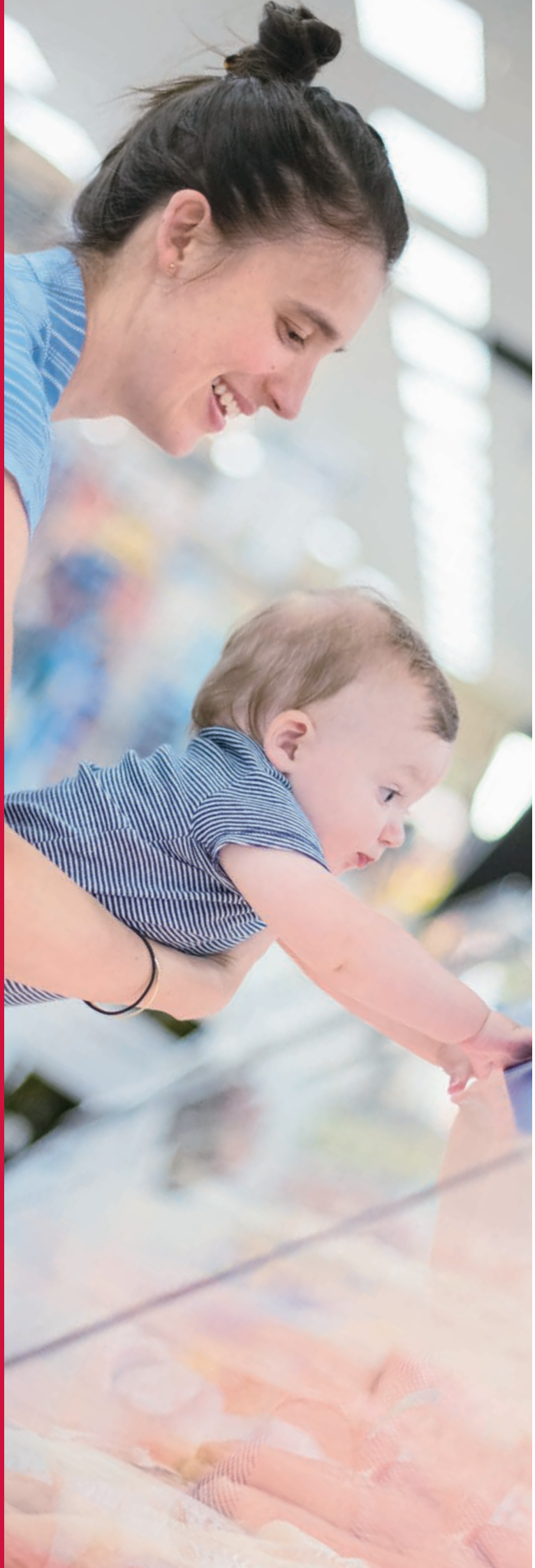
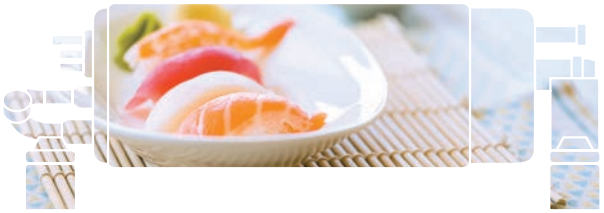


HITACHI

For Refrigeration Application

SCROLL COMPRESSORS

R290
R1270
R448A
R449A
R410A
R404A



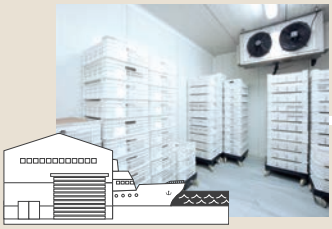
Total Solution For Refrigeration

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**

Cold Chain Management

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



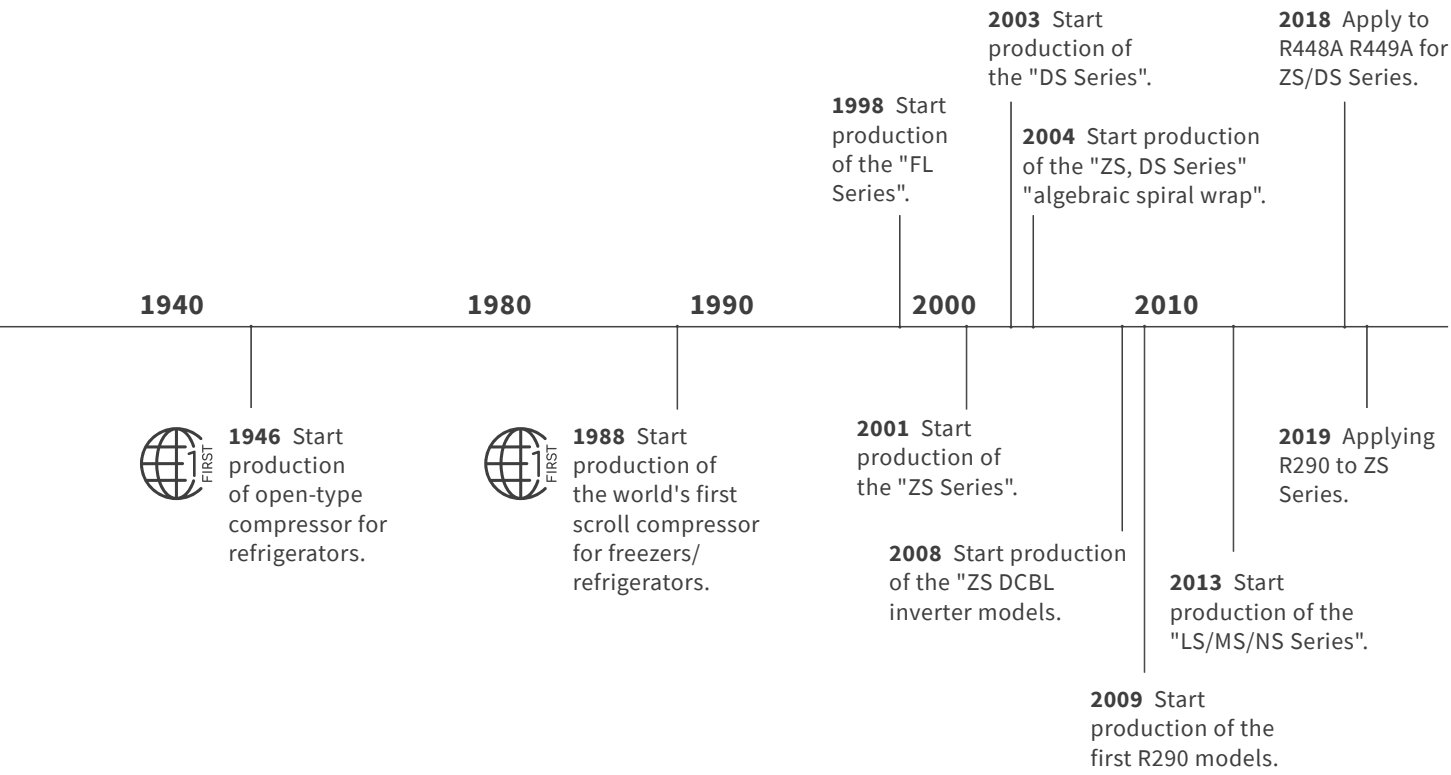
Refrigerated warehouses and Producing areas

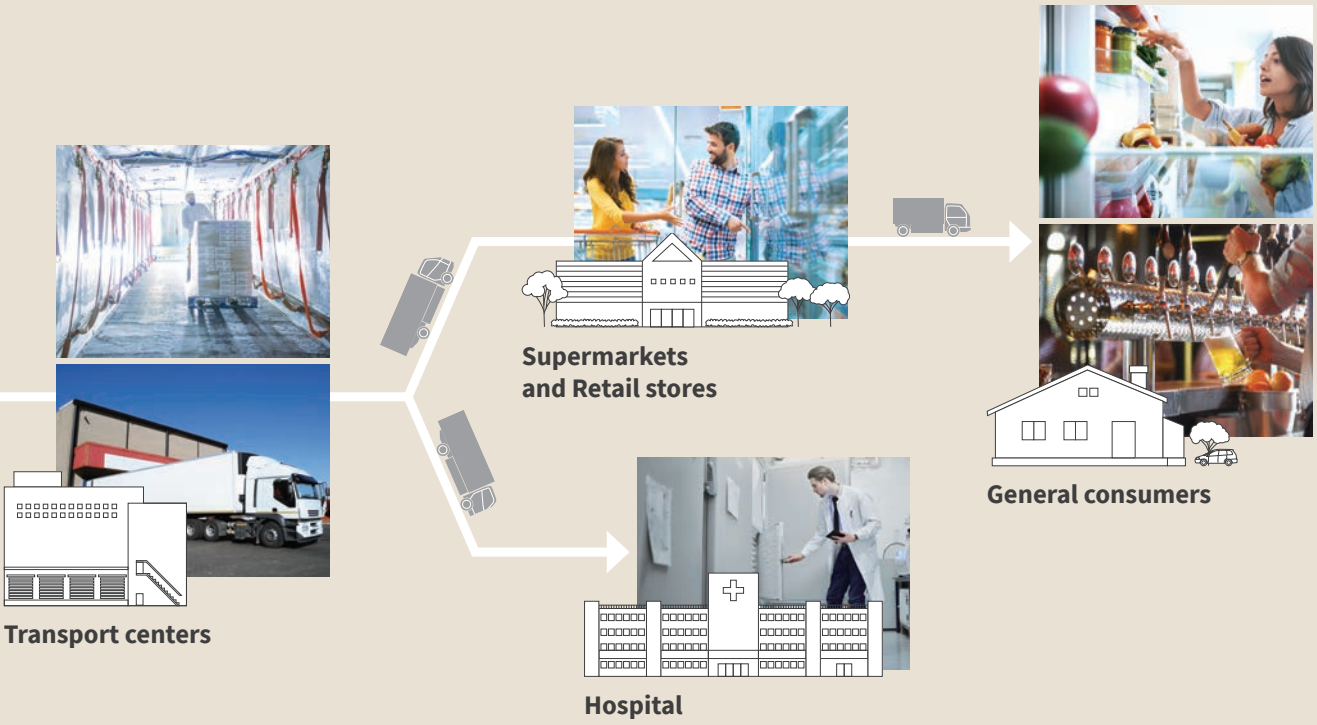
Processing plants

Pharmaceutical companies

Distribution center

History


1940
1980
1990
2000
2010
1946 Start production of open-type compressor for refrigerators.
1988 Start production of the world's first scroll compressor for freezers/ refrigerators.
1998 Start production of the "FL Series".
2001 Start production of the "ZS Series".
2003 Start production of the "DS Series".
2004 Start production of the "ZS, DS Series" "algebraic spiral wrap".
2008 Start production of the "ZS DCBL inverter models.
2009 Start production of the first R290 models.
2013 Start production of the "LS/MS/NS Series".
2018 Apply to R448A R449A for ZS/DS Series.
2019 Applying R290 to ZS Series.


Transport centers
Supermarkets and Retail stores
Hospital
General 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: 2,200~6,000W
- 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

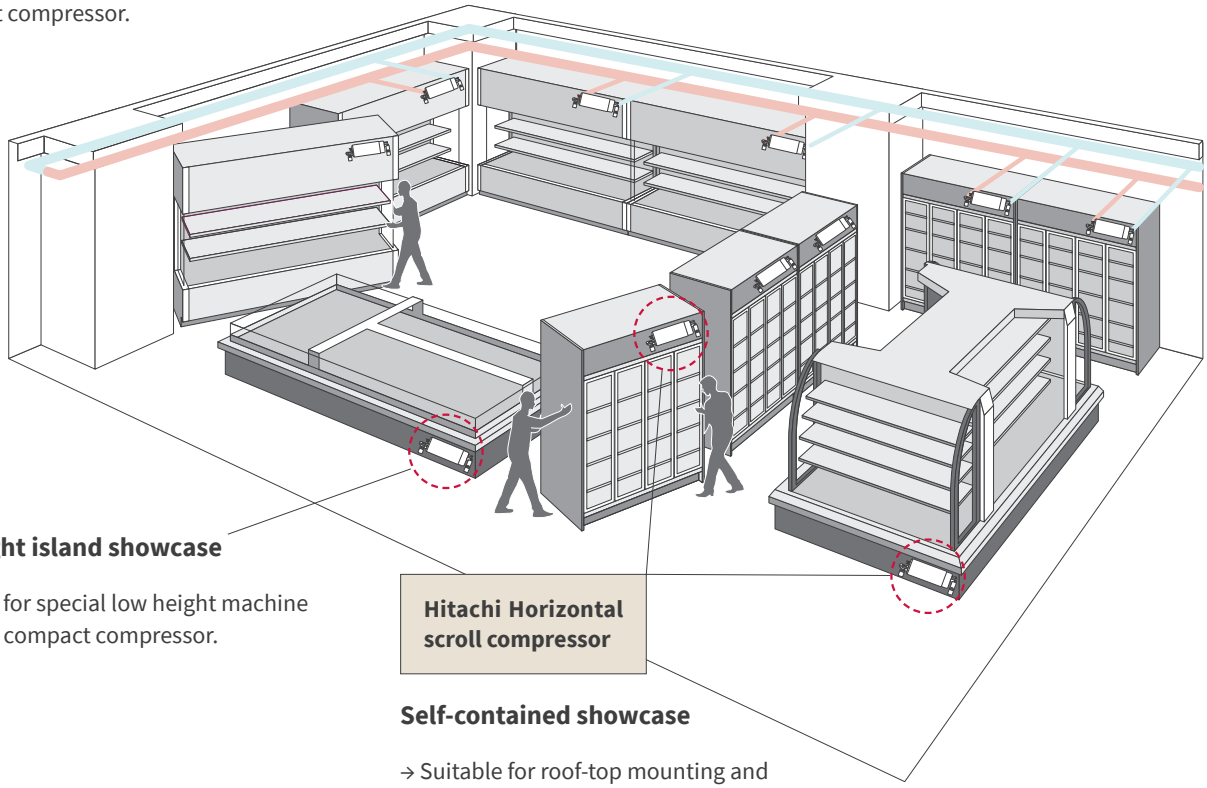
Various Range Of Application

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.

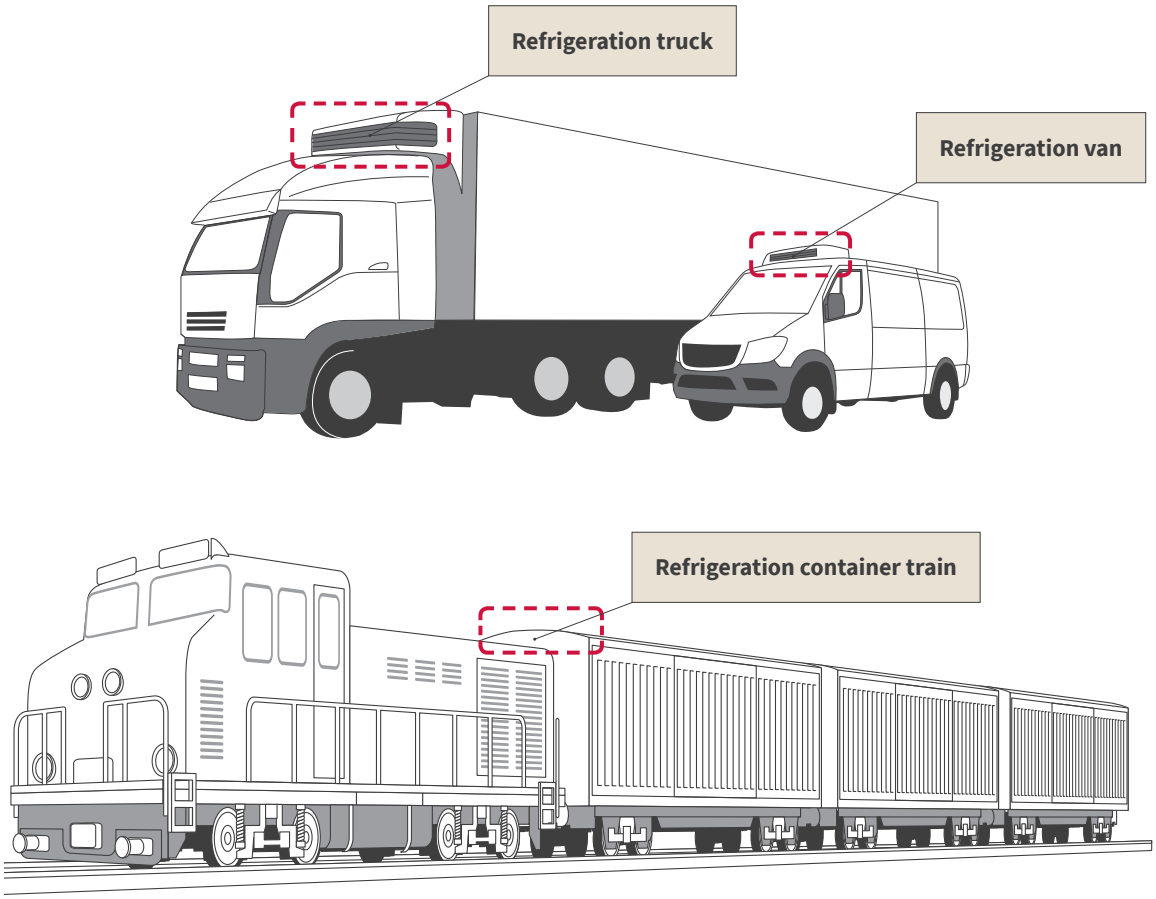
Hitachi Horizontal scroll compressor

Self-contained showcase

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

Transportation Solution*

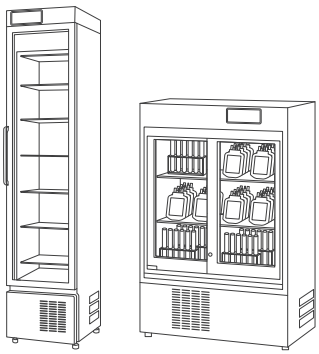
→ Energy saving by light compressor.
→ Small machine room and larger refrigeration space by compact compressor.
→ Suitable for EV vehicles.
→ Precise temperature control.



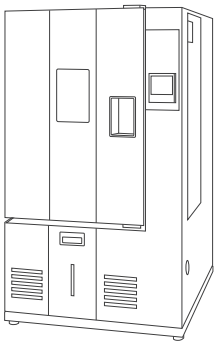
*Application review is required

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

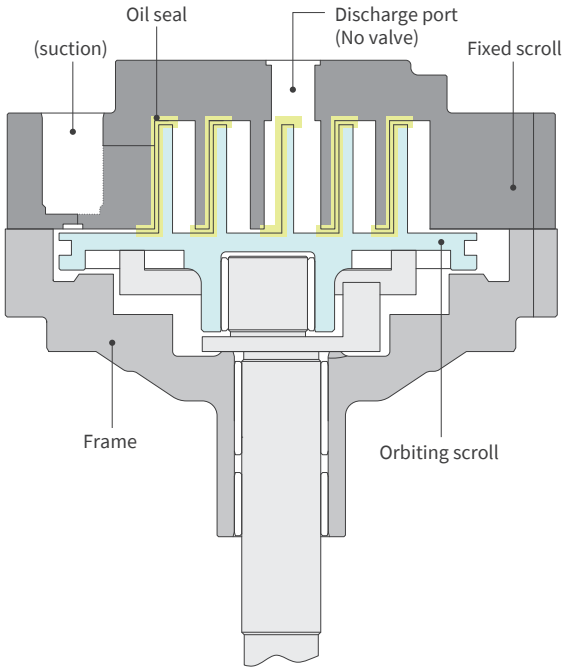
Low Noise

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

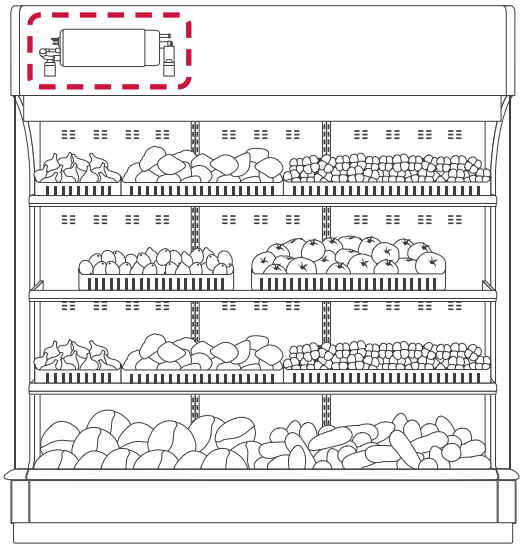
Scroll compressors generate much less noise than rotary compressors.

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

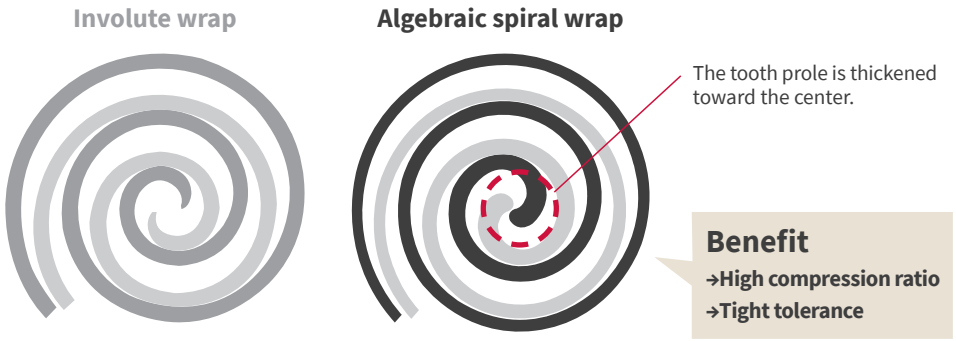
→ Low vibration so less damage to surrounding equipment
→ Reduced maintenance costs
→ Little grating noise and a pleasant environment
→ No expenditure on noise and vibration countermeasures
→ No deterioration of fresh produce

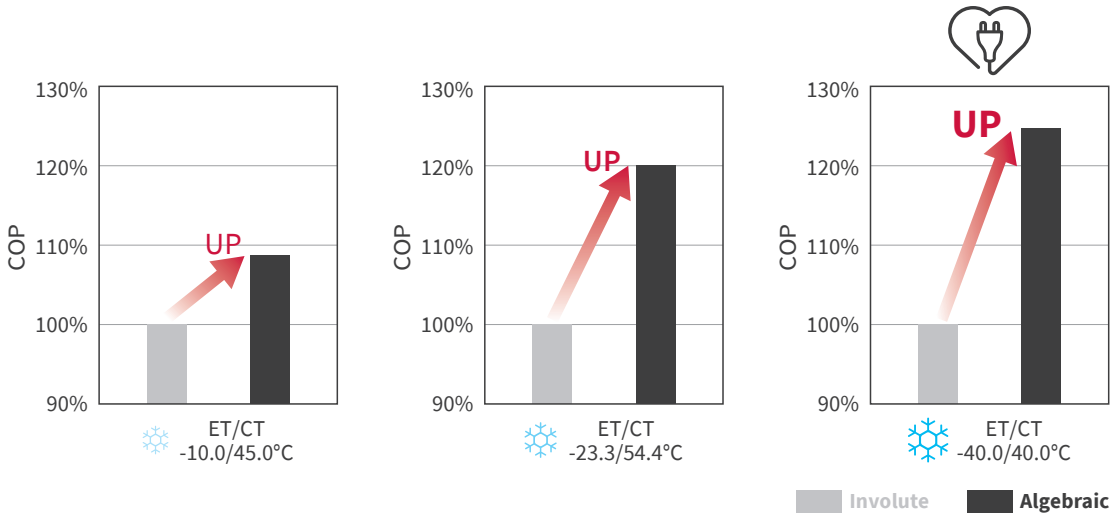


High Efficiency By Advanced Technology

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.



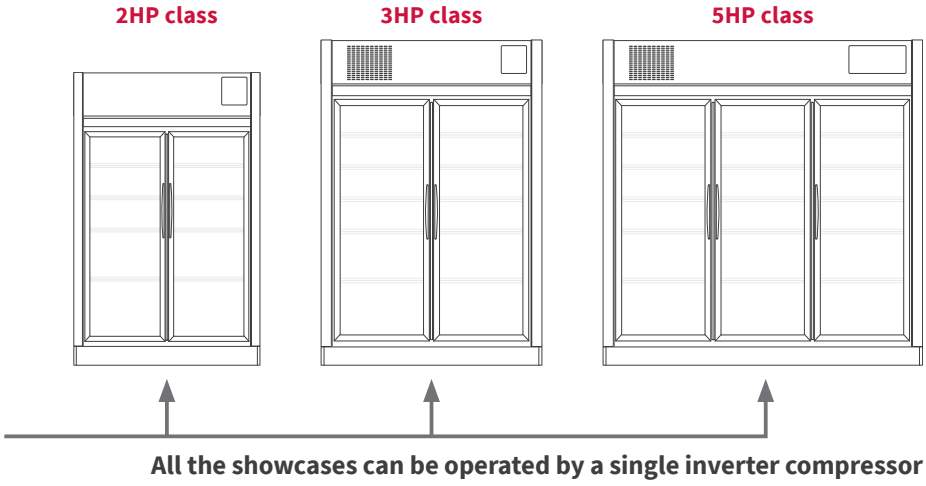


*Evaporating Temperature/Condensing Temperature

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



High Reliability & Comfortable Operation

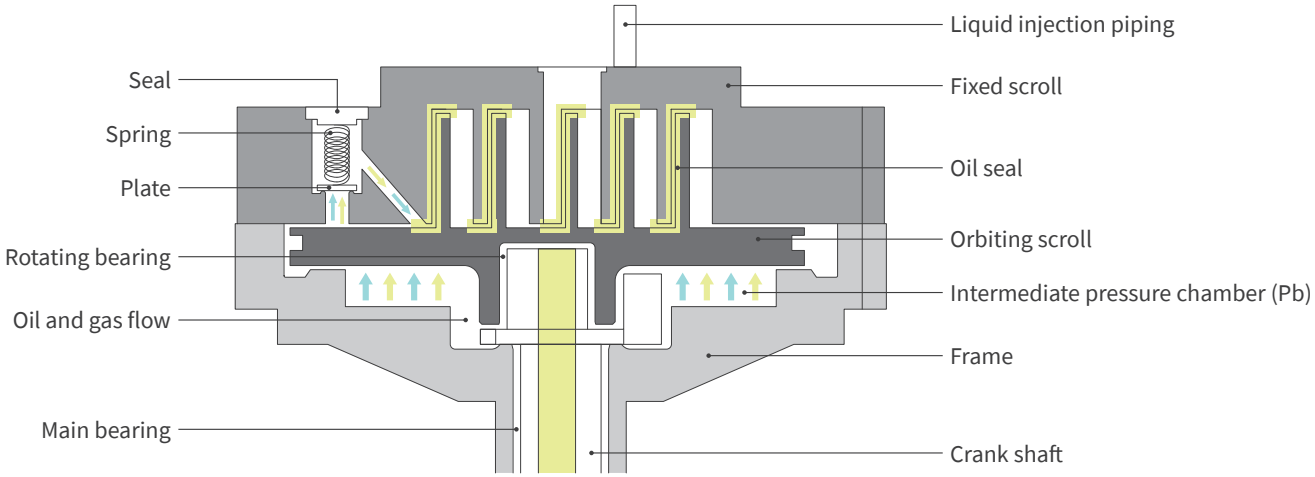
Advantages

Merits of Hitachi Pioneering High-Side Pressure Design

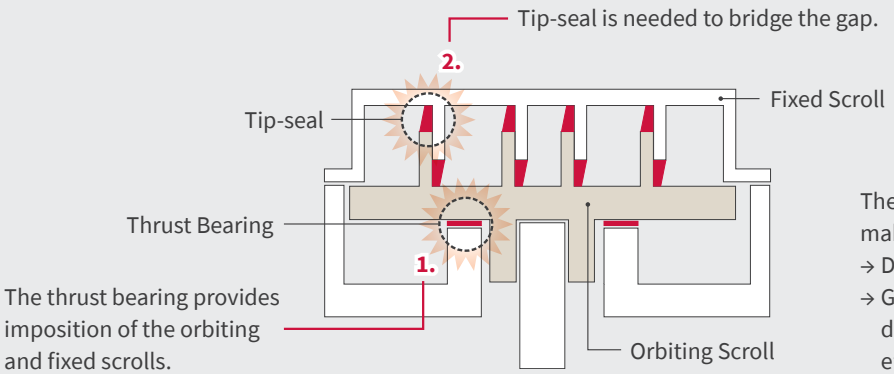
(1) A simple structure leading to fewer superfluous parts

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

Intermediate pressure control valve



Low-side pressure design (Thrust Bearing System)

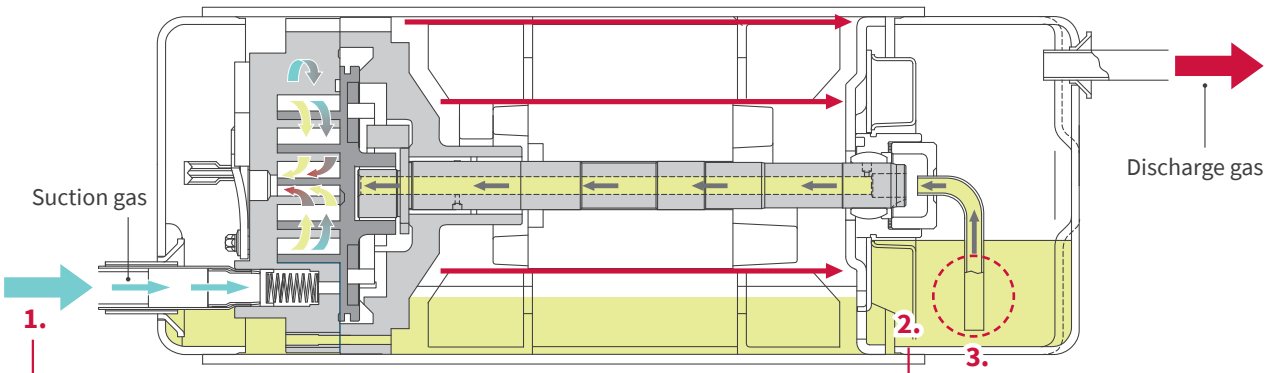


There are many sliding components, making for a complex structure.
→ Damage occurs easily
→ Gaps form easily, resulting in degradation of compression efficiency

High pressure gas Low pressure gas Oil

(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**



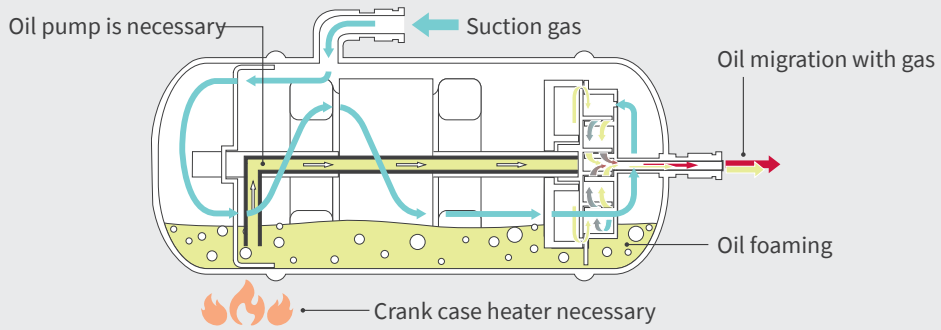
Direct Suction
→ Reduces superheat
→ Improving volumetric efficiency

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

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)

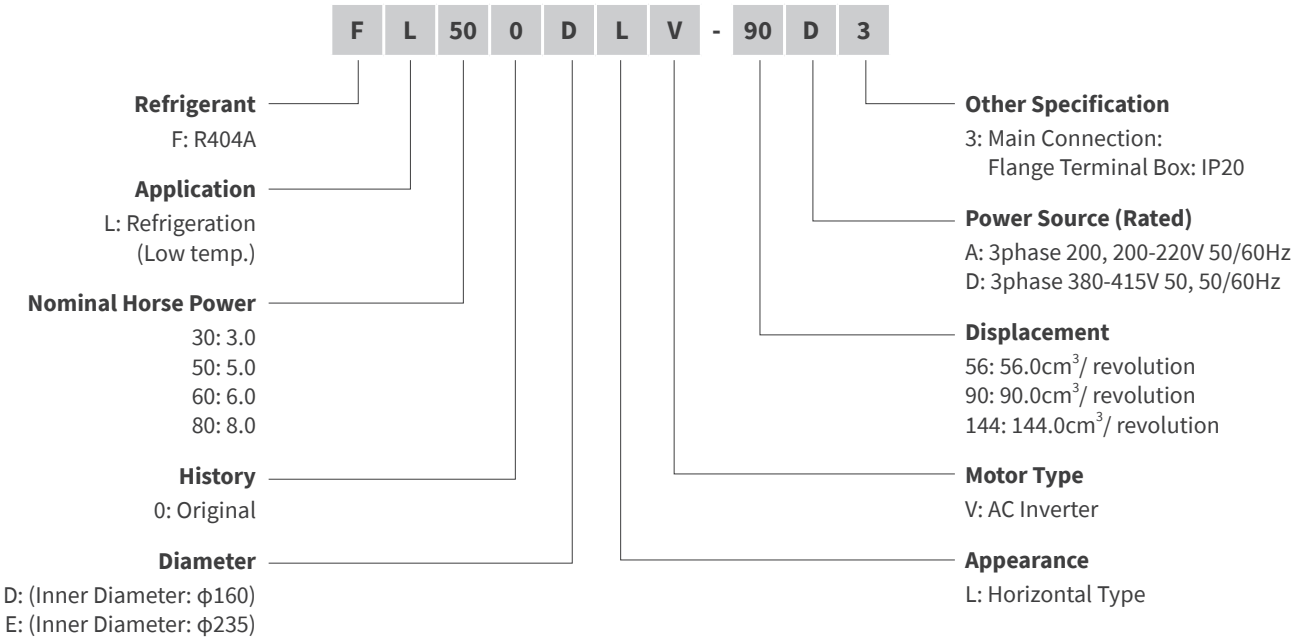
Displacement
098: 9.8cm^3/ revolution
125: 12.5cm^3/ revolution
201: 20.1cm^3/ revolution

Motor Version
X: Motor Version X

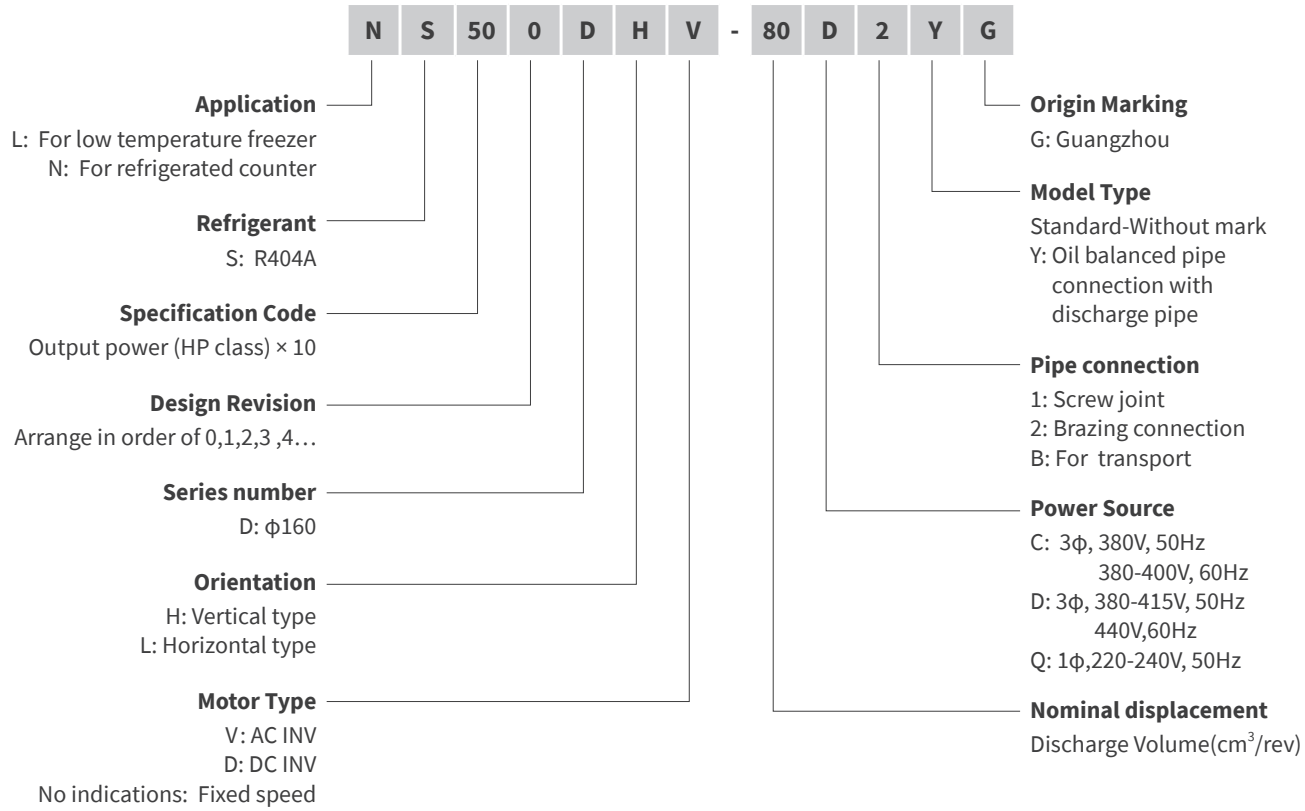
Development Year
C: Oct/ 2012 -Sep/ 2013
D: Oct/ 2013 -Sep/ 2014

History
1: Original

FL Series



LS, NS Series



General Data

Z Series

DC inverter

Model				ZS098XL1								ZS159XL1							
Rated Output			W	770								1,250							
Displacement			cm³/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			kg	10.8								11.1							
			lbs	23.8								24.5							
Oil				POE								POE							
Oil Charge			cm³	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	440	1,750	470	1,870	180	715	205	815	710	2,840	760	3,035	290	1,165	330	1,320
			BTU/h	1,502	5,972	1,604	6,381	614	2,440	700	2,781	2,423	9,692	2,594	10,357	990	3,976	1,126	4,505
Certificate				CE								CE							

Model				ZS201XL1								ZS098XJ1							
Rated Output			W	1,500								770							
Displacement			cm³/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			kg	10.9								10.8							
			lbs	24.0								23.8							
Oil				POE								POE							
Oil Charge			cm³	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	890	3,295	960	3,520	365	1,350	415	1,535	-	-	-	-	-	-	-	-
			BTU/h	3,037	11,244	3,276	12,012	1,246	4,607	1,416	5,238	-	-	-	-	-	-	-	-
	R1270	Cooling Capacity	W	-	-	-	-	-	-	-	-	530	2,115	570	2,260	220	885	250	1,000
			BTU/h	-	-	-	-	-	-	-	-	1,809	7,217	1,945	7,712	751	3,020	853	3,413
Certificate				CE								CE							

Model				ZS159XJ1								ZS201XJ1							
Rated Output			W	1,250								1,500							
Displacement			cm³/rev.	15.9								20.1							
Speed Range			Hz	25-100								25-91.7							
Power supply			ϕ	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			kg	11.1								10.9							
			lbs	24.5								24.0							
Oil				POE								POE							
Oil Charge			cm³	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	860	3,430	920	3,670	360	1,435	405	1,625	1,085	3,980	1,160	4,255	450	1,660	515	1,885
			BTU/h	2,935	11,705	3,140	12,524	1,229	4,897	1,382	5,545	3,703	13,582	3,959	14,520	1,536	5,665	1,757	6,433
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			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	490	1,960	530	2,115	180	710	210	820	795	3,180	860	3,435	290	1,150	335	1,330
			BTU/h	1,672	6,689	1,809	7,217	614	2,423	717	2,798	2,713	10,852	2,935	11,722	990	3,924	1,143	4,539
	R449A	Cooling Capacity	W	490	1,960	530	2,115	180	710	210	820	795	3,180	860	3,435	290	1,150	335	1,330
			BTU/h	1,672	6,689	1,809	7,217	614	2,423	717	2,798	2,713	10,852	2,935	11,722	990	3,924	1,143	4,539
	R404A	Cooling Capacity	W	510	2,030	535	2,135	195	780	220	890	825	3,295	865	3,465	315	1,265	360	1,440
			BTU/h	1,740	6,927	1,826	7,286	665	2,662	751	3,037	2,815	11,244	2,952	11,824	1,075	4,317	1,229	4,914
Certificate				CE								CE							

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			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	1,005	3,685	1,085	3,980	365	1,335	420	1,545
			BTU/h	3,430	12,575	3,703	13,582	1,246	4,556	1,433	5,272
	R449A	Cooling Capacity	W	1,005	3,685	1,085	3,980	365	1,335	420	1,545
			BTU/h	3,430	12,575	3,703	13,582	1,246	4,556	1,433	5,272
	R404A	Cooling Capacity	W	1,040	3,820	1,095	4,015	400	1,465	455	1,670
			BTU/h	3,549	13,036	3,737	13,701	1,365	4,999	1,553	5,699
Certificate				CE							

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			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	515	2,865	545	3,085	220	1,050	250	1,200	980	4,770	1,040	5,130	380	1,830	435	2,100
			BTU/h	1,757	9,777	1,860	10,528	751	3,583	853	4,095	3,344	16,278	3,549	17,506	1,297	6,245	1,484	7,166
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			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	1,355	1,710	-	-	-	-	-	-
			BTU/h	4,624	5,835	-	-	-	-	-	-
	R1270	Cooling Capacity	W	-	-	-	-	1,635	2,065	-	-
			BTU/h	-	-	-	-	5,579	7,047	-	-
	R449A	Cooling Capacity	W	-	-	800	1,195	1,520	1,920	-	-
			BTU/h	-	-	2,730	4,078	5,187	6,552	-	-
	R404A	Cooling Capacity	W	-	-	830	1,235	1,570	1,985	1,985	770
			BTU/h	-	-	2,832	4,214	5,358	6,774	6,774	2,628
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			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	1,270	1,331	1,615	1,661	2,045	2,223	-	-	-	-	-	-	-	-	-	-
			BTU/h	4,334	4,542	5,511	5,668	6,979	7,586	-	-	-	-	-	-	-	-	-	-
	R448A	Cooling Capacity	W	-	-	-	-	-	-	-	-	-	-	1,420	1,535	1,810	1,955	2,285	2,470
			BTU/h	-	-	-	-	-	-	-	-	-	-	4,846	5,238	6,177	6,671	7,798	8,429
	R449A	Cooling Capacity	W	-	-	-	-	-	-	-	-	-	-	1,420	1,535	1,810	1,955	2,285	2,470
			BTU/h	-	-	-	-	-	-	-	-	-	-	4,846	5,238	6,177	6,671	7,798	8,429
	R404A	Cooling Capacity	W	-	-	-	-	-	-	990	1,040	1,475	1,550	1,475	1,550	1,875	1,970	2,370	2,490
			BTU/h	-	-	-	-	-	-	3,378	3,549	5,033	5,289	5,033	5,289	6,398	6,723	8,088	8,497
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			cm^3/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			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			cm^3	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	2,995	1,250	3,670	-	-	-	-	-	-
			BTU/h	10,220	4,266	12,524	-	-	-	-	-	-
	R448A	Cooling Capacity	W	2,775	990	3,405	-	-	-	-	-	-
			BTU/h	9,470	3,378	11,620	-	-	-	-	-	-
	R449A	Cooling Capacity	W	2,775	990	3,405	-	-	-	-	-	-
			BTU/h	9,470	3,378	11,620	-	-	-	-	-	-
	R404A	Cooling Capacity	W	2,875	1,110	3,525	2,875	1,110	3,360	1,300	4,345	1,680
			BTU/h	9,811	3,788	12,029	9,811	3,788	11,466	4,436	14,827	5,733
Certificate				CE/CCC		CE/CCC	CE		CE		CE	

Model				DS1529X1				DS1834X1			
Rated Output			W	1,500				1,800			
Displacement			cm^3/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			kg	22.7				22.6			
			lbs	50.0				49.8			
Oil				POE				POE			
Oil Charge			cm^3	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	3,310	3,575	1,205	1,395	3,865	4,175	1,410	1,630
			BTU/h	11,295	12,200	4,112	4,760	13,189	14,247	4,812	5,562
	R449A	Cooling Capacity	W	3,310	3,575	1,205	1,395	3,865	4,175	1,410	1,630
			BTU/h	11,295	12,200	4,112	4,760	13,189	14,247	4,812	5,562
	R404A	Cooling Capacity	W	3,430	3,605	1,310	1,490	4,210	4,425	1,530	1,740
			BTU/h	11,705	12,302	4,470	5,085	14,367	15,100	5,221	5,938
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

			AC Inverter				Fixed speed	
Model			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
Displacemet		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 contorol				Thermostat	
Scroll Profile			Involute				Involute	
Weight		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	5,900	9,600	20,400	20,400	4,910/5,910	7,970/9,600
		BTU/h	20,130	32,760	69,610	69,610	16,750/20,160	27,190/32,750
	Input	W	3,900	6,030	10,000	10,000	2,910/3,440	9,600/5,500
Certificate			-	-	-	-	-	-

LS Series

DC inverter / AC inverter / Fixed Speed

		DC Inverter		AC Inverter			
Model*		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
Displacemet	cm³/rev.	64	90	47	64	80	95
Speed Range	Hz	60-180	60-180	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 contorol		Thermostat + Inverter contorol			
Scroll Profile		Involute		Involute			
Weight	kg	32	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	7,400	10,530	5,350	7,110	8,900	10,700
	BTU/h	25,234	35,907	18,244	24,245	30,349	36,487
Input	W	4,000	5,400	3,150	4,060	4,800	5,800
Certificate		CE	CE	CE	CE	CE	CE

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

LS Series

Fixed speed

Model*			Fixed speed		
			LS350DH-64D2(Y)G	LS500DH-83D2(Y)G	LS600DH-95D2(Y)G
Rated Output		W	3,000	3,700	4,500
Displacemet		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		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	7,600	8,820
		BTU/h	19,778	25,916	30,076
	Input	W	3,410	4,350	5,050
Certificate			CE/CCC	CE/CCC	CE/CQC

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

NS Series

Fixed speed

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
Displacemet		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		kg	36	36	36	37	36	36
		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	6,370	7,180	9,630	11,050	6,120	7,130
		BTU/h	21,722	24,484	32,838	37,681	20,869	24,313
	Input	W	3,300	3,680	4,700	5,390	3,400	3,960
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

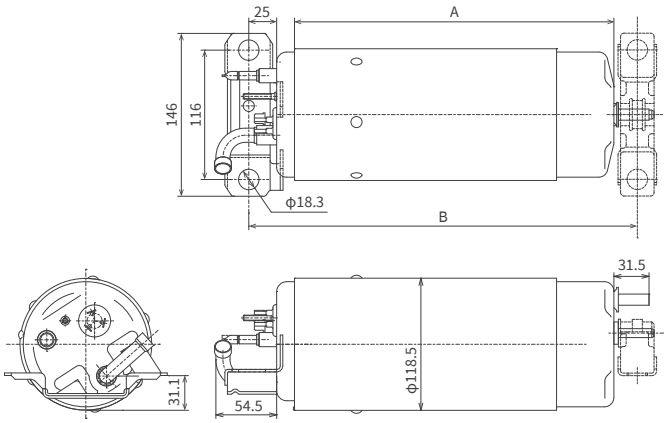
Specification

Z Series

Dimensions

mm

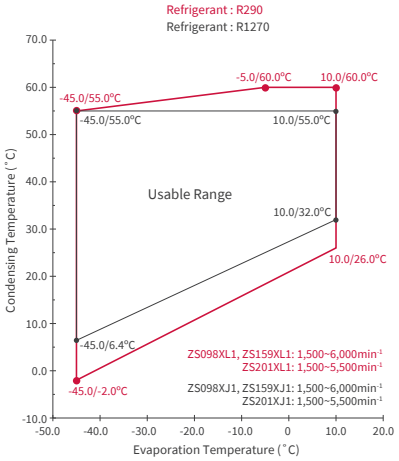
	A	B
ZS4084	311	357
ZS6013		
ZS7516	316	362
ZS1120S/X1	321	367
ZS1120S/X3	316	362
ZS7798/ZS098	302	348
ZS1216/ZS159	307	353
ZS1520/ZS201		
ZD125XC1	302	348
ZD201XC1	307	353



Operating Envelop

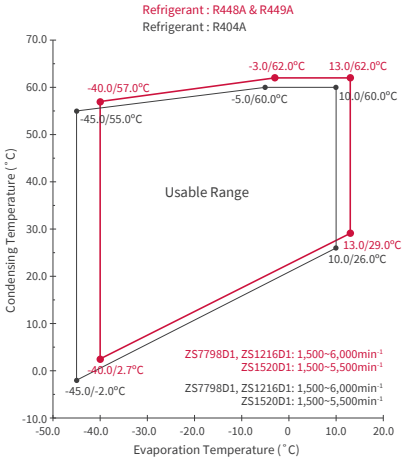
R290
ZS098XL1/ZS159XL1/ZS201XL1

R1270
ZS098XJ1/ZS159XJ1/ZS201XJ1



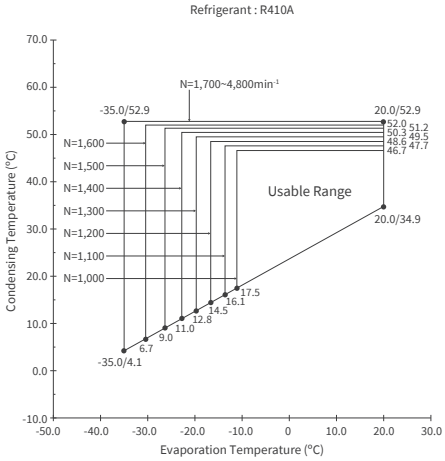
R448A, R449A
ZS7798D1/ZS1216D1/ZS1520D1

R404A
ZS7798D1/ZS1216D1/ZS1520D1

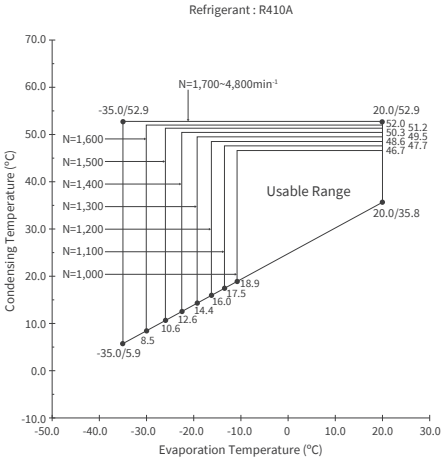


Operating Envelop

R410A
ZD125XC1



R410A
ZD201XC



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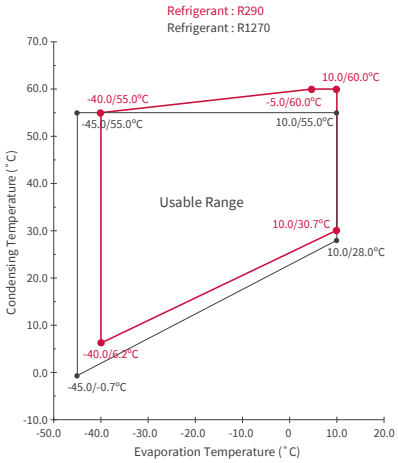
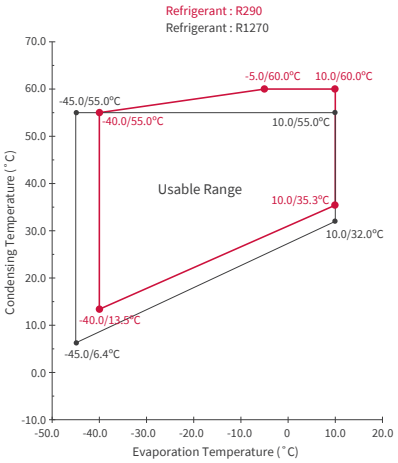
ZS6013X3/ZS7516S3/ZS7516X3

R1270
ZS7516S1



R290
ZS1120S3/ZS1120X3

R1270
ZS1120S1



R448A
ZS6013X1/ZS7516X1

R449A
ZS4084S1/ZS6013S1/ZS6013X1/ZS7516S1/ZS7516X1

R404A
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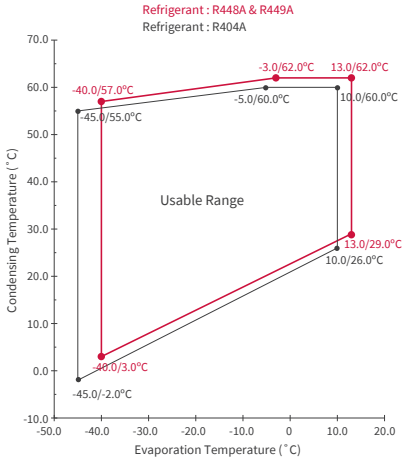
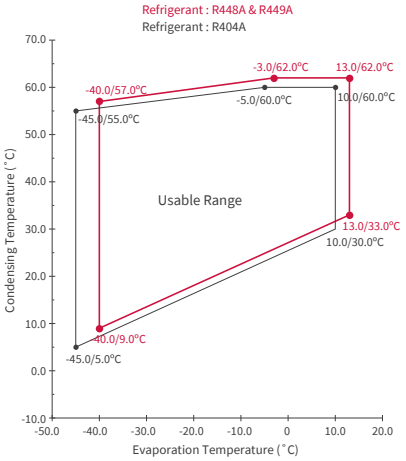


R448A
ZS1120X1

R449A
ZS1120S1/ZS1120X1

R404A
ZS1120S1/ZS1120S2/ZS1120X1



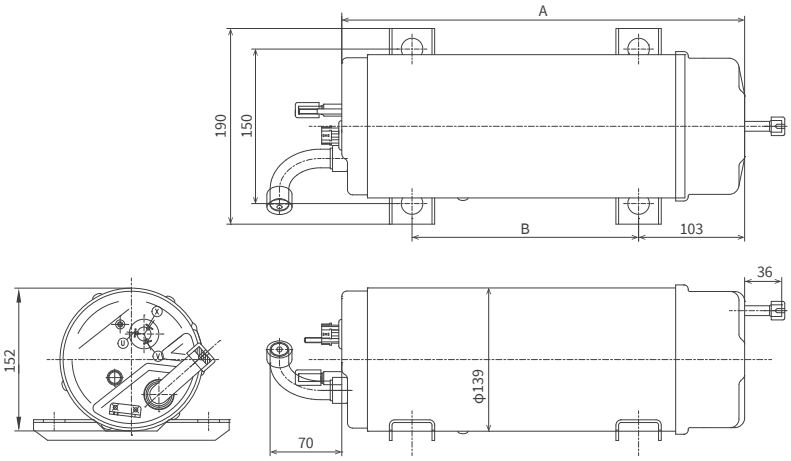
Specification

DS Series

Dimensions

Unit:mm

	A	B
DS1836S1	391	220
DS1529	386	
DS1834		
DS2244V1	441	270



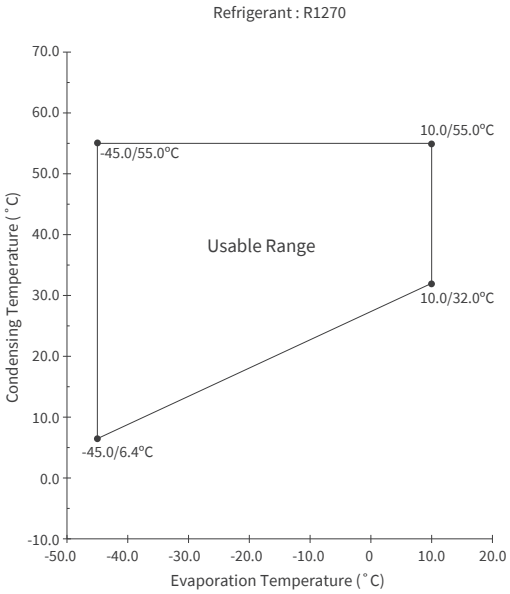
Operating Envelop

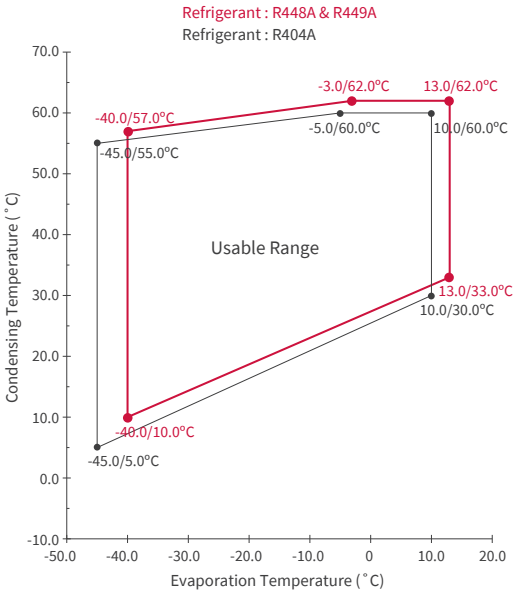
R1270
DS1836S1/DS1529S1

R448A
DS1529X1/DS1834X1

R449A
DS1836S1/DS1529S1/
DS1529X1/DS1834X1

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






008

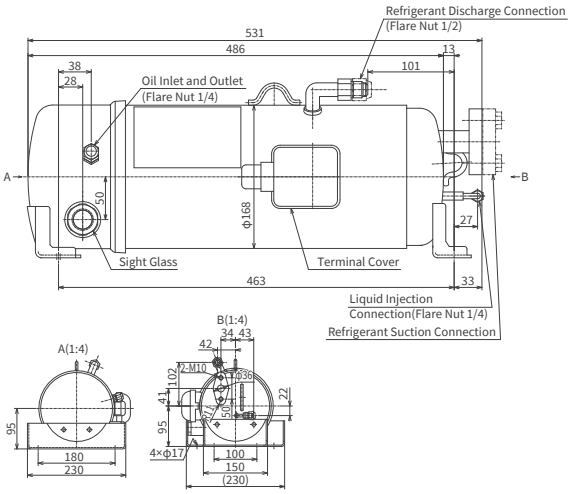
Specification

FL Series

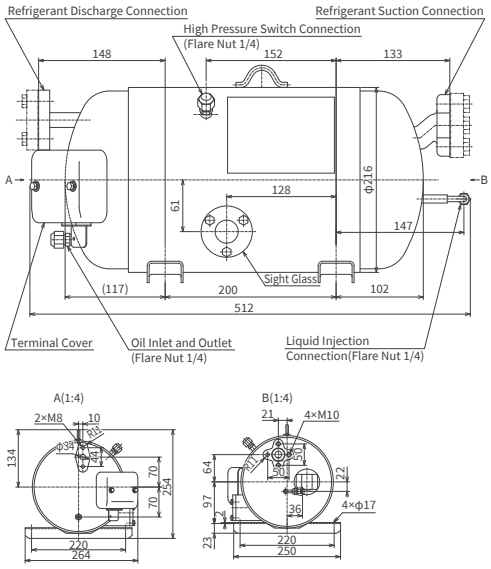
Dimensions

Unit:mm

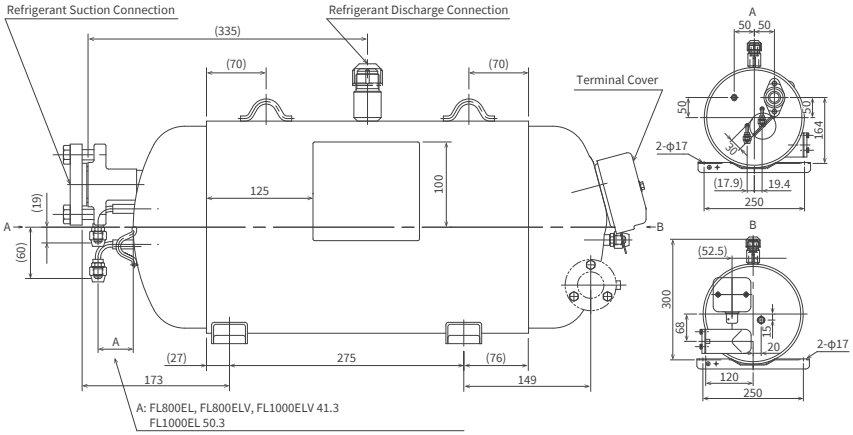
MODEL:
FL300DLV-56A3
FL300DL-56C3



MODEL:
FL600DLV-90A3
FL500DL-90C3

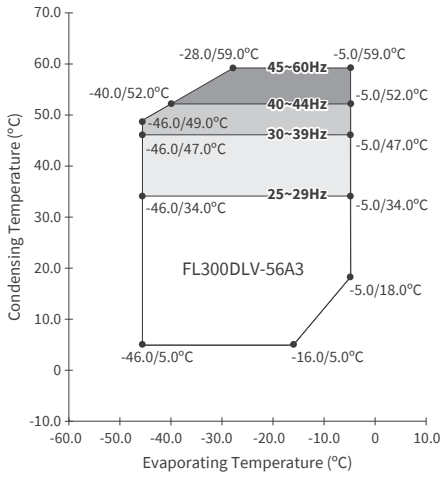


MODEL:
FL800ELV-144A(D)3

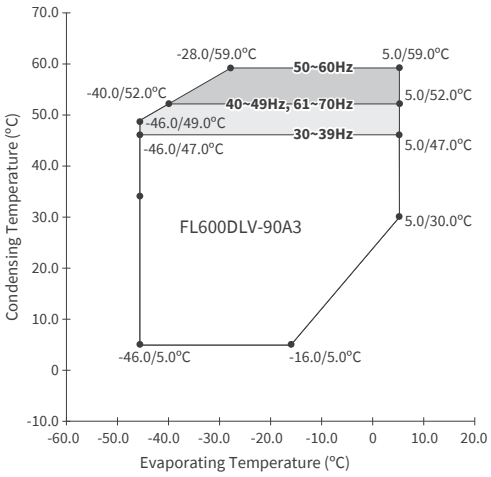


Operating Envelop

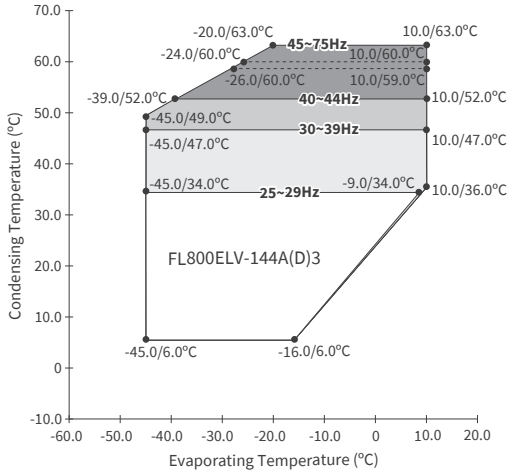
AC inverter



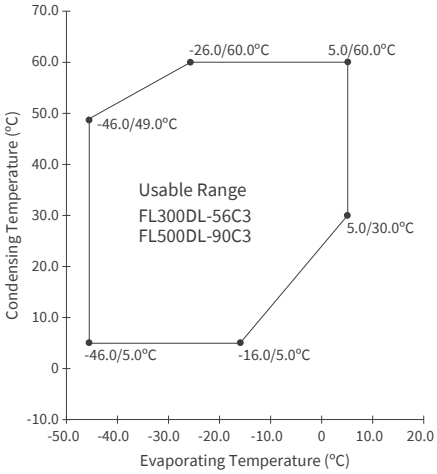
AC inverter



AC inverter



Fixed Speed



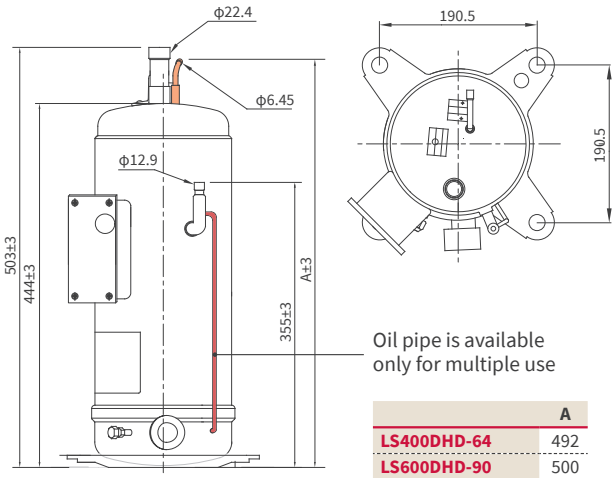
Specification

LS, NS Series

Dimensions

Unit:mm

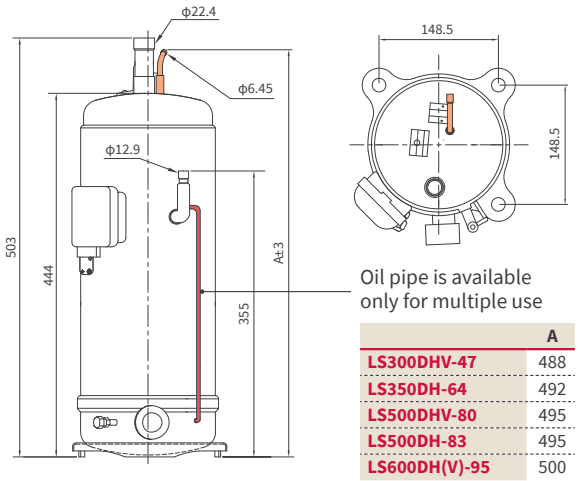
LS DC Inverter



Oil pipe is available only for multiple use

	A
LS400DHD-64	492
LS600DHD-90	500

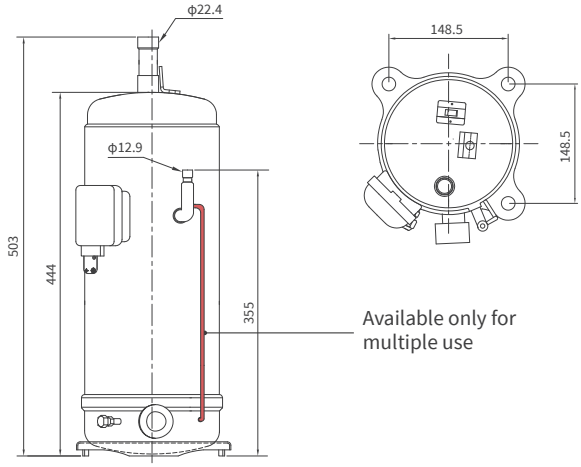
LS AC Inverter & Fixed speed



Oil pipe is available only for multiple use

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

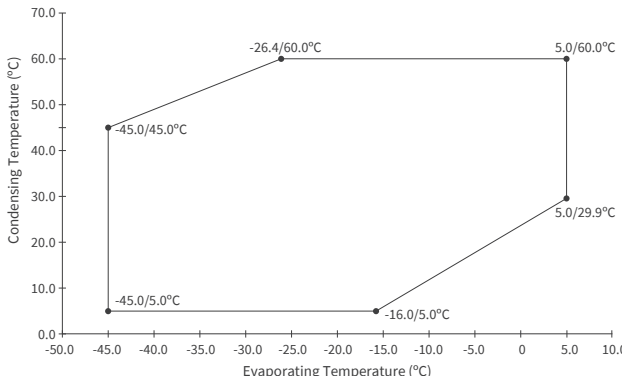
NS, N AC Inverter, Fixed speed



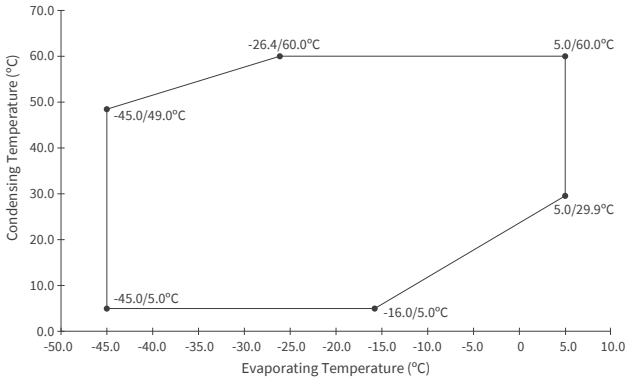
Available only for multiple use

Operating Envelop

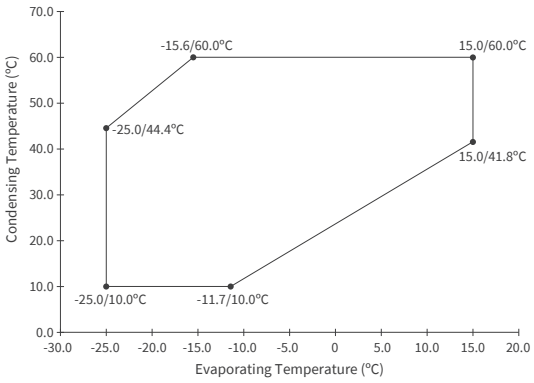
LS DC & AC Inverter Series (R404A)



LS Fixed Series (R404A)



NS Series (R404A)



Johnson Controls - Hitachi Air Conditioning

HEAD QUARTER
New Pier Takeshiba South Tower
1-16-1, Kaigan Minato-ku, Tokyo 105-0022, JAPAN
https://industrial.hitachiaircon.com/en/compressor/scroll

SALES OFFICES

Johnson Controls - Hitachi Air Conditioning Europe SAS
2 Rue de Lombardie, Parc Aktiland II,69800 Saint-Priest, France

Johnson Controls - Hitachi Air Conditioning Singapore Pte. Ltd.
2 Serangoon North Avenue 5, #03-01Singapore 554911

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-202003THQ