Subtype ZHHH-01-15K-R290-R5-M	
Certificate Holder	JBG-2 Sp. z o.o.
Address	ul. Gajowa 5
ZIP	43-254
City	Warszowice
Country	PL
Certification Body	SZU - Strojirensky zkusebni ustav (Engineering Test Institute, Public Enterprise)
Subtype title	ZHHH-01-15K-R290-R5-M
Registration number	037-0139-23
Heat Pump Type	Outdoor Air/Water
Refrigerant	R290
Mass of Refrigerant	0.8 kg
Certification Date	21.11.2023
Testing basis	HP Keymark certification scheme rules rev. no.12
Testing laboratory	SZU Brno, CZ

Model ZHHH-01-15K-R290-R5-M + BSEM01-0000	
Model name	ZHHH-01-15K-R290-R5-M + BSEM01-0000
Application	Heating (medium temp)
Units	Indoor, Outdoor
Climate zone (for heating)	Colder, Warmer, Warmer Climate, Colder Climate
Reversibility	Yes
Cooling mode application (optional)	n/a
Any additional heat sources	n/a

General data	
Power supply	3x400V 50Hz
Off-peak product	n/a

Outdoor Air/Water EN 14511-4 | Heating	
Shutting off the heat transfer medium flow	passed
Complete power supply failure	passed
Defrost test	passed
Starting and operating test	passed

EN 14511-2 | Heating		
	Low temperature	Medium temperature
Heat output	9.79 kW	13.93 kW
El input	2.06 kW	5.17 kW
COP	4.76	2.70

EN 12102-1 | Average Climate		
	Low temperature	Medium temperature
Sound power level indoor	dB(A)	dB(A)
Sound power level outdoor	54 dB(A)	54 dB(A)

EN 14825 | Average Climate		
	Low temperature	Medium temperature
ηs	196 %	148 %
Prated	10.22 kW	10.16 kW
SCOP	4.96	3.77
Tbiv	-10 °C	-10 °C
TOL	-10 °C	-10 °C
Pdh Tj = -7°C	9.04 kW	8.99 kW
COP Tj = -7°C	3.36	2.55
Cdh Tj = -7 °C	0.900	0.900
Pdh Tj = +2°C	5.69 kW	5.31 kW
COP Tj = +2°C	4.98	3.76
Cdh Tj = +2 °C	0.900	0.900

Pdh Tj = +7°C	3.63 kW	3.42 kW
COP Tj = +7°C	5.89	4.50
Cdh Tj = +7 °C	0.900	0.900
Pdh Tj = 12°C	3.04 kW	2.93 kW
COP Tj = 12°C	7.17	5.51
Cdh Tj = +12 °C	0.950	0.960
Pdh Tj = Tbiv	10.23 kW	9.97 kW
COP Tj = Tbiv	2.92	2.19
Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	10.23 kW	9.97 kW
COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh	2.92	2.19
Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	0.900	0.900
WTOL	65 °C	65 °C
Poff	19 W	19 W
PTO	20 W	20 W
PSB	19 W	19 W
PCK	0 W	0 W
Supplementary Heater: Type of energy input	Electricity	Electricity
Supplementary Heater: PSUP	0.00 kW	0.00 kW
Annual energy consumption Qhe	4255 kWh	5577 kWh

EN 14825 | Colder Climate

	Low temperature	Medium temperature
ηs	163 %	131 %
Prated	13.20 kW	13.27 kW
SCOP	4.15	3.36
Tbiv	-15 °C	-15 °C
TOL	-22 °C	-22 °C
Pdh Tj = -7°C	8.06 kW	8.13 kW
COP Tj = -7°C	3.39	2.75
Cdh Tj = -7 °C	0.990	1.000
Pdh Tj = +2°C	4.89 kW	5.00 kW
COP Tj = +2°C	5.02	4.05
Cdh Tj = +2 °C	0.980	0.990
Pdh Tj = +7°C	3.39 kW	3.27 kW
COP Tj = +7°C	6.63	5.32
Cdh Tj = +7 °C	0.960	0.990
Pdh Tj = 12°C	3.43 kW	3.25 kW
COP Tj = 12°C	7.61	6.38
Cdh Tj = +12 °C	0.960	0.990
Pdh Tj = Tbiv	10.65 kW	10.94 kW
COP Tj = Tbiv	2.67	2.06
Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	9.06 kW	8.93 kW

COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh	1.90	1.53
Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	1.000	1.000
WTOL	65 °C	65 °C
Poff	19 W	19 W
PTO	20 W	20 W
PSB	19 W	19 W
PCK	0 W	0 W
Supplementary Heater: Type of energy input	Electricity	Electricity
Supplementary Heater: PSUP	4.14 kW	4.34 kW
Annual energy consumption Qhe	7840 kWh	9743 kWh
Pdh Tj = -15°C (if TOL	10.65	10.94
COP Tj = -15°C (if TOL	2.67	2.06
Cdh Tj = -15 °C	1.000	1.000

EN 14825 | Warmer Climate

	Low temperature	Medium temperature
ηs	232 %	172 %
Prated	10.25 kW	10.20 kW
SCOP	5.89	4.37
Tbiv	2 °C	2 °C
TOL	2 °C	2 °C
Pdh Tj = +2°C	10.25 kW	10.20 kW
COP Tj = +2°C	3.54	2.67
Cdh Tj = +2 °C	0.990	0.990
Pdh Tj = +7°C	6.66 kW	6.78 kW
COP Tj = +7°C	5.34	3.86
Cdh Tj = +7 °C	0.980	0.990
Pdh Tj = 12°C	3.37 kW	3.02 kW
COP Tj = 12°C	7.31	5.30
Cdh Tj = +12 °C	0.960	0.970
Pdh Tj = Tbiv	10.25 kW	10.20 kW
COP Tj = Tbiv	3.54	2.67
Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	10.25 kW	10.20 kW
COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh	3.54	2.67
Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	0.990	0.990
WTOL	65 °C	65 °C
Poff	19 W	19 W
PTO	20 W	20 W
PSB	19 W	19 W
PCK	0 W	0 W

Supplementary Heater: Type of energy input	Electricity	Electricity
Supplementary Heater: PSUP	0.00 kW	0.00 kW
Annual energy consumption Qhe	2328 kWh	3120 kWh