
FUSION SCROLL Commercial Condensing Units

Medium & Low Temperature Applications

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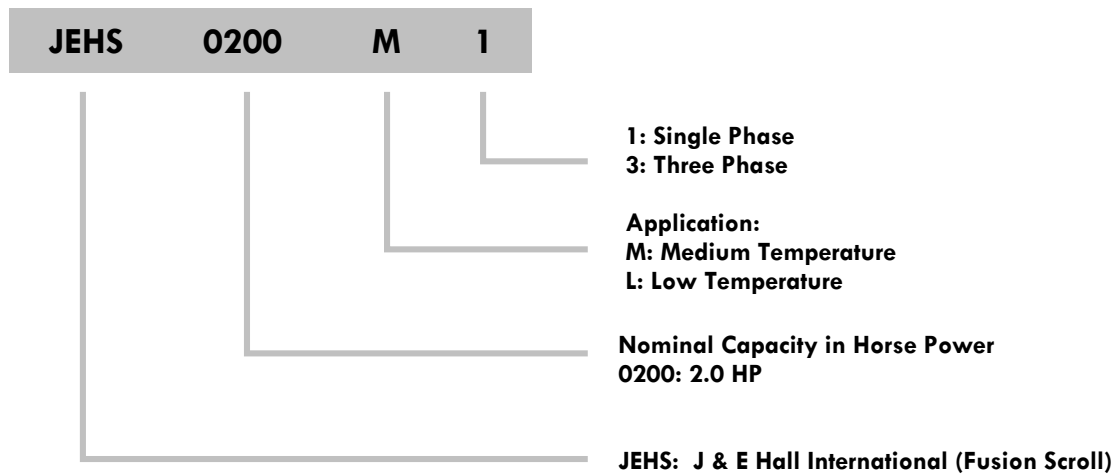


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Nomenclature



Standard product configuration

Series 2, 3 & 4

- Copeland hermetic scroll compressors
- Liquid receiver with fusible plug
- Fitted liquid line drier & sight glass
- Oil separator and discharge check valve on low temperature models
- External service valves
- Dual LP/HP pressure control
- Gomax flexible pressure hoses
- IP54 rated control panel
- Combined mains isolator with short circuit/overload protection
- Compressor contactor
- Fuse protection to fan/crankcase heater/control circuit
- Crankcase heater on compressor
- Alarm output available from HP switch
- Pressure actuated fan speed controller
- Acoustic insulation to compressor compartment
- Multi – refrigerant (model dependent)

Specifications

Unit Model		Series	Compressor			Oil Sep. Charge	Oil Type	Electrical Data					Coil Volume	Liquid Receiver	Airflow	Connections		Unit Dimensions (W x D x H)	Mounting Dimensions (W x D)	Unit Dry Weight	SPL @ 10m
			Type	Swept Volume	Oil Charge			Compressor			Fan Motors					Liquid	Suction				
								NC ^a	MCC ^b	LRC ^c	No.	FLC									
Medium Temperature	JEHS-0200-M-1	2	ZB15KQE-PFJ	5.9	1.24	-	A	7.7	18.5	58.0	1	0.6	3.1	4.6	2620	3/8	3/4	1108 x 478 x 650	703 x 448	88	30
	JEHS-0200-M-3		ZB15KQE-TFD	5.9	1.24	-		3.1	7.0	26.0	1	0.6	3.1	4.6	2620	3/8	3/4	1108 x 478 x 650	703 x 448	88	30
	JEHS-0250-M-1		ZB19KQE-PFJ	6.8	1.30	-		9.6	20.5	61.0	1	0.6	3.1	4.6	2620	3/8	3/4	1108 x 478 x 650	703 x 448	90	31
	JEHS-0250-M-3		ZB19KQE-TFD	6.8	1.36	-		4.1	7.0	32.0	1	0.6	3.1	4.6	2620	3/8	3/4	1108 x 478 x 650	703 x 448	90	31
	JEHS-0300-M-1		ZB21KQE-PFJ	8.6	1.45	-		12.7	21.5	82.0	1	0.6	3.1	4.6	2620	3/8	3/4	1108 x 478 x 650	703 x 448	92	34
	JEHS-0300-M-3		ZB21KQE-TFD	8.6	1.45	-		5.0	10.3	40.0	1	0.6	3.1	4.6	2620	3/8	3/4	1108 x 478 x 650	703 x 448	92	34
	JEHS-0350-M-1	3	ZB26KQE-PFJ	9.9	1.50	-		15.1	26.5	97.0	1	1.1	4.7	7.6	6050	1/2	3/4	1332 x 556 x 884	946 x 500	114	35
	JEHS-0350-M-3		ZB26KQE-TFD	9.9	1.50	-		5.5	9.0	46.0	1	1.1	4.7	7.6	6050	1/2	3/4	1332 x 556 x 884	946 x 500	114	35
	JEHS-0400-M-1		ZB29KQE-PFJ	11.4	1.36	-		15.6	28.0	114.0	1	1.1	4.7	7.6	6050	1/2	7/8	1347 x 556 x 884	946 x 500	121	34
	JEHS-0400-M-3		ZB29KQE-TFD	11.4	1.36	-		7.0	11.0	50.0	1	1.1	4.7	7.6	6050	1/2	7/8	1347 x 556 x 884	946 x 500	121	34
	JEHS-0500-M-3		ZB38KQE-TFD	14.4	2.07	-		9.4	14.0	65.5	1	1.1	4.7	7.6	6050	1/2	7/8	1347 x 556 x 884	946 x 500	126	35
	JEHS-0600-M-3		ZB45KQE-TFD	17.1	1.89	-		9.7	14.2	74.0	1	1.1	7.6	7.6	5180	1/2	7/8	1347 x 556 x 884	946 x 500	128	40
	JEHS-0680-M-3		ZB48KQE-TFD	18.8	1.80	-		9.9	19.1	101.0	1	1.1	7.6	7.6	5180	1/2	7/8	1347 x 556 x 884	946 x 500	129	40
	JEHS-0800-M-3		4	ZB58KCE-TFD	22.1	2.50		-	12.4	23.0	95.0	2	1.2	6.9	14.0	6770	1/2	1 1/8	1261 x 594 x 1435	812 x 560	201
JEHS-1000-M-3	ZB76KCE-TFD	29.1		3.20	-	16.8	28.0	118.0	2	1.2	6.9	14.0	6770	1/2	1 3/8	1261 x 594 x 1435	812 x 560	201	44		
Low Temperature	JEHS-0200-L-3	2	ZF06K4E-TFD	5.9	1.30	0.50	B	2.7	6.0	26.0	1	0.6	3.1	4.6	2620	3/8	3/4	1108 x 478 x 650	703 x 448	94	27
	JEHS-0300-L-3		ZF09K4E-TFD	8.0	1.50	0.50		4.7	7.5	40.0	1	0.6	3.1	4.6	2620	3/8	3/4	1108 x 478 x 650	703 x 448	96	28
	JEHS-0400-L-3	3	ZF13K4E-TFD	11.8	1.90	0.60		4.9	10.0	51.5	1	1.1	4.7	7.6	6050	1/2	7/8	1347 x 556 x 884	946 x 500	129	35
	JEHS-0500-L-3		ZF15K4E-TFD	14.5	1.90	0.60		6.4	12.0	64.0	1	1.1	4.7	7.6	6050	1/2	7/8	1347 x 556 x 884	946 x 500	130	36
	JEHS-0600-L-3		ZF18K4E-TFD	17.1	1.90	0.60		6.6	11.5	74.0	1	1.1	4.7	7.6	6050	1/2	7/8	1347 x 556 x 884	946 x 500	130	41
	JEHS-0750-L-3	4	ZF24K4E-TWD	20.9	4.10	0.60		10.5	18.5	99.0	2	1.2	6.9	14.0	6770	1/2	1 3/8	1261 x 594 x 1435	812 x 560	218	41
	JEHS-1000-L-3		ZF33K4E-TWD	28.8	4.10	0.60		12.8	27.0	127.0	2	1.2	6.9	14.0	6770	1/2	1 3/8	1261 x 594 x 1435	812 x 560	218	42

Oil Type **A** = Polyolester Oil - (Copeland Ultra 22 CC, Copeland Ultra 32 CC, Copeland Ultra 32-3MAF, Mobil EAL Arctic 22CC, Uniqema Emkarate RL32CF)

Oil Type **B** = Polyolester Oil - Mobil Arctic 22CC

^a NC = Nominal Current @ condition -10°Cte / +32°Cta MT and -35°Cte / +32°Cta LT with R404A refrigerant

^b MCC = Maximum Continuous Current

^c LRC = Locked Rotor Current

^d Sound Pressure Level @ 10m free field at (-10/+32°C) MT & (-25/+32°C) LT conditions. Alternative conditions may produce different results

Specifications

Performance Data: Medium Temperature (R404A)

R404A				Cooling Capacity (Watts)						Absorbed Power (Watts)					
	Unit Model	HP	TE TA	-20	-15	-10	-5	0	5	-20	-15	-10	-5	0	5
Series 2	JEHS-0200-M-1&3 R404A	2	27	2500	3050	3650	4350	5150	6019	1460	1510	1560	1600	1630	1655
			32	2315	2820	3400	4050	4800	5617	1590	1630	1680	1720	1760	1799
			38	2075	2545	3050	3700	4400	5197	1770	1810	1860	1900	1940	1979
	JEHS-0250-M-1&3 R404A	2.5	27	2750	3400	4100	4950	5850	6859	1910	1940	1970	2000	2040	2077
			32	2595	3200	3900	4650	5550	6506	2030	2060	2100	2130	2170	2208
			38	2395	2950	3600	4350	5250	6236	2200	2240	2270	2300	2320	2336
	JEHS-0300-M-1&3 R404A	3	27	3400	4200	5050	6100	7250	8529	2480	2520	2570	2610	2670	2726
			32	3200	3950	4800	5800	6850	8040	2630	2670	2730	2770	2830	2885
			38	3000	3700	4500	5400	6450	7590	2830	2880	2930	2970	3020	3061
Series 3	JEHS-0350-M-1&3 R404A	3.5	27	4250	5200	6300	7650	9100	10769	2630	2660	2700	2730	2780	2826
			32	3950	4850	5900	7100	8500	10040	2850	2890	2930	2970	3020	3067
			38	3550	4350	5300	6450	7700	9140	3190	3230	3270	3310	3350	3390
	JEHS-0400-M-1&3 R404A	4	27	4790	5900	7160	8610	10250	12056	3040	3080	3130	3180	3230	3285
			32	4480	5500	6690	8040	9590	11298	3280	3330	3390	3440	3500	3558
			38	4000	4940	6020	7260	8690	10261	3670	3720	3780	3830	3880	3929
	JEHS-0500-M-3 R404A	5	27	5850	7150	8650	10300	12250	14350	3920	4010	4100	4190	4290	4387
			32	5400	6650	8050	9650	11450	13420	4270	4350	4440	4520	4610	4698
			38	4850	5950	7200	8700	10350	12210	4740	4840	4930	5020	5110	5194
	JEHS-0600-M-3 R404A	6	27	6650	8100	9800	11700	13800	16130	4560	4660	4770	4890	5030	5177
			32	6150	7550	9150	10900	12950	15150	4940	5050	5150	5300	5400	5534
			38	5550	6800	8250	9850	11650	13620	5450	5550	5700	5800	5950	6090
	JEHS-0680-M-3 R404A	6.8	27	7150	8750	10500	12550	14750	17190	5090	5210	5350	5500	5700	5908
			32	6700	8150	9850	11650	13800	16090	5450	5600	5750	5950	6100	6290
			38	6000	7300	8850	10550	12400	14460	6050	6200	6350	6550	6750	6980
Series 4	JEHS-0800-M-3 R404A	8	27	8360	10500	12850	15350	18150	21106	6010	6150	6350	6580	6830	7129
			32	7730	9770	12000	14350	16950	19686	6450	6610	6800	7050	7300	7604
			38	6810	8730	10800	13000	15350	17837	7120	7280	7480	7730	7990	8301
	JEHS-1000-M-3 R404A	10	27	10600	12850	15300	17900	20700	-	8320	8720	9170	9310	9840	-
			32	9770	11900	14200	16550	19100	-	8930	9350	9810	9970	10500	-
			38	8660	10650	12750	15000	17450	-	9810	10210	10660	10750	11250	-

TE: Evaporating Temperature (°C)

TA: Ambient Temperature (°C)

Rating Condition: Suction Gas Superheat 10K, Sub cooling 0K

Data presented in accordance with BS EN 13215:2000

Specifications

Performance Data: Low Temperature (R404A)

R404A				Cooling Capacity (Watts)					Absorbed Power (Watts)				
	Unit Model	HP	TE TA	-40	-35	-30	-25	-20	-40	-35	-30	-25	-20
Series 2	JEHS-0200-L-3 R404A	2	27	1075	1350	1665	2030	2450	1390	1480	1580	1690	1800
			32	1000	1260	1560	1910	2310	1480	1570	1670	1770	1890
			38	915	1160	1445	1780	2170	1610	1690	1780	1870	1980
	JEHS-0300-L-3 R404A	3	27	1395	1760	2170	2630	3150	1760	1830	1910	2020	2150
			32	1315	1645	2040	2480	3000	1880	1950	2020	2120	2240
			38	1215	1535	1905	2335	2830	2030	2080	2140	2230	2330
Series 3	JEHS-0400-L-3 R404A	4	27	2070	2665	3350	4100	5000	2200	2300	2420	2560	2720
			32	1940	2485	3100	3850	4700	2360	2470	2590	2730	2880
			38	1780	2275	2860	3550	4350	2580	2680	2790	2920	3050
	JEHS-0500-L-3 R404A	5	27	2495	3200	4000	4900	5900	2600	2790	3000	3220	3470
			32	2330	3000	3750	4600	5550	2790	2990	3200	3420	3670
			38	2135	2745	3450	4250	5200	3040	3230	3430	3640	3860
	JEHS-0600-L-3 R404A	6	27	3050	3850	4700	5700	6850	2980	3410	3630	3870	4140
			32	2850	3600	4400	5350	6450	3190	3630	3840	4080	4340
			38	2620	3300	4100	5050	6100	3430	3860	4060	4280	4510
Series 4	JEHS-0750-L-3 R404A	7.5	27	3630	4610	5690	6880	8180	4128	4458	4788	5148	5528
			32	3390	4320	5350	6490	7750	4358	4698	5038	5398	5768
			38	3100	3990	4970	6070	7320	4618	4968	5318	5658	6008
	JEHS-1000-L-3 R404A	10	27	5060	6330	7770	9380	11150	5238	5728	6248	6808	7388
			32	4660	5850	7200	8720	10400	5568	6098	6638	7188	7768
			38	4200	5300	6540	7950	9570	5968	6528	7088	7648	8228

TE: Evaporating Temperature (°C)

TA: Ambient Temperature (°C)

Rating Condition: Suction Gas Superheat 10K, Sub cooling 0K

Data presented in accordance with BS EN 13215:2000

Specifications

Performance Data: Medium Temperature (R407A)

R407A				Cooling Capacity (Watts)					Absorbed Power (Watts)				
	Unit Model	HP	TE TA	-15	-10	-5	0	5	-15	-10	-5	0	5
Series 2	JEHS-0200-M-1/3 R407A	2	32	2580	3150	3800	4540	5370	1660	1720	1780	1850	1950
	JEHS-0250-M-1/3 R407A	2.5	32	3220	3920	4730	5630	6640	1910	1960	2020	2080	2150
	JEHS-0300-M-1/3 R407A	3	32	3880	4740	5740	6860	8060	2230	2300	2370	2440	2550
Series 3	JEHS-0350-M-1/3 R407A	3.5	32	4570	5610	6800	8190	9790	2490	2550	2620	2700	2770
	JEHS-0400-M-1/3 R407A	4	32	5550	6870	8360	10020	11830	2910	3010	3140	3260	3400
	JEHS-0500-M-3 R407A	5	32	6710	8270	10070	12020	14160	3560	3710	3870	4070	4270
	JEHS-0600-M-3 R407A	6	32	7600	9270	11160	13300	15530	4350	4500	4660	4840	5100
	JEHS-0680-M-3 R407A	6.8	32	-	10740	12940	15390	17970	-	4780	4980	5860	6120
Series 4	JEHS-0800-M-3 R407A	8	32	9210	11540	14160	16960	19860	5720	6020	6330	6700	7200
	JEHS-1000-M-3 R407A	10	32	-	14630	17770	21090	24420	-	8250	8790	9400	10220

TE: Evaporating Temperature (°C)

TA: Ambient Temperature (°C)

Rating Condition: Suction Gas Superheat 10K, Sub cooling 0K

Data presented in accordance with BS EN 13215:2000

For applications below 0°Cte, the suction gas superheat **must** be kept below 20K

For applications in the shaded area (above 0°Cte), the compressor suction gas temperature **must not** exceed 20°C.

Maximum cut-out setting of HP switch **must not** be greater than 25 bar

Specifications

Performance Data: Low Temperature (R407A)

R407A				Cooling Capacity (Watts)					Absorbed Power (Watts)				
	Unit Model	HP	TE TA	-40	-35	-30	-25	-20	-40	-35	-30	-25	-20
Series 2	JEHS-0200-L-3 R407A	2	32										
	JEHS-0300-L-3 R407A	3	32	1330	1700	2160	2690	3300	1370	1530	1720	1950	2240
Series 3	JEHS-0400-L-3 R407A	4	32	1680	2090	2700	3470	4340	1890	1990	2100	2200	2320
	JEHS-0500-L-3 R407A	5	32	2190	2630	3320	4220	5270	2290	2380	2510	2660	2840
	JEHS-0600-L-3 R407A	6	32	2580	3140	3990	5060	6300	2690	2790	2960	3170	3410

TE: Evaporating Temperature (°C)

TA: Ambient Temperature (°C)

Rating Condition: Suction Gas Superheat 10K, Sub cooling 0K

Data presented in accordance with BS EN 13215:2000

The suction gas superheat **must** be kept below 20K

Maximum cut-out setting of HP switch **must not** be greater than 23 bar

Specifications

Performance Data: Medium Temperature (R407F)

R407F				Cooling Capacity (Watts)				Absorbed Power (Watts)			
	Unit Model	HP	TE TA	-10	-5	0	5	-10	-5	0	5
Series 2	JEHS-0200-M -1/3 R407F	2	32	3140	3850	4660	5570	1720	1750	1780	1820
	JEHS-0250-M -1/3 R407F	2.5	32	3990	4870	5860	6980	1970	2020	2080	2140
	JEHS-0300-M -1/3 R407F	3	32	4820	5880	7100	8480	2310	2360	2410	2490
Series 3	JEHS-0350-M -1/3 R407F	3.5	32	5780	7090	8570	10250	2690	2730	2770	2820
	JEHS-0400-M -1/3 R407F	4	32	7180	8770	10600	12600	3070	3130	3190	3270
	JEHS-0500-M -3 R407F	5	32	8700	10600	12750	15200	3960	4070	4190	4330
	JEHS-0600-M -3 R407F	6	32	10050	12300	14800	17500	4660	4820	4990	5180
	JEHS-0680-M -3 R407F	6.8	32	11190	13470	16030	18720	4640	4830	5690	5940
Series 4	JEHS-0800-M -3 R407F	8	32	11790	14450	17330	20430	6150	6460	6810	7210
	JEHS-1000-M -3 R407F	10	32	15080	18180	21510	24930	8290	8900	9610	10440

TE: Evaporating Temperature (°C)

TA: Ambient Temperature (°C)

Rating Condition: Suction Gas Superheat 10K, Sub cooling 0K

Data presented in accordance with BS EN 13215:2000

For applications below 0°Cte, the suction gas superheat **must** be kept below 20K

For applications in the shaded area (above 0°Cte), the compressor suction gas temperature **must not** exceed 20°C.

Maximum cut-out setting of HP switch **must not** be greater than 26 bar

Specifications

Performance Data: Low Temperature (R407F)

R407F				Cooling Capacity (Watts)					Absorbed Power (Watts)				
	Unit Model	HP	TE TA	-40	-35	-30	-25	-20	-40	-35	-30	-25	-20
Series 2	JEHS-0200-L-3 R407F	2	32	980	1190	1510	1880	2320	1420	1550	1570	1640	1720
	JEHS-0300-L-3 R407F	3	32	1310	1620	2020	2510	3090	1940	2000	2070	2150	2240
Series 3	JEHS-0400-L-3 R407F	4	32	1780	2280	2900	3620	4480	2260	2400	2530	2670	2810
	JEHS-0500-L-3 R407F	5	32	2170	2770	3510	4360	5380	2690	2920	3140	3360	3610
	JEHS-0600-L-3 R407F	6	32	2600	3330	4210	5230	6420	3370	3610	3850	4090	4380

TE: Evaporating Temperature (°C)

TA: Ambient Temperature (°C)

Rating Condition: Suction Gas Superheat 10K, Sub cooling 0K

Data presented in accordance with BS EN 13215:2000

The suction gas superheat **must** be kept below 20K

Maximum cut-out setting of HP switch **must not** be greater than 23 bar

Specifications

Performance Data: Medium Temperature (R134a)

R134a				Cooling Capacity (Watts)							Absorbed Power (Watts)						
	Unit Model	HP	TE TA	-15	-10	-5	0	5	10	15	-15	-10	-5	0	5	10	15
Series 2	JEHS-0200-M-1&3 R134a	2	27	1840	2305	2830	3450	4150	4950	5850	931	953	992	1027	1066	1109	1150
			32	1735	2175	2680	3250	3950	4700	5550	1016	1045	1086	1124	1160	1210	1250
			38	1610	2015	2490	3050	3700	4400	5200	1128	1170	1210	1250	1300	1340	1390
	JEHS-0250-M-1&3 R134a	2.5	27	2105	2625	3250	3900	4700	5600	6600	1055	1088	1135	1180	1230	1290	1340
			32	1985	2475	3050	3700	4500	5350	6300	1150	1200	1240	1290	1350	1400	1460
			38	1840	2285	2830	3450	4150	5000	5900	1280	1340	1390	1450	1500	1560	1620
	JEHS-0300-M-1&3 R134a	3	27	2600	3250	3950	4800	5750	6900	8000	1310	1350	1420	1490	1570	1620	1750
			32	2450	3050	3750	4550	5450	6450	7550	1430	1500	1560	1630	1720	1810	1900
			38	2265	2800	3450	4200	5050	6000	7050	1600	1690	1740	1830	1910	2010	2110
Series 3	JEHS-0350-M-1&3 R134a	3.5	27	3100	3900	4800	5900	7150	8550	10150	1490	1510	1560	1600	1650	1710	1770
			32	2950	3700	4550	5600	6800	8150	9650	1620	1660	1710	1760	1810	1860	1920
			38	2720	3400	4250	5200	6350	7600	9050	1800	1860	1910	1960	2010	2070	2130
	JEHS-0400-M-1&3 R134a	4	27	3600	4550	5600	6850	8250	9900	11700	1700	1740	1800	1860	1930	2000	2070
			32	3400	4300	5300	6500	7850	9400	11100	1860	1920	1980	2040	2110	2180	2260
			38	3150	3950	4950	6050	7300	8800	10400	2070	2150	2210	2280	2350	2430	2510
	JEHS-0500-M-3 R134a	5	27	4400	5450	6750	8200	9850	11700	13750	2170	2230	2330	2430	2530	2650	2780
			32	4100	5150	6350	7750	9300	11100	13050	2370	2470	2560	2670	2780	2900	3040
			38	3800	4750	5900	7200	8650	10350	12150	2650	2790	2870	2990	3110	3240	3390
	JEHS-0600-M-3 R134a	6	27	5250	6550	8050	9800	11700	13850	16100	2390	2490	2620	2750	2890	3040	3210
			32	4950	6150	7600	9250	11100	13150	15300	2630	2760	2890	3030	3180	3320	3520
			38	4550	5600	7000	8550	10250	12150	14200	2960	3140	3250	3400	3560	3740	3930
	JEHS-0680-M-3 R134a	6.8	27	5963	7389	8957	10712	12687	14851	16958	2814	2982	3155	3346	3559	3801	3687
			32	5588	6928	8420	10082	11959	14015	15972	3100	3311	3528	3758	3970	4201	4142
			38	5124	6363	7765	9304	11074	13012	14799	3453	3715	3983	4266	4469	4681	4683
Series 4	JEHS-0800-M-3 R134a	8	27	6700	8300	10150	12350	14600	17200	20100	3270	3410	3600	3750	4010	4190	4320
			32	6300	7800	9550	11650	13750	16300	19000	3600	3760	3960	4130	4400	4580	4730
			38	5800	7200	8850	10800	12750	15100	17700	4030	4220	4440	4620	4910	5100	5250
	JEHS-1000-M-3 R134a	10	27	8600	10550	12850	15400	18200	21300	24500	4370	4610	4910	5240	5610	5910	6210
			32	8050	9900	12050	14450	17100	20000	23100	4820	5080	5410	5760	6110	6460	6760
			38	7450	9100	11050	13300	15800	18500	21400	5410	5710	6060	6410	6810	7160	7460

TE: Evaporating Temperature (°C)

TA: Ambient Temperature (°C)

Rating Condition: Suction Gas Superheat 10K, Sub cooling OK

Data presented in accordance with BS EN 13215:2000

Specifications

Performance Data: Medium Temperature (R407C)

R407C				Cooling Capacity (Watts)					Absorbed Power (Watts)				
	Unit Model	HP	TE TA	-15	-10	-5	0	5	-15	-10	-5	0	5
Series 2	JEHS-0200-M-1&3 R407C	2	27	2260	2830	3520	4330	5240	1450	1450	1450	1460	1460
			32	2180	2710	3370	4130	5010	1550	1570	1590	1610	1630
			38	2050	2540	3140	3860	4670	1710	1760	1800	1840	1880
	JEHS-0250-M-1&3 R407C	2.5	27	2590	3340	4220	5240	6390	1800	1800	1810	1830	1840
			32	2510	3220	4060	5020	6110	1880	1910	1940	1970	1990
			38	2400	3070	3860	4760	5790	2000	2040	2090	2130	2170
	JEHS-0300-M-1&3 R407C	3	27	3380	4310	5360	6570	7930	2390	2380	2370	2380	2380
			32	3320	4180	5180	6310	7600	2450	2470	2500	2530	2550
			38	3220	4030	4960	6020	7230	2540	2600	2650	2700	2750
Series 3	JEHS-0350-M-1&3 R407C	3.5	27	3780	4880	6180	7670	9370	2345	2335	2335	2335	2335
			32	3560	4600	5840	7270	8900	2555	2555	2565	2575	2575
			38	3380	4330	5460	6770	8250	2735	2785	2845	2895	2925
	JEHS-0400-M-1&3 R407C	4	27	4590	5920	7450	9190	11200	2935	2925	2925	2945	2985
			32	4350	5590	7020	8670	10550	3165	3175	3195	3235	3275
			38	4180	5280	6560	8030	9710	3335	3425	3515	3605	3705
	JEHS-0500-M-3 R407C	5	27	5200	6810	8670	10800	13200	3615	3665	3735	3815	3905
			32	4910	6410	8180	10200	12500	3865	3955	4045	4125	4225
			38	4780	6110	7670	9460	11450	3995	4185	4375	4555	4745
	JEHS-0600-M-3 R407C	6	27	6050	8040	10200	12550	15150	4465	4515	4565	4635	4715
			32	-	7490	9580	11850	14350	-	4865	4945	5025	5115
			38	-	7120	9000	11000	13200	-	5095	5325	5545	5765

TE: Evaporating Temperature (°C)

TA: Ambient Temperature (°C)

Rating Condition: Suction Gas Superheat 10K, Sub cooling 0K

Data presented in accordance with BS EN 13215:2000

Health and Safety

Important Note:

Only qualified personnel, who are familiar with refrigeration systems and components including all controls, should perform the installation and start-up of the system. To avoid potential injury, use care when working around coil surfaces or sharp edges of metal cabinets. All piping and electrical wiring should be installed in accordance with all applicable codes, ordinances and local by-laws.

General information

Before Installation

- Ensure the units received are the correct models for the intended application.
- Ensure the refrigerant, voltage and MWP are all suitable for the proposed application.
- Check there is no damage to the units. Any damage should be advised to the supplier immediately.
- Check that the proposed equipment locations are suitable and provide adequate support for the weight of the units.

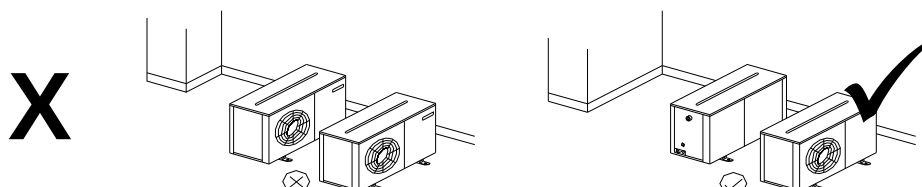
During Installation and subsequent maintenance

- Installation and maintenance are to be performed only by qualified personnel who are familiar with local codes and regulations, and experienced with this type of equipment.
- If lifting equipment is required, ensure that it is suitable for purpose, certificated and that the operatives are qualified to use it.
- Safe working methods are identified and operatives have suitable Personal Protective Equipment (PPE).
- Ensure the working area has adequate ventilation during brazing procedures.
- The units contain moving machinery and electrical power hazards, which may cause severe injury or death. Disconnect and shut off power before installation or service of the equipment.
- Refrigerant release into the atmosphere is illegal. Proper evacuation, recovery, handling and leak testing procedures must be observed at all times.
- Units must be earthed and no maintenance work should be attempted prior to disconnecting the electrical supply.
- The electrical covers and fan guards must remain fitted at all times.
- Use of the units outside of the design conditions and the application for which the units were intended may be unsafe and be detrimental to the units, regardless of short or long term operation.
- The units are not designed to withstand loads or stresses from other equipment or personnel. Such extraneous loads or stress may cause failure/leak/injury.
- In some circumstances, a suction accumulator (not supplied) may be required. It offers protection against refrigerant flood back during operation and also against off-cycle migration by adding internal free volume to the low side of the system.
- Tests must be conducted to ensure the amount of off-cycle migration to the compressor does not exceed the compressor's charge limit.
- Wherever possible the system should be installed to utilize a pump down configuration.
- After installation, the system should be allowed to run for 3 – 4 hours. The oil level should then be checked and topped up as necessary. It should then be rechecked after 24 hours once the system has stabilized. The oil level should be visible at least $\frac{1}{2}$ - $\frac{3}{4}$ way up the compressor oil sight glass (where fitted). For details of the oil requirements, please refer to page 26 in the service and maintenance section.

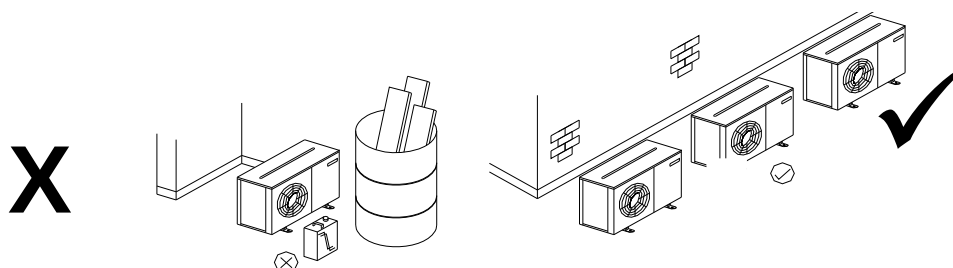
Installation

Unit location

- In order to achieve maximum cooling capacity, the installation location for the condensing unit should be carefully selected.
- Install the condensing unit in such a way so that hot air ejected by the condensing unit cannot be drawn in again (short circuit of hot discharge air). Allow sufficient space for maintenance around the unit.



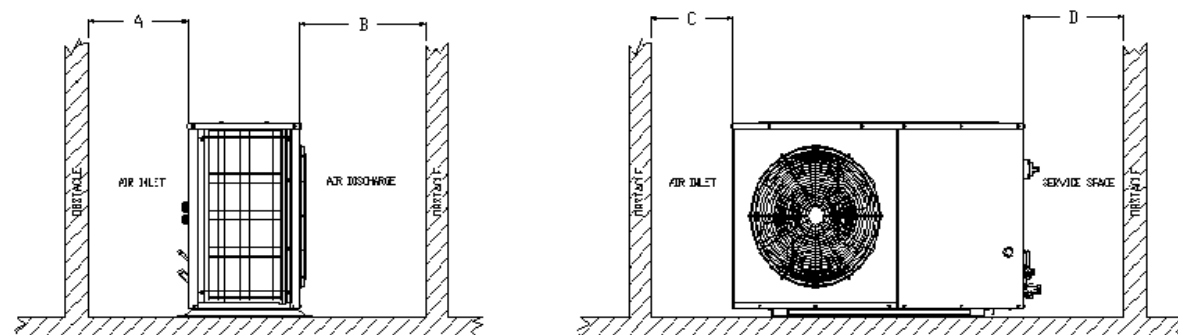
- Ensure that there is no obstruction to air flow into or out of the unit. Remove obstacles which block air intake or discharge.



- The location must be well ventilated, so the unit can draw in and distribute plenty of air thus lowering the condensing temperature.
- To optimize the unit running conditions, the condenser coil must be cleaned at regular intervals.
- The unit must be level in all directions.

Installation clearances

- The installation location should allow sufficient space for air flow and maintenance around the unit.



ALL MODELS	A	B	C	D
Minimum Distance	300 mm	1000 mm	300 mm	500 mm

Installation

Field piping

Important Note:

Pipe sizing should only be determined by qualified personnel. All local codes of practice must be observed in the installation of refrigerant piping.

To ensure satisfactory operation and performance, the following points should be noted for field piping arrangements:

- Pipework routes must be as simple and as short as possible.
- Avoid low points on pipework where oil can accumulate.
- Suction gas velocity must be sufficient to ensure good oil return.
- Use only clean, dehydrated refrigeration grade copper tube with long radius bends.
- Avoid flare type connections and take great care when brazing. Use only silver alloy rods.
- Run braze without over filling to ensure there is no leakage into the tube.
- To prevent oxidation, blow oxygen free nitrogen through pipework when brazing.
- Install insulation on all suction lines and on all pipes penetrating walls or passing through hot areas.
- Adequately support all pipe work at a maximum of 2 metre intervals.
- Where the condensing unit is situated below the indoor unit (coldroom evaporator / display case), the height difference between the two units should be no more than 6 metres.
- In vertical pipework, the use of U-trap and double suction risers is often required. These suction risers must always be fitted with a U-trap at the bottom and a P-trap at the top and never be higher than 4m unless a second U-trap system is fitted.
- Additional oil may be required if piping length exceeds 20m or multiple oil traps are fitted. Check the oil level closely during commissioning and add oil as necessary. Add oil in small amounts. Do not overfill the compressor!
- When installing a single compressor condensing unit with multiple evaporators connected which operate independently, care should be taken to ensure that the evaporating pressure/temperature does not fall outside the compressor operating limit at minimum load. If there is a potential for this scenario, consider multiple evaporators fed by a single solenoid valve or separate condensing units.
- Suction pipework should slope gently back towards the unit to assist oil return to the compressor. A fall of approximately 2cm per metre of pipework is acceptable.
- Liquid lines should be sized to ensure a full supply of liquid refrigerant to the expansion device. Careful attention should be paid to sizing of liquid lines on large risers (maximum 6m).
- Maximum recommended pipe length is 50 metres.

Correct line sizing will minimize the pressure drop and maintain sufficient gas velocity for proper oil return.

Important Note:

One of the main factors affecting equipment reliability and compressor service life is refrigeration circuit contamination. During installation, circuit contamination can be caused by:

- Brazing & Welding Oxides
- Filings & Particles from de-burring pipework
- Brazing Flux
- Moisture & Air

Installation

Pressure testing

The condensing units are pressure tested in the factory prior to dispatch. All units come with a holding charge of oxygen free nitrogen.

Once the pipework installation is complete, it should be pressure tested prior to evacuation to test for leaks.

A pressure leak test should be carried out using oxygen free nitrogen (OFN). NEVER USE OXYGEN FOR PRESSURE TESTING SYSTEMS. A calibrated nitrogen pressure regulator must always be used. Before starting any pressure testing, ensure the area surrounding the system is safe, inform relevant personnel and fit warning signs indicating high pressure testing. Also, use correct PPE as required.

Always pressurize the system slowly, preferably in stages up to the maximum required pressure. Maximum test pressures applicable to the unit are as follows:

Test pressure	
High side	Low side
28 barg (405 psig)	19 barg (275 psig)

Listen for any possible leaks and check all joints with bubble spray. If any leaks are discovered, release pressure slowly from system until empty, repair leak and then restart pressure testing procedure. Never attempt to repair a leak on a pressurized system.

A strength test should also be incorporated (to installed pipework only) according to local regulations.

Once testing has been completed satisfactorily, release the pressure from the system gradually and safely to external atmosphere.

Evacuation & Charging

Important Note:

Moisture prevents proper functioning of the compressor and the refrigeration system. Ensure that a good quality vacuum pump is used to pull a minimum vacuum of 250 microns (0.25 torr).

Once pressure testing has been completed, the system can now be evacuated to remove air and any moisture from the piping. This can be done as follows:

- Ensure any nitrogen charge is safely released from the system.
- Connect a gauge manifold to the connections on the service valves on the condensing unit.
- Connect a vacuum pump and vacuum gauge to the system.
- Ensure all gauge manifold and service valves are open as required.
- Evacuate the system until vacuum is below 250 microns (0.25 torr).

Note: A triple evacuation procedure is recommended for all new systems or where moisture is suspected

Once the system is isolated and the vacuum pump is switched off, any rise in pressure indicates that either there may be a leak in the system or moisture is still present. In this case, recheck the system for leaks, repair as necessary, and then restart the evacuation procedure. Once completed satisfactorily, the vacuum pump and vacuum gauge can be removed.

At this point, the refrigerant charge can be added to the system as required. Refrigerants must be charged in the liquid phase. **Charging of liquid into the suction side of the system should ONLY be done with a metering device.** Use calibrated weighing scales to record the amount of refrigerant added to the system.

Installation

Electrical

Important Note:

The mains electrical supply to the condensing unit must be via a suitable motor rated circuit breaker or fuse. A mains isolator is fitted to all condensing units therefore an additional isolator is not required unless site conditions or regulations dictate differently.

J & E Hall Fusion Scroll condensing units require either a 230 volt / 1 phase / 50Hz supply or a 400 volt / 3 phase / 50Hz supply, both of which must include a Neutral and an Earth. These systems are not suitable for any other supply voltages (other than a deviation of +/- 10% of the above values) and are not suitable for 60Hz supplies.

When utilizing a three phase supply, ensure that the compressor motor rotates in the correct direction. Please see note on page 19.

Mains cable type and sizing must be selected for the particular application and the electrical installation should conform to the current local standards.

- Cables to the condensing unit should wherever possible be routed through the cable glands supplied on the rear of the units.
- Connect the mains supply to the units as per the wiring diagrams on pages 23 – 25.

To gain access to the electrical box, turn the mains isolator switch on the end of the unit to the OFF position, remove the screws from the end cover panel and remove panel. The electrical box is located behind the panel. Remove the screws in the electrical box cover to access components.

Important Note:

There must be no more than 10 compressor starts per hour. A higher number reduces the service life of the compressor. There is no minimum off time for scroll compressors, as they start unloaded. However, consideration should be given to ensuring an adequate minimum run time to ensure proper oil return. A minimum runtime of 3 minutes after each compressor start and a minimum idle time of 3 minutes after each stop are recommended. Only during the pump down cycle may the compressor run for shorter intervals.

Commissioning

Pre startup checks

Before starting the condensing unit the following checks should be carried out as a minimum:

- Check electrical supply is correct and all connections are sound.
- All moving parts are free and guards fitted.
- Compressor oil level satisfactory.
- Initial settings for safety switches and fan speed control.
- Overload set correctly.
- All valves in correct operating position.
- Initial refrigerant charge.
- Crankcase heater energized for a minimum of 12 hours before compressor start-up.
- Gauge manifold connected to both low and high sides of system.

Running the unit

- Run the unit and check compressor and condenser fan operation.
- Check system pressures and temperatures, gas charge and running currents of motors to ensure correct operation.
- Check compressor suction superheat. This should be between 10K and 20K at normal operating conditions.
- Final adjustment of safety switch settings and fan speed control.
- Allow the system to run for 3 – 4 hours. Check compressor oil level and top up with the correct oil type as required (see page 26). Recheck the compressor oil level again after 24 hours operation.
- Carry out final leak test and ensure all panels/covers are fitted and screws tightened.
- Log all information along with the system model and serial numbers for future reference.
- Ensure that the customer / responsible person are provided with basic operating instructions and where electrical isolators are situated in case of emergency.

Commissioning

Important Information!

Compressor operation

Scroll compressor motors are designed to run only in one direction. This is not an issue with single phase compressors as they will always run in the correct direction. The correct rotation of a three phase compressor motor depends on the connection of the three incoming phases to the unit. Correct rotation can be determined by a drop in suction pressure and a rise in discharge pressure when the compressor is energized. Running the compressor for a short period of time in reverse direction will have no negative impact but prolonged running in reverse direction may cause premature failure. ***To reverse the rotation of a three phase scroll compressor, shut off the incoming power supply to the unit, swap connection of any two of the three incoming phases at the unit isolator, reapply power to the unit and following compressor restart, recheck operating pressures.***

Vacuum operation:

Do not operate scroll compressors in a vacuum condition, as this will cause the scrolls to overheat very quickly causing premature failure.

System charge:

Ensure an adequate liquid charge has been introduced to the high side of the system before starting to ensure a minimum operating pressure on the suction side of 0.5 bar is maintained, otherwise overheating of the scrolls and subsequent damage may occur.

Commissioning

Safety pressure switch settings

The Saginomiya DNS pressure switch fitted to JEHS model condensing units with auto reset for low pressure and manual reset for high pressure is **NOT** factory preset. **BOTH THE LP AND HP SWITCH SETTINGS MUST BE ADJUSTED TO SUIT THE APPLICATION BEFORE STARTING THE UNIT.** Be sure that the high pressure setting does not exceed the receiver's maximum service pressure.

High pressure safety

The high pressure safety switch is required to stop the compressor should the discharge pressure exceed the values shown in the following table. The high pressure switch can be set to lower values depending on the application and ambient conditions.

Unit Type	Series 2, 3 & 4	
Refrigerant	R404A / R407C	R134a
Cut Out (bar g)	28	16
Cut Out (psi g)	410	235

Note: For HP switch settings for R407A & R407F, please refer to the notes on the relevant performance data pages in this manual.

Low pressure safety

The low pressure safety switch protects the compressor against deep vacuum operation, a potential cause of failure due to internal arcing and overheating.

For ZB compressors, the low-pressure cut-out should be set as high as possible.

For ZF compressors, the low-pressure cut-out should be set no lower than 0.3 bar(g).

Care should be taken because the scroll sets will unload at a pressure ratio of approximately 10:1 for ZB compressors and approximately 20:1 for ZF compressors.

If the unit fails to pump down, the pump down pressure should be reset to a higher value.

Unit Type	Series 2, 3, 4			
Refrigerant	R404A / R407A/F		R134a	R407C
Application	M*	L*	M*	M*
Cut Out (bar g)	1.0	0.3	0.6	1.4
Cut Out (psi g)	15	5	9	20

* M: Medium Temperature; L: Low Temperature

Fan Speed Controller (XGE)

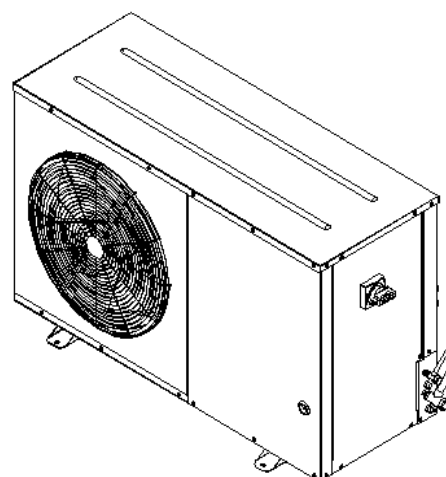
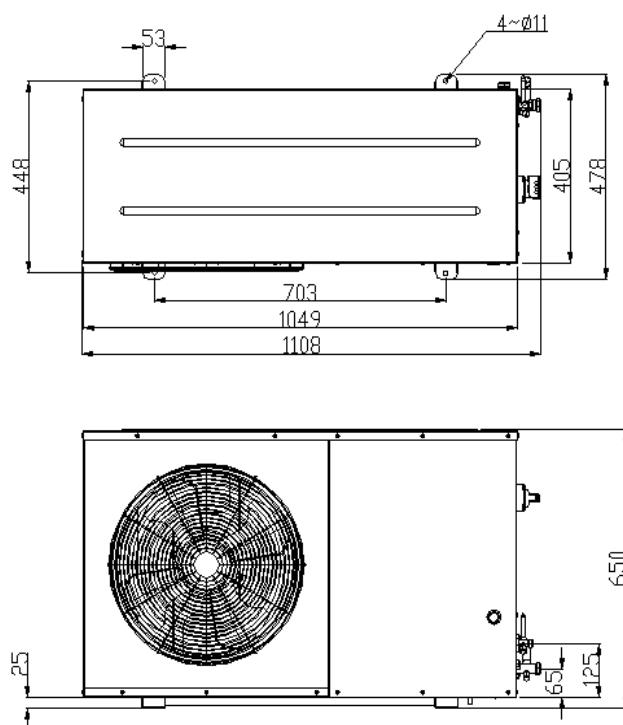
The fan speed controller is factory set to 19 bar for operation with R404A refrigerant. This can be adjusted to suit site conditions / application or alternative refrigerants as described on page 29. The XGE controls are set to stop fan at P_{min}. Recommended settings are as follows:

Refrigerant	R404A / R407A/C/F	R134a
Setting (bar g)	19	11

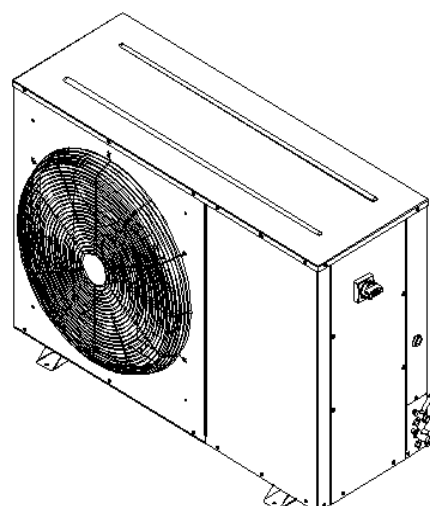
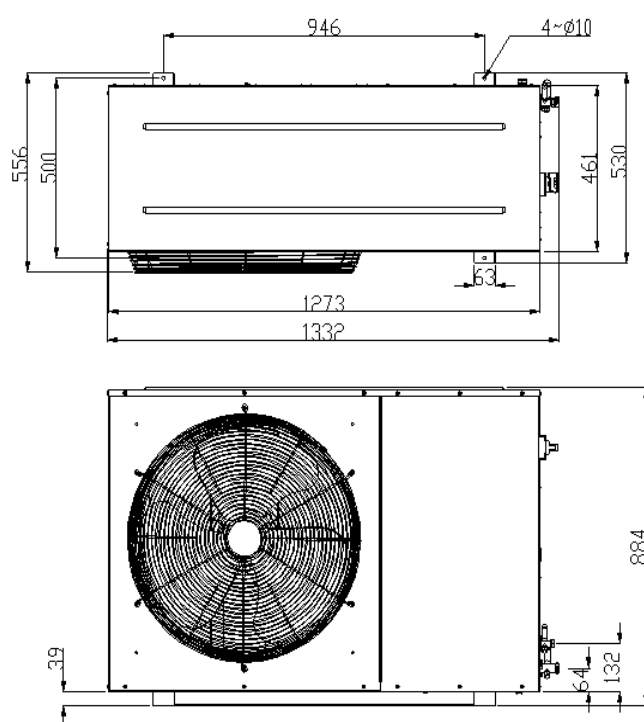
Drawings

Dimensional drawings:

JEHS-0200-M-1/3, JEHS-0250-M-1/3, JEHS-0300-M-1/3, JEHS-0200-L-3, JEHS-0300-L-3



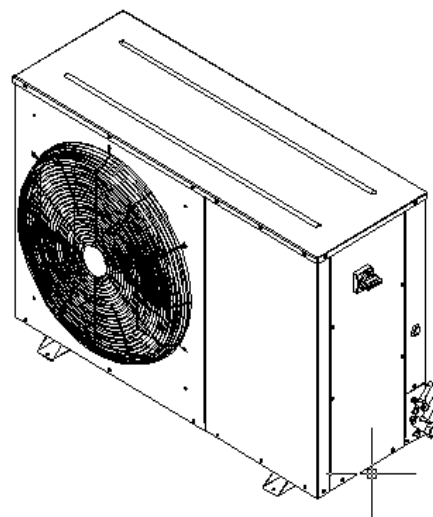
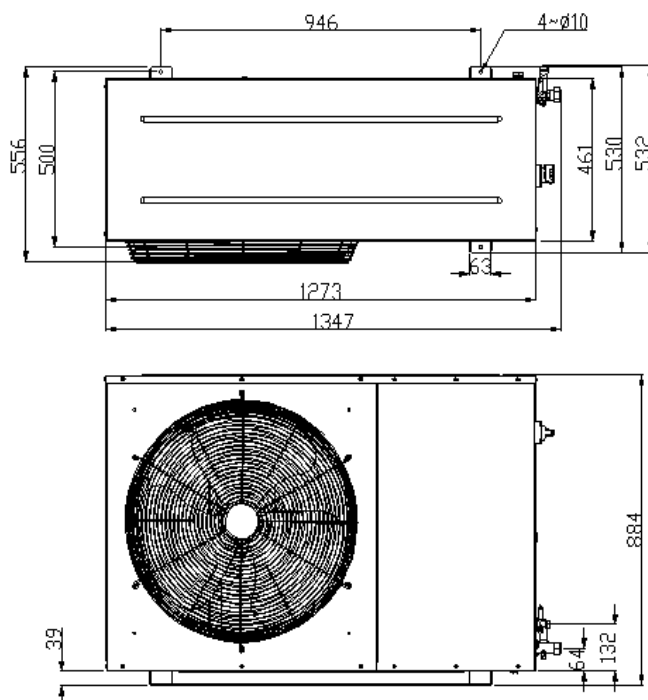
JEHS-0350-M-1/3



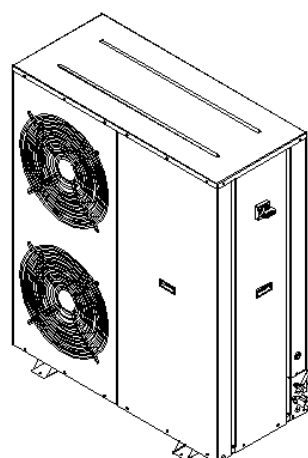
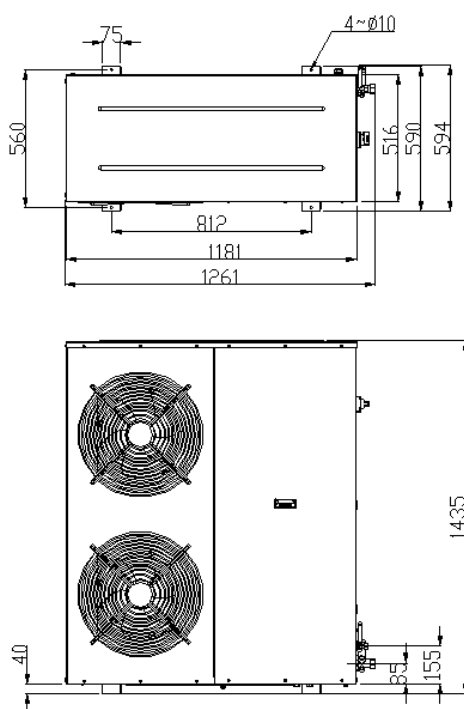
Drawings

Dimensional drawings:

JEHS-0400-M-1/3, JEHS-0500-M-3, JEHS-0600-M-3, JEHS-0680-M-3,
JEHS-0400-L-3, JEHS-0500-L-3, JEHS-0600-L-3



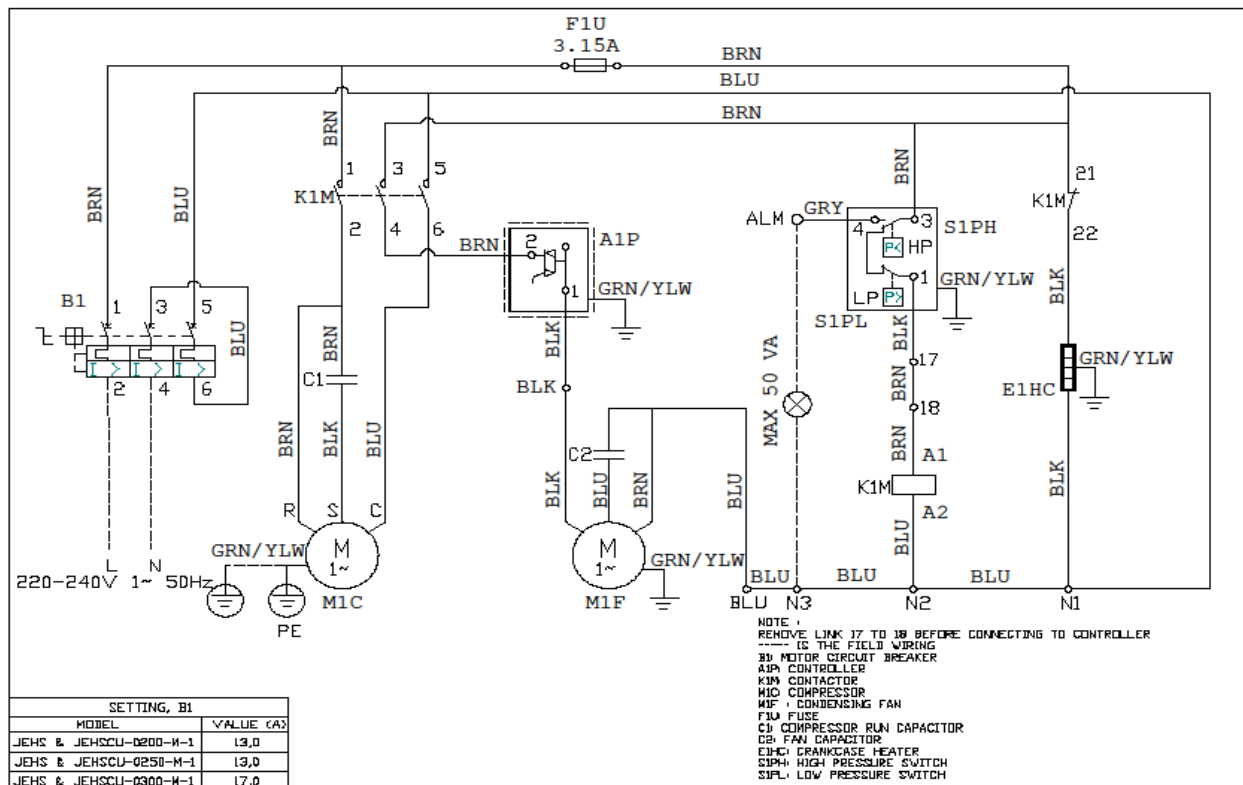
JEHS-0800-M-3, JEHS-1000-M-3, JEHS-0750-L-3, JEHS-1000-L-3



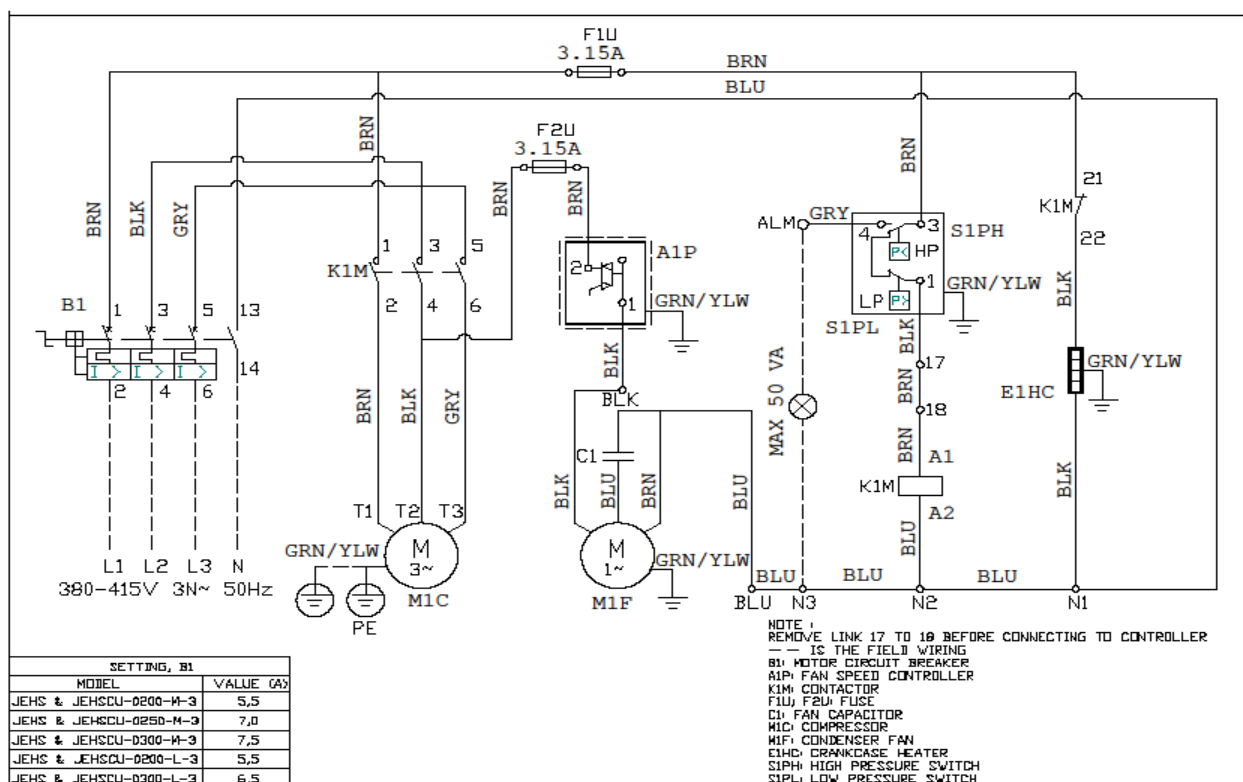
Drawings

Electrical wiring diagrams:

JEHS-0200-M-1, JEHS-250-M-1, JEHS-0300-M-1



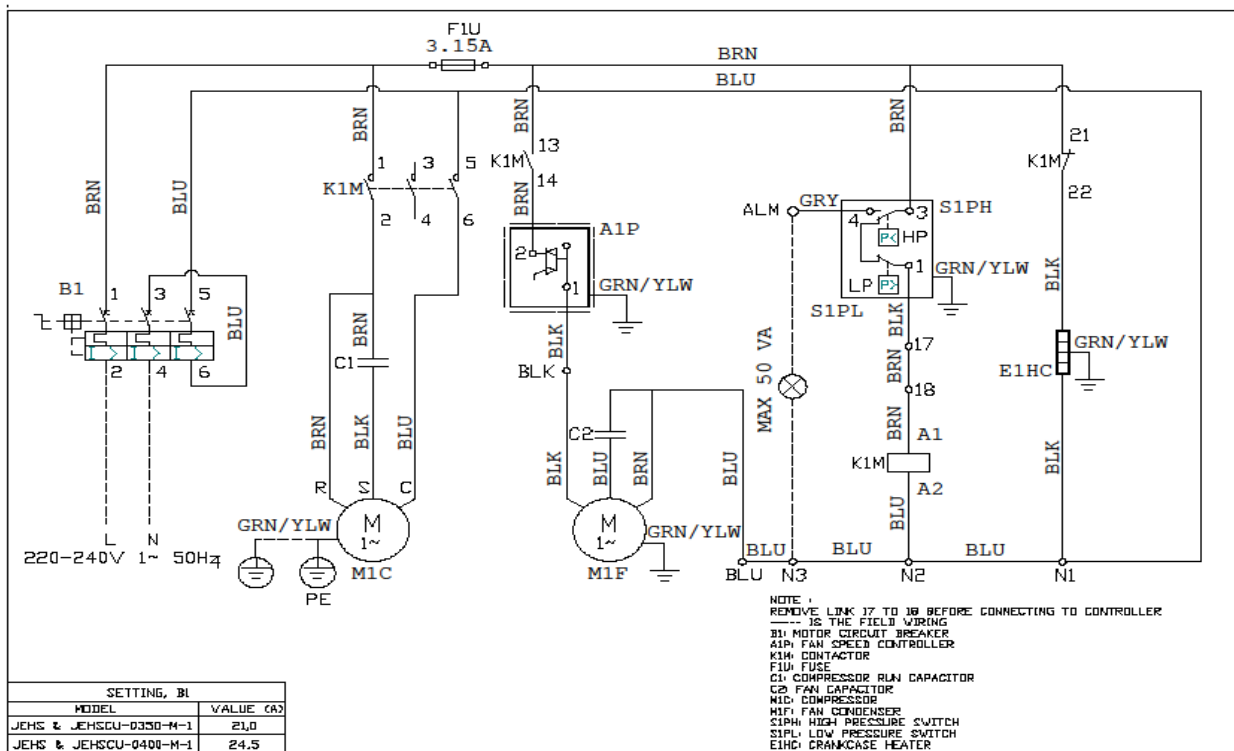
JEHS-0200-M-3, JEHS-0250-M-3, JEHS-0300-M-3, JEHS-0200-L-3, JEHS-0300-L-3



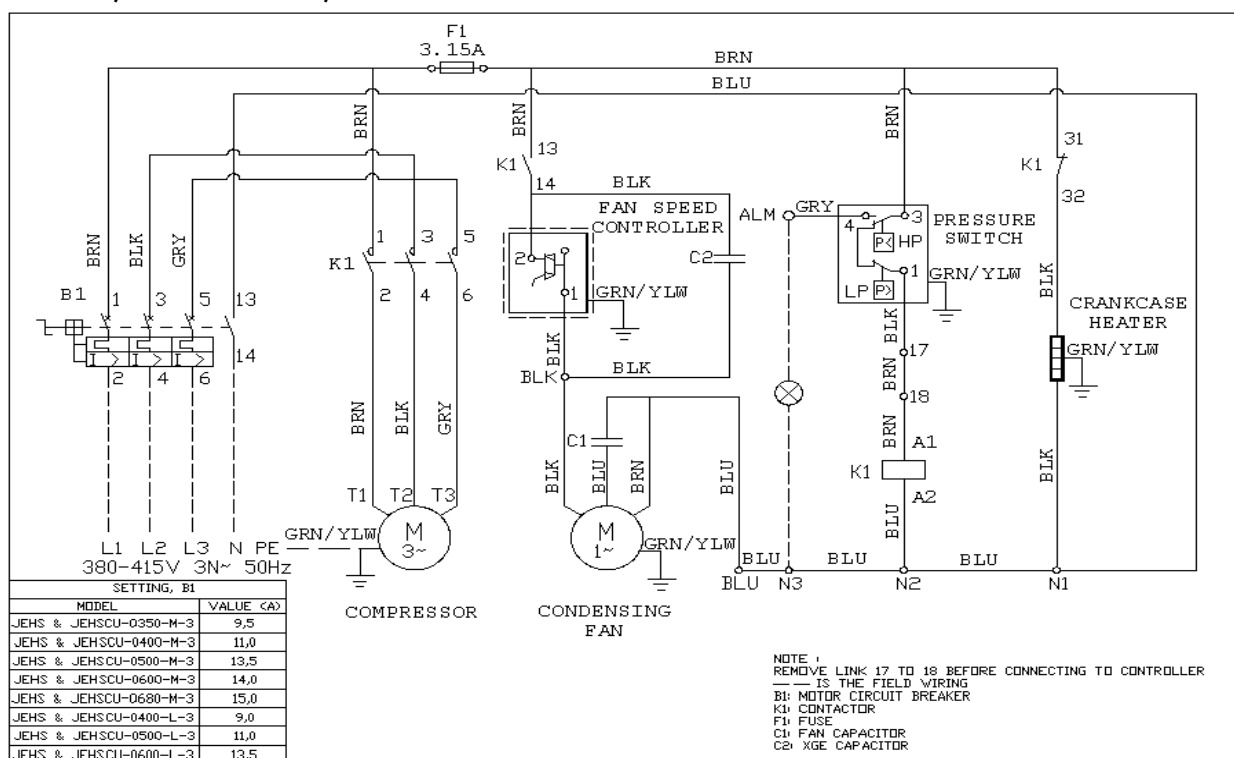
Drawings

Electrical wiring diagrams:

JEHS-0350-M-1, JEHS-0400-M-1



JEHS-0350-M-3, JEHS-0400-M-3, JEHS-0500-M-3, JEHS-0600-M-3, JEHS-0680-M-3
JEHS-0400-L-3, JEHS-0500-L-3, JEHS-0600-L-3



Service & Maintenance

Important Note:



Warning! – Disconnect the mains electrical supply before servicing or opening the unit.

The condensing units are designed to give long life operation with minimum maintenance. However, they should be routinely checked and the following service schedule is recommended under normal circumstances:

The removal of the top, side and front panels ensures that all parts are accessible.

1. Compressor – Inspect at regular intervals

- Check for refrigerant leaks on all joints and fittings.
- Check mountings for tightness and wear.
- Check operation of crankcase heater.
- Check electrical connections.
- Ensure that no abnormal noise or vibration is detected during test run.
- Check the compressor oil levels and top up if required. The oil level should be visible at least ½ way up the sight glass (where fitted).

Compressor Type	Oil Type
ZB/ZF	Emkarate RL32-3MAF
ZB/ZF	Mobil Arctic 22CC

2. Condenser Fan Motor & Blade – Clean and inspect at regular intervals

- Check for abnormal noise, vibration and fan imbalance.
- Ensure that the fan motor is clean and spins freely.
- Check that the condenser fan blade is clean and free from restriction and damage/imbalance.
- **Note:** The Fan Motor is pre-lubricated and factory sealed so no maintenance is necessary.

3. Condenser Coil – Clean and inspect at regular intervals.

- Check and remove the dirt and debris between the fins using a soft brush, low pressure compressed air/inert gas or a low pressure sprayer utilizing clean water. A suitable chemical coil cleaner may be used as required. Accumulations of dirt on the condenser face can be removed with a soft bristle hand brush. When using liquids, ensure electrical items are isolated and correctly protected.
- DO NOT USE HIGH PRESSURE JET WASHERS.
- Check and remove any obstacles which may hinder the airflow through the condenser coil.

Service & Maintenance

4. Controls

- Check settings and operation of pressure switches.
- Check overload setting.
- Check fan speed control setting and operation.

5. Power Supply – Inspect at regular intervals.

- Check the running current and voltage for the condensing unit.
- Check the electrical wiring and tighten the wires onto the terminal blocks if necessary.

6. Refrigerant Charge

- Check the refrigerant charge by ensuring that the system is operating correctly, the pressures are as expected and that the liquid line sight glass shows a full bore of liquid refrigerant.
- Carry out a full leak test.

7. Unit decommissioning and disposal

- At the end of the unit's useful life, a suitably qualified engineer should decommission it. The refrigerant and compressor oil are classed as hazardous waste and as such must be reclaimed and disposed of in the correct manner, including completion of waste transfer paperwork. The unit components must be disposed of or recycled as appropriate in the correct manner.

F-Gas Information

From 1/1/2015, a new F-Gas Regulation (EC 517/2014) comes into force replacing the old Regulation (EC 842/2006. This will affect system labelling, information supplied within documentation and also the way in which thresholds for frequency of leak testing refrigeration systems are calculated. Please be aware of the following:

- The models of equipment covered in this Technical Manual rely on fluorinated greenhouse gases for their functioning.
- All unit models come from the factory pressurized with OFN (Oxygen Free Nitrogen) only.
- The GWP (Global Warming Potential) values of refrigerants which are specified for use along with the three new thresholds for leak testing requirements based on TCO₂Eq (Tonnes CO₂ Equivalent) are as follows:

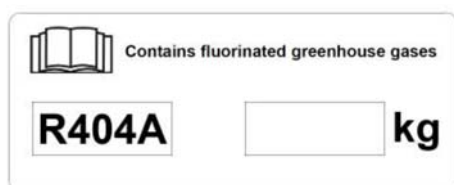
Refrigerant	GWP	Refrigerant Charge - kg		
		5T	50T	500T
		CO ₂ Eq	CO ₂ Eq	CO ₂ Eq
R134a	1430	3.5	35	350
R404A	3922	1.3	12.7	127
R407A	2107	2.4	23.7	237
R407C	1774	2.8	28.2	282
R407F	1825	2.7	27.4	274

- Changes to leak testing requirements are as follows:

OLD LEGISLATION	NEW LEGISLATION	LEAK CHECKING FREQUENCY
3-30 kgs	5-50 TCO ₂ Eq	Every 12 months but can be increased to 24 months if fitted with a fixed leak detection system.
30-300 kgs	50-500 TCO ₂ Eq	Every 6 months but can be increased to 12 months if fitted with a fixed leak detection system.
300+ kgs	500+ TCO ₂ Eq	Every 6 months - however automatic leak detection system is mandatory which requires servicing every 12 months

Please note: For systems with a charge below 3kg, the changes to the leak checking regime will not apply until 2017. Currently, there is no requirement for regular leak testing of systems with a total charge below 3kg.

A refrigerant charge label is supplied with each unit (inside the electrical box) manufactured from January 2015. The total refrigerant charge for the system must be entered on the label with indelible ink and must be adhered in the proximity of the product charging port. The label supplied will represent the refrigerants approved for use with that particular unit. Examples of the unit labels are as follows:



Technical Information

Fan Speed Controller (XGE)

- To ensure stable operation, sine wave AC power supply must also be stable.

LIMIT ON APPLICATION

The product is not designed and manufactured for such equipment or system that is intended to be used under such circumstances as to relate to human life. For application requiring specially high reliability, please contact the Company first.

SCOPE OF WARRANTY

Unless otherwise agreed by the parties, warranty period of the Product shall be one year after delivery. In case of failure attributable to the Company within such period, the Product shall be repaired or replaced, provided that any one of followings are out of the warranty.:

1. Improper handling or application by user.
 2. Modification or repair by other than the Company.
 3. Any failure to be caused by acts of God, fire, storm or the like, war, riot or the like and other causes beyond the control of the parties concerned.
- Warranty described in this paragraph means the warranty for the Product itself and does not include warranty for any consequential damage arising out of or occasioned by a defect or failure of the Product.

First check that the fan functions correctly after connecting to the XGE, and before running in normal operating mode.

- When using a 4A fan motor, the ambient temperature should not exceed 40°C (104°F). Please refer to Fig. 10 for the details of the relationship between electric current and ambient temperature.

ADJUSTING (Fig. 3)

Turn the Range Adjusting Screw to clockwise (+) for increasing the setting value, and to counterclockwise (-) for decreasing the setting value.

(Please use the right chart as reference for adjusting.)

CAUTION

- Do not move the screw other than the Range Adjusting Screw.

OPERATION CHECK

Install and calibrate the product correctly and then check its operation to confirm correct function of the whole system.

CAUTION

- It can not be used for ammonia refrigeration system.
- This product is not available for the system which apply pressure more than 47bar (681Psi) because the rated maximum working pressure of this product is 47bar (681Psi) if the pressure more than the rated maximum working pressure is applied to this product, it causes transformation of characteristics or the destruction. Operation will become unstable when using other than sine waves for the power supply. In this case, proper control may not be achieved.

SPECIFICATIONS

Catalog number	F.V.S. Setting bar [Psi]	E.P.B. Factory Adjusting Range [Psi]	Refrigerants	Electrical Rating	Pressure admission Port	Weight g	Function	Function 2
XGE-4C	19	10	Fixed 6	Single phase 200 to 240V, 50/60Hz	7/16-20UNF female flare	190	Out off	Min in speed
XGE-4M	[276]	[145]	[383]	200 to 440V, 0.2 to 4A (0.2 to 3A)	with Schrader		Out off	Fixed approx. 40% at 50Hz
XGE-6C	25	22	Fixed 7				Min in speed	Fixed approx. 30% at 60Hz
XGE-6M	[383]	[320]	[566]					

Ambient Temperature of Fan Speed Controller Housing : 20 to 55°C (-4 to 131°F) (With 4A rated fans : 40°C (104°F) maximum ambient temperature.) Vibration : 2G or less in normal use / Shock : 100G or less.

Special specification: F.V.S. Factory setting can be set the different points within the Adjusting Range on demand. These model were approved CSA with c-ULS (Master Contract: 170124)

- Applicable requirements: CNA/CSA-22 No. 1010, 1-92 and UL std. No. UL60100-1-1st Ed.

F.V.S. : Full Voltage Set point.

The pressure at which the control delivers 95% out put effective voltage. (R.M.S.(V%))

E.P.B. : Effective Proportional Band

The decrease in pressure below the calibration set point required to transmit a 45% of effective voltage. (R.M.S.(V%))

Read all instructions thoroughly



Installation Instructions: XGE Fan Speed Controller

since this can result in deformation of the controller. For direct mounting, tighten the connection using an appropriately sized spanner and with a torque of 12.7 - 15Nm (see Fig. 2).

- The mounting position should be in the vertical axis and should not be tilted more than 45° from the vertical (See Fig. 1b).

- Failure to install the Copper Packing at the connection portion cause leak of refrigerant gas.

- Provide adequate ventilation space so that heat doesn't build up. At least 50mm clearance above the top and below the bottom of XGE is necessary. Don't mount this instrument directly above equipment that generates large amount of heat. (heaters, transformers, large-wattage resistors.)

WIRING

Please refer to the diagram embossed on the controller (see Fig. 4) for use of correct terminals on the plug (supplied). Connect Ground terminal to the earth line. Please also make sure not to exceed the electrical rating of the XGE when connecting to the fan motor. It is possible to connect fan motors in parallel as long as the rating is not exceeded. The plug can be wired so that orientation is possible in 4 directions as desired. (see Fig. 6)

CAUTION

- For connecting fan motor, use one phase 200 to 240V AC, one-phase induction motor which suited for phase control and with heat preventing thermostat, or shaded pole motor.
- There is a case that the XGE does not control the fan speed of the motor having large angle of its leading current.
- When connect with the power, make sure to use a Circuit Breaker or a Fuse with the rated ampere or less of each XGE model as shown by the cover.
- Fix the plug onto the XGE, using the gasket provided and securely tighten with the screw (also provided) using a torque of 0.4 - 0.6 Nm (see Fig. 5). CAUTION: It is important to use the gasket (DIN 43650) between the plug and controller as well as tightening the screw sufficiently to avoid the risk of electrical shock or short circuit.
- When using a forced operation switch or fuse, make sure to connect across terminals No. 1 and No. 2.

When a fan with selectable speed is being used, please

IMPORTANT
Failure to read and follow all instructions carefully before installing or operating this Fan Speed Controller could cause personal injury and/or property damage. Save these instructions for future use.

NOTES FOR SAFETY

WARNING

- Before wiring and service, be sure to turn off power supply. Otherwise, may cause electrical shock.
- Before connection of a plug and disassembly of a plug, be sure to turn off power supply as it may cause electrical shock.
- Do not touch the main body during driving. Otherwise, it may burn a hands.

OUTLINE

The XGE controls Fan Motor Speed of air cooled condenser of general purpose cold/cooling unit by phase control, and keeps a definite condensing pressure and makes it to drive stably. Further, the XGE has a noise filter, and is suitable to the following Council Directive of European Communities.

ELECTROMAGNETIC COMPATIBILITY & SAFETY

FOR ELECTRICAL EQUIPMENT
As for the XGE, Saginomiya declared for the above directives as follows.

- 1) Electromagnetic Compatibility
- Directives: 89/336/EEC, 92/31/EEC, 93/68/EEC
- 2) Safety for Electrical Equipment
- Directives: 73/23/EEC, 93/68/EEC

MOUNTING

Directly mount onto the pressure line (see Fig. 1a) in a location where pressure can be detected accurately (eg. After the condenser). Alternatively it is possible to remote mount to a side panel using the optional fixing bracket (see fig. 8) and connect to the pressure line with a refrigeration pipe (not supplied).

CAUTION

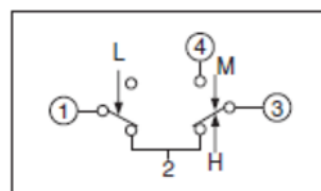
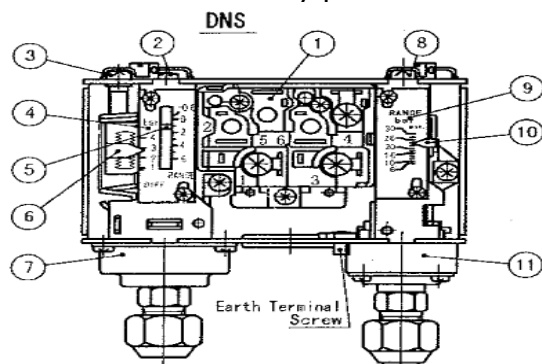
- Don't install at the place to require degrees of protection over IP65 Category 2 enclosures.
- Don't tighten with excessive force whilst holding the unit.

Technical Information

Dual Pressure Switch

Safety pressure switch settings

The pressure switches fitted to condensing units with auto reset for low pressure and manual reset for high pressure are **NOT** factory preset.



- | | | |
|---------------------------------|--|---------------------------------|
| 1. Micro Switch | 5. Low Pressure Range pointer | 9. High Pressure Scale plate |
| 2. Range Adjusting Screw | 6. Differential pointer | 10. High Pressure Range pointer |
| 3. Differential Adjusting Screw | 7. Low Pressure Bellows cover | 11. High Pressure Bellow cover |
| 4. Low Pressure Scale plate | 8. High Pressure range Adjusting Screw | |

Setting procedure for DNS Pressure switch

High Pressure side:

Turning the adjusting screw (8) clockwise will increase the cut-out pressure setting. Turning the adjusting screw anti-clockwise will decrease the cut-out pressure setting. The differential setting is fixed so the cut-in will vary with the cut-out setting. Lock the spindle with locking plate after setting.

Low pressure side:

Range: Turning the range adjusting screw (2) clockwise will decrease the cut-in pressure setting. Turning the range adjusting screw anti-clockwise will increase the cut-in pressure setting.

Differential: Turning the differential adjusting screw (3) clockwise will increase the differential pressure setting. Turning the differential adjusting screw anti-clockwise will decrease the differential pressure setting. Lock the spindle with locking plate after setting.

Important Note:

There must be no more than 10 compressor starts per hour. A higher number reduces the service life of the compressor. There is no minimum off time for scroll compressors, as they start unloaded. However, consideration should be given to ensuring an adequate minimum run time to ensure proper oil return. A minimum runtime of 3 minutes after each compressor start and a minimum idle time of 3 minutes after each stop are recommended. Only during the pumpdown cycle may the compressor run for shorter intervals.

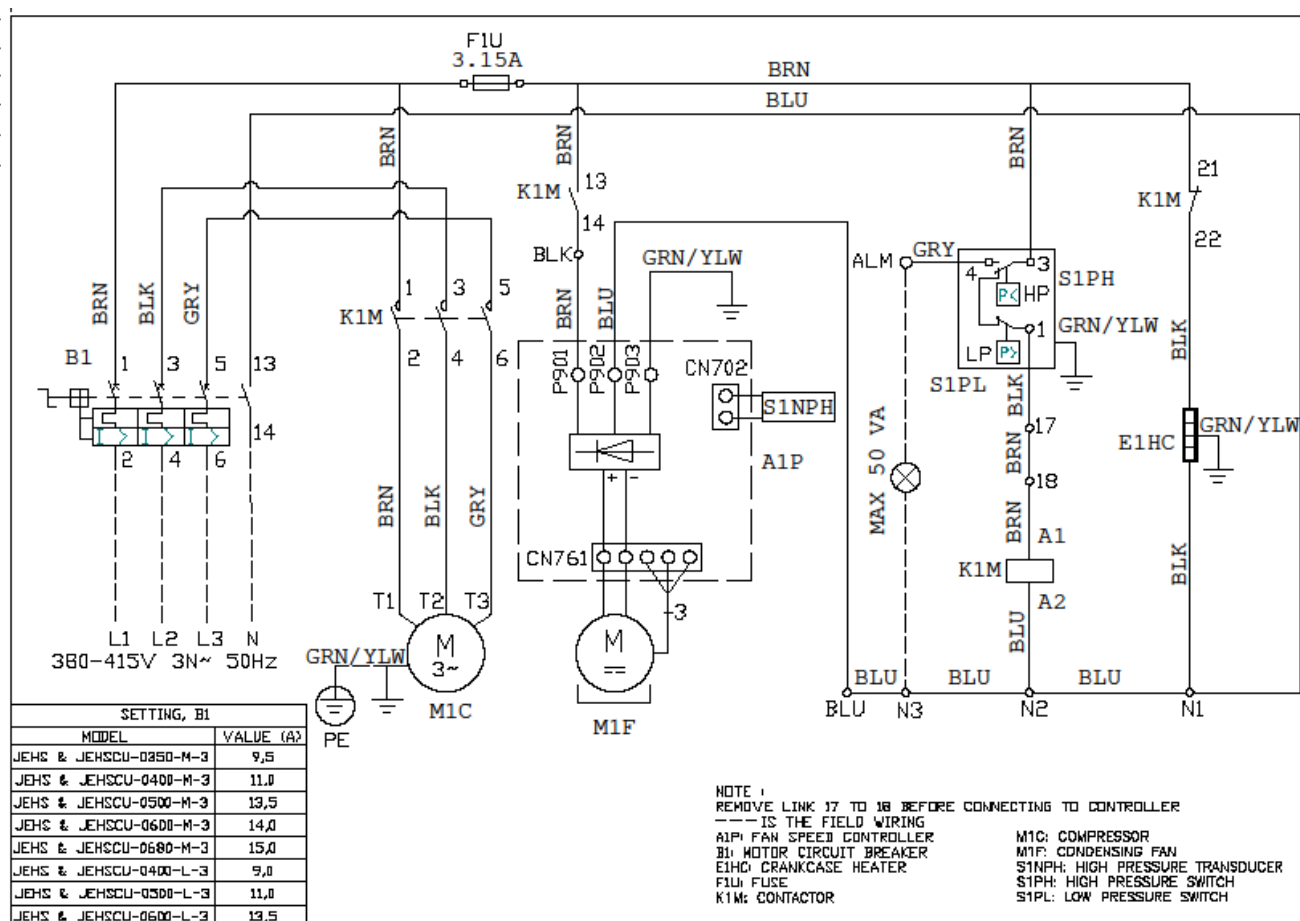
Technical Information

DC Fan & Controller

To comply with ErP 2015 legislation, Series 3 units manufactured from January 2015 are fitted with a DC condenser fan motor. The following unit models are affected:

Medium Temperature	Low Temperature
JEHS-0350-M-1/3	JEHS-0400-L-3
JEHS-0400-M-1/3	JEHS-0500-L-3
JEHS-0500-M-3	JEHS-0600-L-3
JEHS-0600-M-3	
JEHS-0680-M-3	

Wiring diagram

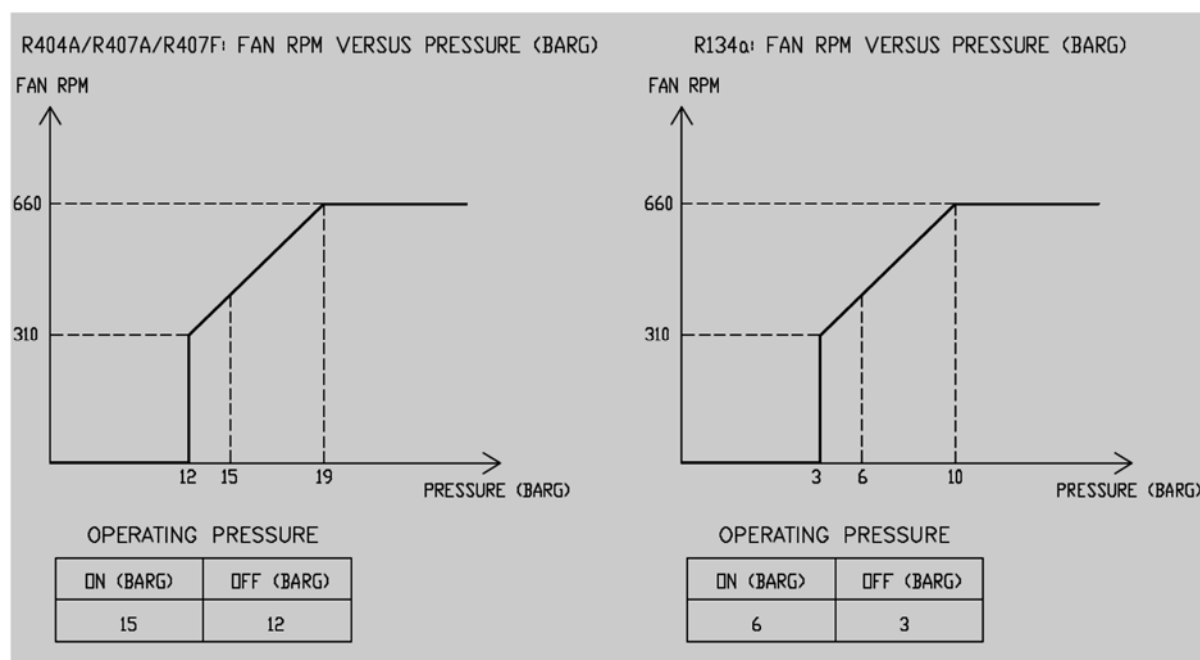


Technical Information

Fan drive controller setting (only applicable to DC fan)

Fan speed is regulated according to the signal received from the pressure transducer (S1NPH).

The default settings for R404A/R407A/R407F & R134a are loaded in different EEPROM's as shown below.



*EEPROM labelled "04EA" consists of the program for R404A/R407A/R407F and is the default program installed in the fan speed controller PCB.

* EEPROM labelled "042A" consists of the program for R134a and is the spare (included in the PCB electrical box).

Installation

It is important to eliminate or prevent annoying static charging which may cause failure of electronics. Below are a few options which may be used when handling the fan speed controller during exchanging the EEPROM:

- 1) Always use anti-static wristband or anti-static gloves. If this is not available, then below option can be used.
- 2) Always grasp an unpainted metal part of the chassis with your bare hand before you touch anything inside the fan speed controller. Do this even if you are wearing an anti-static wristband.
- 3) Always handle electronic components by a non-conducting (non-metallic) edge. Don't touch the pins or other connectors.



WARNING

- Ensure power supply is turned off with LED401 going off before changing the EEPROM.
- Failure to observe these instructions properly may result in property damage or personal injury, which may be serious depending on the circumstances.

Technical Information

Fault signals:

The fan controller PCB will display a signal when a fault is detected.

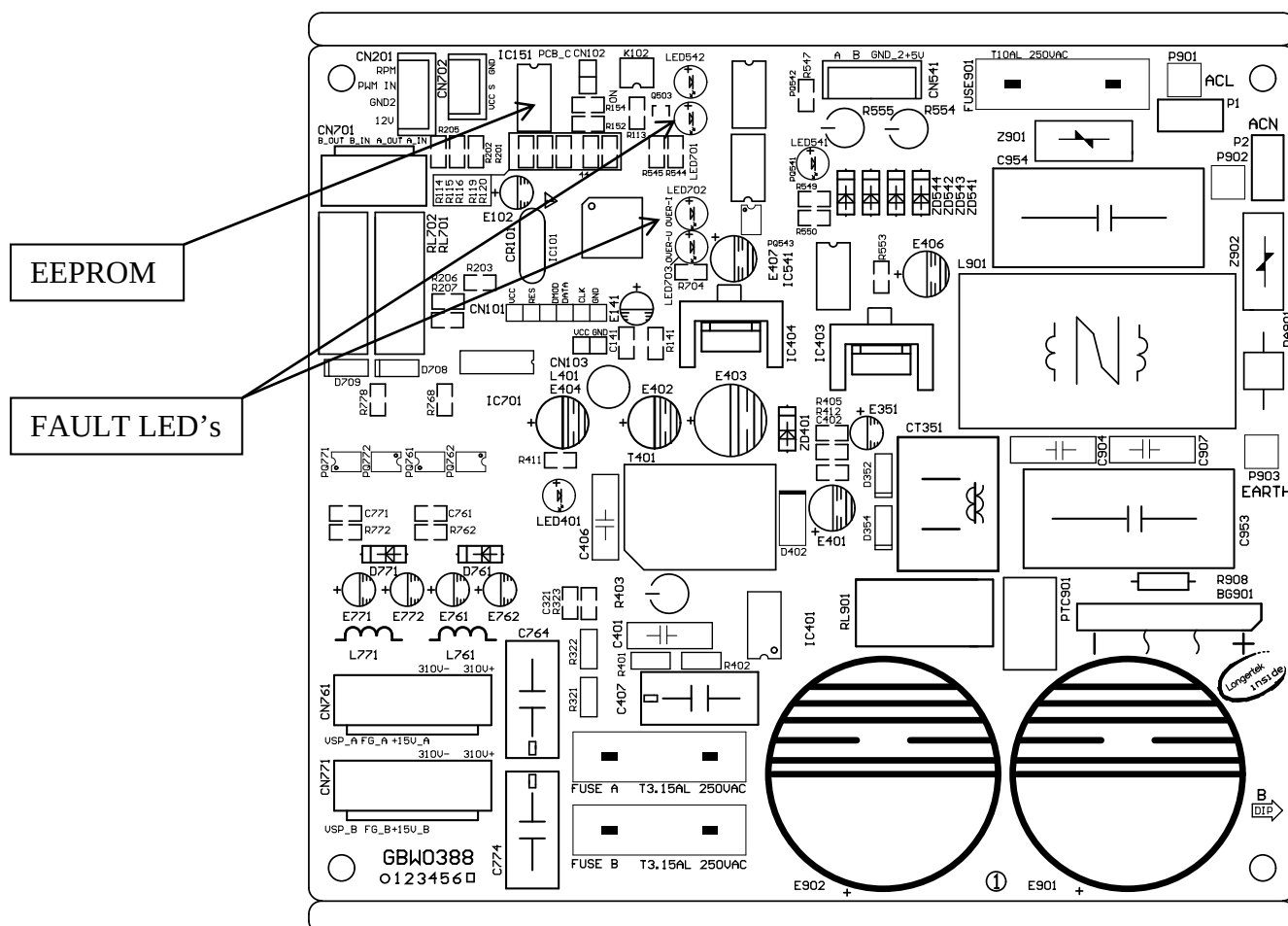
LED701 flashes 0.5s on and 0.5s off and then stops 2s after 1 cycle, the signal is repeated until the fault is removed.

Dip switch K102: 1 indicates run single fan; ON indicates run two fans

The signal from the fan speed controller indicates faults as below:

No.	Signal	Fault
1	LED703 Steady light	Over-Voltage (Overcurrent protection: default DC 1A)
2	LED702 Steady light	Over-Current (Over voltage protection: default DC 380V)
3	LED701 Steady light	Pressure transducer fault
4	LED701 Flash 13 times	Read EEPROM data error
5	LED701 Flash 14 times	Write EEPROM data error
6	LED701 Flash 15 times	Fan A Hall Feedback error
7	LED701 Flash 16 times*	Fan B Hall Feedback error

* If there was more than one fault, the LED701 will display this signal.



Certification

J&E/DOC/003-10(3)



Declaration of Conformity

 Konformitätsbescheinigung
 Déclaration de Conformité
 Conformanceverklaring
 Declaración de Conformidad
 Dichiarazione di Conformità
 Overensstemmelseserklæring
 Declaração de Conformidade

J & E HALL REFRIGERATION SDN. BHD.
**LOT 10, JALAN PERUSAHAAN 8, KAWASAN PERUSAHAAN PEKAN BANTING,
 42700 BANTING, SELANGOR DARUL EHSAN, MALAYSIA.**

declare under our sole responsibility that the products
 bescheinigen auf unsere eigene Verantwortung, daß die Produkten
 déclarons sous notre seule responsabilité que les produits
 verklaren onder onze uitsluitende verantwoordelijkheid de producten
 declaramos sobre nuestra sola responsabilidad que los productos
 dichiariamo sotto nostra sola responsabilità che i prodotti
 erklærer som eneansvarlige, at produktet
 declaramos sob a nossa responsabilidade exclusiva que os produtos

COMMERCIAL REFRIGERATION CONDENSING UNIT

 Unidad que condensa comercial de la refrigeración
 Unité de condensation commerciale de réfrigération
 Commerciële condenserende koel-unit
 Kommerzielle kondensierende Maeinheit der Abkühlung
 Unità condensate commerciale di refrigerazione
 kølekondenseringsenheden til kommercielt brug
 Unidade de condensação de refrigeração

 Model Designations:
 Baumuster-Bezeichnungen:
 Désignations Modèles:
 Aanduidingen Model:
 Designaciones Modelo:
 indicazioni de Modello:
 modelbetegelse:
 Designações do modelo:

 See Appendix 1 overleaf
 Sehen sie anhang 1 umseitig
 Voir l'annexe 1 au verso
 Zie ommezijde voor bijlage 1
 Vea el apéndice 1 a la vuelta
 Veda overleaf l'appendice 1
 se appendiks 1 på bagsiden
 Ver Apêndice 1 verso

which this declaration relates is in conformity with the requirements of the following directives
 auf diese Bescheinigung sich beziehen, sind den Vorschriften der Normen entsprechend
 auxquels se réfèrent cette déclaration, sont conformes aux prescriptions des directives
 waarop deze verklaring betrekking heeft, in overeenstemming is/zijn met de eisen van de volgende richtlijnen
 a los cuales se refieren esta declaración, son conformes a las prescripciones de las directivas
 alla quale si riferisce questa dichiarazione, sono conformi alle prescrizioni delle direttive
 som denne erklæring vedrører, er i overensstemmelse med kravene fremsat i følgende direktiver
 que esta declaração está conforme os requerimentos das seguintes directrizes

**Electromagnetic Compatibility Directive
 Machinery Directive ***
**2004/108/EC
 2006/42/EC**

The conformity was checked for EMC & MD in accordance with the following harmonised EN standard:
 Die Konformität wurde auf EMC u. MD in Übereinstimmung mit dem folgenden harmonisierten en-Standard überprüft:
 La conformité a été vérifiée pour EMC et MD conformément aux normes EN-harmonisées:
 De conformiteit is gecontroleerd voor EMC en MD in overeenstemming met de volgende geharmoniseerde EN-norm:
 La conformidad se repasa para EMC y MD de acuerdo con el siguiente EN-armonizadas:
 La conformità è stata controllata per EMC e MD in conformità con il seguente standard armonizzato dell' EN:
 Overensstemmelsen blev tjekket for EMC & MD i henhold til den harmoniserede EN-standard:
 A conformidade foi verificada por EMC & MD de acordo com a norma harmonizada EN seguinte:

EMC EN 61000-6-1(2001)
MD EN 61000-6-3(2001)
 EN 60335-1
 EN 60335-2-89

 Immunity for residential, commercial and light-industrial environments
 Emission standards for residential, commercial and light-industrial environments
 Safety of Household and Similar Electrical Appliances: Part I
 Safety of Household and Similar Electrical Appliances: Part II

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J & E Hall Limited, Hansard Gate, West Meadows, Derby, DE21 6JN, United Kingdom.

J & E HALL REFRIGERATION SDN. BHD
 General Manager

 Teh Yeow Chong
 Issue Date: 17 May 2011

Certification

J&E/DOC/003-10(3)



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Designaciones Modelo:
Indicazioni de Modello:
modelbetegnelse:
Designações do modelo:

JEHS-0200-M-1	JEHS-0200-M-3	JEHS-0250-M-1
JEHS-0250-M-3	JEHS-0300-M-1	JEHS-0300-M-3
JEHS-0350-M-1	JEHS-0350-M-3	JEHS-0400-M-1
JEHS-0400-M-3	JEHS-0500-M-3	JEHS-0600-M-3
JEHS-0680-M-3	JEHS-0800-M-3	JEHS-1000-M-3
JEHS-0200-L-3	JEHS-0300-L-3	JEHS-0400-L-3
JEHS-0500-L-3	JEHS-0600-L-3	JEHS-0750-L-3
JEHS-1000-L-3		



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