# KD SCROLL INSTALLATION AND OPERATING INSTRUCTIONS.





Thermofrost Cryo Plc Ernest Avenue West Norwood London SE27 0DA

#### Installation, commissioning and maintenance.

The following has been issued to aid installation of the KD Scroll range of low noise units. It is important that the following is read and understood before installation is undertaken.

In compiling the contents of this manual it is assumed that qualified and competent refrigeration and electrical engineers will carry out all installation work.

#### **IMPORTANT NOTES:**

Check that:-

- 1) The electrical supply available is suitable for the KD Scroll unit being installed.
- 2) The equipment is sited correctly to ensure adequate airflow around it and that discharge air is not drawn back into the unit. (Min 300 mm from condenser face to wall is recommended.
- 3) Allow sufficient space around the unit for maintenance purposes.
- 4) If the unit is to be installed on a roof, check that the structure of the roof is able to stand the weight of the unit.
- 5) Ensure the location of the unit is clear of debris such as leaves, paper etc.
- 6) For best noise reduction mount unit onto anti-vibration mounts.

### INSTALLATION.

The KD Scroll is fitted with all necessary components to minimise installation time on site. The units are fitted with compressor contactor, overload, electrical isolator, crankcase heater, start and run capacitors, dual HP/LP switch, pressure operated fan speed controller, liquid line drier/sight glass and liquid receiver. The condenser coil is coated with a blue weatherproof coating suitable for installation in aggressive atmospheres.

The low temperature models using the ZF Copeland scroll have a liquid injection system operated by a discharge temperature control (DTC). This is set at  $89.4 \degree C + 2.4 \degree C$ .

Installation is straightforward and should be carried out in accordance with recognised standards of refrigeration practice and in accordance with current IEE regulations and to comply with any relevant local codes of practice.

To use the units on a pump down system a link wire should be fitted between terminals 1 & 2 of the terminal rail. If you wish to use the unit on direct control, a thermostat with volt free contacts can be wired across these terminals.

Full wiring diagrams are included on the removable side panel of the units

The units are supplied with an inert gas holding charge; the unit should be fully evacuated and then charged with R404A/R407F/R134a to a clear sight glass. Where the silver label states the refrigerant type and weight (Kg), this weight is the liquid receiver volume not the total system charge. The total system charge will depend on pipe line sizing and total pipe run. The system should be charged to the expected running pressures for the refrigerant type and to a clear sight glass!

Units should be sited in free air with a minimum clearance of 300mm from the condenser face to any obstruction, and 1000mm free air discharge from the condenser fan.

#### Piping:

Pipework routes should be a short and simple as possible, avoiding low points where oil can accumulate. Pipelines should be sized to ensure the suction gas velocity is sufficient to ensure good oil return.

All copper tube should be dehydrated refrigeration grade only. Nitrogen should be passed through the pipework when brazing to avoid oxidation.

Suction line should be fully insulated and all pipework should be supported at a maximum of 2m intervals.

In vertical risers, the suction riser should be fitted with a U trap at the bottom and a P trap at the top for a rise of 3m or over.

## PRE-START UP

For all installations it will be necessary to set the LP switch to ensure effective control if using a pump down cycle, we suggest a setting of 1.5bar (R404A/R407F) or 0.6bar (R134a), but this will be dependent on site conditions. The ZB compressor is fitted with an internal relief valve set to operate at a pressure differential of 28bar (+/- 3 bar). To prevent repeated lifting of this valve, ensure that the LP switch is set to avoid reaching the pressure differential limit of 28bar.

The low temperature units fitted with ZF compressors should have a LP cut out setting of approximately 0.3bar (R404A/R407F).

The HP switch is not factory pre-set and will require adjustment to suit conditions on site, suggested maximum cut out for use with R404A/R407F is approximately 28 bar and 16bar for R134a.

NOTE: The 2PAL090M3 and 2PAL100M3 units are fitted with PRVs set at 24.8barg, so the HP switch should be set accordingly on these units to prevent this valve from lifting.

The RGE/XGE fan speed controller should be set to maintain the optimum condensing temperature as shown in the tables at the end of this brochure (ambient 32 °C, R404A refrigerant)

Check condenser fan(s) are free to rotate, and check all service valves are fully open.

Check all electrical wiring is sound and that the power supply is correct for the condensing unit being installed.

Units are rated at a maximum ambient to condenser of  $38 \,^{\circ}$ C, at these ambient conditions the unit should be limited to a maximum evaporating temperature of  $0 \,^{\circ}$ C to prevent excessive head pressures.

### START UP.

Once the unit is running a check should be made to ensure condenser fan(s) are running correctly, drawing air through the condenser, there are no unusual noises coming from the unit, no leaks are apparent and that all readings are within expected ranges (i.e suction pressure, discharge pressure, suction superheat, current drawn etc).

Compressors should be limited to 12 starts per hour, this can be achieved by use of a delay timer or by programming a delay time into an electronic controller which gives the unit its start signal.

#### 3Ph units:

On start up if the compressor is running noisy and not pumping, switch off immediately. The compressor is running in the wrong direction. Change over two of the three-phase supply and restart.

#### SERVICE AND MAINTENANCE.

WARNING: Disconnect the main electrical supply before servicing or opening the unit.

At regular intervals the unit should be checked to ensure that there are no refrigerant or oil leaks, there is no abnormal or unusual vibration or noise from the unit.

Check compressor oil level is correct, minimum oil level is <sup>1</sup>/<sub>4</sub> of a sight glass and maximum level should be <sup>3</sup>/<sub>4</sub> of a sight glass.

Clean and inspect the condenser coil. Remove any obstacles that may hinder airflow.

Check all fan motors for excessive noise or vibration and check all fans run smoothly.

Check running current and voltage to the unit. Check all electrical wiring and tighten as necessary.

#### Safety Notice: Do not operate any device which is not stated on the user's manual for safety.

Units manufactured by: Kyung Dong Industrial Co Ltd. 509 Yongmiri Kwangtanmyon Paju Kyunggido 413-855 Republic of Korea The following tables give the design condensing temperature for each unit based on a 32  $^\circ\!C$  ambient and the required evaporating temperature.

Model	Capacity in Watts / Condensing temp °C						
Evap Temp °C	10	5	0	-5	-10	-15	-20
1PAL015M1	4893/47.1	4200/45.2	3550/43.4	3000/42.3	2495/41.0	2015/40.6	1650/38.8
1PAL020M1	6800/45.9	5800/43.9	4950/42.4	4150/41.5	3450/40.2	2815/39.2	2260/38.3
1PAL020M3	6800/45.9	5800/43.9	4950/42.4	4150/41.5	3450/40.2	2815/39.2	2260/38.3
1PAL025M1	7900/48.3	6800/46.8	5850/44.8	4950/43.6	4150/42.0	3450/40.8	2820/39.7
1PAL025M3	7900/48.3	6800/46.8	5850/44.8	4950/43.6	4150/42.0	3450/40.8	2820/39.7
1PAL030M1	9600/47.6	8250/46.1	7100/44.2	6000/43.0	5000/41.5	4150/40.3	3400/39.2
1PAL030M3	9600/47.6	8250/46.1	7100/44.2	6000/43.0	5000/41.5	4150/40.3	3400/39.2
1PAL036M1	11300/47.5	9750/45.7	8350/43.9	7000/42.7	5900/41.3	4900/40.0	4000/39.0
1PAL036M3	11300/47.5	9750/45.7	8350/43.9	7000/42.7	5900/41.3	4900/40.0	4000/39.0
1PAL040M3	12640/49.6	10850/47.8	9350/45.7	7960/43.9	6660/42.7	5550/41.3	4560/40.0
2PAL050M3	15900/49.5	13650/47.8	11800/45.7	10050/43.9	8400/42.7	7000/41.3	5750/40.1
PAUP050M3	15900/49.5	13650/47.8	11800/45.7	10050/43.9	8400/42.7	7000/41.3	5750/40.1
2PAL075M3	20900/50.8	17950/49.0	15300/47.5	13100/45.5	11100/43.7	9210/42.5	7580/41.1
2PAL100M3	31400/51.5	27400/49.3	23800/47.1	20100/45.7	17000/43.8	14050/42.5	11500/41.0

Capacities R404A, -20°C to +10°C evaporating.

M1 models are single-phase, M3 models are three-phase.

## Capacities R404A, -40°C to -10°C evaporating.

Model	Capacity in Watts / Condensing temp °C						
Evap Temp °C	-10	-15	-20	-25	-30	-35	-40
1PAL030L3	4850/41.1	4050/39.8	3350/38.8	2740/37.9	2220/37.1	1770/36.4	1380/35.9
1PAL035L3	5800/43.2	4850/41.6	4050/40.3	3350/39.2	2735/38.3	2200/37.5	1730/36.8
1PAL040L3	6850/42.8	5750/41.2	4800/39.9	3900/38.8	3150/37.9	2500/37.1	1940/36.3
2PAL050L3	8450/42.6	7100/41.1	5900/39.7	4850/38.6	3900/37.7	3100/36.9	2375/36.1
PAUP050L3	8450/42.6	7100/41.1	5900/39.7	4850/38.6	3900/37.7	3100/36.9	2375/36.1
2PAL060L3	9750/44.0	8150/42.7	6800/41.2	5650/39.9	4600/38.8	3700/37.9	2900/37.1
PAUP060L3	9750/44.0	8150/42.7	6800/41.2	5650/39.9	4600/38.8	3700/37.9	2900/37.1
2PAL075L3	11850/44.9	10000/43.5	8400/42.0	6950/40.6	5650/39.4	4550/38.4	3500/37.5

All model (L3) are three-phase

Duties are quoted at 10K suction superheat with liquid subcooled to condenser limits in an ambient of 32°C.

## ECODESIGN DATA

Model 1PAL020M3			
Refrigerant			
Item	Symbol	Value	Unit
Evaporating Temperature	t	-10	°C
Parameters at full load and ambient temperature 32°C			
Rated cooling capacity	PA	3.64	Kw
Rated power input	DA	1.72	Kw
Rated COP	COP A	2.12	
Parameters at full load and ambient temperature 25°C			
Rated cooling capacity	PA	4.12	Kw
Rated power input	DA	1.45	Kw
Rated COP	COP 2	2.84	
Parameters at full load and ambient temperature 43°C			
(where applicable)			
Rated cooling capacity	PA		Kw
Rated power input	DA		Kw
Rated COP	COP 3		
Other items			
Capacity Control	Fixed		
Contact Details	Thermofrost Cryo Ltd		
	Er	nest Aven	ue
	West Norwood		
	Lon	don SE27 (	DDA

Model 1PAL020M3				
Refrigerant				
Item	Symbol	Value	Unit	
Evaporating Temperature	t	-10	°C	
Parameters at full load and ambient temperature 32°C				
Rated cooling capacity	PA	3.64	Kw	
Rated power input	DA	1.72	Kw	
Rated COP	COP A	2.12		
Parameters at full load and ambient temperature 25°C				
Rated cooling capacity	PA	4.12	Kw	
Rated power input	DA	1.45	Kw	
Rated COP	COP 2	2.84		
Parameters at full load and ambient temperature 43°C				
(where applicable)				
Rated cooling capacity	PA		Kw	
Rated power input	DA		Kw	
Rated COP	COP 3			
Other items				
Capacity Control	Fixed			
Contact Details	Therr	nofrost Cr	yo Ltd	
	Ernest Avenue			
	w	est Norwo	od	
	Lor	London SE27 0DA		

Model 1PAL025M3			
Refrigerant			
Item	Symbol	Value	Unit
Evaporating Temperature	t	-10	°C
Parameters at full load and ambient temperature 32°C			
Rated cooling capacity	PA	4.11	Kw
Rated power input	DA	2.06	Kw
Rated COP	COP A	2.00	
Parameters at full load and ambient temperature 25°C			
Rated cooling capacity	PA	4.58	Kw
Rated power input	DA	1.77	Kw
Rated COP	COP 2	2.59	
Parameters at full load and ambient temperature 43°C			
(where applicable)			
Rated cooling capacity	PA		Kw
Rated power input	DA		Kw
Rated COP	COP 3		
Other items			
Capacity Control		Fixed	
Contact Details	COP 3 Fixed Thermofrost Cryo Ltd		
	Ernest Avenue		
	West Norwood		
	Lor	don SE27 (	DDA

#### Model 1PAL020M1 Refrigerant Item Nerrigerant Item Evaporating Temperature Parameters at full load and ambient temperature 32°C Rated cooling capacity Rated COP Parameters at full load and ambient temperature 25°C Rated cooling capacity Rated power input Rated COP Parameters at full load and ambient temperature 43°C (where applicable) Rated cooling capacity Rated cooler input Rated COP Other items Capacity Control Contact Details Value Unit °C Symbol t -10 PA DA COP A 3.64 1.72 2.12 Kw Kw Pa Da 4.12 1.45 2.84 Kw Kw COP 2 PA DA COP 3 Kw Kw Fixed Thermofrost Cryo Ltd Ernest Avenue West Norwood London SE27 0DA

Model 1PAL025M1			
Refrigerant			
Item	Symbol	Value	Unit
Evaporating Temperature	t	-10	°C
Parameters at full load and ambient temperature 32°C			
Rated cooling capacity	PA	4.11	Kw
Rated power input	DA	2.06	Kw
Rated COP	COP A	2.00	
Parameters at full load and ambient temperature 25°C			
Rated cooling capacity	PA	4.58	Kw
Rated power input	DA	1.77	Kw
Rated COP	COP 2	2.59	
Parameters at full load and ambient temperature 43°C			
(where applicable)			
Rated cooling capacity	PA		Kw
Rated power input	DA		Kw
Rated COP	COP 3		
Other items			
Capacity Control	Fixed		
Contact Details	Therr	nofrost Cr	yo Ltd
	Ernest Avenue		
	W	est Norwo	od
	Lon	idon SE27 (	DDA

Model 1PAL030M1				
Refrigerant R404A				
Item	Symbol	Value	Unit	
Evaporating Temperature	t	-10	°C	
Annual Electrical Consumption	Q	8,765	KWh/a	
Seasonal energy performance ratio	SEPR	3.74		
Parameters at full load and ambient temperature 32°C				
(Point A)				
Declared Cooling capacity	PA	5.33	Kw	
Declared power input	DA	2.46	Kw	
Rated COP	COP A	2.17		
Parameters at full load and ambient temperature 25°C				
(Point B)				
Declared Cooling capacity	PA	5.94	Kw	
Declared power input	DA	2.10	Kw	
Rated COP	COP B	2.83		
Parameters at full load and ambient temperature 15°C				
(Point C)				
Declared Cooling capacity	PA	6.75	Kw	
Declared power input	DA	1.69	Kw	
Rated COP	COP C	3.99		
Parameters at full load and ambient temperature 5°C				
(Point D)				
Declared Cooling capacity	PA	7.46	Kw	
Declared power input	DA	1.36	Kw	
Rated COP	COP D	5.49		
Other items				
Capacity Control	Fixed			
Degradation coefficient for fixed and				
staged capacity unit	Cdc	0.25		
Parameters at full low and ambient temperature 43°C				
(where applicable)				
Cooling capacity	P3			
Powerinput	D <sub>3</sub>			
Declared COP	COP <sub>3</sub>			
Contact Details	Thermofrost Cryo Ltd			
	Er	nest Aven	ue	
	W	West Norwood		
	London SE27 0DA			

Model 1PAL030M3				
Refrigerant R404A				
Item	Symbol	Value	Unit	
Evaporating Temperature	t	-10	°C	
Annual Electrical Consumption	Q	8,765	KWh/a	
Seasonal energy performance ratio	SEPR	3.74		
Parameters at full load and ambient temperature 32°C				
(Point A)				
Declared Cooling capacity	PA	5.33	Kw	
Declared power input	DA	2.46	Kw	
Rated COP	COP A	2.17		
Parameters at full load and ambient temperature 25°C				
(Point B)				
Declared Cooling capacity	PA	5.94	Kw	
Declared power input	DA	2.10	Kw	
Rated COP	COP B	2.83		
Parameters at full load and ambient temperature 15°C				
(Point C)				
Declared Cooling capacity	PA	6.75	Kw	
Declared power input	DA	1.69	Kw	
Rated COP	COP C	3.99		
Parameters at full load and ambient temperature 5°C				
(Point D)				
Declared Cooling capacity	PA	7.46	Kw	
Declared power input	DA	1.36	Kw	
Rated COP	COP D	5.49		
Other items				
Capacity Control	Fixed			
Degradation coefficient for fixed and				
staged capacity unit	Cdc	0.25		
Parameters at full low and ambient temperature 43°C				
(where applicable)				
Cooling capacity	P <sub>3</sub>			
Powerinput	D3			
Declared COP	COP <sub>3</sub>			
Contact Details	Thermofrost Cryo Ltd			
	Ernest Avenue			
	W	est Norwo	od	
	Lon	don SE27	DDA	

Model 1PAL036M1			
Refrigerant R404A			
Item	Symbol	Value	Unit
Evaporating Temperature	t	-10	°C
Annual Electrical Consumption	Q	11,739	KWh/a
Seasonal energy performance ratio	SEPR	3.02	
Parameters at full load and ambient temperature 32°C			
(Point A)			
Declared Cooling capacity	PA	5.76	Kw
Declared power input	DA	3.17	Kw
Rated COP	COP A	1.82	
Parameters at full load and ambient temperature 25°C			
(Point B)			
Declared Cooling capacity	PA	6.42	Kw
Declared power input	DA	2.76	Kw
Rated COP	COP B	2.33	
Parameters at full load and ambient temperature 15°C			
(Point C)			
Declared Cooling capacity	PA	7.32	Kw
Declared power input	DA	2.27	Kw
Rated COP	COP C	3.22	
Parameters at full load and ambient temperature 5°C			1
(Point D)			
Declared Cooling capacity	PA	8.18	Kw
Declared power input	DA	1.89	Kw
Rated COP	COP D	4.40	
Otheritems			
Capacity Control	Fixed		
Degradation coefficient for fixed and			
staged capacity unit	Cdc	0.25	
Parameters at full low and ambient temperature 43°C			1
(where applicable)			
Cooling capacity	P3		
Powerinput	D3		
Declared COP	COP <sub>3</sub>		
Contact Details	Therr	nofrost Cr	yo Ltd
		Ernest Avenue	
	w	est Norwo	od
	Lor	don SE27	0DA

		r	
Model 1PAL036M3			
Refrigerant R404A			
Item	Symbol	Value	Unit
Evaporating Temperature	t	-10	°C
Annual Electrical Consumption	Q	11,739	KWh/a
Seasonal energy performance ratio	SEPR	3.02	
Parameters at full load and ambient temperature 32°C			
(Point A)			
Declared Cooling capacity	PA	5.76	Kw
Declared power input	DA	3.17	Kw
Rated COP	COP A	1.82	
Parameters at full load and ambient temperature 25°C			
(Point B)			
Declared Cooling capacity	PA	6.42	Kw
Declared power input	DA	2.76	Kw
Rated COP	COP B	2.33	
Parameters at full load and ambient temperature 15°C			
(Point C)			
Declared Cooling capacity	PA	7.32	Kw
Declared power input	DA	2.27	Kw
Rated COP	COP C	3.22	
Parameters at full load and ambient temperature 5°C			
(Point D)			
Declared Cooling capacity	PA	8.18	Kw
Declared power input	DA	1.89	Kw
Rated COP	COP D	4.40	
Other items			
Capacity Control	Fixed		
Degradation coefficient for fixed and			
staged capacity unit	Cdc	0.25	
Parameters at full low and ambient temperature 43°C			
(where applicable)			
Cooling capacity	P3		
Power input	D3		
Declared COP	COP <sub>3</sub>		
Contact Details	Therr	nofrost Cr	yo Ltd
	Er	nest Aven	ue
	W	est Norwo	od
	Lon	don SE27	DDA

Model 1PAL040M3			
Refrigerant R404A			
Item	Symbol	Value	Unit
Evaporating Temperature	t	-10	°C
Annual Electrical Consumption	Q	11,367	KWh/a
Seasonal energy performance ratio	SEPR	3.71	
Parameters at full load and ambient temperature 32°C			
(Point A)			
Declared Cooling capacity	PA	6.86	Kw
Declared power input	DA	3.25	Kw
Rated COP	COP A	2.11	
Parameters at full load and ambient temperature 25°C			
(Point B)			
Declared Cooling capacity	PA	7.62	Kw
Declared power input	DA	2.77	Kw
Rated COP	COP B	2.75	
Parameters at full load and ambient temperature 15°C			
(Point C)			
Declared Cooling capacity	PA	8.66	Kw
Declared power input	DA	2.20	Kw
Rated COP	COP C	3.94	
Parameters at full load and ambient temperature 5°C			
(Point D)			
Declared Cooling capacity	PA	9.66	Kw
Declared power input	DA	1.74	Kw
Rated COP	COP D	5.55	
Other items			
Capacity Control	Fixed		
Degradation coefficient for fixed and			
staged capacity unit	Cdc	0.25	
Parameters at full low and ambient temperature 43°C			
(where applicable)			
Cooling capacity	P3		
Powerinput	D3		
Declared COP	COP <sub>3</sub>		
Contact Details	Therr	nofrost Cr	yo Ltd
Ernest Avenue		nest Aven	ue
	w	est Norwo	od

Symbol	Value	Unit	
		°C	
		KWh/a	
~		K WII/a	
JLFIN	3.05		
D.	0.05	Kw	
		KW	
		KW	
COPA	2.09		
	0.0-	Kw	
	0.00	Kw	
COP B	2.72		
Pa	11.35	Kw	
DA	2.93	Kw	
COP C	3.87		
PA	12.75	Kw	
DA	2.33	Kw	
COP D	5.47		
Fixed			
Cdc	0.25		
P3			
D3			
COP <sub>3</sub>			
nofrost Cry			
West Norwood			
don SE27 (	DA		
	DA COP C PA DA COP D Fixed Cdc Cdc D3 COP3 nofrost Cn nest Avenuest Norwo	t -10 Q 14,923 SEPR 3.65 DA 4.24 COP A 2.09 PA 9.92 DA 3.65 COP B 2.72 PA 11.35 DA 2.93 COP C 3.87 PA 11.35 DA 2.93 COP C 3.87 Fixed CCC 0.25 Fixed CCC 0.25 P3 D3 COP 3 P3 D3 COP 3 P3 D3 COP 3 P3 D3 COP 3 P3 D3 COP 3 P5 COP 4 COP 4 CCC 4 CCCC 4 CCC 4 CCCCC 4 CCC 4 CCCCC 4 CCCC 4 CCCC 4 CCCC 4 CCCC 4 CCCC 4 CCCC 4 CCCC 4 CCCC 4	

Model 2PAL090M3			
Refrigerant		R404A	
Item	Symbol	Value	Unit
Evaporating Temperature	t	-10.00	°C
Annual Electrical Consumption	Q	31,391	KWh/a
Seasonal energy performance ratio	SEPR	3.58	
Parameters at full load and ambient temperature 32°C			
(Point A)			
Declared Cooling capacity	PA	18.30	Kw
Declared power input	DA	8.35	Kw
Rated COP	COP A	2.19	
Parameters at full load and ambient temperature 25°C			
(Point B)			
Declared Cooling capacity	PA	20.40	Kw
Declared power input	DA	7.24	Kw
Rated COP	COP B	2.82	
Parameters at full load and ambient temperature 15°C			
(Point C)			
Declared Cooling capacity	PA	23.10	Kw
Declared power input	DA	5.97	Kw
Rated COP	COP C	3.87	
Parameters at full load and ambient temperature 5°C			
(Point D)			
Declared Cooling capacity	PA	25.60	Kw
Declared power input	DA	4.97	Kw
Rated COP	COP D	5.15	
Otheritems			
Capacity Control	Fixed		
Degradation coefficient for fixed and			
staged capacity unit	Cdc		
Parameters at full low and ambient temperature 43°C			
(where applicable)			
Cooling capacity	P <sub>3</sub>		
Power input	D3		
Declared COP	COP3		
Contact Details	Therr	nofrost Cr	yo Ltd
	Er	nest Aven	ue
	w	est Norwo	od
	London SE27 0DA		

Model 2PAL075M3			
Refrigerant R404A			
Item	Symbol	Value	Unit
Evaporating Temperature	t	-10	°C
Annual Electrical Consumption	Q	19,895	KWh/a
Seasonal energy performance ratio	SEPR	3.63	
Parameters at full load and ambient temperature 32°C			
(Point A)			
Declared Cooling capacity	PA	11.75	Kw
Declared power input	DA	5.66	Kw
Rated COP	COP A	2.08	
Parameters at full load and ambient temperature 25°C			
(Point B)			
Declared Cooling capacity	PA	13.20	Kw
Declared power input	DA	4.83	Kw
Rated COP	COP B	2.73	
Parameters at full load and ambient temperature 15°C			
(Point C)			
Declared Cooling capacity	PA	15.10	Kw
Declared power input	DA	3.87	Kw
Rated COP	COP C	3.90	
Parameters at full load and ambient temperature 5°C			
(Point D)			
Declared Cooling capacity	PA	16.75	Kw
Declared power input	DA	3.13	Kw
Rated COP	COP D	5.35	
Other items			
Capacity Control	Fixed		
Degradation coefficient for fixed and			
staged capacity unit	Cdc	0.25	
Parameters at full low and ambient temperature 43°C			
(where applicable)			
Cooling capacity	P3		
Power input	D3		
Declared COP	COP <sub>3</sub>		
Contact Details		nofrost Cr	vo Ltd
	-	nest Aven	
		est Norwo	
	London SE27 0DA		
	1 201		

Model 2PAL100M3			
Refrigerant R404A			
Item	Symbol	Value	Unit
Evaporating Temperature	t	-10	°C
Annual Electrical Consumption	Q	31,391	KWh/a
Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C	SEPR	3.58	
(Point A)			
Declared Cooling capacity	PA	18.30	Kw
Declared power input	DA	8.35	Kw
Rated COP	COP A	2.19	
Parameters at full load and ambient temperature 25°C			
(Point B)		20.40	
Declared Cooling capacity	PA		Kw
Declared power input	DA	7.24	Kw
Rated COP	COP B	2.82	
Parameters at full load and ambient temperature 15°C (Point C)			
Declared Cooling capacity	PA	2.31	Kw
Declared power input			Kw
Rated COP	COP C	5.97 3.87	
Parameters at full load and ambient temperature 5°C			
(Point D)			
Declared Cooling capacity	PA	25.60	Kw
Declared power input	Da	4.97	Kw
Rated COP	COP D	5.15	
Other items	Fixed		
Capacity Control Degradation coefficient for fixed and	Fixed		
staged capacity unit	Cdc	0.25	
Parameters at full low and ambient temperature 43°C		0.120	
(where applicable)			
Cooling capacity	P3		
Power input	D3		
Declared COP	COP <sub>3</sub>		
Contact Details		nofrost Cry	
		nest Avenu	-
	VVe	est Norwoo	00
	Lon	don SE270	
Model 104102512	Lon	don SE27 0	DA
Model 1PAL035L3 Refrigerant R404A	Lon	don SE27 0	DA
Model 1PAL035L3 Refrigerant R404A Item	Symbol		Unit
Refrigerant R404A		Value -35	
Refrigerant R404A Item	Symbol	Value	Unit
Refrigerant R404A Item Evaporating Temperature	Symbol t	Value -35	Unit
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C	Symbol t Q	Value -35 10,973	Unit
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A)	Symbol t Q SEPR	Value -35 10,973 1.72	Unit °C KWh/a
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity	Symbol t Q SEPR PA	Value -35 10,973 1.72 2.53	Unit °C KWh/a
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity Declared power input	Symbol t Q SEPR PA DA	Value -35 10,973 1.72 2.53 2.21	Unit °C KWh/a
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity Declared power input Rated COP	Symbol t Q SEPR PA	Value -35 10,973 1.72 2.53	Unit °C KWh/a
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 25°C	Symbol t Q SEPR PA DA	Value -35 10,973 1.72 2.53 2.21	Unit °C KWh/a
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity Declared Cooling capacity Declared COP Parameters at full load and ambient temperature 25°C (Point B)	Symbol t Q SEPR PA DA COP A	Value -35 10,973 1.72 2.53 2.21 1.14	Unit °C KWh/a Kw Kw
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 25°C (Point B) Declared Cooling capacity	Symbol t Q SEPR PA DA	Value -35 10,973 1.72 2.53 2.21 1.14 2.74	Unit °C KWh/a Kw Kw Kw
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity Declared Cooling capacity Declared COP Parameters at full load and ambient temperature 25°C (Point B)	Symbol t Q SEPR Pa Da COP A - Pa Da	Value -35 10,973 1.72 2.53 2.21 1.14	Unit °C KWh/a Kw Kw
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity Declared Cooling capacity Parameters at full load and ambient temperature 25°C (Point B) Declared Cooling capacity Declared Cooling capacity Declared power input	Symbol t Q SEPR PA DA COP A	Value -35 10,973 1.72 2.53 2.21 1.14 2.74 1.97	Unit °C KWh/a Kw Kw Kw
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 25°C (Point B) Declared power input Rated COP	Symbol t Q SEPR Pa Da COP A - Pa Da	Value -35 10,973 1.72 2.53 2.21 1.14 2.74 1.97	Unit °C KWh/a Kw Kw Kw
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Dooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 25°C (Point B) Declared Dooling capacity Declared Dooling capacity Declared Dower input Rated COP Parameters at full load and ambient temperature 15°C	Symbol t Q SEPR Pa Da COP A - Pa Da	Value -35 10,973 1.72 2.53 2.21 1.14 2.74 1.97	Unit °C KWh/a Kw Kw Kw
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Dooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 25°C (Point B) Declared Cooling capacity Declared Dower input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared Cooling capacity Declared Cooling capacity Declared Cooling capacity Declared Cooling capacity Declared Cooling capacity Declared for temperature 15°C (Point C) Declared power input	Symbol t Q SEPR Pa Da COP A Pa Da COP B	Value -35 10,973 1.72 2.53 2.21 1.14 2.74 1.97 1.39 3.00 1.70	Unit °C KWh/a Kw Kw Kw Kw
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity Declared COP	Symbol t Q SEPR PA DA COP A COP A DA COP B	Value -35 10,973 1.72 2.53 2.21 1.14 2.74 1.97 1.39 3.00	Unit °C KWh/a Kw Kw Kw Kw Kw
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full Ioad and ambient temperature 32°C (Point A) Declared Cooling capacity Declared power input Rated COP Parameters at full Ioad and ambient temperature 25°C (Point B) Declared power input Rated COP Parameters at full Ioad and ambient temperature 15°C (Point C) Declared power input Rated COP Parameters at full Ioad and ambient temperature 15°C (Point C) Declared Cooling capacity Declared power input Rated COP Parameters at full Ioad and ambient temperature 5°C Parameters at full Ioad and ambient temperature 5°C	Symbol t Q SEPR Pa Da COP A Pa Da COP B	Value -35 10,973 1.72 2.53 2.21 1.14 2.74 1.97 1.39 3.00 1.70	Unit °C KWh/a Kw Kw Kw Kw Kw
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Dooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 25°C (Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared Cooling capacity Declared Power input Rated COP Parameters at full load and ambient temperature 5°C (Point D)	Symbol t Q SEPR PA DA COP A COP A PA DA COP B PA DA COP C	Value -35 10,973 1.72 2.53 2.21 1.14 2.74 1.97 1.39 3.00 1.70 1.76	Unit °C KWh/a Kw Kw Kw Kw Kw
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared Cooling capacity Declared Cooling capacity Declared COP Parameters at full load and ambient temperature 5°C (Point D) Declared Cooling capacity Declared COP Parameters at full load and ambient temperature 5°C (Point D) Declared Cooling capacity Declared Co	Symbol t Q SEPR DA DA COPA PA DA COP B PA DA COP C PA	Value -35 10,973 1.72 2.53 2.21 1.14 2.74 1.97 1.39 3.000 1.700 1.76 3.25	Unit °C KWh/a Kw Kw Kw Kw Kw Kw
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity	Symbol t Q PA DA COP A PA DA COP B PA DA COP C PA DA COP C	Value -35 10,973 1.72 2.53 2.21 1.14 2.74 1.97 1.39 3.00 1.70 1.76 3.25 1.48	Unit °C KWh/a Kw Kw Kw Kw Kw
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Dooling capacity Declared Power input Rated COP Parameters at full load and ambient temperature 25°C (Point B) Declared Cooling capacity Declared Power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared Cooling capacity Declared COP	Symbol t Q SEPR DA DA COPA PA DA COP B PA DA COP C PA	Value -35 10,973 1.72 2.53 2.21 1.14 2.74 1.97 1.39 3.000 1.700 1.76 3.25	Unit °C KWh/a Kw Kw Kw Kw Kw Kw
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Parameters at full load and a	Symbol t Q SEPR DA DA COP A DA COP B PA DA COP C PA DA COP D	Value -35 10,973 1.72 2.53 2.21 1.14 2.74 1.97 1.39 3.00 1.70 1.76 3.25 1.48	Unit °C KWh/a Kw Kw Kw Kw Kw Kw
Refrigerant R404A Item Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 25°C (Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared Cooling capacity Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared Cooling capacity Declared power input Rated COP Declared Cooling capacity Declared power input Rated COP Cherit D) Declared Cooling capacity Declared power input Rated COP Cherit D) Declared Cooling capacity Declared power input Rated COP Cherit D) Declared Cooling capacity Declared power input Rated COP Cherit D) Declared Cooling capacity Declared power input Rated COP Cherit D) Declared Cooling capacity Declared power input Rated COP Cherit C) Declared Cooling capacity Declared power input Rated COP Cherit C) Declared Power input Rated COP Cherit C) Cherit C) Declared Power input Rated COP Cherit C)	Symbol t Q PA DA COP A PA DA COP B PA DA COP C PA DA COP C	Value -35 10,973 1.72 2.53 2.21 1.14 2.74 1.97 1.39 3.00 1.70 1.76 3.25 1.48	Unit °C KWh/a Kw Kw Kw Kw Kw Kw
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated Power input Rated Power Parameters at full power Parameters P	Symbol t Q SEPR DA DA COP A DA COP B PA DA COP C PA DA COP D	Value -35 10,973 1.72 2.53 2.21 1.14 2.74 1.97 1.39 3.00 1.70 1.76 3.25 1.48	Unit °C KWh/a Kw Kw Kw Kw Kw Kw
Refrigerant R404A Item Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Dooling capacity Declared Power input Rated COP Parameters at full load and ambient temperature 25°C (Point B) Declared Cooling capacity Declared Power input Rated COP Parameters at full load and ambient temperature 15°C (Point B) Declared Cooling capacity Declared Coolin	Symbol t Q SEPR PA DA COP A PA DA COP B PA DA COP C PA DA COP C Fixed	Value -35 10,973 1.72 2.53 2.21 1.14 2.74 1.97 1.39 3.00 1.70 1.76 3.25 1.48 2.20	Unit °C KWh/a Kw Kw Kw Kw Kw Kw
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared Cooling capacity Declared Power input Rated COP Cother items Capacity Control Degradation coefficient for fixed and Staged capacity unit	Symbol t Q SEPR PA DA COP A PA DA COP B PA DA COP C PA DA COP C Fixed	Value -35 10,973 1.72 2.53 2.21 1.14 2.74 1.97 1.39 3.00 1.70 1.76 3.25 1.48 2.20	Unit °C KWh/a Kw Kw Kw Kw Kw Kw
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Dother items Capacity Control Degradation coefficient for fixed and Staged capacity unit Parameters at full low and ambient temperature 43°C (where applicable) Cooling capacity	Symbol t Q SEPR PA DA COP A PA DA COP B PA DA COP C PA DA COP C Fixed	Value -35 10,973 1.72 2.53 2.21 1.14 2.74 1.97 1.39 3.00 1.70 1.76 3.25 1.48 2.20	Unit °C KWh/a Kw Kw Kw Kw Kw Kw
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 25°C (Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared power input Rated COP Detrared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Parameters at full load and ambient temperature 5°C (Point D) Parameters at full load and ambient temperature 5°C (Point D) Parameters at full load and ambient temperature 5°C (Point D) Parameters at full load and ambient temperature 5°C (Point D) Parameters at full load and ambient temperature 43°C (where applicable) Cooling capacity Parameters at full load and parameters at full parameters	Symbol t Q PA DA COP A PA DA COP B PA DA COP B PA DA COP C PA DA COP C Fixed Fixed Cdc Cdc	Value -35 10,973 1.72 2.53 2.21 1.14 2.74 1.97 1.39 3.00 1.70 1.76 3.25 1.48 2.20	Unit °C KWh/a Kw Kw Kw Kw Kw Kw
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity Declared Power input Rated COP Parameters at full load and ambient temperature 25°C (Point B) Declared Cooling capacity Declared Power input Rated COP Parameters at full load and ambient temperature 15°C (Point B) Declared Cooling capacity Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared Cooling capacity Declared CoP Parameters at full load and ambient temperature 5°C (Point D) Declared Cooling capacity Declared CoP Parameters at full load and ambient temperature 5°C (Point D) Declared CoOling capacity Declared CoP Parameters at full low and ambient temperature 43°C (Where applicable) Cooling capacity Parameters at full CoP	Symbol t Q PA DA COP A PA DA COP B PA DA COP B PA DA COP C PA DA COP C Fixed COC D Fixed COC D Fixed	Value -35 10,973 1.72 2.53 2.21 1.14 2.74 1.97 1.79 3.00 1.70 1.76 3.25 1.48 2.20 0.25	Unit °C KWh/a Kw Kw Kw Kw Kw Kw Kw Kw
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 25°C (Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point C) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Parameters at full load and ambient temperature 5°C (Point D) Parameters at full load and ambient temperature 5°C (Point D) Parameters at full load and ambient temperature 5°C (Point D) Parameters at full load and ambient temperature 5°C (Point D) Parameters at full load and ambient temperature 5°C (Point D) Parameters at full load and ambient temperature 5°C (Point D) Parameters at full load and ambient temperature 5°C (Point D) Parameters at full load and ambient temperature 43°C (Where applicable) Cooling capacity Power input	Symbol t Q SEPR DA DA COPA PA DA COP B PA DA COP B COP C Fixed Fixed Cdc	Value -35 10,973 1.72 2.53 2.21 1.14 2.74 1.97 1.39 3.00 1.70 1.76 3.25 1.48 2.20 0.25	Unit *C KWh/a Kw Kw Kw Kw Kw Kw Kw Kw
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity Declared Power input Rated COP Parameters at full load and ambient temperature 25°C (Point B) Declared Cooling capacity Declared Power input Rated COP Parameters at full load and ambient temperature 15°C (Point B) Declared Cooling capacity Declared CoP Parameters at full load and ambient temperature 5°C (Point D) Declared Cooling capacity Declared CoP Parameters at full load and ambient temperature 5°C (Point D) Declared CoOling capacity Declared CoP Other items Capacity Control Degradation coefficient for fixed and staged capacity unit Parameters at full low and ambient temperature 43°C (where applicable) Cooling capacity Declared COP	Symbol t Q SEPR DA COP A DA COP A DA COP B COP B COP C COP C C COP C C COP C C COP C	Value -35 10,973 1.72 2.53 2.21 1.14 2.74 1.97 1.39 3.00 1.70 1.70 1.70 1.70 1.76 3.25 1.48 2.20 0.25	Unit *C KWh/a Kw Kw Kw Kw Kw Kw Kw Kw Kw Kw Kw Kw
Refrigerant R404A Item Evaporating Temperature Annual Electrical Consumption Seasonal energy performance ratio Parameters at full load and ambient temperature 32°C (Point A) Declared Cooling capacity Declared Power input Rated COP Parameters at full load and ambient temperature 25°C (Point B) Declared Cooling capacity Declared Power input Rated COP Parameters at full load and ambient temperature 15°C (Point B) Declared Cooling capacity Declared CoP Parameters at full load and ambient temperature 5°C (Point D) Declared Cooling capacity Declared CoP Parameters at full load and ambient temperature 5°C (Point D) Declared CoOling capacity Declared CoP Other items Capacity Control Degradation coefficient for fixed and staged capacity unit Parameters at full low and ambient temperature 43°C (where applicable) Cooling capacity Declared COP	Symbol t Q SEPR DA COP A DA COP A DA COP B PA DA COP B PA DA COP C COC Fixed COC D Fixed COC COC COC COC COC COC COC COC COC CO	Value -35 10,973 1.72 2.53 2.21 1.14 2.74 1.97 1.39 3.00 1.70 1.76 3.25 1.48 2.20 0.25	Unit °C KWh/a Kw Kw Kw Kw Kw Kw Kw Kw Kw Kw Kw Kw Kw

Kw Kw Kw Kw Kw		Parameters at full load and ambient temperature 25°C (Point B) Declared Cooling capacity Declared Cooling capacity Declared COP Parameters at full load and ambient temperature 15°C (Point C) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared Cooling capacity Declared power input Rated COP Cherritems Capacity Control Degradation coefficient for fixed and Staged capacity unit Parameters at full low and ambient temperature 43°C (where applicable) Cooling capacity Power input Declared COP	PA DA COP B PA DA COP C PA DA COP C Fixed Fixed COC Fixed COC Fixed COC	3.14 2.06 1.52 3.50 1.75 2.00 3.87 1.50 2.58 0.25	Kw Kw Kw Kw Kw Kw
Kw Kw Kw		(Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared Cooling capacity Declared power input Rated COP Other items Capacity Control Degradation coefficient for fixed and staged capacity unit Parameters at full low and ambient temperature 43°C (where applicable) Cooling capacity Power input	DA COP B PA DA COP C PA DA COP D Fixed Cdc Cdc P3 D3	2.06 1.52 3.50 1.75 2.00 3.87 1.50 2.58	Kw Kw Kw Kw
Kw Kw Kw		(Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared Cooling capacity Declared Cooling capacity Capacity Control Degradation coefficient for fixed and staged capacity unit Parameters at full Iow and ambient temperature 43°C (where applicable) Cooling capacity	DA COP B PA DA COP C PA DA COP D Fixed Cdc	2.06 1.52 3.50 1.75 2.00 3.87 1.50 2.58	Kw Kw Kw Kw
Kw Kw Kw		(Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared Cooling capacity Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared Cooling capacity Declared power input Rated COP Other items Capacity Control Degradation coefficient for fixed and staged capacity unit Parameters at full low and ambient temperature 43°C (where applicable)	DA COP B PA DA COP C PA DA COP D Fixed Cdc	2.06 1.52 3.50 1.75 2.00 3.87 1.50 2.58	Kw Kw Kw Kw
Kw Kw Kw		(Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared Cooling capacity Declared cooling capacity Dec	DA COP B PA DA COP C PA DA COP D Fixed	2.06 1.52 3.50 1.75 2.00 3.87 1.50 2.58	Kw Kw Kw Kw
Kw Kw Kw		(Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared Cooling capacity Declared Cooling capacity Dec	DA COP B PA DA COP C PA DA COP D Fixed	2.06 1.52 3.50 1.75 2.00 3.87 1.50 2.58	Kw Kw Kw Kw
Kw Kw Kw		(Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared Cooling capacity Declared Cooling capacity Dec	DA COP B PA DA COP C PA DA COP D	2.06 1.52 3.50 1.75 2.00 3.87 1.50	Kw Kw Kw Kw
Kw Kw Kw		(Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared Cooling capacity Declared Cooling capacity Declared Cooling capacity Declared Cooling capacity Declared COP Rated COP	DA COP B PA DA COP C PA DA COP D	2.06 1.52 3.50 1.75 2.00 3.87 1.50	Kw Kw Kw Kw
Kw Kw Kw		(Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared Cooling capacity Declared Cooling capacity Declared COP Parameters at full load and ambient temperature 5°C (Point D) Declared Cooling capacity Declared power input Rated COP	DA COP B PA DA COP C	2.06 1.52 3.50 1.75 2.00 3.87 1.50	Kw Kw Kw Kw
Kw Kw Kw		(Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared Cooling capacity Declared power input	DA COP B PA DA COP C	2.06 1.52 3.50 1.75 2.00 3.87 1.50	Kw Kw Kw Kw
Kw Kw Kw		(Point B) Declared Cooling capacity Declared Dower input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 5°C (Point D) Declared Cooling capacity	DA COP B PA DA COP C	2.06 1.52 3.50 1.75 2.00 3.87	Kw Kw Kw Kw
Kw Kw Kw		(Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared Cooling capacity Declared Cooling capacity Declared COP Parameters at full load and ambient temperature 5°C (Point D)	DA COP B PA DA COP C	2.06 1.52 3.50 1.75 2.00	Kw Kw Kw
Kw		(Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 5°C	DA COP B PA DA	2.06 1.52 3.50 1.75	Kw
Kw		(Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full Ioad and ambient temperature 15°C (Point C) Declared Cooling capacity Declared power input Rated COP	DA COP B PA DA	2.06 1.52 3.50 1.75	Kw
Kw		(Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared Cooling capacity Declared power input	DA COP B PA DA	2.06 1.52 3.50 1.75	Kw
Kw		(Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C) Declared Cooling capacity	DA COP B PA	2.06 1.52 3.50	Kw
Kw		(Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C (Point C)	DA COP B	2.06 1.52	Kw
		(Point B) Declared Cooling capacity Declared power input Rated COP Parameters at full load and ambient temperature 15°C	DA	2.06	
		(Point B) Declared Cooling capacity Declared power input Rated COP	DA	2.06	
		(Point B) Declared Cooling capacity Declared power input	DA	2.06	
		(Point B) Declared Cooling capacity			
	_	(Point B)	-		
	_				
		Description of full lead and such is at the section of 20%		1	1
		Rated COP	COP A	1.23	
Kw		Declared power input	DA	2.34	Kw
Kw		Declared Cooling capacity	PA	2.88	Kw
		(Point A)	1		1
	1		3211	1.55	1
A WIN d					K WII/d
					KWh/a
	-				°C
Unit	-		Symbol	Value	Unit
	_				-
A	7		Lone	don SE27 (	JUA
Ltd		Contact Details			
		Declared COP	COP <sub>3</sub>		L
		Power input	D3		
		(where applicable)			
		staged capacity unit	Cdc	0.25	
			Fixed		
		Other items			
		Rated COP	COP D	2.21	
Kw		Declared power input	DA	1.19	Kw
Kw		Declared Cooling capacity	PA	2.63	Kw
		(Point D)			
		Parameters at full load and ambient temperature 5°C			
		Rated COP	COP C	1.77	
Kw		Declared power input	DA	1.36	Kw
Kw		· · ·	PA	2.41	Kw
			COP B	1.38	
KW					Kw
					Kw
		(Point B)			
		Parameters at full load and ambient temperature 25°C			
		Rated COP	COP A	1.13	
Kw		Declared power input	DA	1.80	Kw
Kw			PA	2.03	Kw
			JEFN	1.72	
K WII/a					K WII/a
					KWh/a
					Unit °C
	Kw Kw Kw Kw Kw Kw	*C Wh/a Kw Kw Kw Kw Kw Kw Kw Kw Kw Kw	*C       Evaporating Temperature         Wh/a       Annual Electrical Consumption         Seasonal energy performance ratio       Parameters at full load and ambient temperature 32°C (Point A)         Kw       Declared Cooling capacity         Kw       Declared power input         Rated COP       Parameters at full load and ambient temperature 25°C (Point B)         Kw       Declared power input         Rated COP       Parameters at full load and ambient temperature 15°C (Point C)         Kw       Declared Cooling capacity         Kw       Declared power input         Rated COP       Other items         Capacity Control       Degradation coefficient for fixed and         staged capacity unit       Parameters at full low and ambient temperature 43°C (Where applicable)         Cooling capacity       Power input	Unit     Refrigerant R404A     Symbol       "C     Evaporating Temperature     t       Wh/a     Annual Electrical Consumption     Q       Seasonal energy performance ratio     SEPR       Parameters at full load and ambient temperature 32°C     (Point A)       Kw     Declared Cooling capacity     PA       Rated COP     COP COP C     COP COP C       Kw     Declared Cooling capacity     PA       Kw     Declared power input     DA       Rated COP     COP C     COP C       Kw     Declared power input     DA       Rated COP     COP C     COP D       Cheir et as tfull load and ambient temperature 5°C     (Point D)       Kw     Declared Cooling capacity	Unit     Refrigerant R404A     Symbol     Value       "C     Symbol     Value       "C     Evaporating Temperature     t     -35       XWh/a     Annual Electrical Consumption     Q     8,786       Seasonal energy performance ratio     SEPR     1.72       Parameters at full load and ambient temperature 32°C     (Point A)     L       Kw     Declared Cooling capacity     PA     2.03       Kw     Declared Cooling capacity     PA     2.03       Kw     Declared Cooling capacity     PA     2.03       Kw     Declared Cooling capacity     PA     2.19       Kw     Declared Cooling capacity     PA     2.19       Kw     Declared Cooling capacity     PA     2.19       Kw     Declared Cooling capacity     PA     2.41       Declared Cooling capacity     PA     2.41       Kw     Declared Cooling capacity     PA     2.41       Kw     Declared Cooling capacity     PA     2.63       Kw     Declared Cooling capacity     PA     2.63       Kw     Declared Opwer input     DA     1.19       Kw     Declared Opwer input     DA     1.19       Rated COP     COP D     2.21       Cherther items <t< td=""></t<>

Г			
Model 2PAL050L3			
Refrigerant R404A			
Item	Symbol	Value	Unit
Evaporating Temperature	t	-35	°C
Annual Electrical Consumption	Q	14,711	KWh/a
Seasonal energy performance ratio	SEPR	1.79	
Parameters at full load and ambient temperature 32°C			
(Point A)			
Declared Cooling capacity	PA	3.54	Kw
Declared power input	DA	3.11	Kw
Rated COP	COP A	1.14	
Parameters at full load and ambient temperature 25°C			
(Point B)			
Declared Cooling capacity	PA	3.87	Kw
Declared power input	DA	2.76	Kw
Rated COP	COP B	1.40	
Parameters at full load and ambient temperature 15°C			
(Point C)			
Declared Cooling capacity	PA	4.32	Kw
Declared power input	DA	2.34	Kw
Rated COP	COP C	1.85	
Parameters at full load and ambient temperature 5°C			
(Point D)			
Declared Cooling capacity	PA	4.73	Kw
Declared power input	Da	2.01	Kw
Rated COP	COP D	2.35	
Other items			
Capacity Control	Fixed		
Degradation coefficient for fixed and			
staged capacity unit	Cdc	0.25	
Parameters at full low and ambient temperature 43°C			
(where applicable)			
Cooling capacity	P3		
Power input	D3		
Declared COP	COP3		
Contact Details		nofrost Cr	vo Ltd
		nest Aven	
		est Norwo	
	London SE27 0DA		
	LUHUUH SEZT UDA		

Model 2PAL075L3			
Refrigerant R404A			
Item	Symbol	Value	Unit
Evaporating Temperature	t	-35	°C
Annual Electrical Consumption	0	22.883	KWh/a
Seasonal energy performance ratio	SEPR	1.70	,.
Parameters at full load and ambient temperature 32°C			
(Point A)			
Declared Cooling capacity	Pa	5.23	Kw
Declared power input	Da	4.67	Kw
Rated COP	COP A	1.12	
Parameters at full load and ambient temperature 25°C	00171	1.12	
(Point B)			
Declared Cooling capacity	Pa	5.68	Kw
Declared power input	Da	4.20	Kw
Bated COP	COP B	1.35	
Parameters at full load and ambient temperature 15°C		2.00	
(Point C)			
Declared Cooling capacity	Pa	6.23	Kw
Declared power input	Da	3.58	Kw
Rated COP	COP C	1.74	
Parameters at full load and ambient temperature 5°C			
(Point D)			
Declared Cooling capacity	PA	6.75	Kw
Declared power input	DA	3.06	Kw
Rated COP	COP D	2.21	
Other items			
Capacity Control	Fixed		
Degradation coefficient for fixed and			
staged capacity unit	Cdc	0.25	
Parameters at full low and ambient temperature 43°C			
(where applicable)			
Cooling capacity	P3		
Powerinput	D3		
Declared COP	COP <sub>3</sub>		
Contact Details	Therr	nofrost Cr	vo Ltd
	Er	nest Aven	ue
	West Norwood		
	Lor	don SE27	DDA

	1			
Model 2PAL060L3	-			
Refrigerant R404A				
Item	Symbol	Value	Unit °C	
Evaporating Temperature	t	-35	Č.	
Annual Electrical Consumption	Q	17,049	KWh/a	
Seasonal energy performance ratio	SEPR	1.81		
Parameters at full load and ambient temperature 32°C				
(Point A)				
Declared Cooling capacity	Pa	4.14	Kw	
Declared power input	Da	3.69	Kw	
Rated COP	COP A	1.12		
Parameters at full load and ambient temperature 25°C				
(Point B)				
Declared Cooling capacity	Pa	4.57	Kw	
Declared power input	DA	3.17	Kw	
Rated COP	COP B	1.44		
Parameters at full load and ambient temperature 15°C				
(Point C)				
Declared Cooling capacity	PA	5.12	Kw	
Declared power input	DA	2.70	Kw	
Rated COP	COP C	1.90		
Parameters at full load and ambient temperature 5°C				
(Point D)				
Declared Cooling capacity	PA	5.60	Kw	
Declared power input	DA	2.40	Kw	
Rated COP	COP D	2.33		
Other items				
Capacity Control	Fixed			
Degradation coefficient for fixed and				
staged capacity unit	Cdc	0.25		
Parameters at full low and ambient temperature 43°C				
(where applicable)				
Cooling capacity	P3		1	
Power input	D3			
Declared COP	COP3			
Contact Details	Thermofrost Cryo Ltd			
· · · · · · · · · · · · · · · · · · ·	Ernest Avenue			
	West Norwood			
	London SE27 0DA		DDA	

Issue: 03/07/2018