

RefComp

SNOWMAN CO., LTD.

134-IS INVERTER TECHNOLOGY

Twin screw refrigerant compressors

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RefComp

MODEL DESIGNATION

COMPRESSOR		134	-	I	S	-	220
COMPRESSOR TYPE							
134	Semi-hermetic Refrigerant Compressor optimized for R134a						
SERIES							
I	Inverter capacity regulation						
BUILT IN VOLUMETRIC RATIO Vi							
S	Vi = 3.2 (Standard)						
A	Vi = 2.2 (Optional)						
V	Vi Variable 2.2 - 2.6 - 3.2 - 4.4 (Optional)						
220	Specification code						

DELIVERY

EXTENT OF DELIVERY

Integrated inverter (VFD) for infinite control of capacity, built-in volumetric ratio $V_i=3,2$ ("S" version) and radial suction. Electrical motor (400 [V] /3/50 [Hz] - 460/3/60 [Hz]), EMI filter, suction side solder connection, discharge shut-off valve, discharge check valve, safety relief valve, flanged-on oil separator, two oil sight glasses, oil filter, crankcase heater, oil cooling connections, oil charge/drain valve, oil charge, electrical motor with 6 PTC temperature sensors embedded, terminal and inverter box with IP 54 protection, nitrogen protective charge, rubber vibration dampers.

ACCESSORIES

Different built-in volumetric ratio: $V_i=2,2$ ("134-IA" version). On request is available the adjustable built-in volumetric ratio control ("134-IV" version). Suction shut-off valve, connection for liquid injection, ECO connection with shut-off valve, oil flow switch. The standard and/or optional electrical accessories are suitable for 230 [V]-1-50/60 [Hz].

1	Suction gas, bush
2	Oil line connection
3	Oil pressure connection, 1/4" SAE
4	Internal check valve
5	Inverter
6	Low pressure connection, 1/4" SAE
7	Discharge shut-off valve
8	High pressure connection, 1/4" SAE
9	Oil drain plug (motor housing)
10	Economiser/Liquid injection connection (option)
11	Discharge temperature sensor (option)
12	Electrical connection, ISO 63
13	Signal connection, ISO 20
14	Inverter cooling connection
15	Return gas inverter plate
16	Crankcase heater
17	Oil sight glass
18	Oil charge/Drain



INTRODUCTION

134-I series is the new range of RefComp screw compressors for R134a designed in order to control the capacity varying the electrical motor frequency by an inverter. The main characteristic of this kind of compressors is the extreme compactness of the inverter which is completely incorporated on the body of the compressor due to the new cooling system of inverter by refrigerant patented by RefComp.

To the existing range optimized for R134a, thus adding a new compressor that provides improved efficiency and versatility available today for twin screw refrigeration compressors. The ability to use the compressor frequency variation from 30 to 70 [Hz] (extended from 15 to 80 [Hz] after consultation with RefComp) allows the installer the freedom to exploit the different capabilities depending on the particular application.

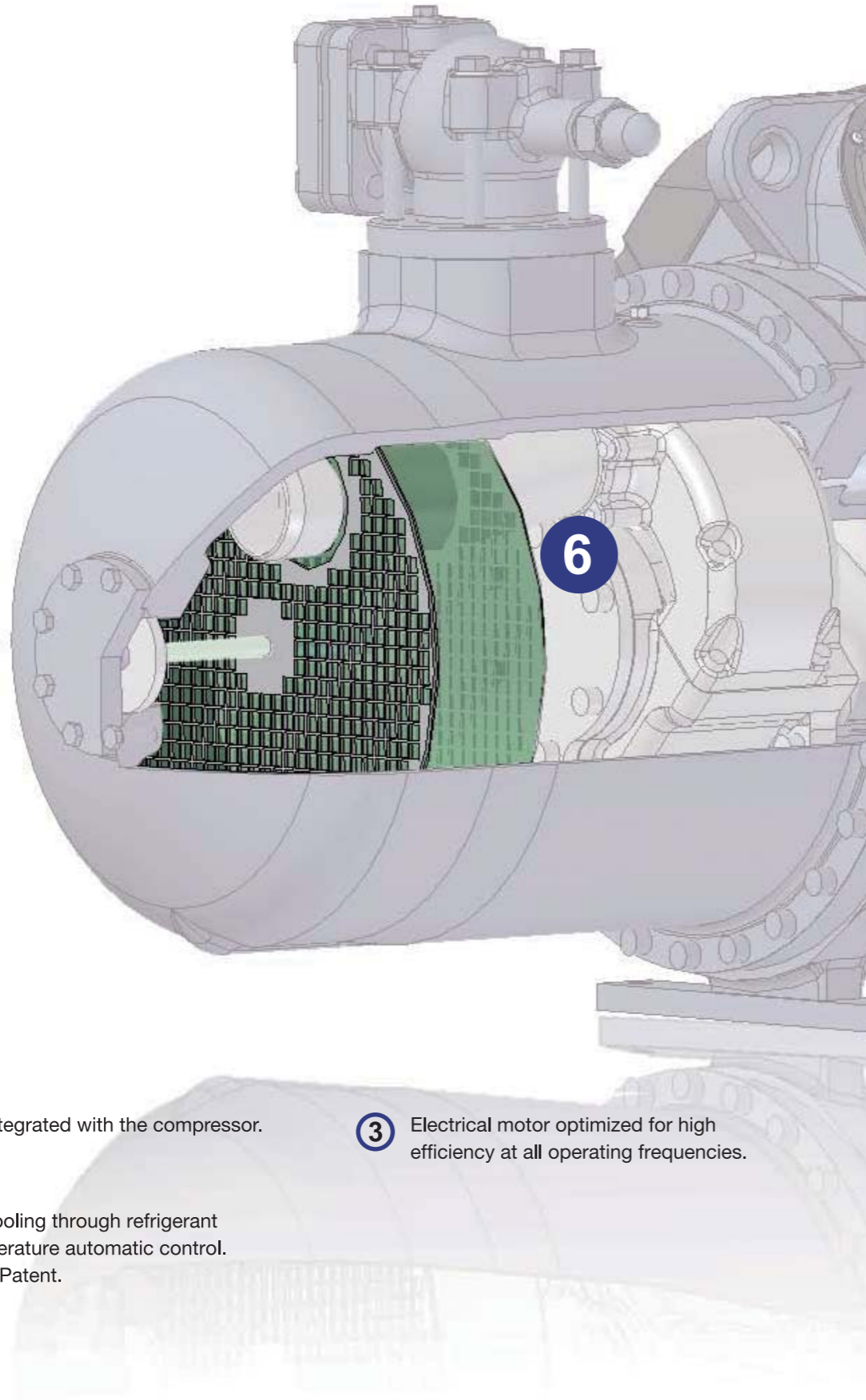
The innovative system for controlling the volume ratio also allows high accuracy intrinsic capacity regulation, the maximum adaptability to different conditions of use, ensuring the utmost efficiency and ability to be used in different types of applications, such as unit free cooling, heat pumps, chillers, process ice storage unit cooled by water or air.



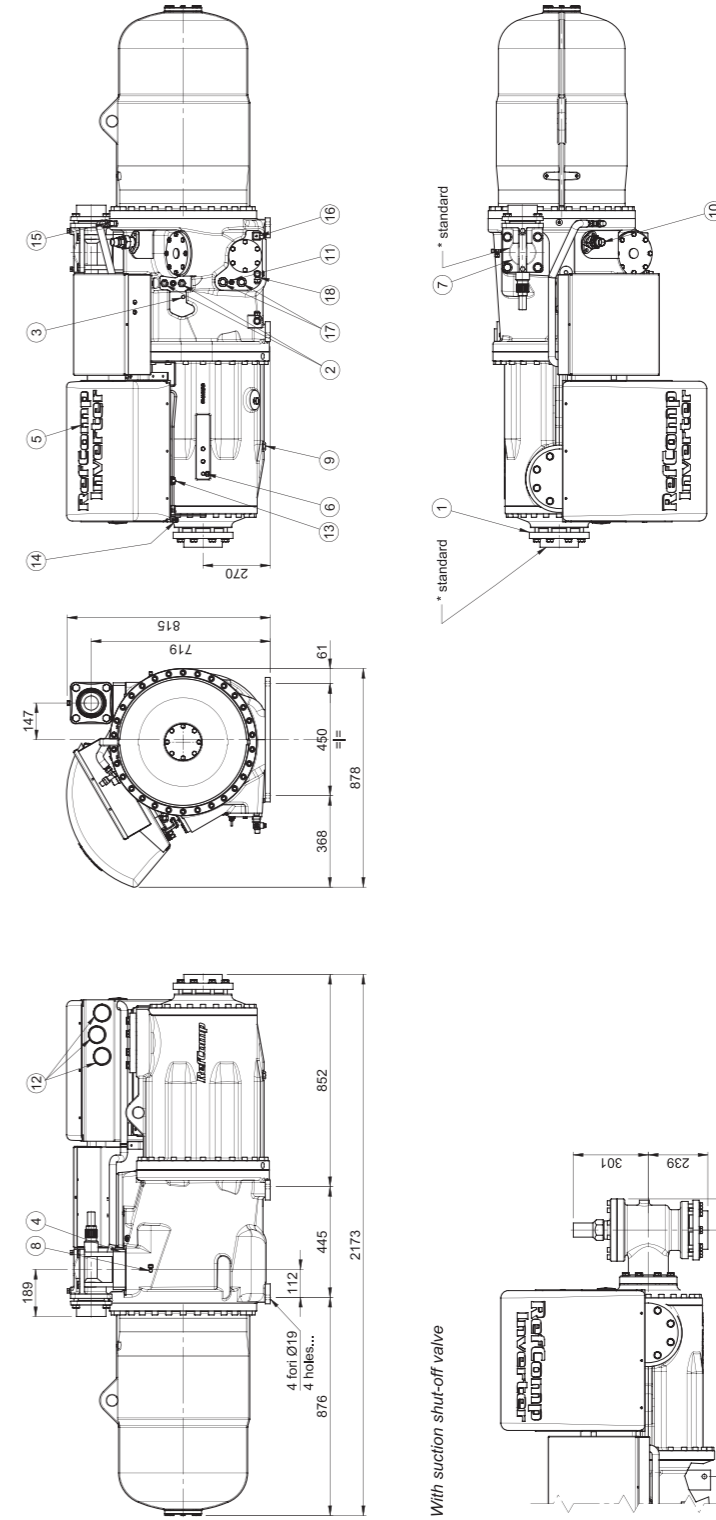
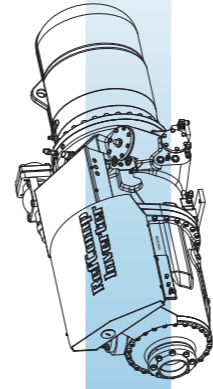
134-I Series

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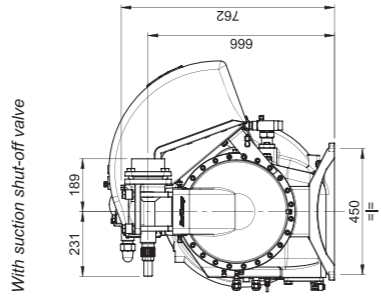
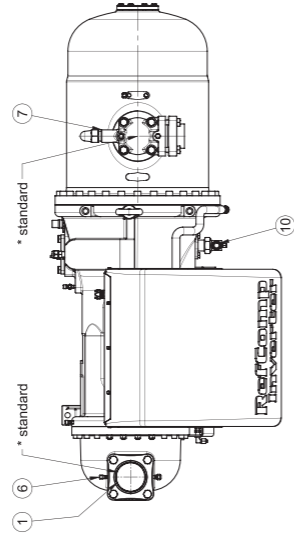
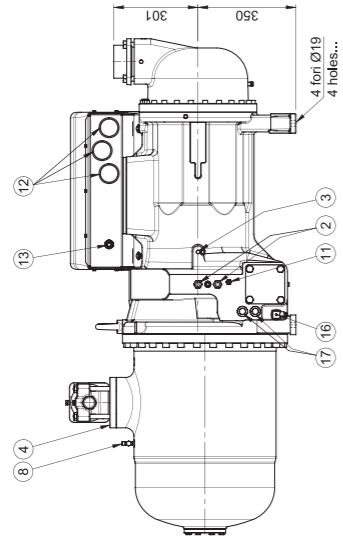
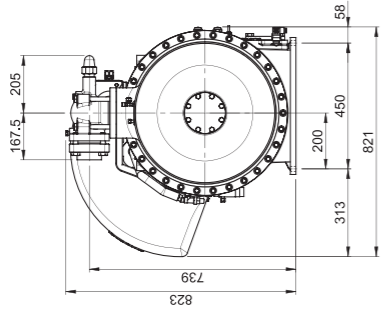
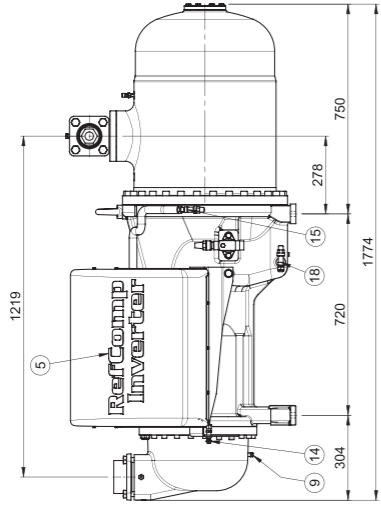
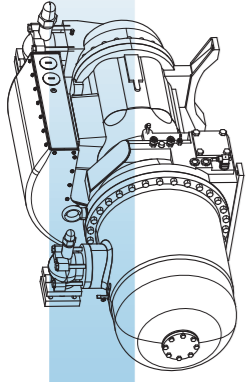
134-I



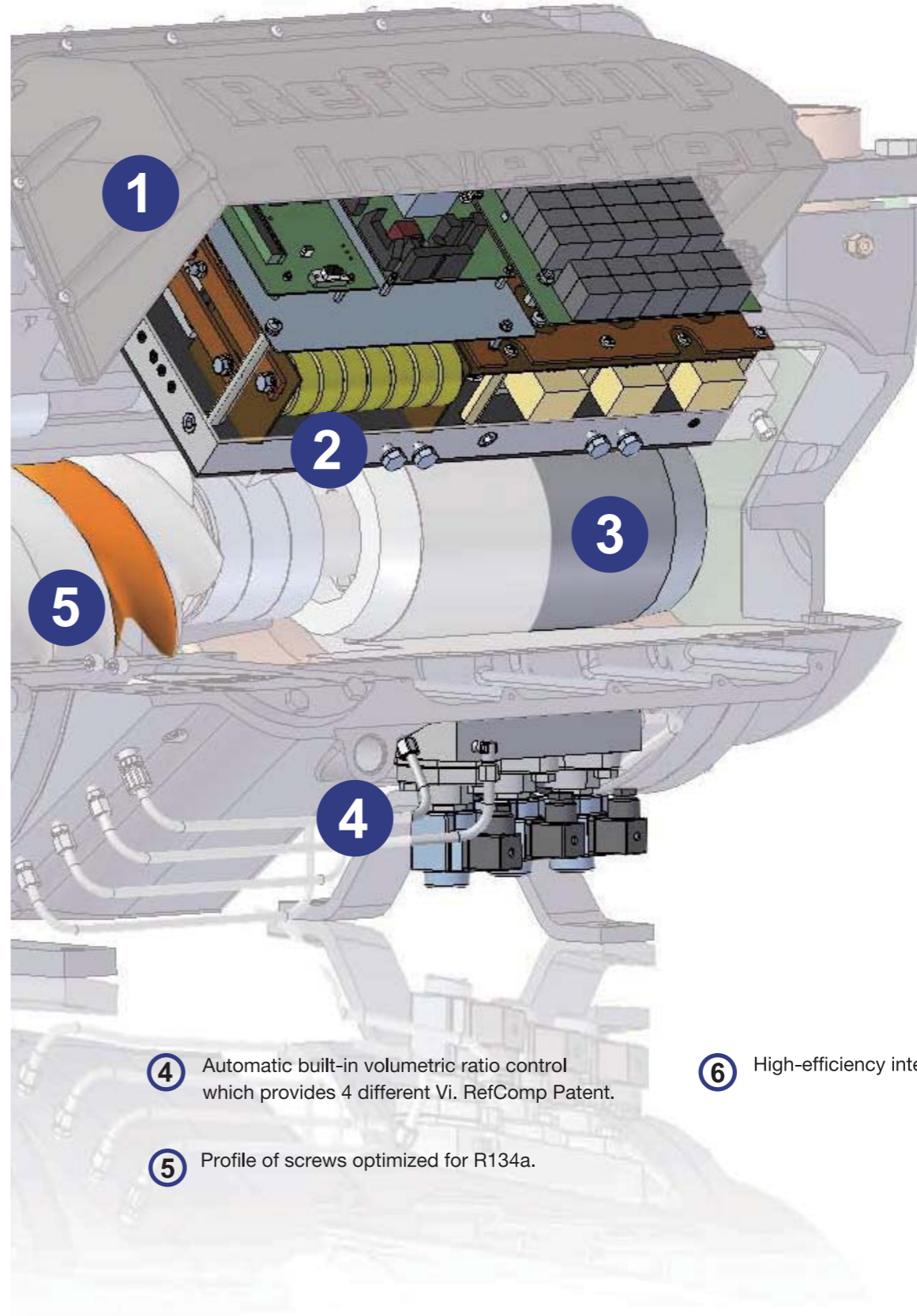
- ① Inverter integrated with the compressor.
- ② Inverter cooling through refrigerant with temperature automatic control. RefComp Patent.
- ③ Electrical motor optimized for high efficiency at all operating frequencies.



134-I-325-375-415
134-I-330-380-420



RefComp



- ④ Automatic built-in volumetric ratio control which provides 4 different Vi. RefComp Patent.
- ⑤ Profile of screws optimized for R134a.

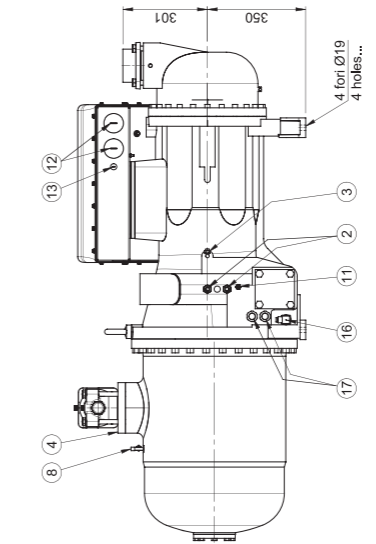
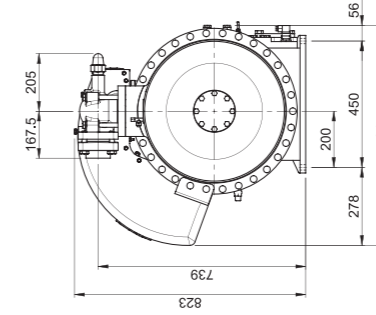
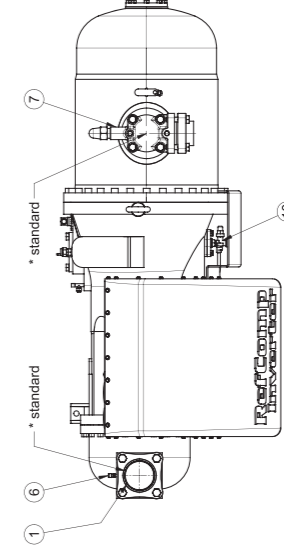
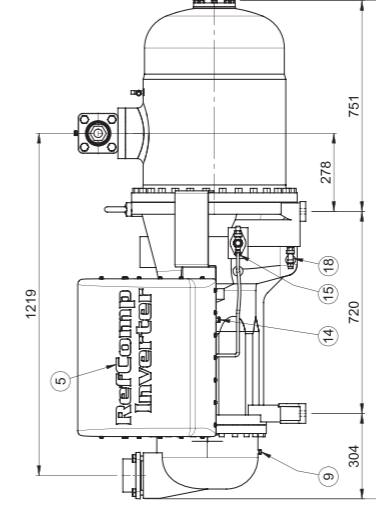
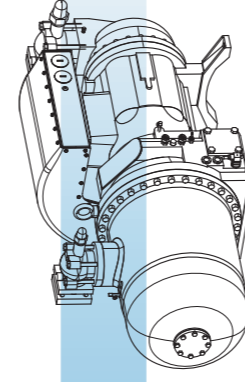
- ⑥ High-efficiency integrated oil separator.

TECHNICAL DATA

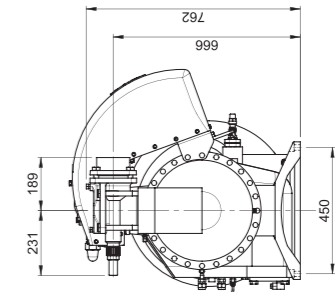
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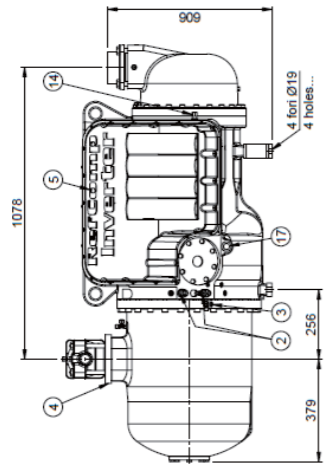
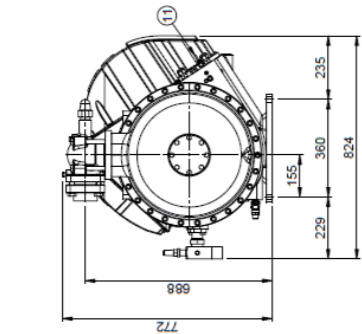
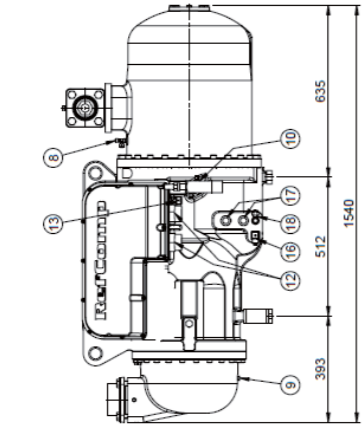
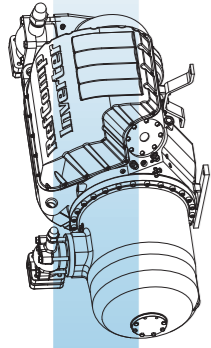
MODEL		SMALL SIZE												
		134-I-95	134-I-105	134-I-125	134-I-135	134-I-155	134-I-175	134-I-215	134-I-225	134-I-245	134-I-295	134-I-325	134-I-375	134-I-415
Displacement 70 [Hz]	[m³/h]	378	430	482	532	578	672	784	896	1008	1127	1274	1400	1540
Weight	[Kg]	560	568	582	588	710	720	730	980	990	1000	1380	1410	1460
Oil charge	[dm³]	11	11	11	11	17	17	17	23	23	23	25	25	25
Crankcase heater		200W-230V/1/50(60)Hz												
Discharge connection internal ø	[mm/inch]	54 2 1/8"	54 2 1/8"	54 2 1/8"	67 2 5/8"	80 3 1/8"	80 3 1/8"	80 3 1/8"	80 3 1/8"	80 3 1/8"	80 3 1/8"	104,8 4 1/8"	104,8 4 1/8"	104,8 4 1/8"
Suction connection internal ø	[mm/inch]	80 3 1/8"	80 3 1/8"	92 3 5/8"	92 3 5/8"	104,8 4 1/8"	104,8 4 1/8"	104,8 4 1/8"	104,8 4 1/8"	104,8 4 1/8"	104,8 4 1/8"	133 5 1/4"	133 5 1/4"	133 5 1/4"
Compressor power supply		400 [V] /3/50 [Hz] - 460 [V] /3/60 [Hz]												
Inverter insulation		IP 54												
FLA	[A]	118	132	145	158	179	198	200	268	300	317	373	416	473



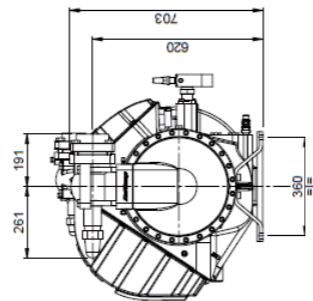
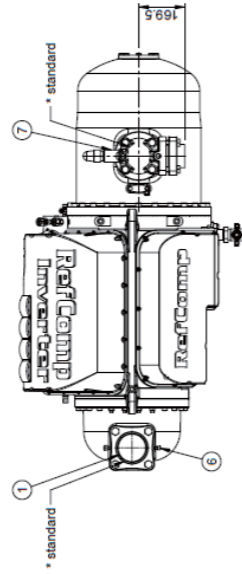
With suction shut-off valve



134-I-225_245_295



With suction shut-off valve



RefComp

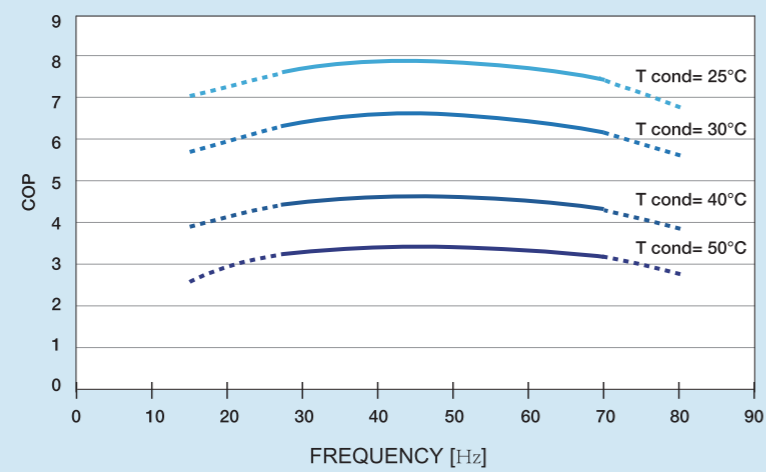
MODEL		FULL SIZE												
		134-I-100	134-I-110	134-I-130	134-I-140	134-I-160	134-I-180	134-I-220	134-I-230	134-I-250	134-I-300	134-I-330	134-I-380	134-I-420
Displacement 70 [Hz]	[m ³ /h]	378	430	482	532	578	672	784	896	1008	1127	1274	1400	1540
Weight	[Kg]	560	568	582	588	780	790	800	980	990	1000	1380	1410	1460
Oil charge	[dm ³]	11	11	11	11	17	17	17	23	23	23	25	25	25
Crankcase heater		200W-230V/1/50(60)Hz												
Discharge connection internal ø	[mm/inch]	54 2 1/8"	54 2 1/8"	54 2 1/8"	67 2 5/8"	80 3 1/8"	80 3 1/8"	80 3 1/8"	80 3 1/8"	80 3 1/8"	80 3 1/8"	104,8 4 1/8"	104,8 4 1/8"	104,8 4 1/8"
Suction connection internal ø	[mm/inch]	80 3 1/8"	80 3 1/8"	92 3 5/8"	92 3 5/8"	104,8 4 1/8"	104,8 4 1/8"	104,8 4 1/8"	104,8 4 1/8"	104,8 4 1/8"	104,8 4 1/8"	133 5 1/4"	133 5 1/4"	133 5 1/4"
Compressor power supply		400 [V] /3/50 [Hz] - 460 [V] /3/60 [Hz]												
Inverter insulation		IP 54												
FLA	[A]	142	165	182	196	226	250	285	338	350	350	470	525	560

BENEFITS

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HIGH EFFICIENCY AT PARTIAL LOADS

$T_{ev} = 3^{\circ}\text{C}$

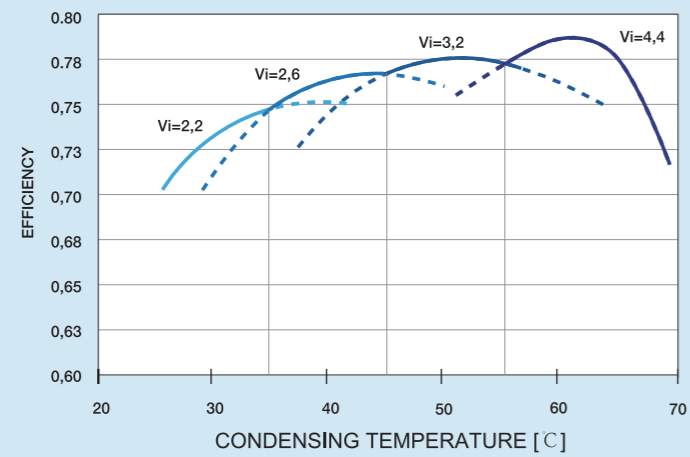


The possibility of reducing the rotational speed of the engine at part load combined with the optimization of fluidynamics inside the compressor provides a performance boost in terms of ESEER: +14% compared with a traditional screw compressor equal size.

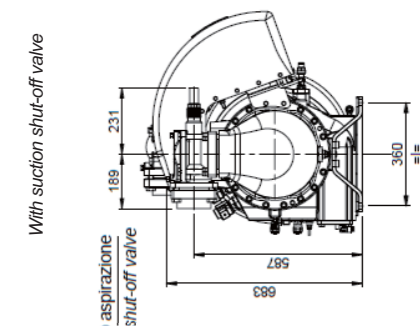
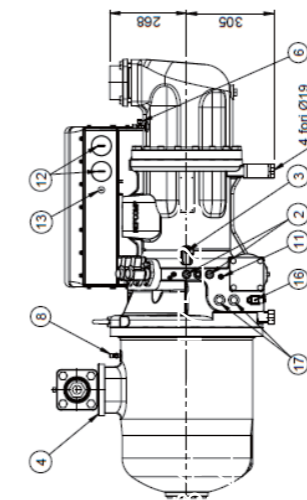
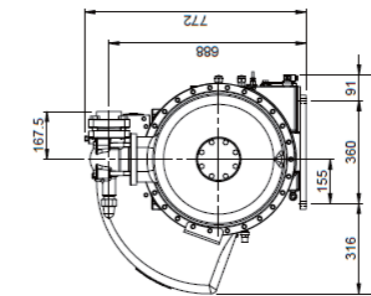
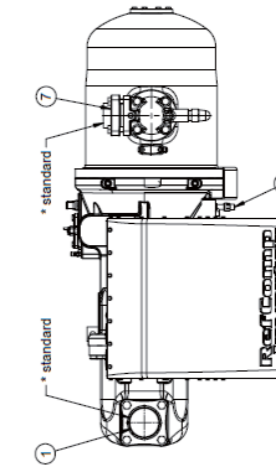
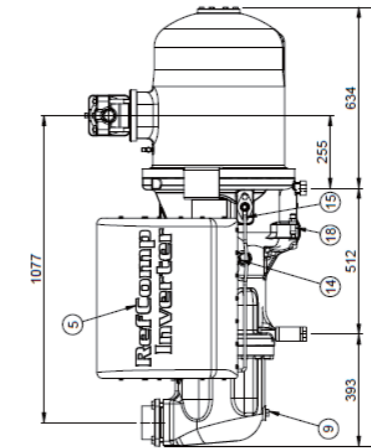
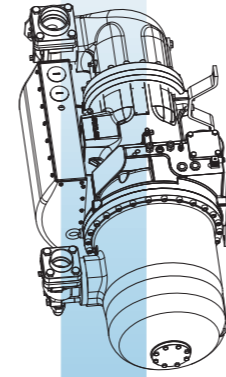
MAXIMUM ADAPTABILITY TO DIFFERENT OPERATING CONDITIONS

EFFICIENCY

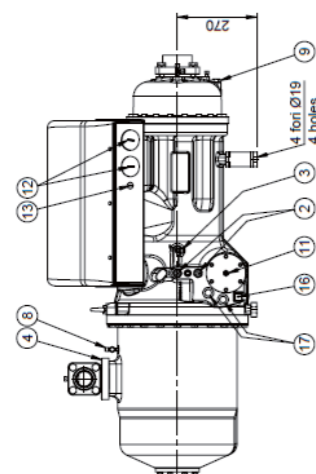
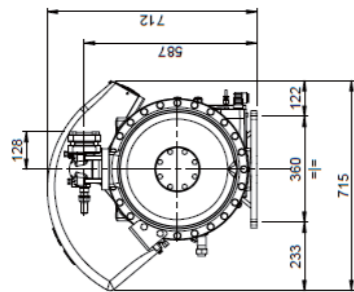
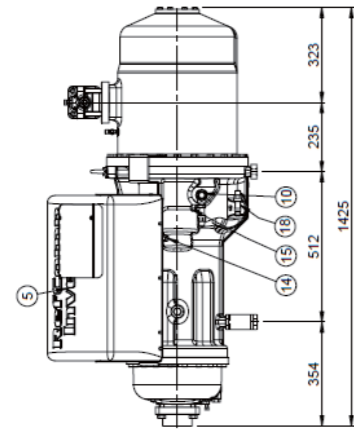
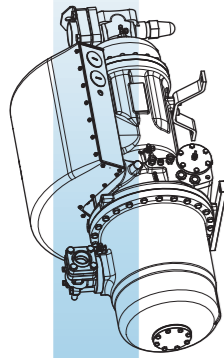
$T_{ev} = 3^{\circ}\text{C}$



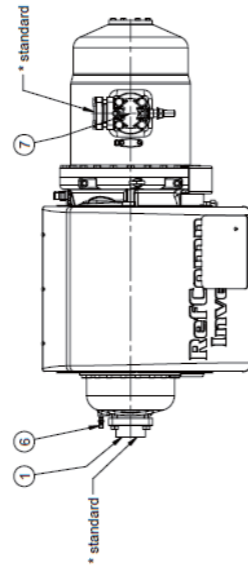
Innovative built-in volumetric ratio control (Patent RefComp) permits, used in conjunction with the inverter, an increase in terms of ESEER of 26% compared to a traditional screw compressor of the same size.



134-I-95_105_125_135
134-I-100_110_130_140



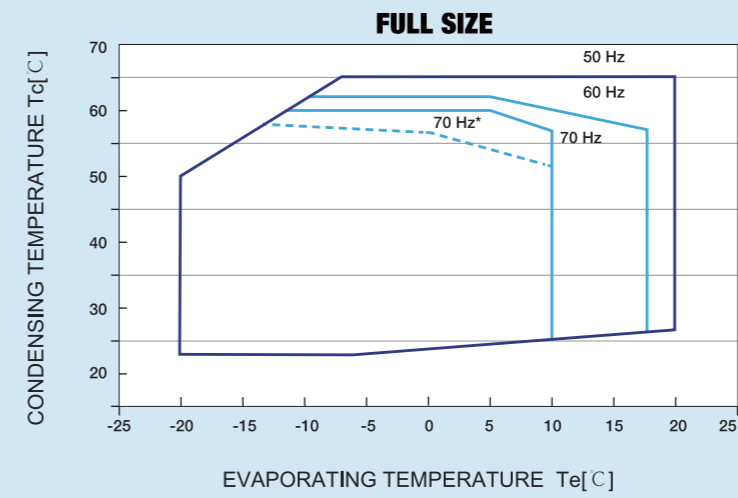
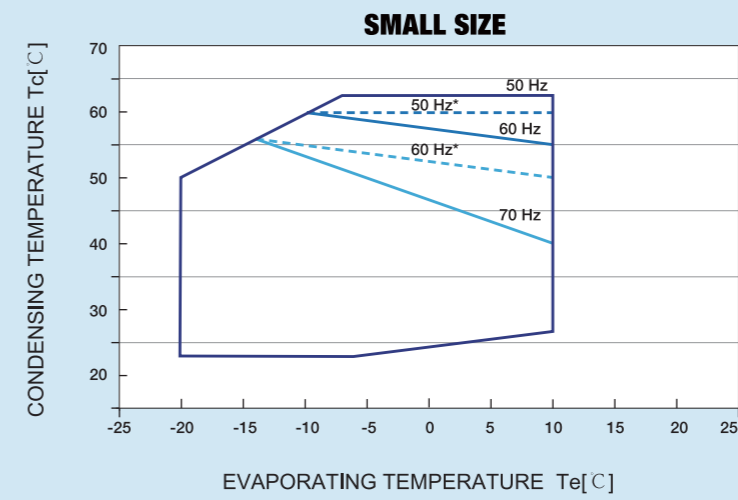
With suction shut-off valve



RefComp

ENVELOPE

MAXIMUM ADAPTABILITY TO DIFFERENT OPERATING CONDITIONS



For more detail information, please refer to Refcomp technology.

PERFORMANCES R134a

T ev = 2 [°C] ; T cond = 50 [°C]									
MODEL	30 [Hz]			50 [Hz]			70 [Hz]		
	Q0 [kW]	Pa [kW]	COP	Q0 [kW]	Pa [kW]	COP	Q0 [kW]	Pa [kW]	COP
134-IS 134-IV									
134-IS-100 134-IV-100	82,5	28,9	2,86	139,2	48,9	2,85	190,2	72,3	2,63
134-IS-110 134-IV-110	93,5	32,2	2,91	157,8	54,4	2,9	215,6	80,6	2,68
134-IS-130 134-IV-130	105,3	36,1	2,91	177,6	61,2	2,9	242,7	90,5	2,68
134-IS-140 134-IV-140	113,4	38,9	2,92	191,3	65,8	2,91	261,4	97,4	2,68
134-IS-160 134-IV-160	136,6	43,8	3,12	230,5	74,2	3,11	315	109,7	2,87
134-IS-180 134-IS-180	153,7	48,4	3,17	259,4	82	3,16	354,4	121,4	2,92
134-IS-220 134-IV-220	177,3	55,3	3,21	299,1	93,6	3,2	408,7	138,5	2,95
134-IS-230 134-IV-230	206,2	65,4	3,15	348	110,8	3,14	475,5	163,9	2,9
134-IS-250 134-IV-250	233,5	73,3	3,19	394	124,1	3,18	538,3	183,6	2,93
134-IS-300 134-IV-300	249,5	77,5	3,22	421	131,2	3,21	575,3	194,1	2,96
134-IS-330 134-IV-330	291,7	91	3,21	492,2	154,1	3,19	672,6	228	2,95
134-IS-380 134-IV-380	329,4	101,7	3,24	555,8	172,2	3,23	759,5	254,8	2,98
134-IS-420 134-IV-420	367,8	115,5	3,18	620,6	195,5	3,17	848	289,3	2,93

KEY / LEGENDA

Q₀ = Cooling Capacity [kW] - Pa = Input Power [kW] - T_{ev} = Evaporating temperature [°C] - T_{cond} = Condensing temperature [°C] - Liquid subcooling 5K
 -Suction gas superheat 10K

T ev = 5 [°C] ; T cond = 38 [°C]									
MODEL	30 [Hz]			50 [Hz]			70 [Hz]		
	Q ₀ [kW]	Pa [kW]	COP	Q ₀ [kW]	Pa [kW]	COP	Q ₀ [kW]	Pa [kW]	COP
134-IA 134-IV									
134-IA-100 134-IV-100	117,6	24,1	4,87	198,5	40,9	4,86	271,2	60,5	4,48
134-IA-110 134-IV-110	132,7	26,8	4,95	224	45,4	4,93	306,1	67,2	4,55
134-IA-130 134-IV-130	148,7	30,1	4,95	250,9	50,9	4,93	342,9	75,3	4,55
134-IA-140 134-IV-140	160,1	32,3	4,96	270,2	54,6	4,95	369,2	80,8	4,57
134-IA-160 134-IV-160	177,4	33,7	5,26	299,3	57,1	5,25	408,9	84,4	4,84
134-IA-180 134-IV-180	209,2	39,2	5,34	353,1	66,3	5,32	482,4	98,1	4,92
134-IA-220 134-IV-220	239,5	45,2	5,3	404,2	76,6	5,28	552,3	113,3	4,87
134-IA-230 134-IV-230	279,3	52,6	5,31	471,4	89	5,3	644,1	131,7	4,89
134-IA-250 134-IV-250	318,1	59,5	5,34	536,8	100,8	5,33	733,5	149,1	4,92
134-IA-300 134-IV-300	339,2	63,4	5,35	572,3	107,4	5,33	782,1	158,9	4,92
134-IA-330 134-IV-330	397,5	74,4	5,34	670,7	126	5,33	916,5	186,4	4,92
134-IA-380 134-IV-380	448,8	84	5,34	757,4	142,2	5,32	1034,9	210,5	4,92
134-IA-420 134-IV-420	501,1	93,8	5,34	845,6	158,8	5,32	1155,5	235	4,92

KEY / LEGENDA

Q₀ = Cooling Capacity [kW] - Pa = Input Power [kW] - T_{ev} = Evaporating temperature [°C] - T_{cond} = Condensing temperature [°C] - Liquid subcooling 5K
 -Suction gas superheat 10K