



R290 New Products Introduction



Sonyo Compressor (Dalian) Co., Ltd.

March 2025

■ Sonyo Scroll Compressor Product Lineup



■ Sonyo New Products and Applications

Commercial A/C



Applications



Heat Pump



Refrigeration



Transportation



- ✓ R410A 20HP,25HP
- ✓ Compact 8HP, 10HP
- ✓ R513A, 4-20HP
- ✓ R32/R454B DC Inverter 67~120cc (up to 25HP)
- ✓ Low-GWP Refrigerant R32 / R454B / R454C/ R290



- ✓ R410A Fixed Speed (+vapor inj.) up to 25HP
- ✓ R32/R454B/R290 DC Inverter (+ vapor inj.) up to 120cc
- ✓ R513A Heat Pump Dryer 4~13HP
- ✓ Low-GWP R454B/R454C



- ✓ Medium Temp R454C 3~15HP
- ✓ Low Temp (Liquid Inj. or Vapor Inj.) R448A/R449A/R454C 3~15HP Fixed + AC/DC INV
- ✓ Low-GWP R290 / R454C



- ✓ R407C AC INV. 110cc (40KW)
- ✓ R410A DC INV.+EVI 73cc (34KW)
- ✓ Low-GWP R290
- ✓ Low-GWP R513A



Sonyo New Products and Applications

Applications	Refrigerants	Type	Output [HP]															
			3	3.5	4	4.5	5	5.5	6	7	8	9	10	12	13	15	20	25
Commercial A/C	R410A R32 R454B	Fixed Speed																
		Inverter	42 cc 67 cc 81 cc 120 cc															
	R407C R513A R134a	Fixed Speed																
		Inverter	84 cc 149 cc															
Heat Pump	R410A R454B R454C R513A R407C R134a R515B R245fa	Fixed Speed																
		Inverter	42 cc (+vapor inj.) 67 cc (+vapor inj.) 81 cc (+vapor inj.) 120 cc (+vapor inj.)															
Refrigeration (MBP & LBP)	R448A R449A R454C R455A R404A R513A	Fixed Speed																
		Inverter	62 cc (standard / +vapor inj.) 84 cc (standard / +vapor inj.) 110 cc (standard / +vapor inj.)															
Mobile A/C	R407C R410A R513A R134a	Inverter	56 cc 74 cc 110 cc															

■ Technology Trend of Sonyo Scroll Compressor

Green

Environmental Friendly
Refrigerants

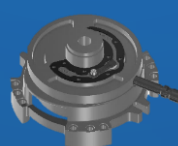


R454B, R454C, R513A, R32,
R515B, R290, CO₂ etc.



Scroll Compressor

High
Efficiency



Variable Speed
Variable Volume
Variable Compression Ratio

Innovation

New Applications



Electric-Bus
A/C



energy storage
A/C



Heat-Pump
Water Heating

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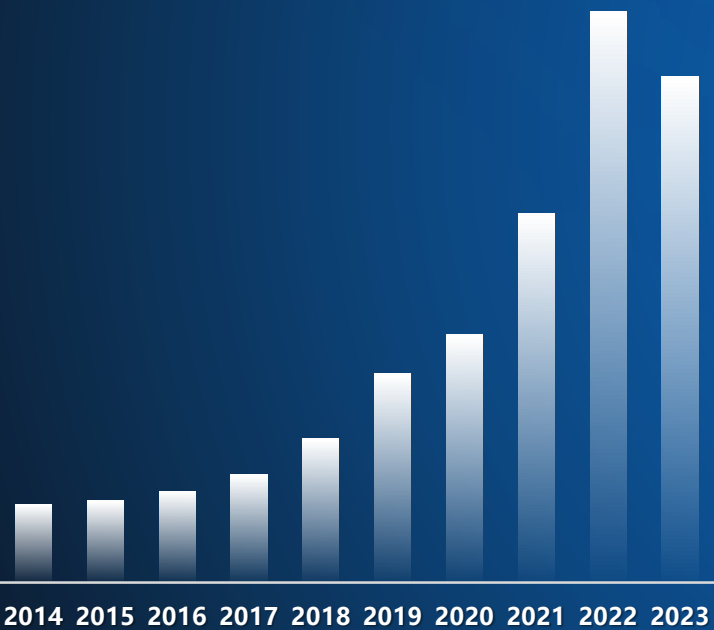
Energy Saving

Sonyo R290 Refrigerant Products

Heat pump technology has been recognized globally in achieving the energy transition and climate goals.

<ATW market in EU>

Data from: JARN



- More strict refrigerant regulations
- More strict working conditions for heating

- F-Gas of EU
- Cold areas heating
- Efficiency
- R290
- EVI tech.
- DC Inverter



Sonyo cooperates with EU partners to achieve large-scale application of R290 products.



Match cold areas heating needs



Higher temp. of water heating

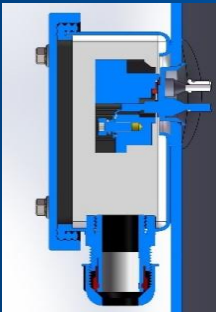


Capacity Of Unit	5~9 kW	9~16 kW	20~30 kW	32~40 kW
Compressor Displacement cc	67cc	80cc	120cc	160cc

Sonyo R290 Refrigerant Products

Type	Heating Capacity [kW]						A-15°C/W55°C		Vapor-Inj. ON			
	2	4	6	8	10	12	14	16	18	20	22	25
DC Inverter (Standard / Vapor inj.)												
	67 cc (2.5-12kW)						Sample					
	81 cc (3-16kW)						Mass production					
	120 cc (5-25kW)								Mass production			
Type	Output [HP]											
	3	4	4.5	5	6	7	8	9	10	12	15	20
Fixed speed (Standard or Tandem for Heat pump &Transportation)	● ●		● ●		●	● ● ●		● ● ●		● ● ●		●
	E series		B series			G series			C series			F series
	24.12		24.12			25.3			24.12			2026
												

■ Sonyo R290 Refrigerant Products(Safety Measures)

Design Features		Technical Advantages
Refrigeration oil	PZ68S (PAG)	Better mutual solubility with R290
Ceramics terminal & Plastic protecting shell		Inside the compressor, the ceramics terminal is protected by a plastic shell, to avoid sparking caused by the impurity.
IP67 Terminal box		IP67 level terminal box, be applicable to avoid sparking caused by external factors.
Brazing oil port for tandem use		Brazing type oil balance port, to avoid leakage in tandem application.



New Labs for R290 Compressor Performance Tests



New Labs for R290 Compressor Reliability Tests



Explosion Proof Tests for Terminal Box

■ Sonyo New Frame——D Series 67-120cc

◆ Design Features



Suction Filter

- ※ Prevent debris entering into compressor

Oil / Gas split design

- ※ Better management of oil displacement

New designed terminal box

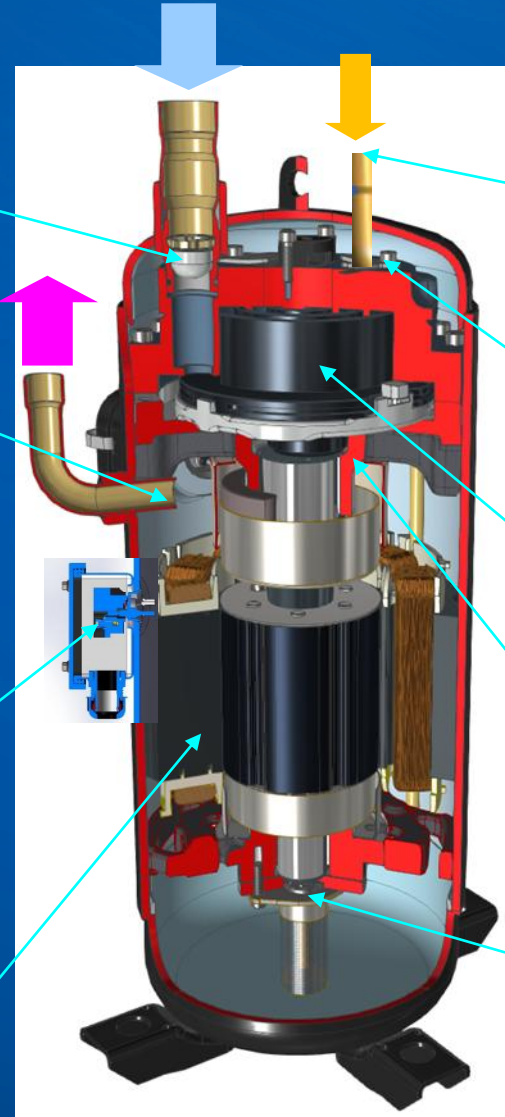
- ※ IP67, water resistance solution

Ceramics terminal & Plastic protecting shell

- ※ avoid sparking caused by the impurity

DC Motor

- ※ 6 poles / concentrated winding
- ※ Internal Permanent Magnets (rare earth)



High Pressure Shell

Gas Injection

- ※ Increase the heating capacity and the outlet water temperature at low ambient temperature conditions

Bypass Valve

- ※ Improve efficiency at part load conditions (IPLV)

New involute shape scroll

- ※ High compression ratio design
- ※ Flexible construction

Flexible groove in the main frame

- ※ Improve reliability

Oil pump

- ※ Ensure oil supply under all running speed

■ Sonyo R290 Refrigerant DC Inverter Products

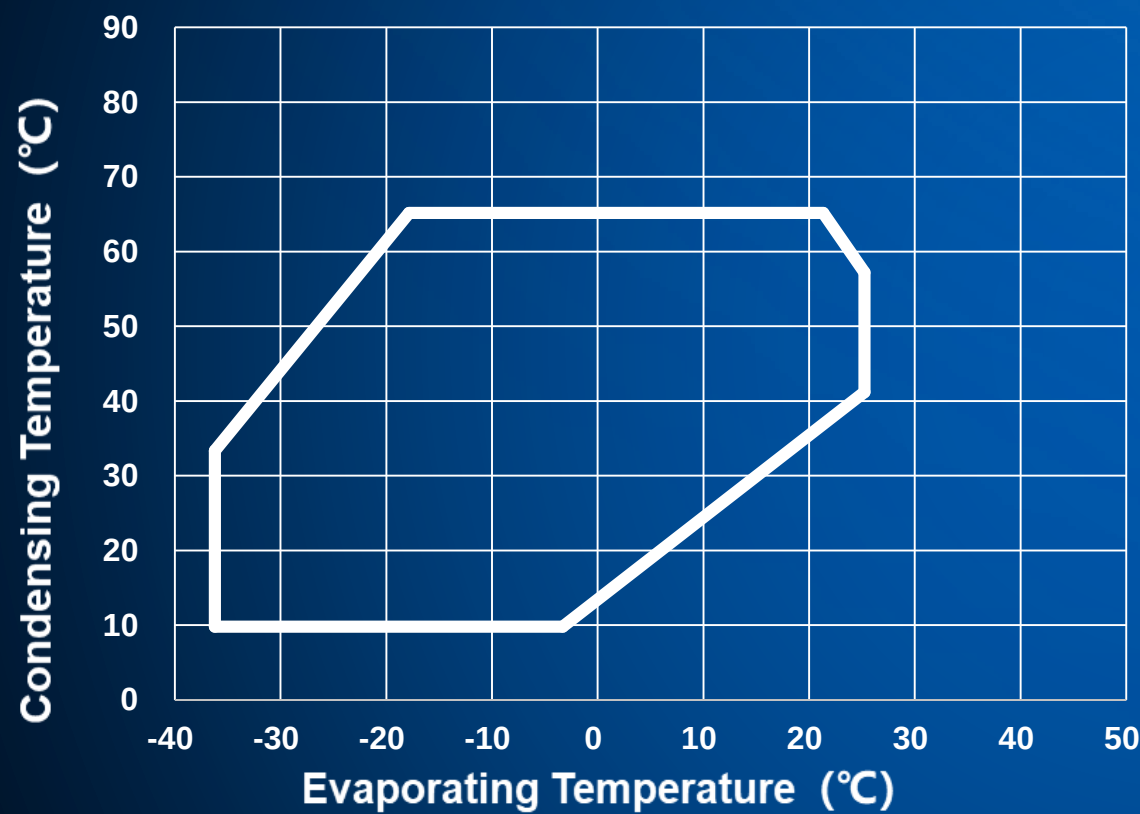
Refrigerant	Series	Electric Supply (to inverter)	Revolution Range(r/s)	Model and type	Displacement (rev/cm ³)	Capacity (W) 60r/s	COP (W/W) 60r/s
R290	D	400V	15-120	7CD081ZA01(standard)	81	15800	3.55
			15-120	7CD081ZA12 (EVI)	81	15800	3.55
			15-120	7CD120ZA02 (EVI)	120	23500	3.59
		200V	15-100	7CD081XA01(standard)	81	15800	3.55
			15-100	7CD081XA02 (EVI)	81	15800	3.55

Rating Condition: Tc = 54.4℃, Te = 7.2℃, SC = 8.3K, SH = 11.1K

■ Sonyo R290 DC Inverter Products (Operation Envelope)

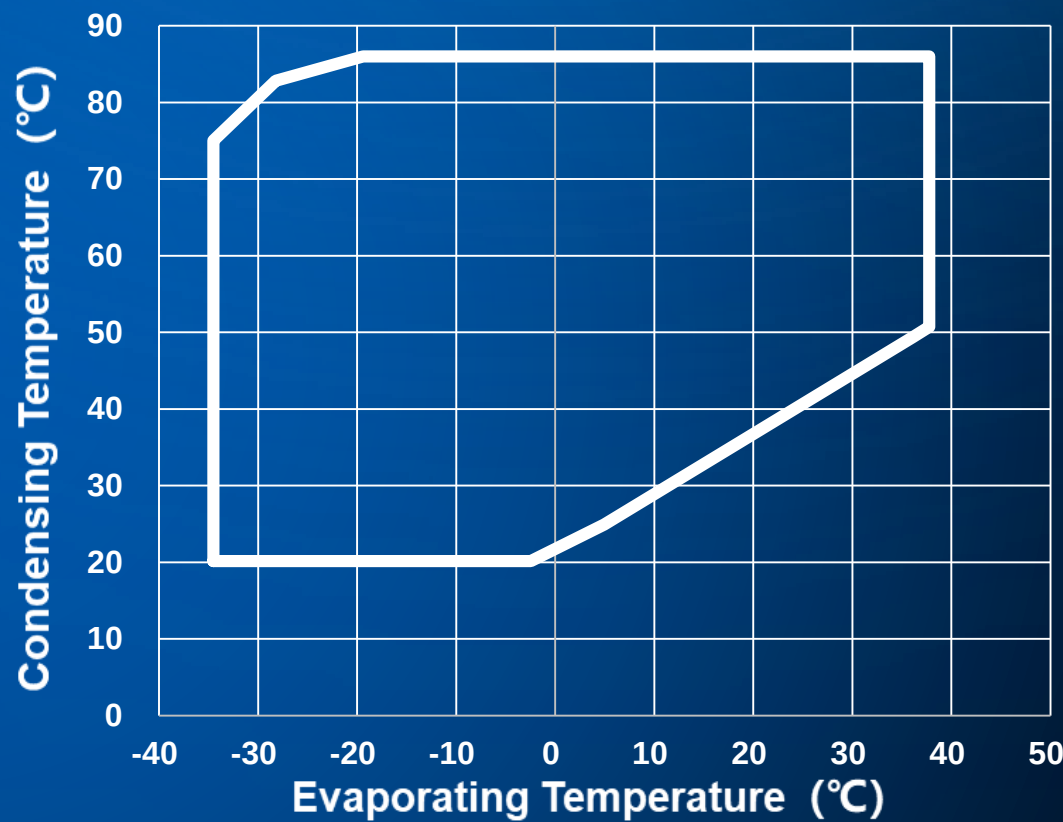
Traditional Refrigerant (R32+vapor inj.)

Discharge Temp. <110°C



R290 Refrigerant (vapor inj.)

Discharge Temp. <100°C



Maximum Operation Envelope

■ Sonyo R290 Fixed Speed Products

Refrigerant	Series	Power Source	Output (HP)	Model and type	Displacement (rev/cm ³)	Capacity (W) 50Hz	COP (W/W) 50Hz
R290	E	50Hz 380~415V 60Hz 440-460V	3	7CE058LA01 (standard)	58.5	8800	3.31
				7CE058LA04 (tandem)			
			4	7CE069LA01 (standard)	68.9	10550	3.35
				7CE069LA04 (tandem)			
	B		4.5	7CB083LA01 (standard)	83.2	12500	3.30
				7CB083LA04 (tandem)			
			5	7CB100LA01 (standard)	100	15000	3.36
				7CB100LA04 (tandem)			
			6	7CB110LA01 (standard)	110	16500	3.38
				7CB100LA04 (tandem)			

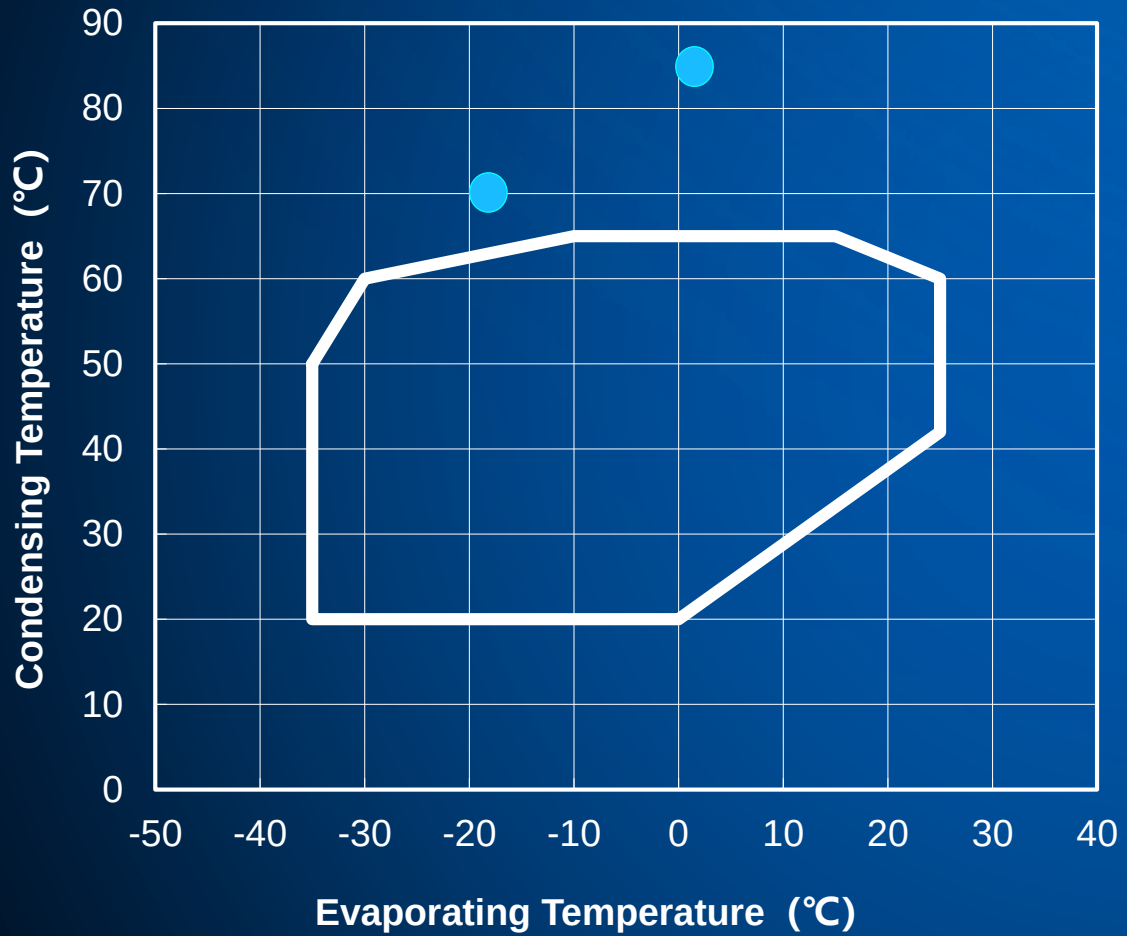
Refrigerant	Series	Power Source	Output (HP)	Model	Displacement (rev/cm ³)	Capacity (W) 50Hz	COP (W/W) 50Hz
R290	G	50Hz 380~415V 60Hz 440-460V	7	7CG124LA01 (standard)	124	20500	3.38
				7CG124LA04 (tandem)			
			8	7CG145LA01 (standard)	145	23300	3.37
				7CG145LA04 (tandem)			
			9	7CG170LA01 (standard)	170	27900	3.38
				7CG170LA04 (tandem)			
	C		10	7CC185LA01 (standard)	185	28900	3.34
				7CC185LA04 (tandem)			
			12	7CC220LA01 (standard)	220	33600	3.38
				7CC220LA04 (tandem)			
			15	7CC260LA01 (standard)	260	39600	3.27
				7CC260LA04 (tandem)			

Rating Condition: T_c = 54.4°C, T_e = 7.2°C, SC = 8.3K, SH = 11.1K

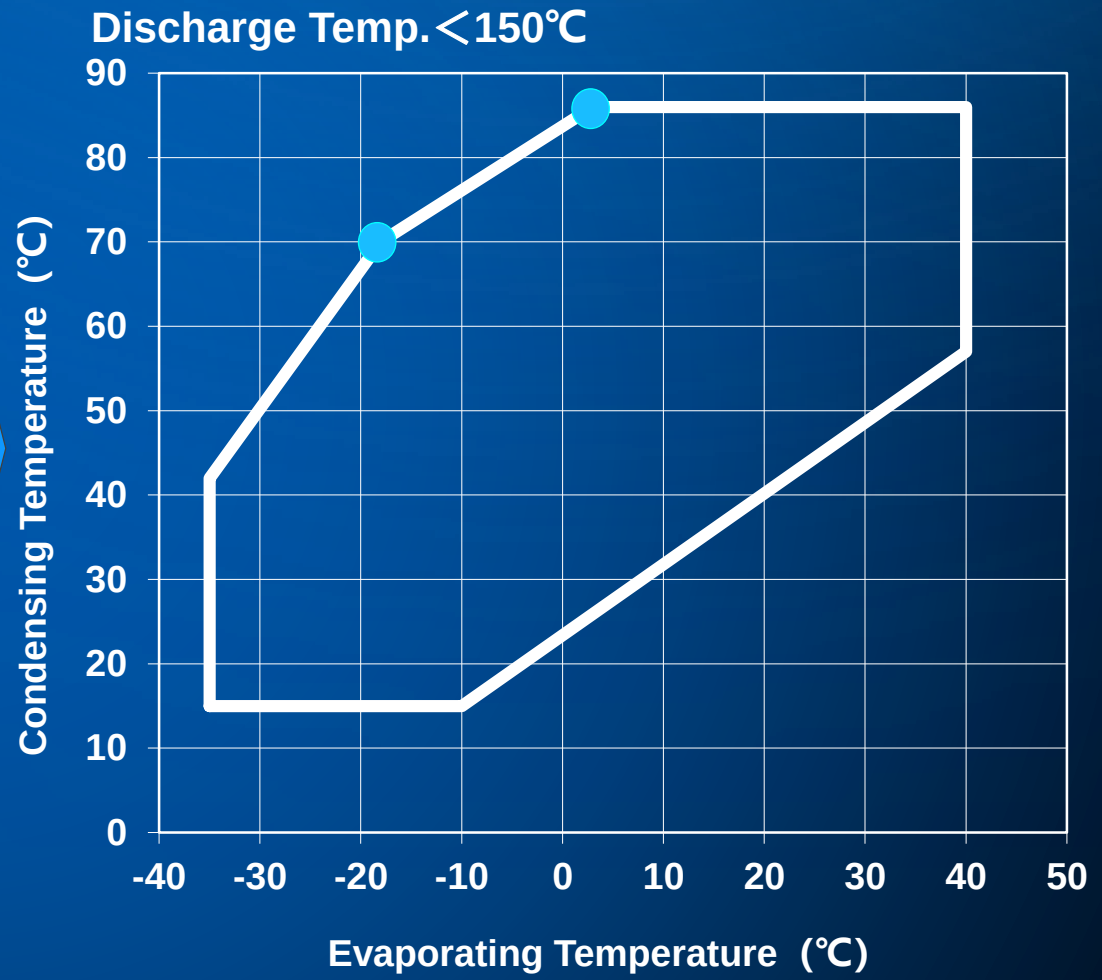
■ Sonyo R290 Fixed Speed Products (Operation Envelope)



Traditional Refrigerant (R410A+vapor inj.)



R290 Refrigerant



■ Improvement of Sonyo New Products

Before

Present

Power Source
(for EU)

50Hz 380-415V
OR
50Hz 380-415V
60Hz 440V

50Hz 380-415V
60Hz 440-460V

Capacity

3-15HP

3-25HP Fixed speed and Inverter
(50HP Coming soon)

Terminal Box



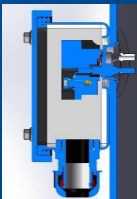
IP21



IP21



IPX3



IP67



Anti-explosion

Refrigerant

R410A/R407C/R134a/
R404A/R32/R454B

R32/R454B/R513A/R448A/R449A/
R454C/R455A/R515B/R290 ...

etc.

*Innovating and advancing Technologies of
Refrigeration and Heating to Improve the
Human Environment.*

Thank You!