

## Subtype JAMA Star-16 inverter

Certificate Holder	Kaukora
Address	Tuotekatu 11
ZIP	FI-21200
City	Raisio
Country	FI
Certification Body	RISE CERT
Subtype title	JAMA Star-16 inverter
Registration number	012-SC0666-18
Heat Pump Type	Brine/Water and Water/Water
Refrigerant	R407c
Mass of Refrigerant	2.2 kg
Testing laboratory	Austrian Institute of Technology (AIT)

## Model Star-16 inverter

Model name	Star-16 inverter
Application	Heating (medium temp)
Units	Indoor
Climate zone (for heating)	Colder Climate
Cooling mode application (optional)	n/a
Any additional heat sources	n/a

## General data

Power supply	3x400V 50Hz
Off-peak product	No

## Brine/Water

### EN 14511-4 | Heating

Shutting off the heat transfer medium flow passed

Complete power supply failure	passed
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### EN 14511-2 | Heating

	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

### EN 12102-1 | Average Climate

	Low temperature	Medium temperature
Sound power level indoor	42 dB(A)	42 dB(A)

### EN 14825 | Average Climate

	Low temperature	Medium temperature
$\eta_s$	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 or Pdh Tj = Tdesignh if TOL < Tdesignh	15.90 kW	16.00 kW
COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh	3.90	2.80
Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	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

#### EN 12102-1 | Colder Climate

	Low temperature	Medium temperature
Sound power level indoor	42 dB(A)	42 dB(A)

#### EN 14825 | Colder Climate

	Low temperature	Medium temperature
$\eta_s$	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 or Pdh Tj = Tdesignh if TOL < Tdesignh	15.90 kW	16.00 kW
COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh	3.90	2.80
Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	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 Q <sub>he</sub>	7218 kWh	9434 kWh

Water/Water

EN 14511-4 | Heating

Shutting off the heat transfer medium flow passed

Complete power supply failure passed

EN 14511-2 | Heating

	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

EN 12102-1 | Average Climate

	Low temperature	Medium temperature
Sound power level indoor	42 dB(A)	42 dB(A)

EN 14825 | Average Climate

	Low temperature	Medium temperature
$\eta_s$	265 %	202 %
Prated	19.00 kW	19.00 kW
SCOP	6.47	5.00
T <sub>biv</sub>	-10 °C	-10 °C
TOL	-10 °C	-10 °C
P <sub>d,h</sub> T <sub>j</sub> = -7°C	16.90 kW	16.90 kW
COP T <sub>j</sub> = -7°C	5.34	3.82
P <sub>d,h</sub> T <sub>j</sub> = +2°C	10.30 kW	10.30 kW
COP T <sub>j</sub> = +2°C	6.61	5.08
P <sub>d,h</sub> T <sub>j</sub> = +7°C	7.20 kW	7.00 kW
COP T <sub>j</sub> = +7°C	7.50	5.93
P <sub>d,h</sub> T <sub>j</sub> = 12°C	7.30 kW	7.10 kW
COP T <sub>j</sub> = 12°C	7.61	6.28
P <sub>d,h</sub> T <sub>j</sub> = T <sub>biv</sub>	19.00 kW	19.00 kW
COP T <sub>j</sub> = T <sub>biv</sub>	5.01	3.51
P <sub>d,h</sub> T <sub>j</sub> = TOL or P <sub>d,h</sub> T <sub>j</sub> = T <sub>design,h</sub> if TOL < T <sub>design,h</sub>	19.00 kW	19.00 kW
COP T <sub>j</sub> = TOL or COP T <sub>j</sub> = T <sub>design,h</sub> if TOL < T <sub>design,h</sub>	5.01	3.51
C <sub>d,h</sub> T <sub>j</sub> = TOL or P <sub>d,h</sub> T <sub>j</sub> = T <sub>design,h</sub> if TOL < T <sub>design,h</sub>	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

#### EN 12102-1 | Colder Climate

	Low temperature	Medium temperature
Sound power level indoor	42 dB(A)	42 dB(A)

#### EN 14825 | Colder Climate

	Low temperature	Medium temperature
$\eta_s$	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 or Pdh Tj = Tdesignh if TOL < Tdesignh	19.00 kW	19.00 kW
COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh	5.01	3.51
Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	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

Model name	Star-16 RST inverter
Application	Heating + DHW + low temp
Units	Indoor
Climate zone (for heating)	Colder Climate
Cooling mode application (optional)	n/a
Any additional heat sources	n/a

## General data

Power supply	3x400V 50Hz
Off-peak product	No

## Brine/Water

### EN 16147 | Average Climate

Declared load profile	XL
Efficiency $\eta_{DHW}$	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

### EN 16147 | Colder Climate

Declared load profile	XL
Efficiency $\eta_{DHW}$	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

### EN 14511-4 | Heating

Shutting off the heat transfer medium flow passed

Complete power supply failure	passed
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### EN 14511-2 | Heating

	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

### EN 12102-1 | Average Climate

	Low temperature	Medium temperature
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Sound power level indoor	42 dB(A)	42 dB(A)
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#### EN 14825 | Average Climate

	Low temperature	Medium temperature
$\eta_s$	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
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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 or Pdh Tj = Tdesignh if TOL < Tdesignh	15.90 kW	16.00 kW
COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh	3.90	2.80
Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	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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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
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Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	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

### EN 16147 | Average Climate

Declared load profile	XL
Efficiency $\eta_{DHW}$	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

### EN 16147 | Colder Climate

Declared load profile	XL
Efficiency $\eta_{DHW}$	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

### EN 14511-4 | Heating



Shutting off the heat transfer medium flow passed

Complete power supply failure passed

#### EN 14511-2 | Heating

	Low temperature	Medium temperature
Heat output	11.20 kW	10.90 kW
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Pdh Tj = +7°C	7.20 kW	7.00 kW
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Pdh Tj = 12°C	7.30 kW	7.10 kW
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COP Tj = Tbiv	5.01	3.51
Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	19.00 kW	19.00 kW
COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh	5.01	3.51
Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	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

#### EN 12102-1 | Colder Climate

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EN 14825   Colder Climate		
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Prated	19.00 kW	19.00 kW
SCOP	6.82	5.25
Tbiv	-22 °C	-22 °C
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COP Tj = 12°C	7.46	6.47
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COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh	5.01	3.51
Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	0.96	0.98
WTOL	65 °C	65 °C
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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