This information was generated by the HP KEYMARK database on 17 Dec 2020

Summary of	JAMA Star-16 inverter	Reg. No.	012-SC0666-18
Certificate Holder			
Name	Kaukora		
Address	Tuotekatu 11	Zip	FI-21200
City	Raisio	Country	Finland
Certification Body	RISE CERT		
Name of testing laboratory	AIT		
Subtype title	JAMA Star-16 inverter		
Heat Pump Type	Brine/Water and Water/Water		
Refrigerant	R407c		
Mass Of Refrigerant	2.2 kg		

Model: Star-16 inverter

General Data	
Power supply	3x400V 50Hz

Brine/Water Heat Pump

Heating

EN 14511-4	
Operating range outdoor exchanger/indoor exchanger upper limit/upper limit	passed
Operating range outdoor exchanger/indoor exchanger lower limit/lower limit	passed
Shutting off the heat transfer medium flow	passed
Complete power supply failure	passed

EN 14511-2		
	Low temperature	**Medium temperature**
Heat output	8.89 kW	8.54 kW
El input	1.83 kW	2.72 kW
COP	4.85	3.14
Indoor water flow rate	2.76 m³/h	1.72 m³/h

Average Climate

EN 12102-1		
	Low temperature	**Medium temperature**
Sound power level indoor	42 dB(A)	42 dB(A)

EN 14825		
	Low temperature	**Medium temperature**
η_s	199 %	154 %
Prated	16.00 kW	16.00 kW
SCOP	5.18	4.05
Tbiv	-10 °C	-10 °C
TOL	-10 °C	-10 °C
Pdh Tj = -7°C	14.20 kW	14.20 kW
COP Tj = -7°C	4.19	3.00
Pdh Tj = +2°C	8.70 kW	8.70 kW
COP Tj = +2°C	5.26	4.10
Pdh Tj = +7°C	5.70 kW	5.60 kW
COP Tj = +7°C	6.06	4.90
Pdh Tj = 12°C	5.80 kW	5.50 kW
COP Tj = 12°C	5.85	5.00
Pdh Tj = Tbiv	15.90 kW	16.00 kW
COP Tj = Tbiv	3.90	2.80

Pdh Tj = TOL	15.90 kW	16.00 kW
COP Tj = TOL	3.90	2.80
Cdh	0.98	0.99
WTOL	65 °C	65 °C
Poff	2 W	2 W
PTO	30 W	30 W
PSB	7 W	7 W
PCK	30 W	30 W
Supplementary Heater: Type of energy input	electricity	electricity
Supplementary Heater: PSUP	0.10 kW	0.00 kW
Annual energy consumption Qhe	6373 kWh	8167 kWh

Colder Climate

EN 12102-1		
	Low temperature	**Medium temperature**
Sound power level indoor	42 dB(A)	42 dB(A)

EN 14825		
	Low temperature	**Medium temperature**
η_s	211 %	159 %
Prated	16.00 kW	16.00 kW

SCOP	5.48	4.18
Tbiv	-22 °C	-22 °C
TOL	-22 °C	-22 °C
Pdh Tj = -7°C	9.80 kW	9.80 kW
COP Tj = -7°C	5.10	3.80
Pdh Tj = +2°C	6.00 kW	6.00 kW
COP Tj = +2°C	6.10	4.70
Pdh Tj = +7°C	5.70 kW	5.60 kW
COP Tj = +7°C	6.10	5.00
Pdh Tj = 12°C	5.70 kW	5.60 kW
COP Tj = 12°C	5.60	5.00
Pdh Tj = Tbiv	15.90 kW	16.00 kW
COP Tj = Tbiv	3.90	2.80
Pdh Tj = TOL	15.90 kW	16.00 kW
COP Tj = TOL	3.90	2.80
Cdh	0.99	0.99
WTOL	65 °C	65 °C
Poff	2 W	2 W
PTO	30 W	30 W
PSB	7 W	7 W
PCK	30 W	30 W

Supplementary Heater: Type of energy input	electricity	electricity
Supplementary Heater: PSUP	0.10 kW	0.00 kW
Annual energy consumption Qhe	7218 kWh	9434 kWh

Water/Water Heat Pump

Heating

EN 14511-4	
Operating range outdoor exchanger/indoor exchanger upper limit/upper limit	passed
Operating range outdoor exchanger/indoor exchanger lower limit/lower limit	passed
Shutting off the heat transfer medium flow	passed
Complete power supply failure	passed

EN 14511-2		
	Low temperature	**Medium temperature**
Heat output	11.20 kW	10.90 kW
El input	1.84 kW	2.79 kW
COP	6.11	3.91
Indoor water flow rate	3.27 m³/h	2.05 m³/h

Average Climate

EN 12102-1		
	Low temperature	**Medium temperature**
Sound power level indoor	42 dB(A)	42 dB(A)

EN 14825		
	Low temperature	**Medium temperature**
η_s	265 %	202 %
Prated	19.00 kW	19.00 kW
SCOP	6.47	5.00
Tbiv	-10 °C	-10 °C
TOL	-10 °C	-10 °C
Pdh Tj = -7°C	16.90 kW	16.90 kW
COP Tj = -7°C	5.34	3.82
Pdh Tj = +2°C	10.30 kW	10.30 kW
COP Tj = +2°C	6.61	5.08
Pdh Tj = +7°C	7.20 kW	7.00 kW
COP Tj = +7°C	7.50	5.93
Pdh Tj = 12°C	7.30 kW	7.10 kW
COP Tj = 12°C	7.61	6.28
Pdh Tj = Tbiv	19.00 kW	19.00 kW
COP Tj = Tbiv	5.01	3.51

Pdh Tj = TOL	19.00 kW	19.00 kW
COP Tj = TOL	5.01	3.51
Cdh	0.97	0.98
WTOL	65 °C	65 °C
Poff	2 W	2 W
PTO	45 W	35 W
PSB	10 W	7 W
PCK	30 W	30 W
Supplementary Heater: Type of energy input	electricity	electricity
Supplementary Heater: PSUP	0.00 kW	0.00 kW
Annual energy consumption Qhe	6070 kWh	7834 kWh

Colder Climate

EN 12102-1		
	Low temperature	**Medium temperature**
Sound power level indoor	42 dB(A)	42 dB(A)

EN 14825		
	Low temperature	**Medium temperature**
η_s	265 %	202 %
Prated	19.00 kW	19.00 kW

SCOP	6.82	5.25
Tbiv	-22 °C	-22 °C
TOL	-22 °C	-22 °C
Pdh Tj = -7°C	11.60 kW	11.60 kW
COP Tj = -7°C	6.51	4.82
Pdh Tj = +2°C	7.30 kW	7.10 kW
COP Tj = +2°C	7.56	5.87
Pdh Tj = +7°C	7.30 kW	7.00 kW
COP Tj = +7°C	7.62	6.24
Pdh Tj = 12°C	7.30 kW	7.00 kW
COP Tj = 12°C	7.46	6.47
Pdh Tj = Tbiv	19.00 kW	19.00 kW
COP Tj = Tbiv	5.01	3.51
Pdh Tj = TOL	19.00 kW	19.00 kW
COP Tj = TOL	5.01	3.51
Cdh	0.96	0.98
WTOL	65 °C	65 °C
Poff	2 W	2 W
PTO	45 W	35 W
PSB	10 W	7 W
PCK	30 W	30 W

Supplementary Heater: Type of energy input	electricity	electricity
Supplementary Heater: PSUP	0.00 kW	0.00 kW
Annual energy consumption Qhe	6861 kWh	8907 kWh

Model: Star-16 RST inverter

General Data	
Power supply	3x400V 50Hz
Off-peak product	No

Brine/Water Heat Pump

Heating

EN 14511-4	
Operating range outdoor exchanger/indoor exchanger upper limit/upper limit	passed
Operating range outdoor exchanger/indoor exchanger lower limit/lower limit	passed
Shutting off the heat transfer medium flow	passed
Complete power supply failure	passed

EN 14511-2		
	Low temperature	**Medium temperature**
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COP Tj = 12°C	5.85	5.00
Pdh Tj = Tbiv	15.90 kW	16.00 kW
COP Tj = Tbiv	3.90	2.80

Pdh Tj = TOL	15.90 kW	16.00 kW
COP Tj = TOL	3.90	2.80
Cdh	0.98	0.99
WTOL	65 °C	65 °C
Poff	2 W	2 W
PTO	30 W	30 W
PSB	7 W	7 W
PCK	30 W	30 W
Supplementary Heater: Type of energy input	electricity	electricity
Supplementary Heater: PSUP	0.10 kW	0.00 kW
Annual energy consumption Qhe	6373 kWh	8167 kWh

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Pdh Tj = -7°C	9.80 kW	9.80 kW
COP Tj = -7°C	5.10	3.80
Pdh Tj = +2°C	6.00 kW	6.00 kW
COP Tj = +2°C	6.10	4.70
Pdh Tj = +7°C	5.70 kW	5.60 kW
COP Tj = +7°C	6.10	5.00
Pdh Tj = 12°C	5.70 kW	5.60 kW
COP Tj = 12°C	5.60	5.00
Pdh Tj = Tbiv	15.90 kW	16.00 kW
COP Tj = Tbiv	3.90	2.80
Pdh Tj = TOL	15.90 kW	16.00 kW
COP Tj = TOL	3.90	2.80
Cdh	0.99	0.99
WTOL	65 °C	65 °C
Poff	2 W	2 W
PTO	30 W	30 W
PSB	7 W	7 W
PCK	30 W	30 W

Supplementary Heater: Type of energy input	electricity	electricity
Supplementary Heater: PSUP	0.10 kW	0.00 kW
Annual energy consumption Qhe	7218 kWh	9434 kWh

Domestic Hot Water (DHW)

Average Climate

EN 16147	
Declared load profile	XL
Efficiency ηDHW	98 %
COP	2.45
Heating up time	01:04 h:min
Standby power input	50.0 W
Reference hot water temperature	50.0 °C
Mixed water at 40°C	240 l

Colder Climate

EN 16147	
Declared load profile	XL
Efficiency ηDHW	98 %
COP	2.45
Heating up time	01:04 h:min
Standby power input	50.0 W
Reference hot water temperature	50.0 °C
Mixed water at 40°C	240 l

Water/Water Heat Pump

Heating

EN 14511-4	
Operating range outdoor exchanger/indoor exchanger upper limit/upper limit	passed
Operating range outdoor exchanger/indoor exchanger lower limit/lower limit	passed
Shutting off the heat transfer medium flow	passed
Complete power supply failure	passed

EN 14511-2		
	Low temperature	**Medium temperature**
Heat output	11.20 kW	10.90 kW
El input	1.84 kW	2.79 kW
COP	6.11	3.91
Indoor water flow rate	3.27 m³/h	2.05 m³/h

Average Climate

EN 12102-1		
	Low temperature	**Medium temperature**
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	Low temperature	**Medium temperature**
η_s	265 %	202 %
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SCOP	6.47	5.00
Tbiv	-10 °C	-10 °C
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Pdh Tj = -7°C	16.90 kW	16.90 kW
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COP Tj = +7°C	7.50	5.93
Pdh Tj = 12°C	7.30 kW	7.10 kW
COP Tj = 12°C	7.61	6.28
Pdh Tj = Tbiv	19.00 kW	19.00 kW
COP Tj = Tbiv	5.01	3.51
Pdh Tj = TOL	19.00 kW	19.00 kW
COP Tj = TOL	5.01	3.51
Cdh	0.97	0.98
WTOL	65 °C	65 °C
Poff	2 W	2 W
PTO	45 W	35 W
PSB	10 W	7 W
PCK	30 W	30 W
Supplementary Heater: Type of energy input	electricity	electricity
Supplementary Heater: PSUP	0.00 kW	0.00 kW
Annual energy consumption Qhe	6070 kWh	7834 kWh

Colder Climate

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	Low temperature	**Medium temperature**
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EN 14825		
	Low temperature	**Medium temperature**
η_s	265 %	202 %
Prated	19.00 kW	19.00 kW
SCOP	6.82	5.25
Tbiv	-22 °C	-22 °C
TOL	-22 °C	-22 °C
Pdh Tj = -7°C	11.60 kW	11.60 kW
COP Tj = -7°C	6.51	4.82
Pdh Tj = +2°C	7.30 kW	7.10 kW
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Pdh Tj = 12°C	7.30 kW	7.00 kW
COP Tj = 12°C	7.46	6.47
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COP Tj = Tbiv	5.01	3.51

Pdh Tj = TOL	19.00 kW	19.00 kW
COP Tj = TOL	5.01	3.51
Cdh	0.96	0.98
WTOL	65 °C	65 °C
Poff	2 W	2 W
PTO	45 W	35 W
PSB	10 W	7 W
PCK	30 W	30 W
Supplementary Heater: Type of energy input	electricity	electricity
Supplementary Heater: PSUP	0.00 kW	0.00 kW
Annual energy consumption Qhe	6861 kWh	8907 kWh

Domestic Hot Water (DHW)

Average Climate

EN 16147	
Declared load profile	XL
Efficiency ηDHW	113 %
COP	2.82
Heating up time	00:58 h:min
Standby power input	45.0 W
Reference hot water temperature	45.0 °C
Mixed water at 40°C	235 l

Colder Climate

EN 16147	
Declared load profile	XL
Efficiency ηDHW	113 %
COP	2.82
Heating up time	00:58 h:min
Standby power input	45.0 W
Reference hot water temperature	45.0 °C
Mixed water at 40°C	235 l