Johnson Controls - Hitachi Air Conditioning

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https://industrial.hitachiaircon.com/en/compressor/scroll

SALES OFFICES

Johnson Controls - Hitachi Air Conditioning Europe SAS
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Johnson Controls - Hitachi Air Conditioning North America LLC
8304 Esters Blvd. Suite 810, Irving, Texas, USA 75063

Johnson Controls - Hitachi Wanbao Compressor (Guangzhou) Co., Ltd. (China)
No.1086 Cheng Ao East Road, Conghua City,Guangzhou 510935, China

CERTIFICATION

Concerning [Quality Management Systems]
ISO 9000 series
Hitachi-Johnson Controls Air Conditioning, Inc.
Shimizu Factory
JQA-1084 obtained in November 1995

Concerning [Environmental Management Systems]
ISO 14000 series
Hitachi-Johnson Controls Air Conditioning, Inc.
Shimizu Factory
EC97J1107 obtained in October 1997

Concerning
[Occupational Health and Safety Management Systems]
ISO45001/ OHSAS 18001
Hitachi-Johnson Controls Air Conditioning, Inc.
Shimizu Factory
WC18J0002 obtained in July 2018

GB/T28001-2011 / OHSAS18001:2007
Johnson Controls-Hitachi Wanbao Compressor (Guangzhou) Co., Ltd.
Initial Issue Date: April 30, 2006
[Certificate No. 15918S20003R4M]

GB/T19001-2016 / ISO9001:2015
Johnson Controls-Hitachi Wanbao Compressor (Guangzhou) Co., Ltd.
Initial Issue Date: July 8, 2004
[Certificate No. 15918Q20011R6M]

GB/T24001-2016 / ISO14001:2015
Johnson Controls-Hitachi Wanbao Compressor (Guangzhou) Co., Ltd.
Initial Issue Date: April 30, 2006
[Certificate No. 15918E20005R4M]

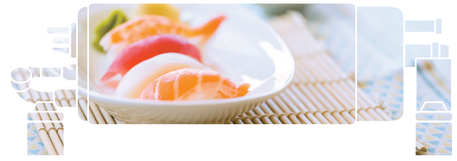
RE-202102THQ-G

HITACHI

For Refrigeration Application

SCROLL COMPRESSORS

R290
R1270
R448A
R449A
R410A
R404A

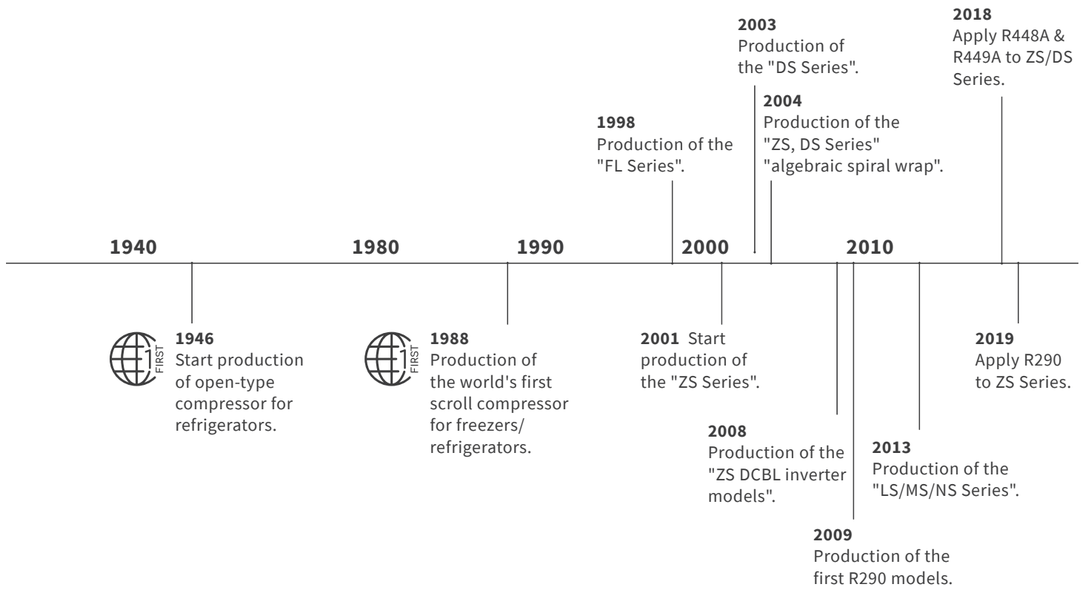


Total Solution For Refrigeration

Hitachi's high quality compressors contribute at various stages in the cold chain, by keeping products at low temperature without interruption between the producing, transporting and consuming processes.

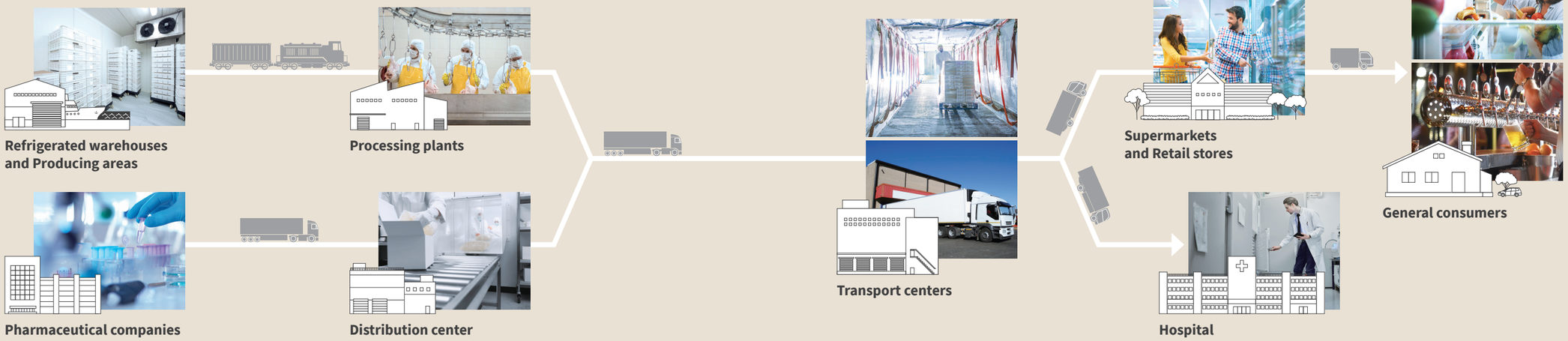
- **Compact size & lightweight**
- **Low sound level & Low vibration**
- **High reliability & quality**
- **High efficiency thanks to advanced technology**

History

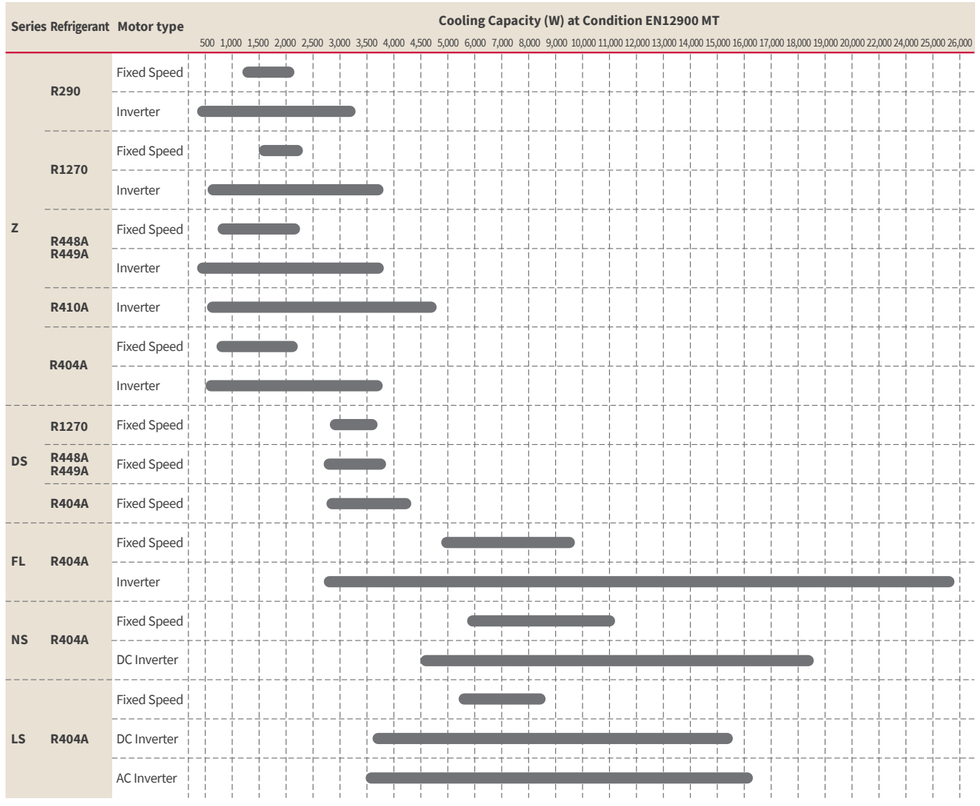


Cold Chain Management

Cold chains play an important role in delivering fresh foods and pharmaceutical drugs in a safe, fresh state to consumers.



Line Up Overview



Test Condition

	Te(°C)	Tc(°C)	SC(deg)	Ts(°C)
EN12900 MT	-10.0	45.0	0	20.0

Z Series

- Rated Output: 400W~1,500W
- Low Height due to Horizontal Type
- R290, R1270, R448A, R449A, R410A, R404A
- BLDC inverter technology
- Wide working range for Medium and Low temperature
- Suitable for self-contained type showcase
- Suitable for water-loop solution

DS Series

- Rated Output: 1,500W~2,200W
- Low Height due to Horizontal Type
- R1270, R448A, R449A, R404A
- Wide working range for Medium and Low temperature
- Suitable for self-contained type showcase
- Suitable for water-loop solution

FL Series

- Rated Output: 2,200W~6,000W
- Low Height due to Horizontal Type
- Large cooling capacity
- Wide working range for Medium and Low temperature
- Suitable for overall design from self-contained to remote type showcase.

LS, NS Series

- Rated Output: 2,200W~4,500W
- Vertical Type
- Exclusive design for each temperature range
- Liquid injection available
- Oil sight glass available
- Tandem ready configurations
- Suitable for cold room and showcases

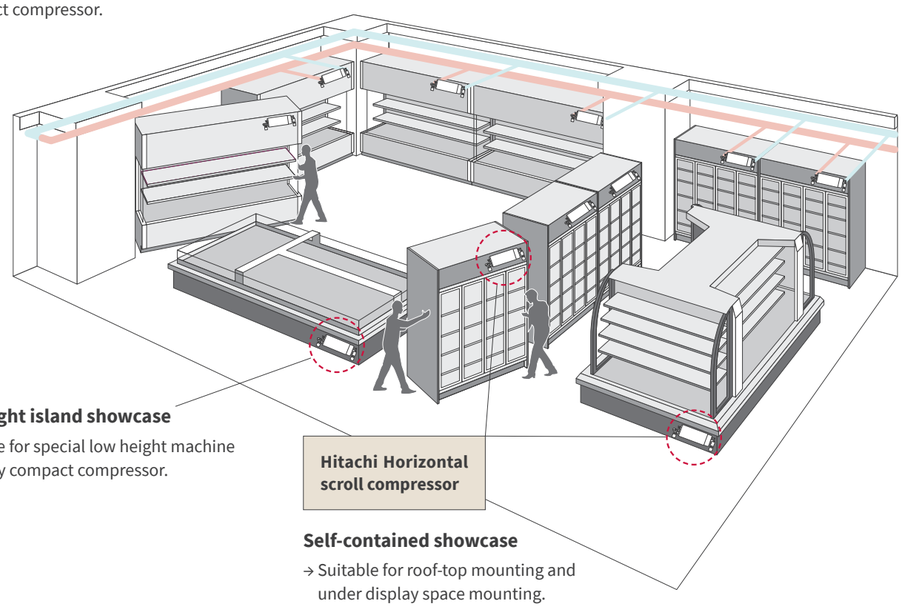
Various Range Of Application

Space-Saving Retail Solution

→ More display space by smaller machine room with compact compressor.
→ No out door unit to be installed.
→ Less maintenance cost by Low-noise, low vibration.
→ Energy saving by BLDC inverter compressor.

Water-loop system by self-contained showcase

→ Suitable for roof top mounting by compact compressor.



Low height island showcase

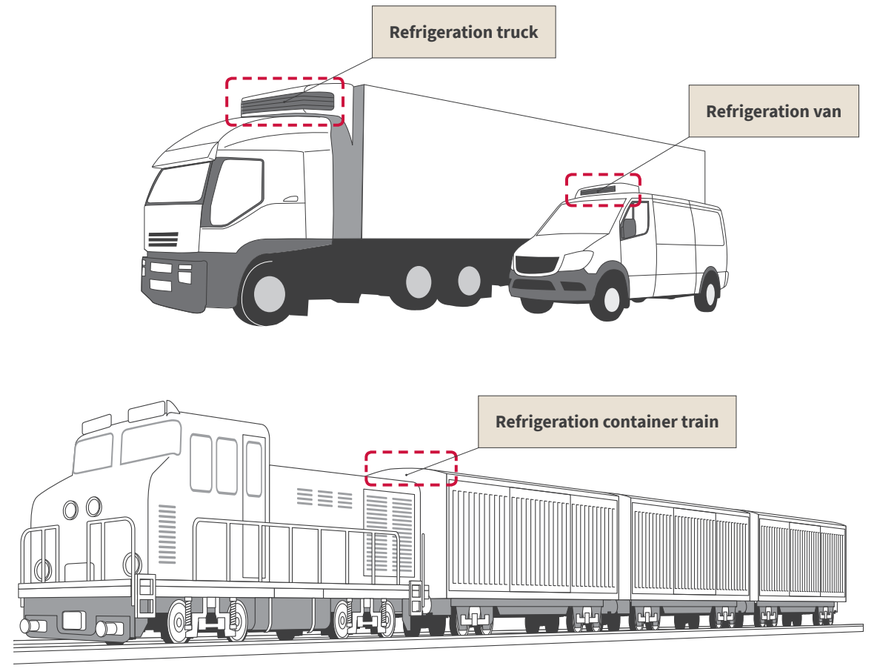
→ Suitable for special low height machine room by compact compressor.

Self-contained showcase

→ Suitable for roof-top mounting and under display space mounting.

Transportation Solution*

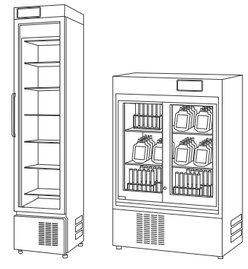
→ Energy saving by light compressor.
→ Small machine room and larger refrigeration space by compact compressor.
→ Suitable for EV vehicles.
→ Precise temperature control.



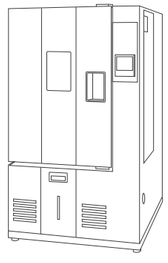
*Application review is required

Bio-Technological, Medical, And Chemical Solution

→ Ultra low temperature until -45.0°C.
→ Special precise temperature control by DCBL inverter compressor.
→ High level quality control by Low-noise, low-vibration.
→ Energy saving.
→ Suitable for customized design by compact compressor.



Biomedical freezer



Environmental testing equipment

Low Sound Level & Low Vibration

Low-noise low-vibration compressors provide a safe and pleasant low-temperature environment.

Features

Low Noise

The human ear is sensitive to low-frequency sounds, so noise generated in low frequencies causes particular discomfort. With Hitachi scroll compressors there is little low-frequency noise and ear-grating mechanical sounds are greatly reduced.

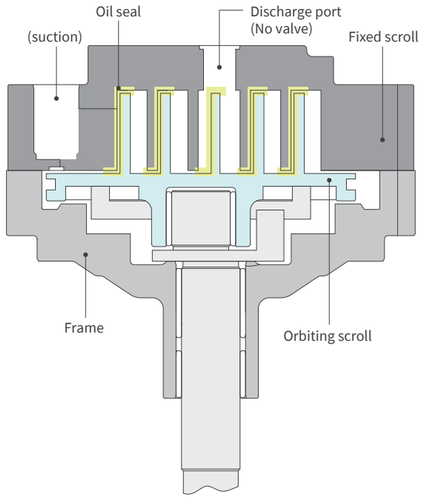
→ Low Vibration.
→ Less torque fluctuation than other type of compressors.

Noise level

ZS7516S1 → 55dB(A)

DS1836S1 → 63dB(A)

When measured at a position 30cm away from the compressor surface (at EVP/COND=-10.0/45.0°C)



Cross section of scroll compressor

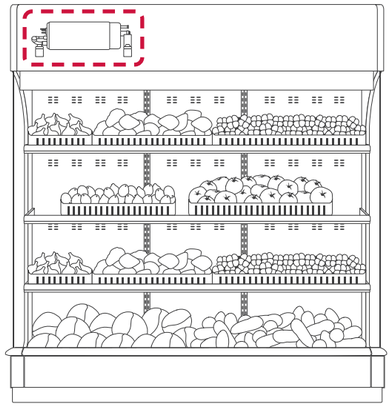
Scroll compressors generate much less noise than rotary compressors.

Benefits

Using a low-noised and low-vibration compressor has advantages in terms of maintenance and freshness of the products. Creating a pleasanter and safer low-temperature environment.

Showcase using Hitachi horizontal scroll compressor

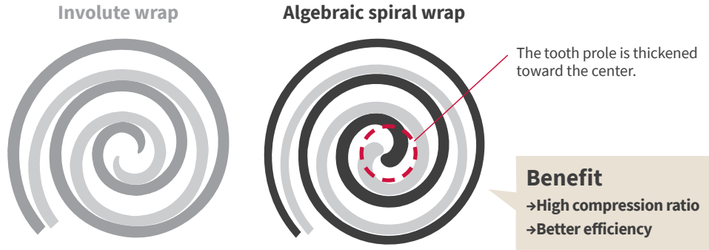
→ Low vibration so less damage to surrounding equipment
→ Reduced maintenance costs
→ Little grating noise and a pleasant environment
→ No expenditure on noise and vibration countermeasures
→ No deterioration of fresh produce

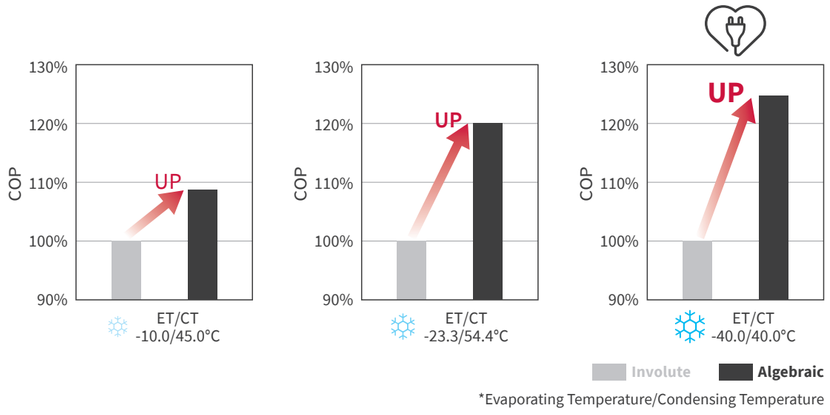


High Efficiency By Advanced Technology

High Efficiency At Low Temperature Usage By "Algebraic Spiral Wrap"

The compressor chamber volume in the tooth profile center is smaller and the compression ratio is larger, compared with the involute, thus efficiency is higher in a low temperature zone.



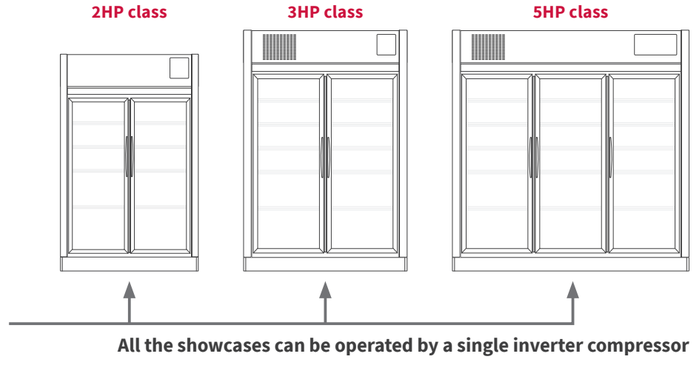


*Evaporating Temperature/Condensing Temperature

Platform Design

With its ability to cover a wide range of capacities, a single inverter compressor model can be used in showcases of varying shapes and sizes.

Showcases using conventional 2HP class, 3HP class and 5HP class fixed compressors



All the showcases can be operated by a single inverter compressor

High Reliability & Comfortable Operation

☆ Advantages

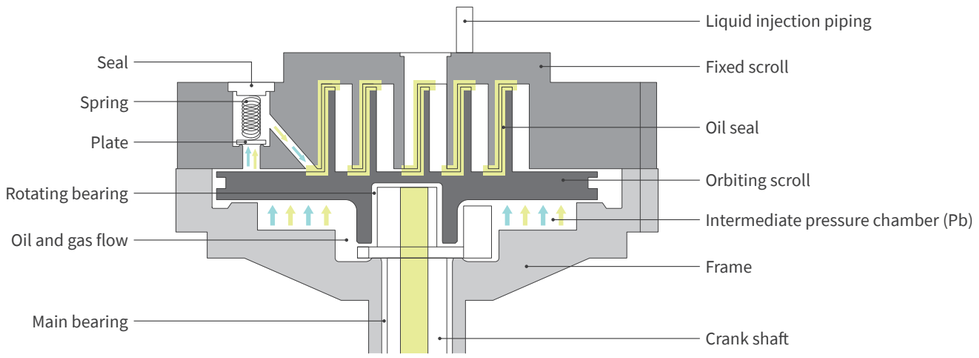
Merits of Hitachi Pioneering High-Side Pressure Design

• High reliability • Low noise and low vibration • High performance

(1) A simple structure leading to fewer superfluous parts

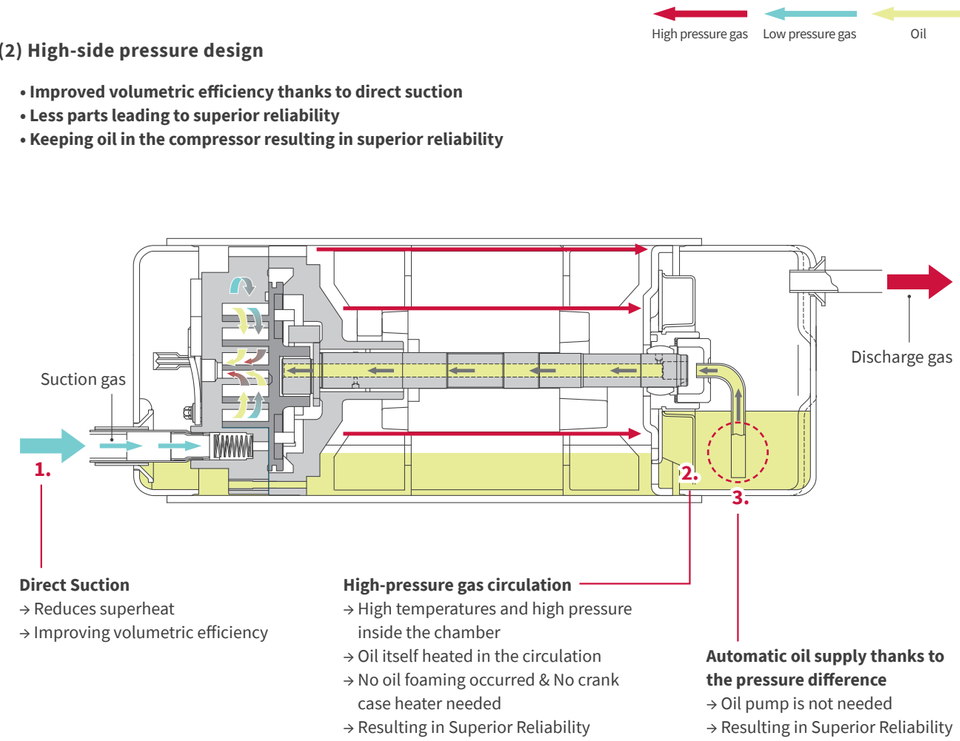
- **Damage is abated, improving reliability**
- **Compressor efficiency is improved**

Intermediate pressure control valve



(2) High-side pressure design

- **Improved volumetric efficiency thanks to direct suction**
- **Less parts leading to superior reliability**
- **Keeping oil in the compressor resulting in superior reliability**

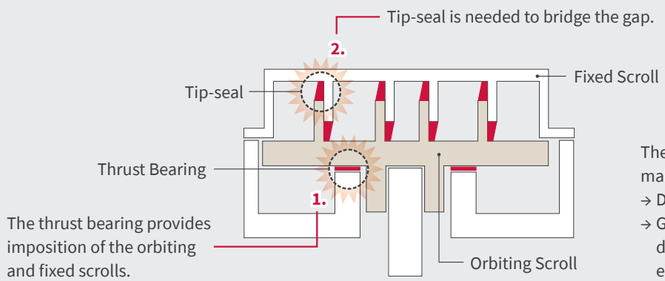


Direct Suction
→ Reduces superheat
→ Improving volumetric efficiency

High-pressure gas circulation
→ High temperatures and high pressure inside the chamber
→ Oil itself heated in the circulation
→ No oil foaming occurred & No crank case heater needed
→ Resulting in Superior Reliability

Automatic oil supply thanks to the pressure difference
→ Oil pump is not needed
→ Resulting in Superior Reliability

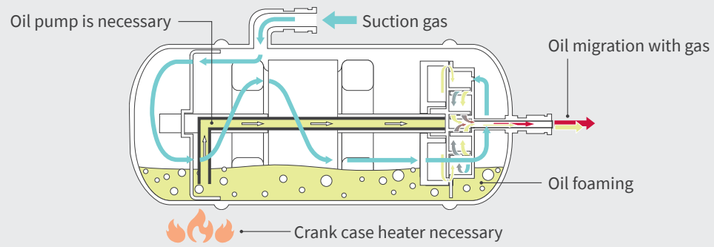
Low-side pressure design (Thrust Bearing System)



There are many sliding components, making for a complex structure.
→ Damage occurs easily
→ Gaps form easily, resulting in degradation of compression efficiency

Low-side pressure design

After starting, pressure and temperature decreases and refrigerant bubbles come over from the oil.



Nomenclature

Z Series & DS Series (Type A)

Z	S	75	16	S	1

Diameter
ZS: Horizontal Type (Stator core O/D ϕ112mm)
DS: Horizontal Type (Stator core O/D ϕ132mm)

Rated Output
40: 400W (0.5HP class)
60: 600W (0.75HP class)
75: 750W (1.0HP class)
77: 770W (1.0HP class)
11: 1,100W (1.5HP class)
12: 1,250W (1.7HP class)
15: 1,500W (2.0HP class)
18: 1,800W (2.5HP class)
22: 2,200W (3.0HP class)

Displacement
84: 8.4cm^3/ revolution
98: 9.8cm^3/revolution
13: 12.5cm^3/ revolution
16: 15.9cm^3/ revolution
20: 20.1cm^3/ revolution
29: 29.1cm^3/ revolution
34: 34.0cm^3/ revolution
36: 35.7cm^3/ revolution
44: 44.0cm^3/ revolution

Power Source (Rated)
S: 1phase 220-240V 50Hz
V: 1phase 380-415V 50Hz
P: 1phase 110V 60Hz
X: 1phase 208-230V 60Hz
D: DC inv (1phase 220-240V 50/60Hz)

History
1: Original

(Type B)

Z	D	125	X	C	1

Diameter
ZS, ZD:Horizontal Type (Stator core O/D ϕ112mm)

Displacement
098: 9.8cm^3/ revolution
125: 12.5cm^3/ revolution
201: 20.1cm^3/ revolution

Motor Version
X: Motor Version X

Development Year
C: Oct/ 2012 -Sep/ 2013
D: Oct/ 2013 -Sep/ 2014

History
1: Original

FL Series

F	L	50	0	D	L	V	-	90	D	3

Refrigerant
F: R404A

Application
L: Refrigeration (Low temp.)

Nominal Horse Power
30: 3.0
50: 5.0
60: 6.0
80: 8.0

History
0: Original

Diameter
D: (Inner Diameter: ϕ160)
E: (Inner Diameter: ϕ235)

Displacement
56: 56.0cm^3/ revolution
90: 90.0cm^3/ revolution
144: 144.0cm^3/ revolution

Power Source (Rated)
A: 3phase 200, 200-220V 50/60Hz
D: 3phase 380-415V 50, 50/60Hz

Other Specification
3: Main Connection: Flange Terminal Box: IP20

Motor Type
V: AC Inverter

Appearance
L: Horizontal Type

LS, NS Series

N	S	50	0	D	H	V	-	80	D	2	Y	G

Application
L: For low temperature freezer
N: For refrigerated counter

Refrigerant
S: R404A

Specification Code
Output power (HP class) × 10

Design Revision
Arrange in order of 0,1,2,3 ,4…

Series number
D: ϕ160

Orientation
H: Vertical type
L: Horizontal type

Motor Type
V: AC INV
D: DC INV
No indications: Fixed speed

Nominal displacement
Discharge Volume(cm^3/rev)

Power Source
C: 3ϕ, 380V, 50Hz 380-400V, 60Hz
D: 3ϕ, 380-415V, 50Hz 440V,60Hz
Q: 1ϕ,220-240V, 50Hz

Pipe connection
1: Screw joint
2: Brazing connection
B: For transport

Model Type
Standard-Without mark
Y: Oil balanced pipe connection with discharge pipe

Origin Marking
G: Guangzhou

General Data

Z Series

DC inverter

Model			ZS098XL1								ZS159XL1							
Rated Output		W	770								1,250							
Displacement		cm^3/rev.	9.8								15.9							
Speed Range		Hz	25-100								25-100							
Power supply			DC inverter								DC inverter							
Motor Type			DCBL								DCBL							
Overload Protection			OH thermistor(Temperature detection) + Inverter control								OH thermistor(Temperature detection) + Inverter control							
Scroll Profile			Algebraic								Algebraic							
Weight (include oil)		kg	10.8								11.1							
		lbs	23.8								24.5							
Oil			POE								POE							
Oil Charge		cm^3	550								650							
Test Condition			EN12900 MT		ARI540 MT		EN12900 LT		ARI540 LT		EN12900 MT		ARI540 MT		EN12900 LT		ARI540 LT	
		N(Hz)	25	100	25	100	25	100	25	100	25	100	25	100	25	100	25	100
Performance	R290 Cooling Capacity	W	343	1,580	352	1,656	152	618	175	699	645	2,584	653	2,726	264	1,040	308	1,183
		BTU/h	1,171	5,395	1,202	5,657	520	2,110	596	2,387	2,204	8,826	2,228	9,311	901	3,552	1,051	4,040
Certificate			CE								CE							

Model			ZS201XL1								ZS098XJ1							
Rated Output		W	1,500								770							
Displacement		cm^3/rev.	20.1								9.8							
Speed Range		Hz	25-91.7								25-100							
Power supply			DC inverter								DC inverter							
Motor Type			DCBL								DCBL							
Overload Protection			OH thermistor(Temperature detection) + Inverter control								OH thermistor(Temperature detection) + Inverter control							
Scroll Profile			Algebraic								Algebraic							
Weight (include oil)		kg	10.9								10.8							
		lbs	24.0								23.8							
Oil			POE								POE							
Oil Charge		cm^3	650								550							
Test Condition			EN12900 MT		ARI540 MT		EN12900 LT		ARI540 LT		EN12900 MT		ARI540 MT		EN12900 LT		ARI540 LT	
		N(Hz)	25	91.7	25	91.7	25	91.7	25	91.7	25	100	25	100	25	100	25	100
Performance	R290 Cooling Capacity	W	860	3,058	884	3,173	349	1,304	395	1,474	-	-	-	-	-	-	-	-
		BTU/h	2,937	10,444	3,020	10,836	1,194	4,454	1,348	5,035	-	-	-	-	-	-	-	-
	R1270 Cooling Capacity	W	-	-	-	-	-	-	-	-	433	2,023	447	2,138	194	782	223	894
		BTU/h	-	-	-	-	-	-	-	-	1,479	6,909	1,525	7,302	663	2,670	761	3,052
Certificate			CE								CE							

Model			ZS159XJ1								ZS201XJ1							
Rated Output		W	1,250								1,500							
Displacement		cm^3/rev.	15.9								20.1							
Speed Range		Hz	25-100								25-91.7							
Power supply			DC inverter								DC inverter							
Motor Type			DCBL								DCBL							
Overload Protection			OH thermistor(Temperature detection) + Inverter control								OH thermistor(Temperature detection) + Inverter control							
Scroll Profile			Algebraic								Algebraic							
Weight (include oil)		kg	11.1								10.9							
		lbs	24.5								24.0							
Oil			POE								POE							
Oil Charge		cm^3	650								650							
Test Condition			EN12900 MT		ARI540 MT		EN12900 LT		ARI540 LT		EN12900 MT		ARI540 MT		EN12900 LT		ARI540 LT	
		N(Hz)	25	100	25	100	25	100	25	100	25	91.7	25	91.7	25	91.7	25	91.7
Performance	R1270 Cooling Capacity	W	816	3,313	843	3,525	323	1,299	381	1,488	1,088	3,868	1,130	4,078	416	1,622	495	1,842
		BTU/h	2,786	11,314	2,878	12,037	1,105	4,436	1,301	5,082	3,717	13,210	3,861	13,927	1,420	5,538	1,689	6,291
Certificate			CE								CE							

Test Condition

	Te(°C)	Tc(°C)	SC(deg)	Ts(°C)
EN12900 MT	-10.0	45.0	0	20.0
EN12900 LT	-35.0	40.0	0	20.0
ARI540 MT	-6.7	48.9	0	18.3
ARI540 LT	-31.7	40.6	0	18.3

Note:
Algebraic: Type of scroll wrap improved performance at low temperature condition.

Model			ZS7798D1								ZS1216D1							
Rated Output		W	770								1,250							
Displacement		cm^3/rev.	9.8								15.9							
Speed Range		Hz	25-100								25-100							
Power supply			DC inverter								DC inverter							
Motor Type			DCBL								DCBL							
Overload Protection			OHR(Overheat relay)								OHR(Overheat relay)							
Scroll Profile			Algebraic								Algebraic							
Weight (include oil)		kg	10.8								11.1							
		lbs	23.8								24.5							
Oil			POE								POE							
Oil Charge		cm^3	550								650							
Test Condition			EN12900 MT		ARI540 MT		EN12900 LT		ARI540 LT		EN12900 MT		ARI540 MT		EN12900 LT		ARI540 LT	
		N(Hz)	25	100	25	100	25	100	25	100	25	100	25	100	25	100	25	100
Performance	R448A Cooling Capacity	W	400	1,871	416	1,995	160	642	187	746	755	3,067	787	3,295	262	1,047	314	1,226
		BTU/h	1,366	6,391	1,422	6,812	548	2,193	638	2,548	2,578	10,473	2,688	11,253	893	3,575	1,073	4,185
	R449A Cooling Capacity	W	400	1,871	416	1,995	160	642	187	746	755	3,067	787	3,295	262	1,047	314	1,226
		BTU/h	1,366	6,391	1,422	6,812	548	2,193	638	2,548	2,578	10,473	2,688	11,253	893	3,575	1,073	4,185
	R404A Cooling Capacity	W	419	1,958	425	2,034	181	729	208	835	790	3,211	802	3,359	301	1,207	355	1,390
		BTU/h	1,431	6,686	1,451	6,946	617	2,489	710	2,853	2,698	10,967	2,740	11,470	1,027	4,124	1,214	4,747
Certificate			CE/UL (R404A/R448A only)								CE/UL (R404A/R448A only)							

Model			ZS1520D1							
Rated Output		W	1,500							
Displacement		cm^3/rev.	20.1							
Speed Range		Hz	25-91.7							
Power supply			DC inverter							
Motor Type			DCBL							
Overload Protection			OHR(Overheat relay)							
Scroll Profile			Algebraic							
Weight (include oil)		kg	10.9							
		lbs	24.0							
Oil			POE							
Oil Charge		cm^3	650							
Test Condition			EN12900 MT		ARI540 MT		EN12900 LT		ARI540 LT	
		N(Hz)	25	91.7	25	91.7	25	91.7	25	91.7
Performance	R448A Cooling Capacity	W	1,006	3,580	1,067	3,811	345	1,315	400	1,524
		BTU/h	3,436	12,225	3,645	13,015	1,178	4,492	1,367	5,204
	R449A Cooling Capacity	W	1,006	3,580	1,067	3,811	345	1,315	400	1,524
		BTU/h	3,436	12,225	3,645	13,015	1,178	4,492	1,367	5,204
	R404A Cooling Capacity	W	1,053	3,748	1,087	3,885	396	1,508	455	1,721
		BTU/h	3,596	12,801	3,713	13,268	1,354	5,149	1,553	5,876
Certificate			CE/UL (R404A/R448A only)							

Model			ZD125XC1								ZD201XC1							
Rated Output		W	750								1,500							
Displacement		cm^3/rev.	12.5								20.1							
Speed Range		Hz	16.7-80								16.7-80							
Power supply			DC inverter								DC inverter							
Motor Type			DCBL								DCBL							
Overload Protection			OH thermistor(Temperature detection) + Inverter control								OH thermistor(Temperature detection) + Inverter control							
Scroll Profile			Algebraic								Algebraic							
Weight (include oil)		kg	11.0								11.0							
		lbs	24.3								24.3							
Oil			POE								POE							
Oil Charge		cm^3	510								600							
Test Condition			EN12900 MT		ARI540 MT		EN12900 LT		ARI540 LT		EN12900 MT		ARI540 MT		EN12900 LT		ARI540 LT	
		N(Hz)	16.7	80	16.7	80	16.7	80	16.7	80	16.7	80	16.7	80	16.7	80	16.7	80
Performance	R410A Cooling Capacity	W	205	2,875	85	3,076	363	1,057	369	1,207	1,030	4,811	972	5,156	417	1,838	529	2,069
		BTU/h	699	9,820	289	10,505	1,240	3,611	1,261	4,123	3,518	16,429	3,321	17,609	1,423	6,277	1,807	7,067
Certificate			CE								CE							

General Data

Z Series

Fixed speed

Model				ZS7516S3	ZS1120S3	ZS4084S1	ZS6013S1	ZS7516S1	ZS1120S1	ZS1120S2	
Rated Output			W	750	1,100	400	600	750	1,100	1,100	
Displacement			cm³/rev.	15.9	20.1	8.4	12.5	15.9	20.1	20.1	
Power supply	Phase		ϕ	1	1	1	1	1	1	1	
	Voltage		V	220-230	220-230	220-240	220-240	220-240	220-240	220-240	
	Frequency		Hz	50	50	50	50	50	50	50	
Motor Type				CSR	CSR	CSR	CSR	CSR	CSR	CSR	
Overload Protection				Internal protector	Internal protector	Internal protector	Internal protector	Internal protector	Internal protector	Internal protector	
Scroll Profile				Involute	Involute	Involute	Involute	Involute	Involute	Algebraic	
Weight (include oil)			kg	12.9	13.6	12.4	12.6	12.9	13.6	13.6	
			lbs	28.4	30.0	27.3	27.8	28.4	30.0	30.0	
Oil				POE	POE	POE	POE	POE	POE	POE	
Oil Charge			cm³	550	650	550	550	550	650	650	
Test condition				EN12900 MT	EN12900 MT	EN12900 MT	EN12900 MT	EN12900 MT	EN12900 MT	EN12900 MT	EN12900 LT
			N(Hz)	50	50	50	50	50	50	50	50
Performance	R290	Cooling Capacity	W	1,174	1,521	-	-	-	-	-	-
			BTU/h	4,011	5,194	-	-	-	-	-	-
	R1270	Cooling Capacity	W	-	-	-	-	1,644	2,118	-	-
			BTU/h	-	-	-	-	5,616	7,234	-	-
	R449A	Cooling Capacity	W	-	-	748	1,136	1,452	1,871	-	-
			BTU/h	-	-	2,554	3,879	4,961	6,390	-	-
	R404A	Cooling Capacity	W	-	-	838	1,273	1,628	2,097	2,153	838
			BTU/h	-	-	2,862	4,347	5,559	7,161	7,352	2,862
Certificate				CE	CE	CE	CE	CE/CCC	CE/CCC	CE/CCC	

Model				ZS6013X3		ZS7516X3		ZS1120X3		ZS4084P1		ZS6013P1		ZS6013X1		ZS7516X1		ZS1120X1	
Rated Output			W	600		750		1,100		400		600		600		750		1,100	
Displacement			cm³/rev.	12.5		15.9		20.1		8.4		12.5		12.5		15.9		20.1	
Power supply	Phase		ϕ	1		1		1		1		1		1		1		1	
	Voltage		V	208-230		208-230		208-230		115		115		208-230		208-230		208-230	
	Frequency		Hz	60		60		60		60		60		60		60		60	
Motor Type				CSR		CSR		CSR		CSR		CSR		CSR		CSR		CSR	
Overload Protection				Internal protector		Internal protector		Internal protector		Internal protector		Internal protector		Internal protector		Internal protector		Internal protector	
Scroll Profile				Involute		Involute		Involute		Involute		Involute		Involute		Involute		Involute	
Weight (include oil)			kg	12.6		12.7		13.6		12.4		12.4		12.6		12.7		13.6	
			lbs	27.8		28.0		30.0		27.3		27.3		27.8		28.0		30.0	
Oil				POE		POE		POE		POE		POE		POE		POE		POE	
Oil Charge			cm³	550		550		650		550		550		550		550		650	
Test condition				EN12900 MT	ARI540 MT	EN12900 MT	ARI540 MT	EN12900 MT	ARI540 MT	EN12900 MT	ARI540 MT	EN12900 MT	ARI540 MT	EN12900 MT	ARI540 MT	EN12900 MT	ARI540 MT	EN12900 MT	ARI540 MT
			N(Hz)	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
Performance	R290	Cooling Capacity	W	1,155	1,224	1,551	1,643	1,986	2,105	-	-	-	-	-	-	-	-	-	-
			BTU/h	3,946	4,181	5,296	5,611	6,783	7,187	-	-	-	-	-	-	-	-	-	-
	R448A	Cooling Capacity	W	-	-	-	-	-	-	-	-	-	-	1,363	1,445	1,774	1,879	2,189	2,310
			BTU/h	-	-	-	-	-	-	-	-	-	-	4,654	4,936	6,057	6,417	7,477	7,889
	R449A	Cooling Capacity	W	-	-	-	-	-	-	-	-	-	-	1,363	1,445	1,774	1,879	2,189	2,310
			BTU/h	-	-	-	-	-	-	-	-	-	-	4,654	4,936	6,057	6,417	7,477	7,889
	R404A	Cooling Capacity	W	-	-	-	-	-	-	1,013	1,046	1,523	1,575	1,527	1,580	1,987	2,054	2,453	2,526
			BTU/h	-	-	-	-	-	-	3,460	3,574	5,200	5,377	5,214	5,395	6,787	7,016	8,377	8,626
Certificate				UL		UL		UL		UL		UL		UL		UL		UL	

Test Condition

	Te(°C)	Tc(°C)	SC(deg)	Ts(°C)
EN12900 MT	-10.0	45.0	0	20.0
EN12900 LT	-35.0	40.0	0	20.0
ARI540 MT	-6.7	48.9	0	18.3
ARI540 LT	-31.7	40.6	0	18.3

Note:
Algebraic: Type of scroll wrap improved performance at low temperature condition.

※Motor Type
CSR: Capacitor Starting Run
IM: Induction Motor

DS Series

Fixed speed

Model				DS1529S1		DS1836S1	DS1529V1		DS1834V1		DS2244V1	
Rated Output			W	1,500		1,800	1,500		1,800		2,200	
Displacement			cm³/rev.	29.1		35.7	29.1		34.0		44.0	
Power supply	Phase		ϕ	1		1	3		3		3	
	Voltage		V	220-240		220-240	380-415		380-415		380-415	
	Frequency		Hz	50		50	50		50		50	
Motor Type				CSR		CSR	IM		IM		IM	
Overload Protection				Internal protector		Internal protector	Internal protector		Internal protector		Internal protector	
Scroll Profile				Algebraic		Involute	Algebraic		Algebraic		Algebraic	
Weight (include oil)			kg	22.6		22.9	21.8		21.7		23.7	
			lbs	49.8		50.5	48.1		47.8		52.2	
Oil				POE		POE	POE		POE		POE	
Oil Charge			cm³	850		850	850		850		850	
Test condition				EN12900 MT	EN12900 LT	EN12900 MT	EN12900 MT	EN12900 LT	EN12900 MT	EN12900 LT	EN12900 MT	EN12900 LT
			N(Hz)	50	50	50	50	50	50	50	50	50
Performance	R1270	Cooling Capacity	W	2,991	1,210	3,561	-	-	-	-	-	-
			BTU/h	10,215	4,132	12,162	-	-	-	-	-	-
	R449A	Cooling Capacity	W	2,868	1,019	3,475	-	-	-	-	-	-
			BTU/h	9,794	3,479	11,867	-	-	-	-	-	-
	R404A	Cooling Capacity	W	2,950	1,139	3,568	2,908	1,135	3,343	1,317	4,158	1,660
			BTU/h	10,075	3,889	12,187	9,930	3,876	11,415	4,498	14,200	5,671
Certificate				CE/CCC		CE/CCC	CE		CE		CE	

Model				DS1529X1				DS1834X1			
Rated Output			W	1,500				1,800			
Displacement			cm³/rev.	29.1				34.0			
Power supply	Phase		ϕ	1				1			
	Voltage		V	208-230				208-230			
	Frequency		Hz	60				60			
Motor Type				CSR				CSR			
Overload Protection				Internal protector				Internal protector			
Scroll Profile				Algebraic				Algebraic			
Weight (include oil)			kg	22.7				22.6			
			lbs	50.0				49.8			
Oil				POE				POE			
Oil Charge			cm³	850				850			
Test condition				EN12900 MT	ARI540 MT	EN12900 LT	ARI540 LT	EN12900 MT	ARI540 MT	EN12900 LT	ARI540 LT
			N(Hz)	60	60	60	60	60	60	60	60
Performance	R448A	Cooling Capacity	W	3,319	3,522	1,208	1,403	3,881	4,123	1,413	1,634
			BTU/h	11,336	12,028	4,126	4,790	13,253	14,080	4,825	5,580
	R449A	Cooling Capacity	W	3,319	3,522	1,208	1,403	3,881	4,123	1,413	1,634
			BTU/h	11,336	12,028	4,126	4,790	13,253	14,080	4,825	5,580
	R404A	Cooling Capacity	W	3,412	3,527	1,347	1,543	3,992	4,130	1,572	1,794
			BTU/h	11,654	12,045	4,601	5,268	13,633	14,105	5,369	6,128
Certificate				UL				UL			

Test Condition

	Te(°C)	Tc(°C)	SC(deg)	Ts(°C)
EN12900 MT	-10.0	45.0	0	20.0
EN12900 LT	-35.0	40.0	0	20.0
ARI540 MT	-6.7	48.9	0	18.3
ARI540 LT	-31.7	40.6	0	18.3

Note:
Algebraic: Type of scroll wrap improved performance at low temperature condition.

※Motor Type
CSR: Capacitor Starting Run
IM: Induction Motor

General Data

FL Series AC inverter / Fixed speed

Model				AC Inverter				Fixed speed	
				FL300DLV-56A3	FL600DLV-90A3	FL800ELV-144A3	FL800ELV-144D3	FL300DL-56C3	FL500DL-90C3
Rated Output			W	2,200	4,500	6,000	6,000	2,200	3,750
Displacement			cm³/rev.	56.0	90.0	144.0	144.0	56.0	90.0
Speed Range			Hz	25-60	30-70	25-75	25-75	-	-
Primary power supply 3 phase Voltage			V	200	200	200-220	380-415	-	-
Power supply	Phase		ϕ	-	-	-	-	3	3
	Voltage		V	-	-	-	-	346-380/380-400	346-380/380-400
	Frequency		Hz	-	-	-	-	50/60	50/60
Motor Type				IM	IM	IM	IM	IM	IM
Overload Protection				Thermostat + Inverter control				Thermostat	
Scroll Profile				Involute				Involute	
Weight (include oil)			kg	37	51	94	94	37	51
			lbs	81.6	112.4	207.2	207.2	81.6	112.4
Oil				PVE	PVE	PVE	PVE	PVE	PVE
Oil Charge			cm³	1,200	1,700	3,000	3,000	1,200	1,700
Test condition				A	A	A	A	A	A
			N(Hz)	60	60	60	60	50	50
Performance	R404A	Cooling Capacity	W	5,910	9,596	20,400	20,400	4,910/5,910	7,970/9,600
			BTU/h	20,184	32,771	69,610	69,610	16,750/20,160	27,190/32,750
		Input	W	3,904	5,984	10,000	10,000	2,910/3,440	9,600/5,500
Certificate				-	-	-	-	-	-

LS Series DC inverter / AC inverter / Fixed Speed

Model*				DC Inverter		AC Inverter			
				LS400DHD-64DB(Y)G	LS600DHD-90DB(Y)G	LS300DHV-47D2(Y)G	LS400DHV-64D2(Y)G	LS500DHV-80D2(Y)G	LS600DHV-95D2(Y)G
Rated Output			W	3,000	4,500	2,200	3,000	3,700	4,500
Displacement			cm³/rev.	64	90	47	64	80	95
Speed Range			Hz	30-90	30-90	30-90	30-90	30-90	30-90
Primary power supply 3 phase Voltage			V	380-415/440	380-415/440	380-415/440	380-415/440	380-415/440	380-415/440
Motor Type				DCBL	DCBL	IM	IM	IM	IM
Overload Protection				Thermostat + Inverter control		Thermostat + Inverter control			
Scroll Profile				Involute		Involute			
Weight (include oil)			kg	34	37	36	36	37	38
			lbs	70.5	81.6	79.4	79.4	81.6	83.8
Oil				PVE	PVE	PVE	PVE	PVE	PVE
Oil Charge			cm³	1,800	1,800	1,800	1,800	1,800	1,800
Test condition				A	A	A	A	A	A
			N(Hz)	120	120	60	60	60	60
Performance	R404A	Cooling Capacity	W	7,521	10,530	5,329	7,111	8,900	11,098
			BTU/h	25,684	35,907	18,201	24,287	30,349	37,900
		Input	W	4,050	5,400	3,115	4,064	4,800	6,006
Certificate				CE	CE	CE	CE	CE	CE

Model*				Fixed speed		
				LS350DH-64D2(Y)G	LS500DH-83D2(Y)G	LS600DH-95D2(Y)G
Rated Output			W	3,000	3,700	4,500
Displacement			cm³/rev.	64	83	95
Power supply	Phase		ϕ	3	3	3
	Voltage		V	380-415/440	380-415/440	380-415/440
	Frequency		Hz	50/60	50/60	50/60
Motor Type				IM	IM	IM
Overload Protection				Internal protector + Thermostat		
Scroll Profile				Involute		
Weight (include oil)			kg	36	36	37
			lbs	79.4	79.4	81.6
Oil				PVE	PVE	PVE
Oil Charge			cm³	1,800	1,800	1,800
Test condition				A	A	A
			N(Hz)	50	50	50
Performance	R404A	Cooling Capacity	W	5,800	7,603	8,820
			BTU/h	19,808	25,966	30,076
		Input	W	3,410	4,351	5,050
Certificate				CE/CCC	CE/CCC	CE/CQC

*Models with (Y) is with oil pipe for multiple use

NS Series DC inverter / Fixed speed

Model*				DC Inverter	
				NS400DHD-64DB(Y)G	NS600DHD-90DB(Y)G
Rated Output			W	3,000	4,500
Displacement			cm³/rev.	64	90
Speed Range			Hz	30-90	30-90
Primary power supply 3 phase Voltage			V	380-415/440	380-415/440
Motor Type				DCBL	DCBL
Overload Protection				Thermostat + Inverter control	
Scroll Profile				Involute	
Weight (include oil)			kg	34	37
			lbs	75.0	81.6
Oil				PVE	PVE
Oil Charge			cm³	1,800	1,800
Test condition				B	B
			N(Hz)	120	120
Performance	R404A	Cooling Capacity	W	8,900	12,300
			BTU/h	30,349	41,943
		Input	W	4,350	5,840
Certificate				CE	CE

Model*				Fixed speed					
				NS300DH-56D2(Y)G	NS350DH-64D2(Y)G	NS500DH-83D2(Y)G	NS600DH-95D2(Y)G	NS300DH-56Q2(Y)G	NS350DH-64Q2(Y)G
Rated Output			W	2,600	3,000	3,700	4,500	2,600	3,000
Displacement			cm³/rev.	56	64	83	95	56	64
Power supply	Phase		ϕ	3	3	3	3	1	1
	Voltage		V	380-415/440	380-415/440	380-415/440	380-415/440	220-240	220-240
	Frequency		Hz	50/60	50/60	50/60	50/60	50	50
Motor Type				IM	IM	IM	IM	IM	IM
Overload Protection				Internal protector + Thermostat					
Scroll Profile				Involute					
Weight (include oil)			kg	36	36	36	37	36	37
			lbs	79.4	79.4	79.4	81.6	79.4	79.4
Oil				PVE	PVE	PVE	PVE	PVE	PVE
Oil Charge			cm³	1,800	1,800	1,800	1,800	1,800	1,800
Test condition				B	B	B	B	B	B
			N(Hz)	50	50	50	50	50	50
Performance	R404A	Cooling Capacity	W	6,235	7,076	9,401	10,749	6,250	7,250
			BTU/h	21,293	24,165	32,106	36,711	21,313	24,723
		Input	W	3,405	3,846	4,721	5,400	3,400	3,800
Certificate				CE/CCC	CE/CCC	CE/CCC	CE/CQC	CE	CE

*Models with (Y) is with oil pipe for multiple use

Test Condition

	Te(°C)	Tc(°C)	SC(deg)	Ts(°C)
A	-15	45	5	18
B	-6.7	48.9	5	4.4

※Motor Type
IM: Induction Motor

Specification

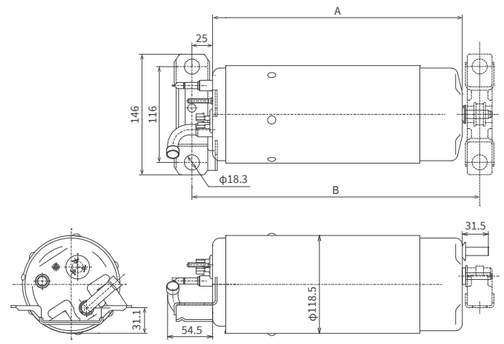
Z Series

Dimensions

Unit:mm

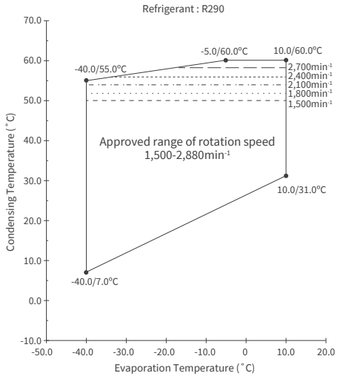
	A	B
ZS4084S1	311	358
ZS4084P1		
ZS6013S1		
ZS6013P1		
ZS6013X1		
ZS6013X3		
ZS7516S1	316	363
ZS7516X1		
ZS7516S3		
ZS7516X3		
ZS1120S3		
ZS1120X3		
ZS1120S1	321	368
ZS1120X1		

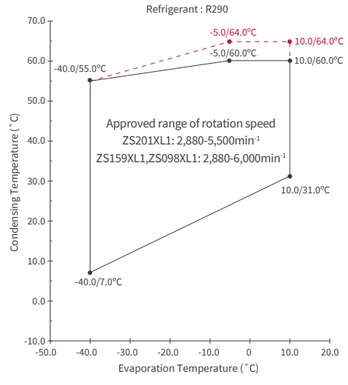
	A	B
ZS7798D1	302	348
ZS098XJ1		
ZS098XL1		
ZS159XJ1		
ZS159XL1		
ZD125XC1		
ZS1216D1	307	353
ZS1520D1		
ZS201XJ1		
ZS201XL1		
ZD201XC1		



Operating Envelop

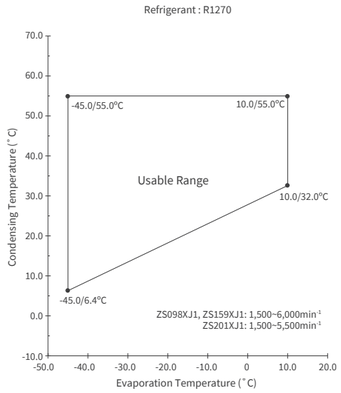
R290
ZS098XL1/ZS159XL1/ZS201XL1



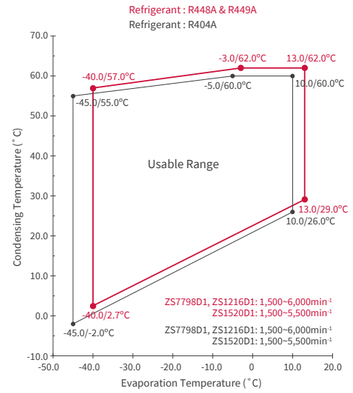


Operating Envelop

R1270
ZS098XJ1/ZS159XJ1/ZS201XJ1



R448A, R449A
ZS7798D1/ZS1216D1/ZS1520D1
R404A
ZS7798D1/ZS1216D1/ZS1520D1



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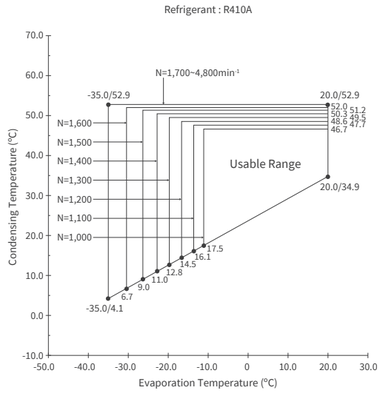
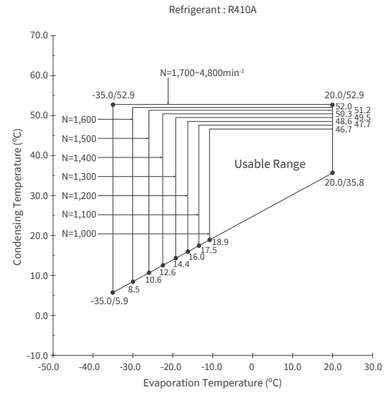
ZD125XC1



R410A
ZD201XC



R290
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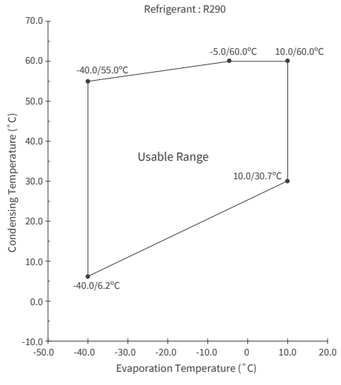
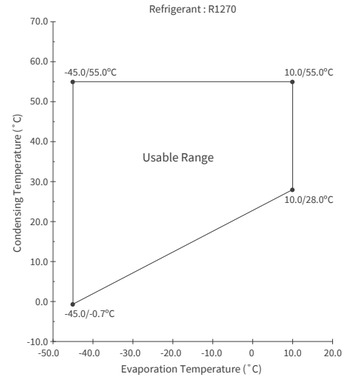


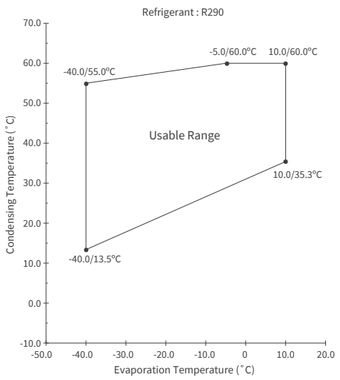
R1270
ZS7516S1



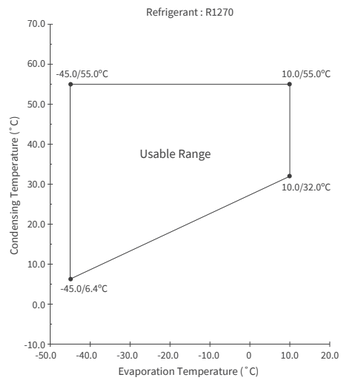
Specification

Operating Envelop

R290
ZS1120S3/ZS1120X3



R1270
ZS1120S1

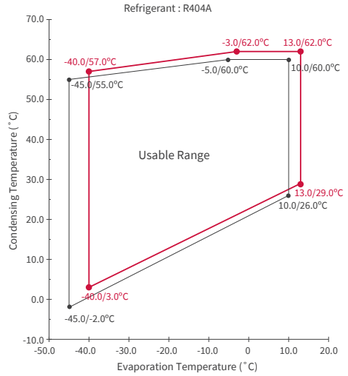


R448A
ZS6013X1/ZS7516X1

R449A
ZS4084S1/ZS6013S1/ZS6013X1/ZS7516S1/ZS7516X1

R404A
ZS4084S1/ZS4084P1/ZS6013S1/ZS6013P1/ZS6013X1/
ZS7516S1/ZS7516X1

Refrigerant : R448A & R449A
Refrigerant : R404A

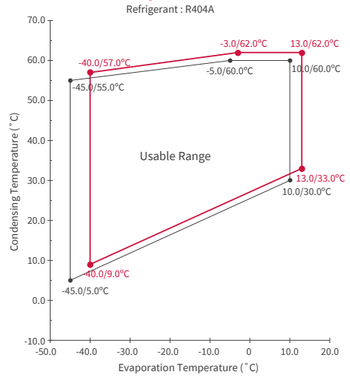


R448A
ZS1120X1

R449A
ZS1120S1/ZS1120X1

R404A
ZS1120S1/ZS1120S2/ZS1120X1

Refrigerant : R448A & R449A
Refrigerant : R404A

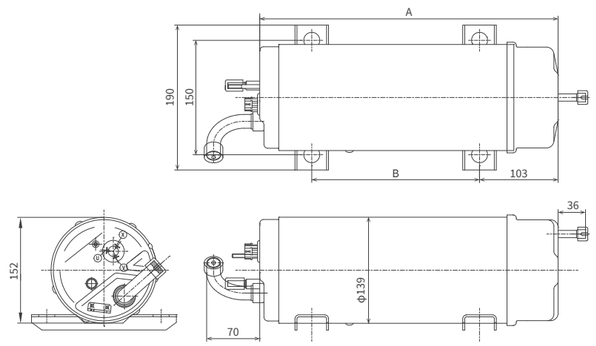


DS Series

Dimensions

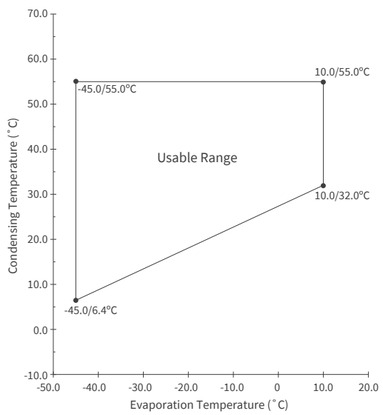
Unit:mm

	A	B
DS1529S1	386	220
DS1529X1		
DS1529V1		
DS1834S1		
DS1834X1		
DS1834V1		
DS1836S1	391	220
DS2244V1	441	270



Operating Envelop

R1270
DS1836S1/DS1529S1

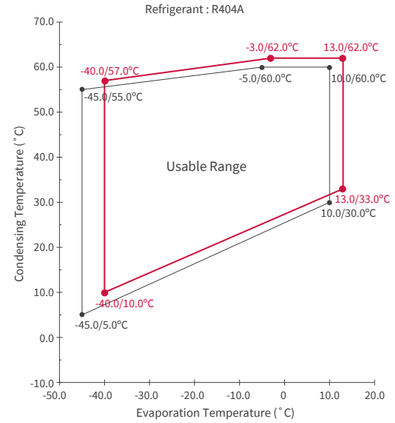


R448A
DS1529X1/DS1834X1

R449A
DS1836S1/DS1529S1/
DS1529X1/DS1834X1

R404A
DS1836S1/DS1529S1/DS1529X1/DS1529V1/DS1834X1/
DS1834V1/DS2244V1

Refrigerant : R448A & R449A
Refrigerant : R404A



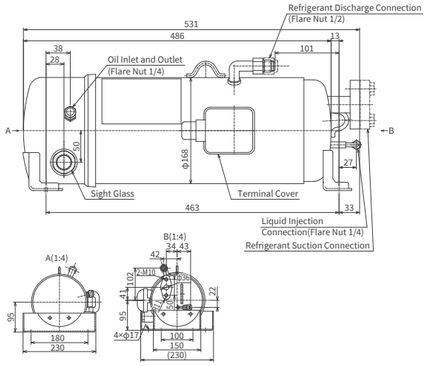
Specification

FL Series

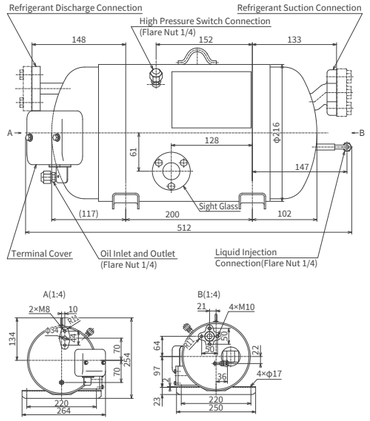
Dimensions

Unit:mm

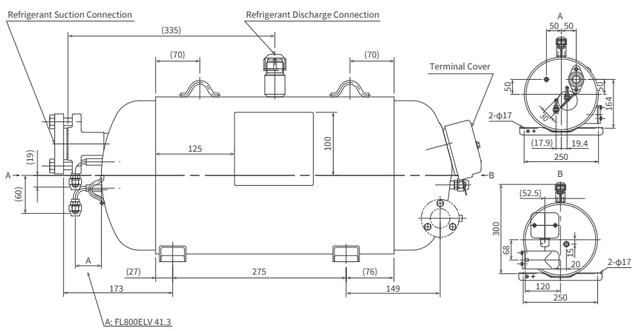
MODEL:
FL300DLV-56A3
FL300DL-56C3



MODEL:
FL600DLV-90A3
FL500DL-90C3

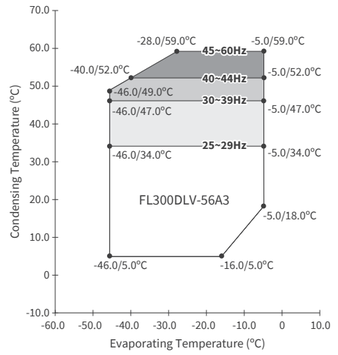


MODEL:
FL800ELV-144A(D)3

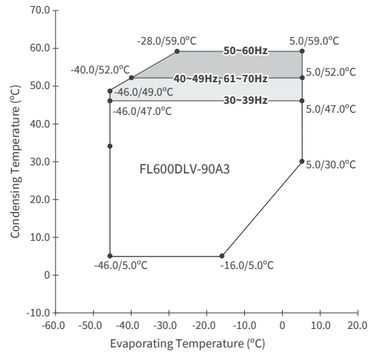


Operating Envelop

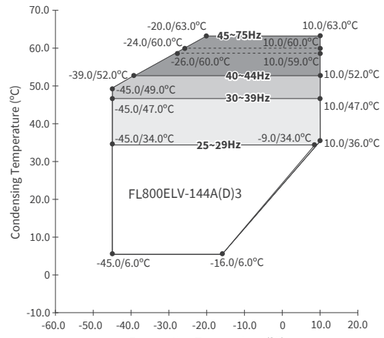
AC inverter



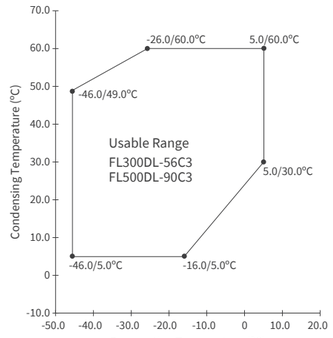
AC inverter



AC inverter



Fixed Speed



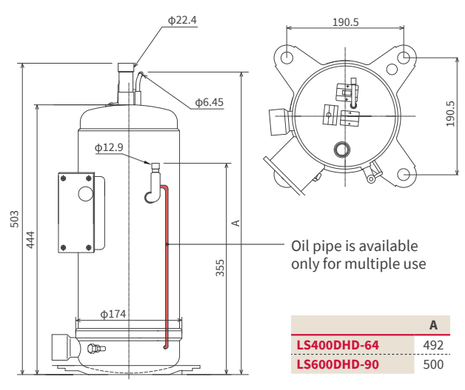
Specification

LS, NS Series

Dimensions

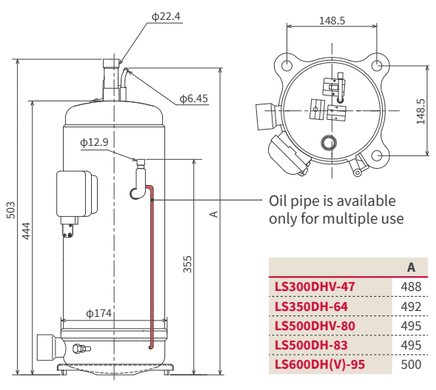
Unit:mm

LS DC Inverter



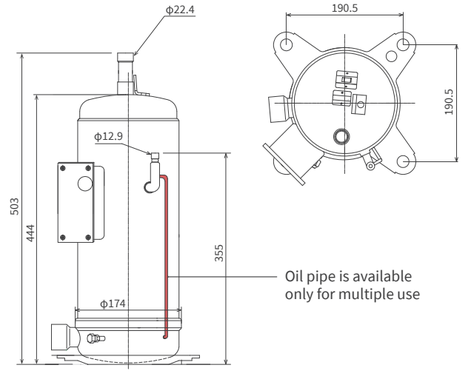
	A
LS400DHD-64	492
LS600DHD-90	500

LS AC Inverter & Fixed speed

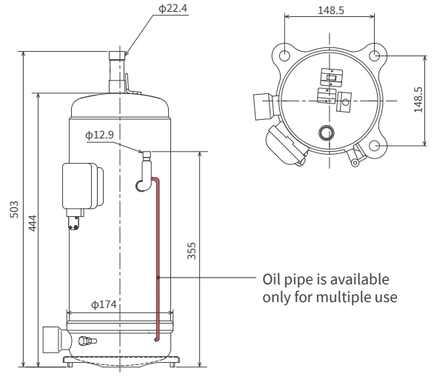


	A
LS300DHV-47	488
LS350DH-64	492
LS500DHV-80	495
LS500DH-83	495
LS600DH(V)-95	500

NS DC Inverter

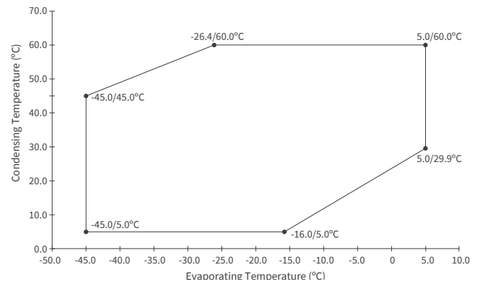


NS Fixed speed

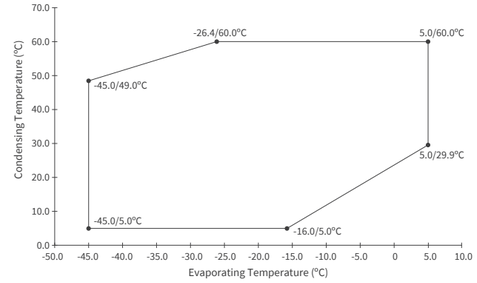


Operating Envelop

LS DC & AC Inverter Series (R404A)



LS Fixed Series (R404A)



NS DC Inverter & Fixed speed(R404A)