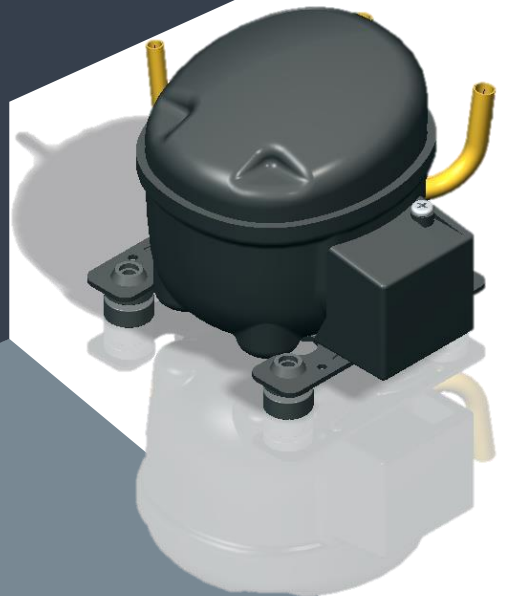


DAEWOO
COMPRESSOR



Super Mini Inverter Compressor “NEO”

Compressor Technology for Refrigerator



Offer innovative
solutions
for a better quality of life

"NEO" Super Mini Inv' Compressor

Brief History

1977

Established compressor plant in Incheon city in KOREA
Started the production of M-series

1993

Developed and started producing YE & YG & YH Series
Production capacity exceeded 2.0 million
(units per year)

2001

Started producing DS-series
WX-series small capacity compressors

2008

Developed and Started producing
High-Efficient model NW-series

2010

Moved compressor factory to Gwang-ju city
(5.0 million capacities)

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2013

Developed and started producing Inverter compressor VNW-series / Produced the full range of R134a and R600a compressors

2015

Introduction of Super High Efficiency Compressor GD-Series (COP 2.0)

2016

Developed high efficient BLDC model VNW
Developed super high efficient model GD

2017

Introduction of World Top Tier efficiency Inverter compressor VGD-Series

2019

Development of Super mini Inverter NEO-Series

China(OEM)

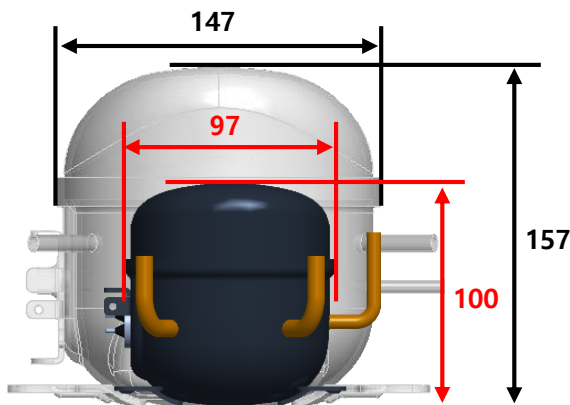
Hangzhou
(DM / DQ / VFM / VFC)

Korea(HQ)

Gwangju
(GD, NW, YE, WX
VNW, VGD, NEO)

“NEO” Super Mini Inv’ Compressor

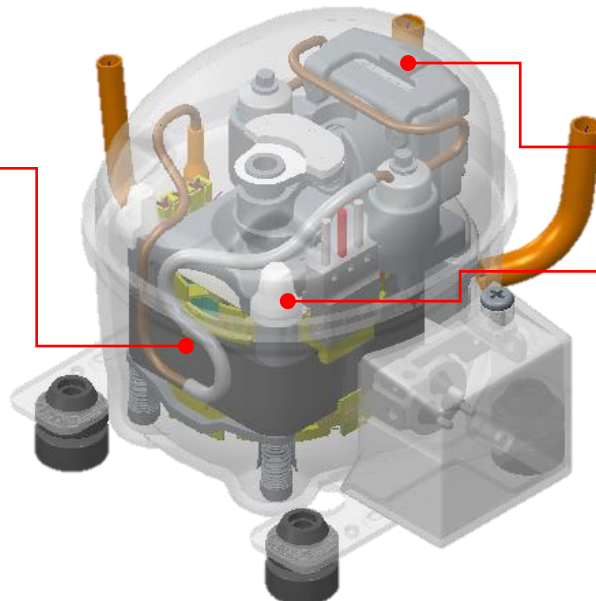
Feature



Comparing size to AC model

Model	WX (Daewoo Small AC Comp)	NEO (Daewoo Super Mini Inverter Comp)
Efficiency (COP, Max)	0.90	1.31 ~ 2.35
Size (W X D X H)	147 X 147 x 157	97 x 108 x 100
Weight	6.1kg	1.9kg
Volume	274cm ³	120cm ³

- Motor Part
- BLDC / DC Motor
(High Efficiency)
 - Inverter Controller



Compact & High Durability

- ✓ Head Damper
- ✓ Rear Damper
(AC HBP / DC Model)

✓ High Efficiency Motor / Inverter

- Variable Speed Control
- High grade magnet application
(depending on model)

✓ Compact Size

- Height : 100 (mm)
- Weight : 1.9 kg

✓ AC / DC Model Line-Up

✓ Wide Range

- Wide Cooling Range
(32W ~ 390W)
- Wide Operating Speed
(2,400 ~ 4200 Rpm)

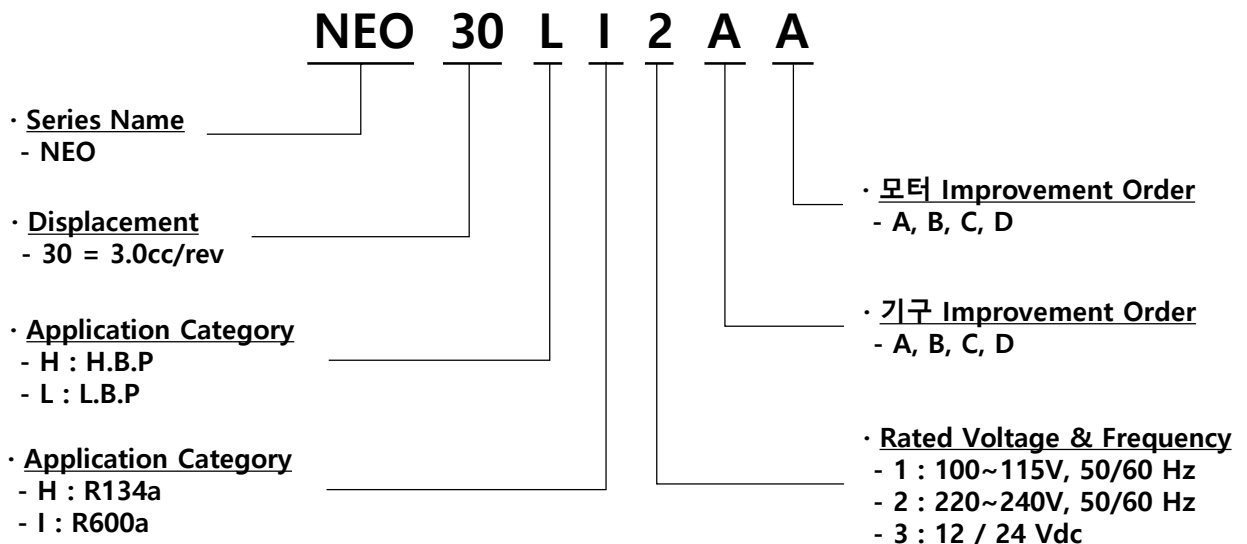
“NEO” Super Mini Inv’ Compressor

Product Range

Power Source	Refrigerant	Test Condition	Displacement [cc/rev]	Capacity (W)				
				0	100	200	300	400
AC (220/110V)	R600a	ASHRAE LBP	[3.0]	(33) ● (64) 3.0				
	R134a		[1.4~3.0]	(34) ●●●● (95) 1.4 ~ 3.0				
	R134a	ASHRAE HBP	[1.8~3.0]		(139) ●●●●● (401) 1.8 2.2 2.5 3.0			
DC (12/24V)	R600a	ASHRAE LBP	[3.0]	(33) ● (64) 3.0				
	R134a		[1.8~3.0]	(39) ●●●● (95) 1.8 ~ 3.0				
	R134a	ASHRAE HBP	[1.8~3.0]		(139) ●●●●● (401) 1.8 2.2 2.5 3.0			

Test Condition	Test Condition	ASHRAE	
		LBP	HBP
	Evaporating Temperature	-23.3 °C (-10 °F)	7.2 °C (45 °F)
	Condensing Temperature	54.4 °C (130 °F)	54.4 °C (130 °F)
	Ambient Temperature	32.2 °C (90 °F)	35.0 °C (95 °F)
	Gas Superheated to	32.2 °C (90 °F)	46.1 °C (115 °F)
	Liquid Subcooled to	32.2 °C (90 °F)	35.0 °C (95 °F)

Model Identification



“NEO” Super Mini Inv’ Compressor

AC Model Line-Up

Power Source	Refrigerant	Test Condition	Displacement [cc/rev]	Capacity (W)				
				0	100	200	300	400
AC (220/100V)	R600a	ASHRAE LBP	[3.0]	(33)  (64) 3.0				
	R134a		[1.4~3.0]	(34)  (95) 1.4 ~ 3.0				
	R134a	ASHRAE HBP	[1.8~3.0]		(139)  (401) 1.8 2.2 2.5 3.0			

Ref.	Application	Rated Voltage	Freq.	Model	Displ. [cc/rev]	Speed (RPM)	Capacity			COP [W/W]	EER [Btu/Wh]	EEF [kcal/Wh]	Height [mm]
							[kcal/h]	[Btu/h]	[W]				
R134a	ASHRAE LBP	AC 220V	50/60Hz	NEO14	1.4	4200	40	158	46	1.40	4.78	1.20	100
						3600	36	144	42	1.41	4.81	1.21	
						2700	29	116	34	1.42	4.85	1.22	
				NEO18	1.8	4200	49	193	57	1.35	4.60	1.16	100
						3600	44	176	52	1.36	4.64	1.17	
						2700	36	144	42	1.36	4.64	1.17	
				NEO22	2.2	4200	59	236	69	1.35	4.60	1.16	100
						3600	51	204	60	1.36	4.64	1.17	
						2400	34	134	39	1.36	4.64	1.17	
				NEO25	2.5	4200	67	265	78	1.35	4.60	1.16	100
						3600	58	228	67	1.36	4.64	1.17	
						2400	38	151	44	1.36	4.64	1.17	
				NEO30	3.0	4200	82	324	95	1.35	4.60	1.16	100
						3600	70	278	81	1.36	4.64	1.17	
						2400	47	186	55	1.36	4.64	1.17	
		AC 100V	50/60Hz	NEO18	1.8	4200	49	193	57	1.35	4.60	1.16	100
						3600	44	176	52	1.36	4.64	1.17	
						2700	36	144	42	1.36	4.64	1.17	
R134a	ASHRAE HBP	AC 220V	50/60Hz	NEO18	1.8	4200	206	819	240	2.42	8.26	2.08	100
						3600	177	703	206	2.37	8.08	2.04	
						2400	120	474	139	2.21	7.56	1.90	
				NEO22	2.2	4200	266	1,054	309	2.37	8.08	2.04	100
						3600	228	903	265	2.32	7.91	1.99	
						2400	151	601	176	2.16	7.38	1.86	
				NEO25	2.5	4200	283	1,121	329	2.32	7.91	1.99	100
						3600	242	959	281	2.27	7.73	1.95	
						2400	164	650	191	2.11	7.20	1.82	
				NEO30	3.0	4200	345	1,367	401	2.11	7.20	1.82	100
						3600	295	1,170	343	2.01	6.85	1.73	
						2400	199	791	232	1.91	6.50	1.64	
R600a	ASHRAE LBP	AC 220V	50/60Hz	NEO30	3.0	4200	55	218	64	1.42	4.85	1.22	100
						3600	49	193	57	1.42	4.85	1.22	
						2400	28	112	33	1.13	3.87	0.97	

“NEO” Super Mini Inv’ Compressor

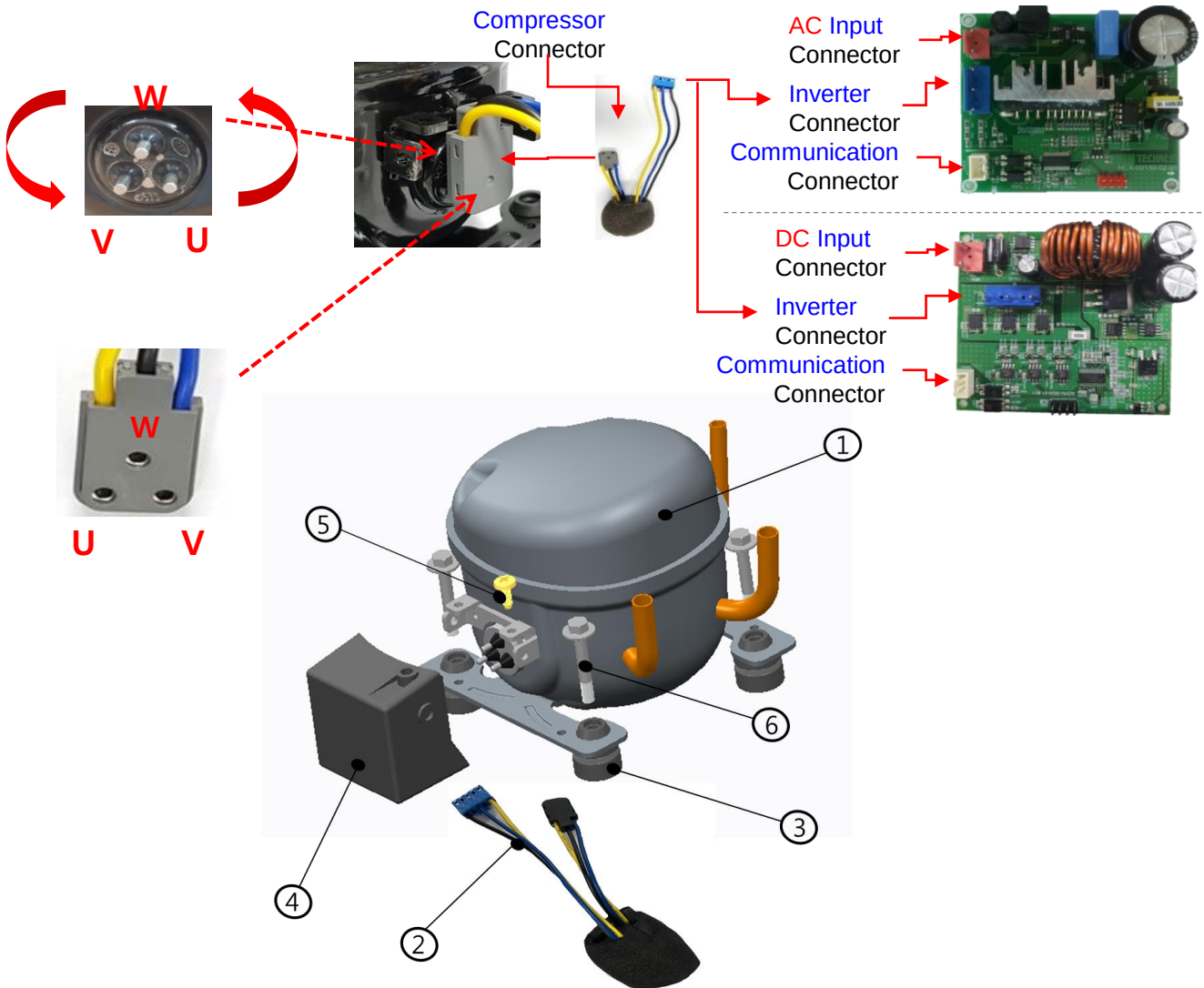
DC Model Line-Up

Power Source	Refrigerant	Test Condition	Displacement [cc/rev]	Capacity (W)				
				0	100	200	300	400
DC (12/24V)	R134a	ASHRAE LBP	[1.8~3.0]	(39)  1.8 ~ 3.0 (95)				
		ASHRAE HBP	[1.8~3.0]		(139) 			(401)
	R600a	ASHRAE LBP	[3.0]	(33)  3.0 (64)				

Ref.	Application	Rated Voltage	Model	Displ. [cc/rev]	Speed (RPM)	Capacity			COP	EER	EEF	Height [mm]
						[kcal/h]	[Btu/h]	[W]				
R134a	ASHRAE LBP	DC12/24V	NEO18	1.8	4200	49	193	57	1.25	4.25	1.07	100
					3600	44	176	52	1.22	4.15	1.05	
					2400	36	144	42	1.27	4.32	1.09	
			NEO22	2.2	4200	59	236	69	1.24	4.22	1.06	100
					3600	51	204	60	1.24	4.22	1.06	
					2400	34	134	39	1.03	3.51	0.89	
			NEO25	2.5	4200	67	265	78	1.13	3.87	0.97	100
					3600	58	228	67	1.08	3.69	0.93	
					2400	38	151	44	1.03	3.51	0.89	
			NEO30	3.0	4200	82	324	95	1.13	3.87	0.97	100
					3600	70	278	81	1.03	3.51	0.89	
					2400	47	186	55	0.98	3.34	0.84	
	ASHRAE HBP	DC12/24V	NEO18	1.8	4200	206	819	240	2.27	7.73	1.95	100
					3600	177	703	206	2.21	7.56	1.90	
					2400	120	474	139	2.14	7.31	1.84	
			NEO22	2.2	4200	266	1,054	309	2.21	7.56	1.90	100
					3600	228	903	265	2.16	7.38	1.86	
					2400	151	601	176	2.11	7.20	1.82	
			NEO25	2.5	4200	283	1,121	329	2.16	7.38	1.86	100
					3600	242	959	281	2.06	7.03	1.77	
					2400	164	650	191	1.78	6.07	1.53	
			NEO30	3.0	4200	345	1,367	401	1.91	6.50	1.64	100
					3600	295	1,170	343	1.80	6.15	1.55	
					2400	199	791	232	1.72	5.88	1.48	
R600a	ASHRAE LBP	DC12/24V	NEO30	3.0	4200	55	218	64	1.31	4.48	1.13	100
					3600	49	193	57	1.27	4.34	1.09	
					2400	28	112	33	1.06	3.60	0.91	

“NEO” Super Mini Inv’ Compressor

Connection and Cables



No.	Parts	No.	Parts
1	Compressor	4	Relay Cover
2	Harness Assy(+Noise Filter)	5	Taptite Screw
3	Rubber Grommet	6	Fix Bolt

PCB Assembly can be applied by changing the method and location according to the method of mounting on the Comp and the applied product after being assembled in the case.

TX : 3 Bytes
(Inverter→Main)

“NEO” Super Mini Inv’ Compressor

UART Communication (Two-Way)

✓ UART Communication Frequency Command

Frequency Command [Hz]	Binary Code	Rotational Speed [RPM]
0	0000 0000	0
1 ~ 39	0000 0001 ~ 0010 0111	2400
40	0010 1000	2400
41	0010 1001	2460
42	0010 1010	2520
43	0010 1011	2580
44	0010 1100	2640
45	0010 1101	2700
46	0010 1110	2760
47	0010 1111	2820
48	0011 0000	2880
49	0011 0001	2940
50	0011 0010	3000
51	0011 0011	3060
52	0011 0100	3120
53	0011 0101	3180
54	0011 0110	3240
55	0011 0111	3300
56	0011 1000	3360
57	0011 1001	3420
58	0011 1010	3480
59	0011 1011	3540
60	0011 1100	3600
61	0011 1101	3660
62	0011 1110	3720
63	0011 1111	3780
64	0100 0000	3840
65	0100 0001	3900
66	0100 0010	3960
67	0100 0011	4020
68	0100 0100	4080
69	0100 0101	4140
70	0100 0110	4200
70 ~	0100 0110 ~	4200

“NEO” Super Mini Inv’ Compressor

UART Communication (Two-Way)

✓ UART Communication Error Code

Error	Data Code	
	Binary	Decimal
Normal	0000 0000	0
RPM Error or Phase Open	0000 0011	3
Over Current	0000 0110	6
IPM Fault	0000 0111	7
Communication	0000 1000	8
Over Load or Over Heat	0000 1001	9
Over Load Protection Logic	0000 1010	10
Warning Code 1 ¹⁾	0000 0001	1
Warning Code 2 ²⁾	0001 0000	16
Warning Code 3 ³⁾	0001 0001	17

1) Transmission when input more than 180W / Normal when less than 160W

2) Transmission when IPM Temperature exceeds 110℃ / Normal when it is below 100℃

3) Input 180W, IPM Transmission when Temperature exceeds 110℃ / Normal when 160W, less than 100℃

ex) PCB Input 170W, IPM Temperature 111℃ → ‘0001 0000’ Data code Transmission

PCB Input 181W, IPM Temperature 111℃ → ‘0001 0001’ Data code Transmission

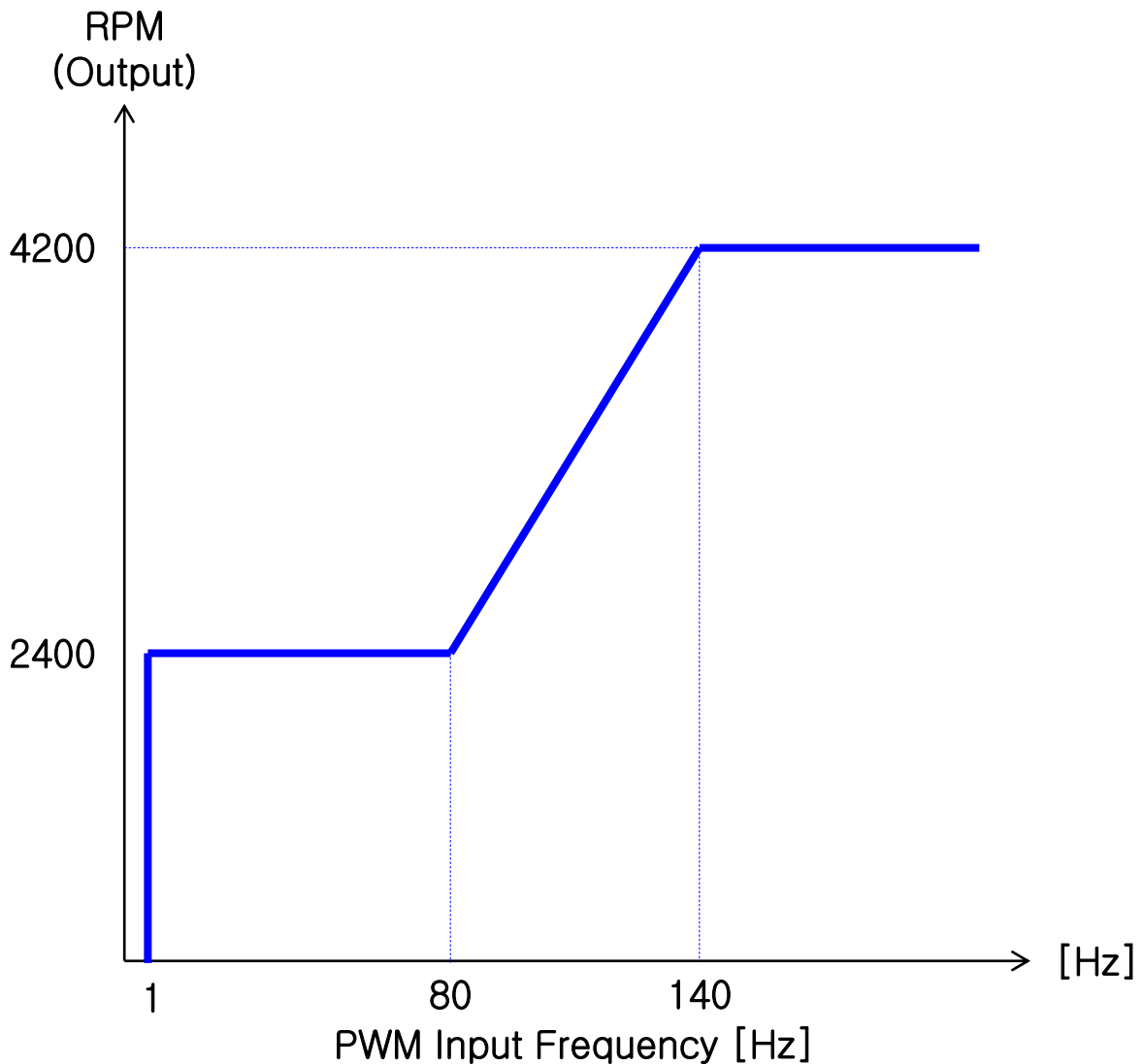
“NEO” Super Mini Inv’ Compressor

PWM Communication (One-Way)

- ✓ PWM Input Frequency vs. Operating Frequency

Operating Frequency = PWM Frequency / 2

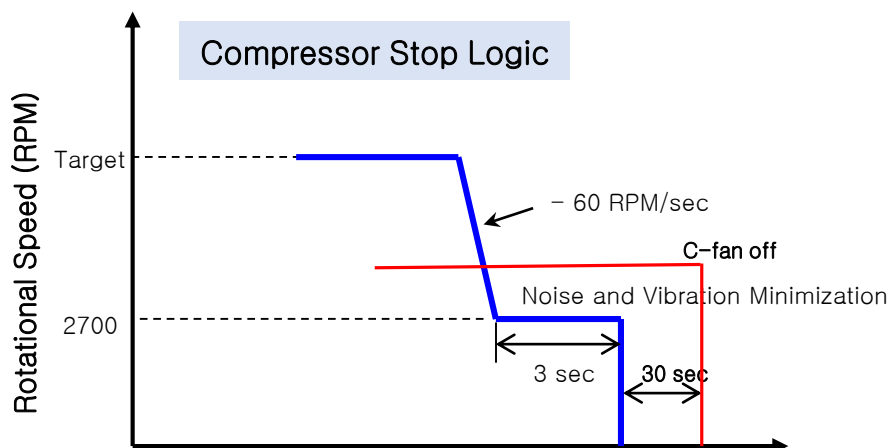
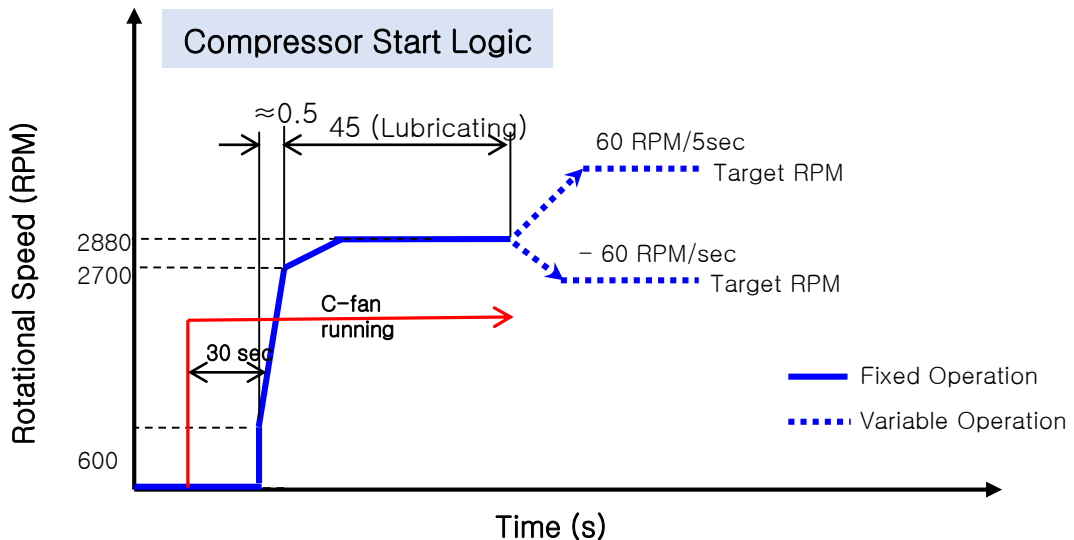
RPM = PWM Frequency x 30



“NEO” Super Mini Inv’ Compressor

Compressor Start and Stop Logic

- A. In order to avoid compressor vibration at low RPM, it starts running from 600RPM. After that, it accelerates rapidly to 2700RPM within 0.5 seconds and then gradually reaches 2880RPM.
 - B. After starting the Compressor, keep it at 2880RPM for 45 seconds (Lubricating) and then operate at Target RPM.
 - C. When the compressor is stopped, it stops at 2700RPM for 3 seconds (Noise and Vibration Prevention) and then decelerates to 60RPM/sec.
 - D. Operate the condenser cooling fan before starting the compressor (about 30 seconds) and stop it after stopping the compressor (about 30 seconds).
- (The graph below is an example, and it is determined by the load and operating conditions of the set.)



“NEO” Super Mini Inv’ Compressor

Protection Logic

BLDC compressors, motors and drives have 9 different protection logics for protection. Whenever protection is activated, the LED on the inverter controller PCB will flash and the compressor will restart after a waiting time.

The blinking of the LED continues during the Standby Time, and the number of blinks indicates which protection logic is active.

Protection	Fault Condition	Standby Time	Number of LED Blinking
Phase Open	In case one or more of the motor 3 phase wires are broken or not connected	5 Minutes	2
RPM Error	When the RPM exceeds the error range (300RPM) for more than 1 second when driving the motor	5 Minutes	3
Low Voltage	When the DC Link voltage drops below 220V	1 Minutes	4
High Voltage	When the DC Link voltage rises above 385V	1 Minutes	5
Over Current Trip	When the motor's phase current exceeds 3.5A _{peak}	5 Minutes	6
IPM Fault	When a current trip occurs in the IPM itself due to an overcurrent phenomenon	5 Minutes	7
Communication Error	In case of bidirectional communication, if there is no response for more than 1 minute after data transmission	5 Minutes	8
Overload Protection	When the compressor operates continuously for more than 1 minute under overload condition	6 Minutes	9
Over Heat Protection	When the temperature of the IPM exceeds 125 degrees.	5 Minutes	10

“NEO” Super Mini Inv’ Compressor

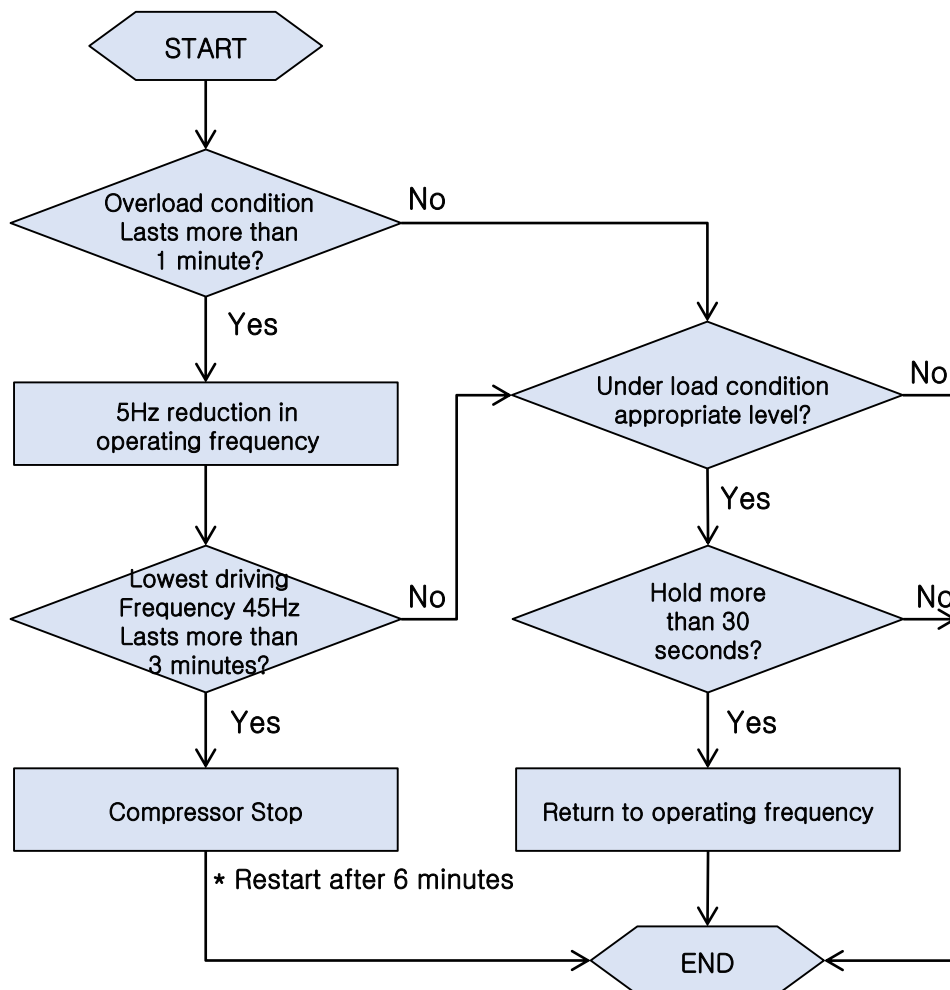
Overload Protection Algorithm

Every time the overload condition is maintained for more than 1 minute, the operating frequency is reduced by 5Hz. (minimum 45Hz)

If the overload condition continues for more than 3 minutes even at the lowest operating frequency of 45Hz in the overload condition, Stop the compressor and restart it after a 6 minute rest period.

If the load condition continues for more than 30 seconds at the appropriate level or less, it returns to the original frequency.

The algorithm below is an example, and the overload state and the appropriate load state are determined through set matching.



“NEO” Super Mini Inv’ Compressor

Appliances



Need of **“Compact”** and **“Mobile”**

Appliances in Refrigeration & Air Treatment



Water Purifier



Portable Ref.



Camping Air-Con



Super Mini Inv’ Compressor

“NEO”



Luxury Car Cooler



Personal Cooler



Bus/Truck/Yacht Ref.



Cond’ Unit

**DAEWOO
COMPRESSOR**



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