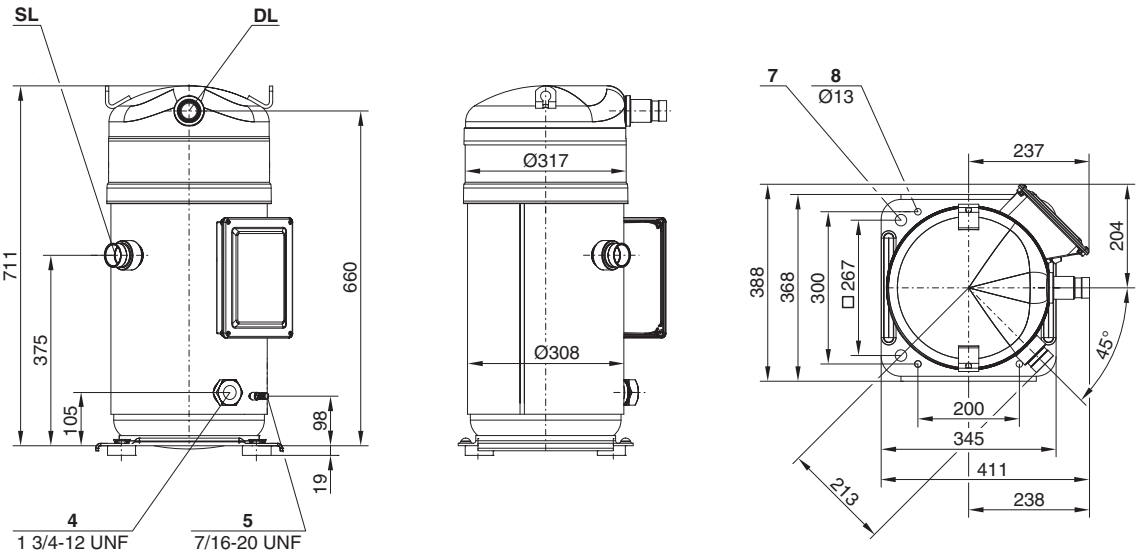
Dimensional drawings

ORBIT 8
with direct brazing connections

GSD80182V(A/W)B & GSD80235V(A/W)B



GSD80295V(A/W)B .. GSD80485V(A/W)B



Connection positions

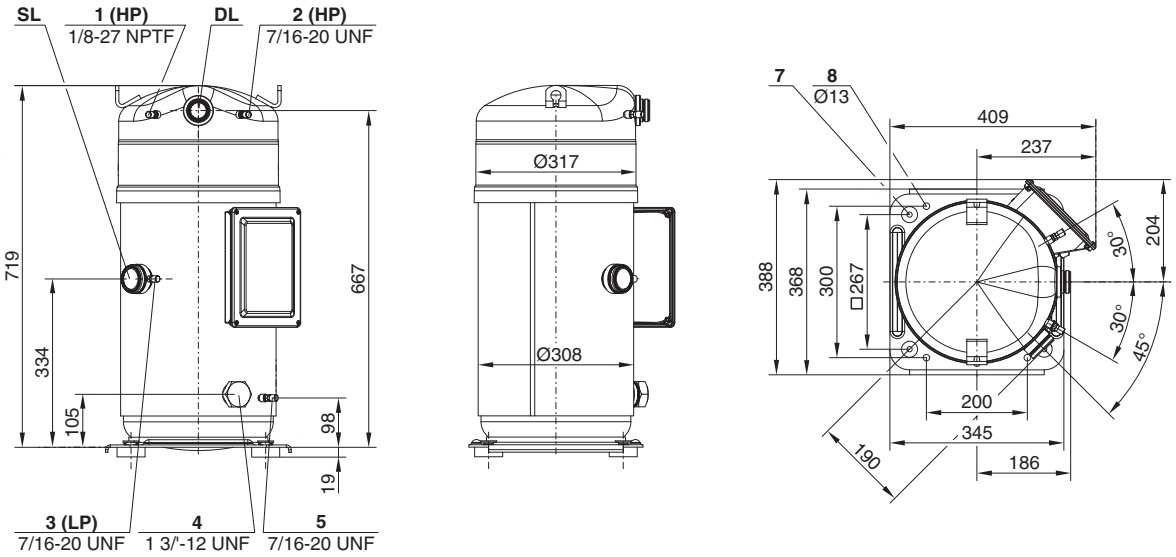
1 –
2 High pressure (HP) or discharge gas temperature sensor (Schrader)
3 –
4 Sight glass
5 Oil fill port (Schrader)
7 Mounting position for vibration dampers
8 Mounting position for Tandem and Trio fixing rails

SL Suction gas line
DL Discharge gas line

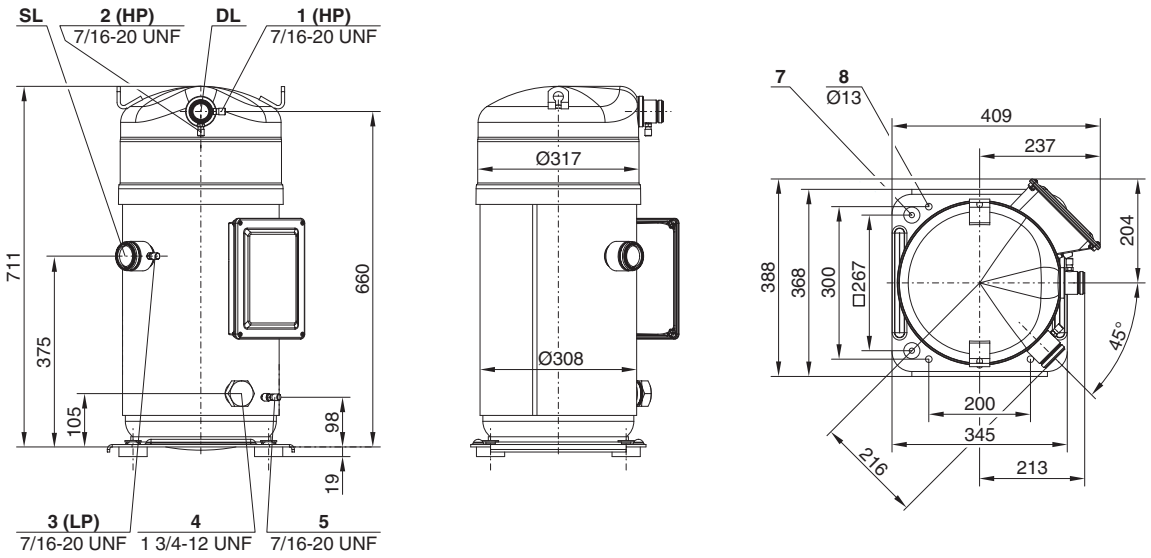
Dimensional drawings

ORBIT 8
with Rotalock connections

GSD80182V(A/W)R & GSD80235V(A/W)R



GSD80295V(A/W)R .. GSD80485V(A/W)R



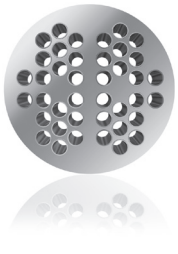
Connection positions

1 High pressure connection (HP)
2 Discharge gas temperature sensor connection (Schrader)
3 Low pressure connection (LP)
4 Sight glass
5 Oil service connection (Schrader)
7 Mounting position for vibration dampers
8 Mounting position for Tandem and Trio fixing rails

SL Suction gas line
DL Discharge gas line

Notes



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