DAIKIN

altherma

Heating

Technical Data

Daikin Altherma High temperature

EEDEN13-726

ERSQ-AV1

TABLE OF CONTENTS

ERSQ-AV1

1 Features

- Outdoor unit extracts heat from the outdoor air, even at -20ºC
- Easy replacement of existing boiler, without changing heating pipes

Inverter

2 Specifications

CONNECTABLE INDOOR UNITS							
2-1 Nominal Capacity And Nominal Input				EKHBRD011ACV1/ERSQ011AV1	EKHBRD014ACV1/ERSQ014AV1	EKHBRD016ACV1/ERSQ016AV1
Heating capacity	Nom.		kW	11 (1) / 11 (2) / 11 (3)	14 (1) / 14 (2) / 14 (3)	16 (1) / 16 (2) / 16 (3)
Power input	Heating	Nom.	kW	3.57 (1) / 4.40 (2) / 2.61 (3)	4.66 (1) / 5.65 (2) / 3.55 (3)	5.57 (1) / 6.65 (2) / 4.31 (3)
COP				3.08 (1) / 2.50 (2) / 4.22 (3)	3.00 (1) / 2.48 (2) / 3.94 (3)	2.88 (1) / 2.41 (2) / 3.72 (3)

Notes

(1) EW 55ºC; LW 65ºC; Dt 10ºC; ambient conditions: 7ºCDB/6ºCWB

(2) EW 70ºC; LW 80ºC; Dt 10ºC; ambient conditions: 7ºCDB/6ºCWB

(3) EW 30ºC; LW 35ºC; Dt 5ºC; ambient conditions: 7ºCDB/6ºCWB

2-2 Technical Specifications					ERSQ011AV1	ERSQ014AV1	ERSQ016AV1
Capacity control	Method				Inverter controlled		
Casing	Colour				Daikin White		
	Material				Painted galvanized steel plate		
Dimensions	Unit	Height		mm	1,345		
		Width		mm	900		
		Depth		mm	320		
	Packed unit	Height		mm	1,524		
		Width		mm	980		
		Depth		mm	420		
Weight	Unit			kg	120		
	Packed unit			kg	130		
Packing	Material				Wood / EPS / Cardboard		
	Weight			kg	8		
Heat exchanger	Length			mm	857		
	Rows	Quantity			2		
	Fin pitch			mm	2		
	Passes	Quantity			10		
	Face area			m²	1.131		
	Stages	Quantity			60		
	Empty tubeplate hole	Quantity			0		
	Tube type				Hi-XSS		
	Fin	Type			Non-symmetric waffle louvre		
		Treatment			Corrosion resistant		
Fan	Type				Propeller fan		
	Quantity				2		
	Discharge direction				Horizontal		
Fan motor	Quantity				2		
	Model				Brushless DC motor		
	Output			W	70		
	Drive				Direct drive		
Compressor	Quantity				1		
	Type				Hermetically sealed scroll compressor		
	Starting method				Direct on line		
	Motor	Crankcase heater	Quantity		1		
			Output	W	33		
Operation range	Heating	Min.		ºCWB	-20		
		Max.		ºCWB	20		
	Domestic hot water	Min.		ºCDB	-20		
		Max.		ºCDB	35		
Refrigerant	Type				R-410A		
	Charge			kg	4.5		
	Control				Expansion valve (electronic type)		
	Circuits	Quantity			1		
Refrigerant oil	Type				Daphne FVC68D		
	Charged volume			l	1.5		

2 Specifications

2-2 Technical Specifications					ERSQ011AV1	ERSQ014AV1	ERSQ016AV1
Piping connections	Liquid	Quantity			1		
		Type			Flare connection		
		OD		mm	9.52		
	Gas	Quantity			1		
		Type			Flare connection		
		OD		mm	15.9		
	Drain	Quantity			3		
		OD		mm	26x3		
	Piping length	OU - IU	Max.	m	50		
		System	Equivalent	m	63		
			Chargeless	m	10		
	High pressure side	Design pressure		bar	40		
	Additional refrigerant charge			kg/m	See installation manual		
	Level difference	IU - OU	Max.	m	30		
	Heat insulation				Both liquid and gas pipes		
Sound power level	Heating	Nom.		dBA	68	69	71
Sound pressure level	Heating	Nom.		dBA	52	53	55
Defrost method					Reversed cycle		
Defrost control					Sensor for outdoor heat exchanger temperature		
Safety devices	Item	01			High pressure switch		
		02			Fan motor thermal protection		
		03			Inverter overload protector		
		04			PC board fuse		

2-3 Electrical Specifications				ERSQ011AV1	ERSQ014AV1	ERSQ016AV1
Power supply	Name			V1		
	Phase			1~		
	Frequency		Hz	50		
	Voltage		V	220-440		
	Voltage range	Min.	%	-10		
		Max.	%	10		
Current	Zmax	Text		0.28		
	Maximum running current	Heating	A	23.8		
	Recommended fuses		A	25		
Wiring connections	For power supply	Quantity		2G		
		Remark		Select diameter and type according to national and local regulations		
	For connection with indoor	Quantity		2		
		Remark		F1,F2		
Power supply intake				Both indoor and outdoor unit		

Notes

(1) See separate drawing for operation range

(2) Zmax: In accordance with EN/IEC 61000-3-11, it may be necessary to consult the distribution network operator to ensure that the equipment is connected only to a supply with Zsys (system impedance) ≤ Zmax

(3) EN/IEC 61000-3-11: European/international technical standard setting the limits for voltage changes, voltage fluctuations and flicker in public low-voltage supply systems for equipment with rated ≤ 75A

(4) Minimum Ssc (=Short-circuit power) value: Equipment complying with EN/IEC 61000-3-12: European/International Technical Standard setting the limits for harmonic currents produced by equipment connected to public low-voltage systems with input current \>16A and ≤ 75A per phase

3 Capacity tables

3 - 1 Heating Capacity Tables

ERSQ-AAV1
EKHBRD*(V1/Y1)

Capacity table

Peak	Ta[°CDB]	LW [°C] 45		LW [°C] 55		LW [°C] 65		LW [°C] 75		LW [°C] 80	
	[°CDB]	HC	PI	HC	PI	HC	PI	HC	PI	HC	PI
EKHBRD 011	-20	11,0	5,07	11,0	5,10	11,0	5,55	11,0	6,04	11,0	6,35
	-15	11,0	4,82	11,0	4,91	11,0	5,39	11,0	5,98	11,0	6,32
	-7	11,0	4,11	11,0	4,24	11,0	4,71	11,0	5,31	11,0	5,67
	-2	11,0	3,66	11,0	3,80	11,0	4,24	11,0	4,81	11,0	5,15
	2	11,0	3,35	11,0	3,50	11,0	3,93	11,0	4,47	11,0	4,80
	7	11,0	3,03	11,0	3,18	11,0	3,57	11,0	4,12	11,0	4,40
	12	11,0	2,75	11,0	2,90	11,0	3,31	11,0	3,82	11,0	4,13
	15	11,0	2,61	11,0	2,77	11,0	3,17	11,0	3,67	11,0	3,96
EKHBRD 014	-20	12,2	5,59	12,1	5,57	12,0	5,86	12,1	6,56	12,0	6,81
	-15	13,5	5,80	13,4	5,84	13,4	6,20	13,5	6,97	13,3	7,29
	-7	14,0	5,41	14,0	5,53	14,0	5,98	14,0	6,76	14,0	7,20
	-2	14,0	4,92	14,0	5,07	14,0	5,50	14,0	6,30	14,0	6,72
	2	14,0	4,50	14,0	4,66	14,0	5,09	14,0	5,87	14,0	6,27
	7	14,0	4,07	14,0	4,23	14,0	4,66	14,0	5,42	14,0	5,65
	12	14,0	3,72	14,0	3,91	14,0	4,34	14,0	5,09	14,0	5,47
	15	14,0	3,55	14,0	3,73	14,0	4,16	14,0	4,89	14,0	5,27
EKHBRD 016	-20	12,6	5,85	12,5	5,80	12,5	6,15	12,1	6,50	11,9	6,76
	-15	14,1	6,14	14,1	6,14	14,0	6,52	13,5	6,92	13,3	7,24
	-7	15,9	6,24	15,9	6,34	15,8	6,78	15,6	7,50	15,3	7,81
	-2	16,0	5,82	16,0	5,97	16,0	6,48	16,0	7,33	15,9	7,69
	2	16,0	5,39	16,0	5,55	16,0	6,08	16,0	6,92	16,0	7,33
	7	16,0	4,83	16,0	5,01	16,0	5,57	16,0	6,35	16,0	6,65
	12	16,0	4,48	16,0	4,66	16,0	5,17	16,0	5,98	16,0	6,40
	15	16,0	4,29	16,0	4,47	16,0	4,99	16,0	5,78	16,0	6,20
		EW = 40°C		EW = 45°C		EW = 55°C		EW = 65°C		EW = 70°C	
		ΔT = 5°C		ΔT = 10°C		ΔT = 10°C		ΔT = 10°C		ΔT = 10°C	

Symbols:
HC Heating capacity [kW]
PI Power input [kW]
LW Leaving water temperature
EW Entering water temperature

Conditions:
- $\triangle T$ (Leaving water temperature - Entering water temperature)
- *Piping length:* R410A Refrigerant piping length = 5m
- No pump power input is included
- if Ta < 3°C and unit has bottom plate heater, 95 W has to be added to PI value
- Ta < 0°C: RH=75%
- Ta > 0°C: RH=85%

flowrate [l/min]	*011*	*014*	*016*
ΔT = 15°C	10,5	13,4	15,3
ΔT = 10°C	15,8	20,1	22,9
ΔT = 5°C	31,5	40,1	45,9

Remark:
Capacity table is only valid for EKHBRD*AC* + ER(R/S)Q*.
For EKHBRD*AC* + EMRQ* see capacity table EMRQ*!.

Integrated	Ta[°CDB]	LW [°C] 45		LW [°C] 55		LW [°C] 65		LW [°C] 75		LW [°C] 80	
	[°CDB]	HC	PI	HC	PI	HC	PI	HC	PI	HC	PI
EKHBRD 011	-20	9,18	4,31	9,23	4,34	9,30	4,72	9,39	5,18	9,43	5,49
	-15	9,71	4,57	9,77	4,65	9,84	5,11	10,0	5,69	10,0	6,05
	-7	9,54	4,06	9,60	4,19	9,69	4,65	9,86	5,27	9,91	5,65
	-2	9,48	3,59	9,54	3,72	9,62	4,16	9,75	4,74	9,79	5,09
	2	9,47	3,31	9,53	3,45	9,62	3,88	9,76	4,42	9,80	4,75
	7	11,0	3,03	11,0	3,18	11,0	3,57	11,0	4,12	11,0	4,40
	12	11,0	2,75	11,0	2,90	11,0	3,31	11,0	3,82	11,0	4,13
	15	11,0	2,61	11,0	2,77	11,0	3,17	11,0	3,67	11,0	3,96
EKHBRD 014	-20	9,82	4,31	9,92	4,57	10,0	4,86	10,1	5,40	10,1	5,76
	-15	10,9	4,80	10,9	4,90	11,0	5,23	11,1	5,86	11,2	6,24
	-7	11,7	5,00	11,8	5,12	11,9	5,53	12,1	6,31	12,1	6,73
	-2	11,8	4,73	11,8	4,87	12,0	5,31	12,2	6,12	12,2	6,54
	2	11,8	4,41	11,8	4,56	11,9	4,99	12,1	5,78	12,2	6,19
	7	14,0	4,07	14,0	4,23	14,0	4,66	14,0	5,42	14,0	5,65
	12	14,0	3,72	14,0	3,91	14,0	4,34	14,0	5,09	14,0	5,47
	15	14,0	3,55	14,0	3,73	14,0	4,16	14,0	4,89	14,0	5,27
EKHBRD 016	-20	10,2	4,83	10,3	4,83	10,4	5,14	10,1	5,50	10,0	5,71
	-15	11,3	5,05	11,3	5,07	11,4	5,43	11,2	5,84	11,1	6,09
	-7	12,5	5,34	12,6	5,43	12,7	5,88	12,6	6,46	12,6	6,76
	-2	13,0	5,31	13,1	5,44	13,3	5,93	13,3	6,64	13,3	6,99
	2	13,2	5,06	13,3	5,29	13,5	5,80	13,6	6,59	13,6	6,99
	7	16,0	4,83	16,0	5,01	16,0	5,57	16,0	6,35	16,0	6,65
	12	16,0	4,48	16,0	4,66	16,0	5,17	16,0	5,98	16,0	6,40
	15	16,0	4,29	16,0	4,47	16,0	4,99	16,0	5,78	16,0	6,20
		EW = 40°C		EW = 45°C		EW = 55°C		EW = 65°C		EW = 70°C	
		ΔT = 5°C		ΔT = 10°C		ΔT = 10°C		ΔT = 10°C		ΔT = 10°C	

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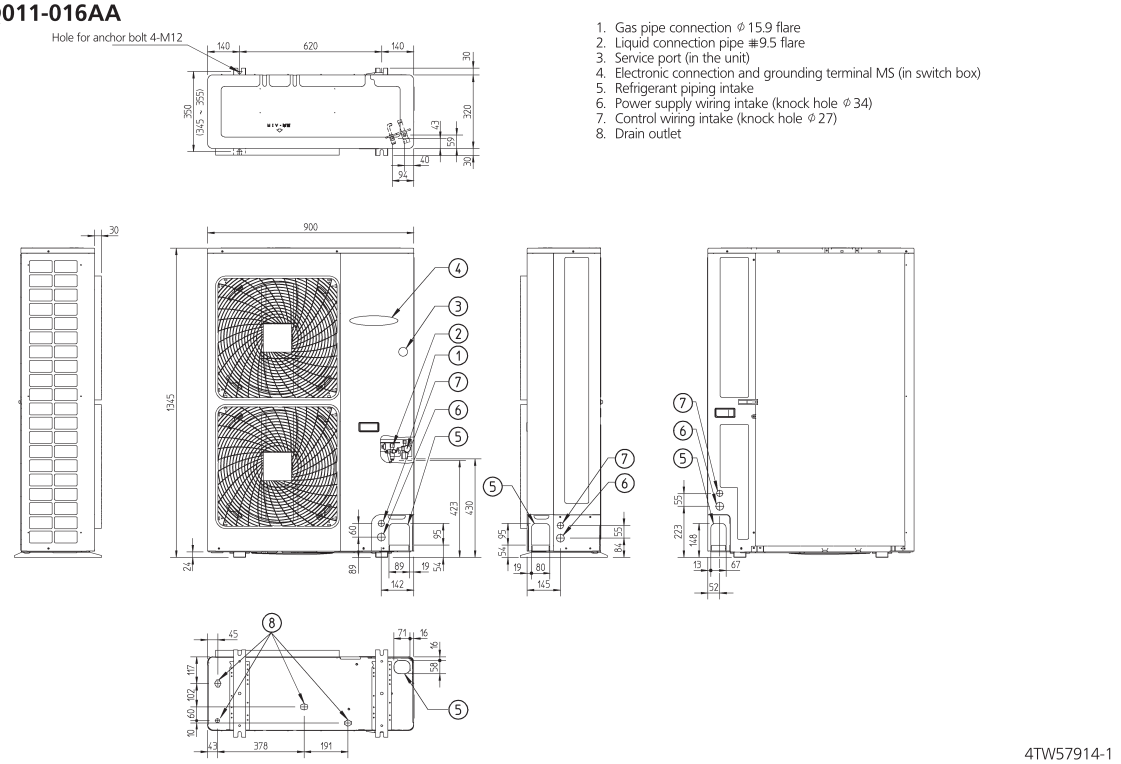
4 Dimensional drawings

4 - 1 Dimensional Drawings

ERSQ011-016AA



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5 Centre of gravity

5 - 1 Centre of Gravity

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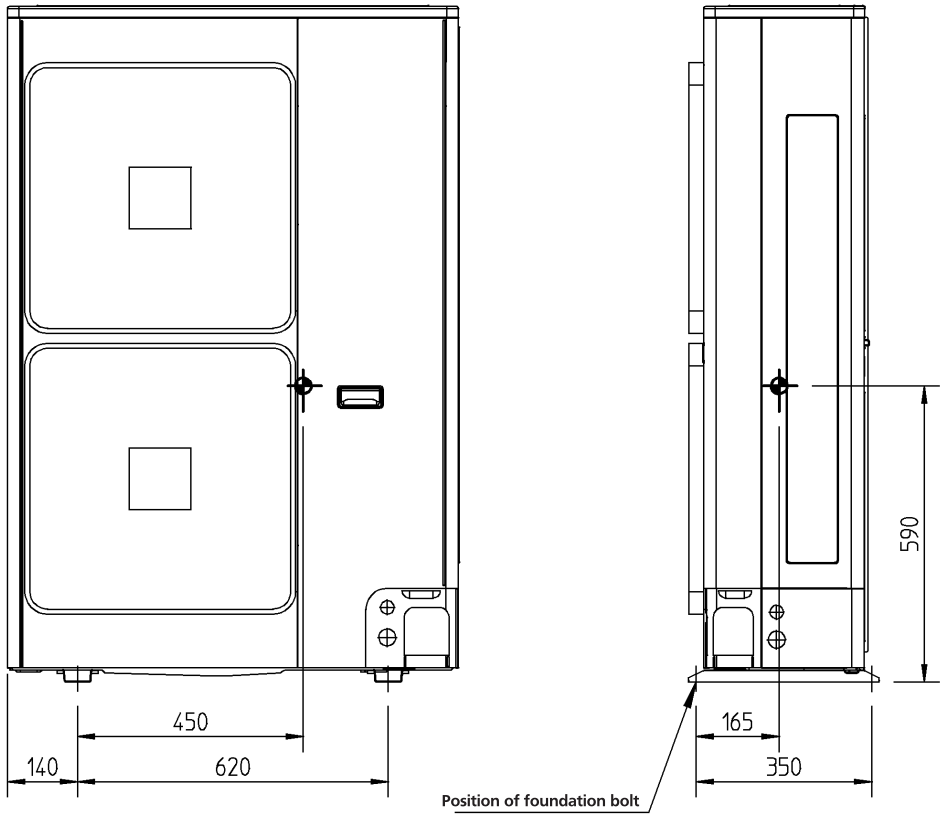

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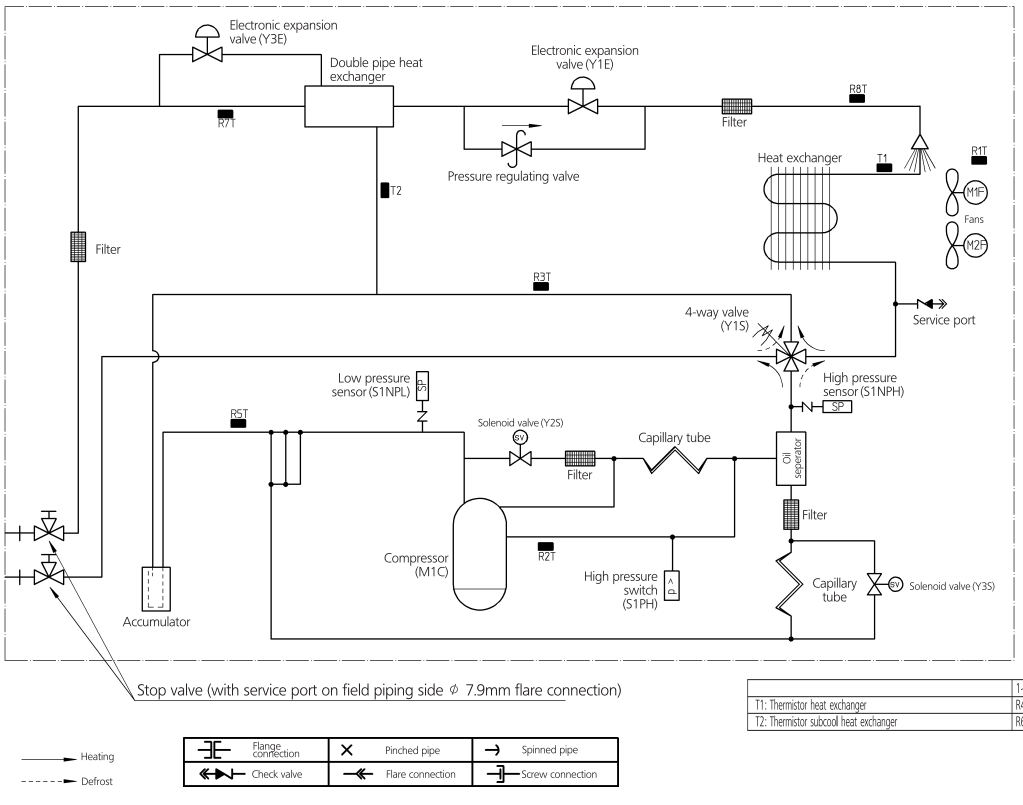
6 Piping diagrams

6 - 1 Piping Diagrams

ERSQ-AV1



R1T: Ambient thermistor
R2T: Discharge thermistor
R3T: Suction thermistor (1)
R5T: Suction thermistor (2)
R7T: Liquid thermistor (1)
R8T: Liquid thermistor (2)

	1~	3~
T1: Thermistor heat exchanger	R4T	R6T
T2: Thermistor subcool heat exchanger	R6T	R4T

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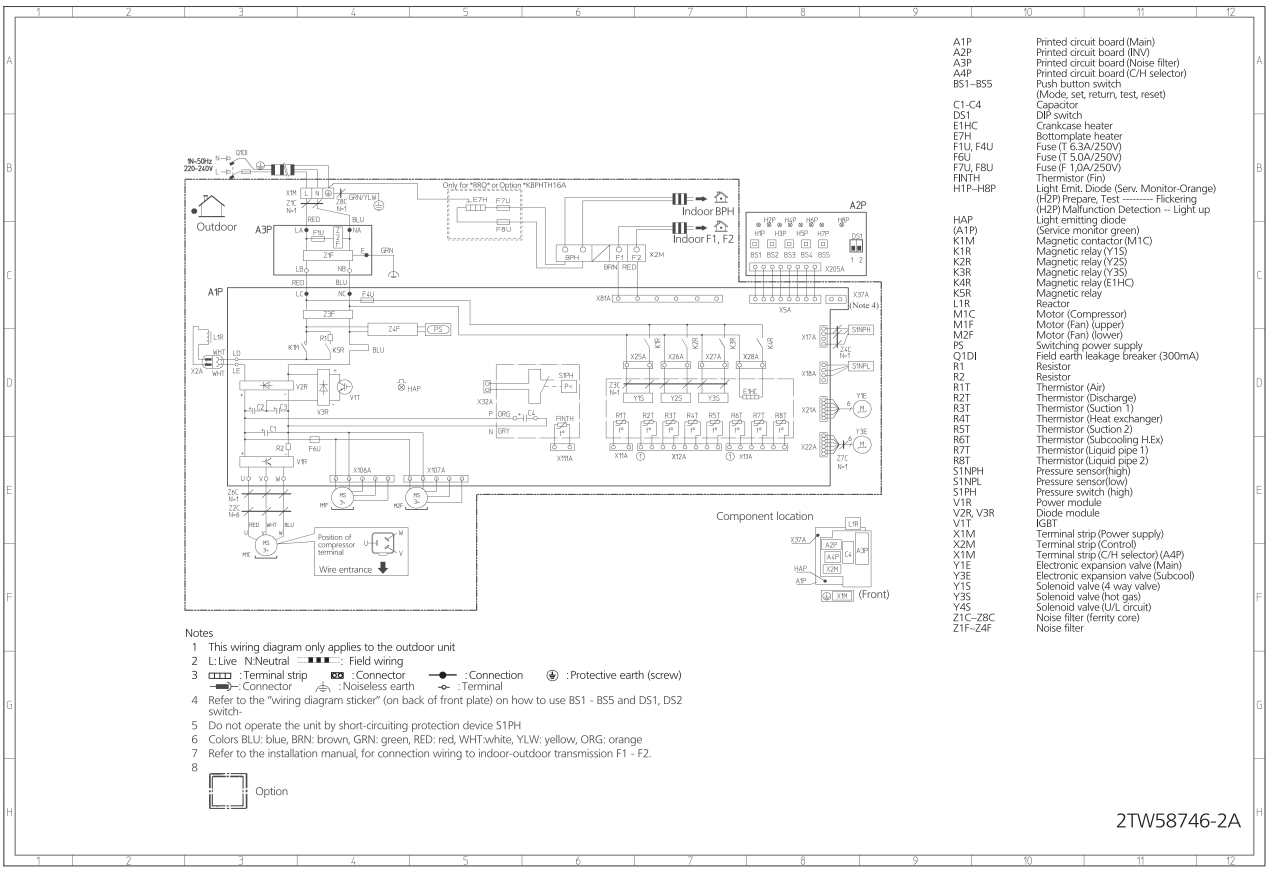
7 Wiring diagrams

7 - 1 Wiring Diagrams - Single Phase

ERSQ-AV1

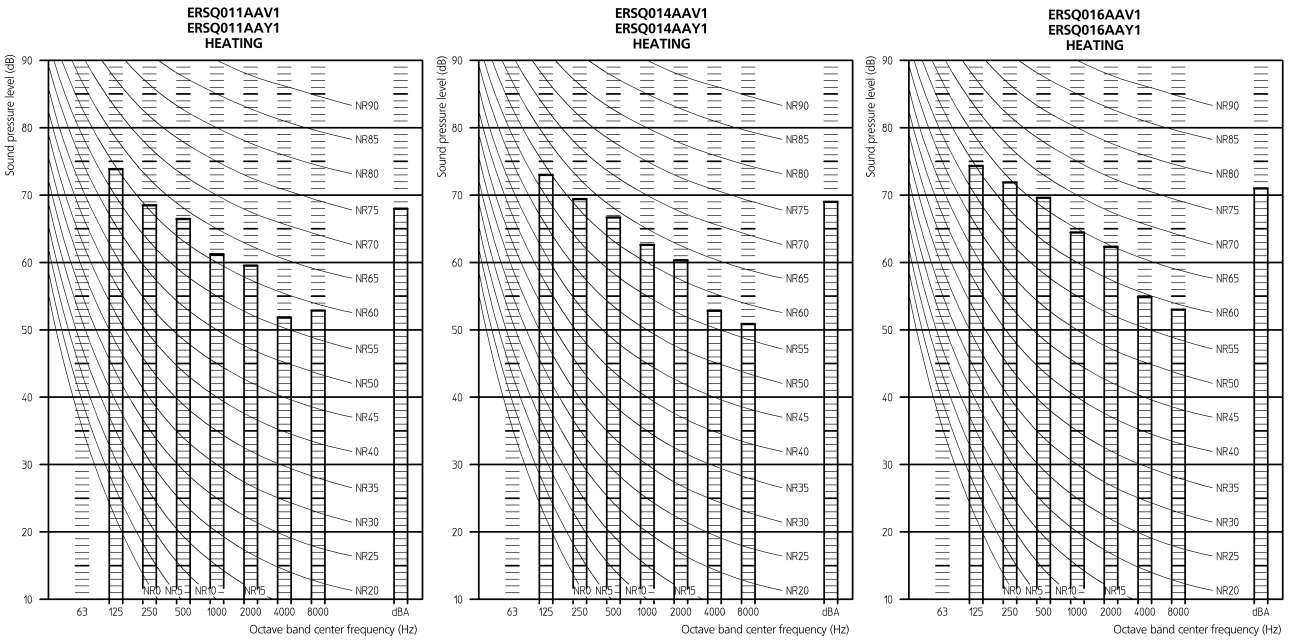


A1P Printed circuit board (Main)
A2P Printed circuit board (INV)
A3P Printed circuit board (Noise filter)
A4P Printed circuit board (C/H selector)
BS1–BS5 Push button switch (Mode, set, return, test, reset)
C1-C4 Capacitor
DS1 DIP switch
E1HC Crankcase heater
E7H Bottomplate heater
F1U, F4U Fuse (T 6.3A/250V)
F6U Fuse (T 5.0A/250V)
F7U, F8U Fuse (F 1.0A/250V)
FINTH Thermistor (Fin)
H1P–H8P Light Emit. Diode (Serv. Monitor-Orange) (H2P) Prepare, Test ——— Flickering (H2P) Malfunction Detection -- Light up
HAP Light emitting diode (Service monitor green)
K1M Magnetic contactor (M1C)
K1R Magnetic relay (Y1S)
K2R Magnetic relay (Y2S)
K3R Magnetic relay (Y3S)
K4R Magnetic relay (E1HC)
K5R Magnetic relay
L1R Reactor
M1C Motor (Compressor)
M1F Motor (Fan) (upper)
M2F Motor (Fan) (lower)
PS Switching power supply
Q1DI Field earth leakage breaker (300mA)
R1 Resistor
R2 Resistor
R1T Thermistor (Air)
R2T Thermistor (Discharge)
R3T Thermistor (Suction 1)
R4T Thermistor (Heat exchanger)
R5T Thermistor (Suction 2)
R6T Thermistor (Subcooling HEx)
R7T Thermistor (Liquid pipe 1)
R8T Thermistor (Liquid pipe 2)
S1NPH Pressure sensor(high)
S1NPL Pressure sensor(low)
S1PH Pressure switch (high)
V1R Power module
V2R, V3R Diode module
V1T IGBT
X1M Terminal strip (Power supply)
X2M Terminal strip (Control)
X1M Terminal strip (C/H selector) (A4P)
Y1E Electronic expansion valve (Main)
Y3E Electronic expansion valve (Subcool)
Y1S Solenoid valve (4 way valve)
Y3S Solenoid valve (hot gas)
Y4S Solenoid valve (U/L circuit)
Z1C–Z8C Noise filter (ferrity core)
Z1F–Z4F Noise filter

Notes
1 This wiring diagram only applies to the outdoor unit
2 L: Live N:Neutral ▭▭▭: Field wiring
3 ▭▭▭ : Terminal strip ⊠ : Connector —●— : Connection ⏚ : Protective earth (screw)
—▸— : Connector ⏚ : Noiseless earth —○— : Terminal
4 Refer to the "wiring diagram sticker" (on back of front plate) on how to use BS1 - BS5 and DS1, DS2 switch-
5 Do not operate the unit by short-circuiting protection device S1PH
6 Colors BLU: blue, BRN: brown, GRN: green, RED: red, WHT:white, YLW: yellow, ORG: orange
7 Refer to the installation manual, for connection wiring to indoor-outdoor transmission F1 - F2.
8 ▭ Option

8 Sound data

8 - 1 Sound Power Spectrum



Notes:

1 dBA = A-weighted sound power level (A-scale according to IEC)
2 Reference acoustic pressure 0dB = 20µPa
3 Measured according to ISO 3744

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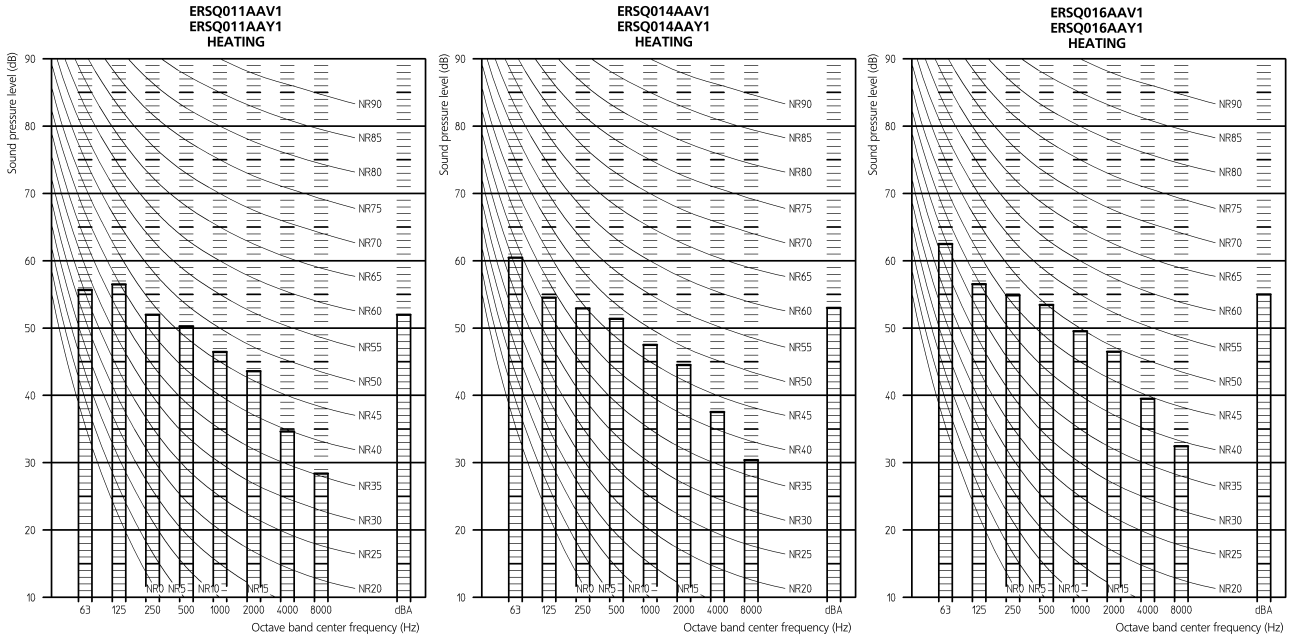
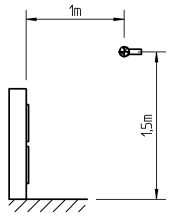
8 Sound data

8 - 2 Sound Pressure Spectrum - Heating



Notes:

1. Data is valid at free field condition (measured in a semi-anachoic room)
2. dBA = A-weighted sound power level (A-scale according to IEC)
3. Reference acoustic pressure 0dB = 20µPa
4. If sound is measured under actual installation conditions, the measured value will be higher due to environmental noise and sound reflections.



Measuring location (discharge side)

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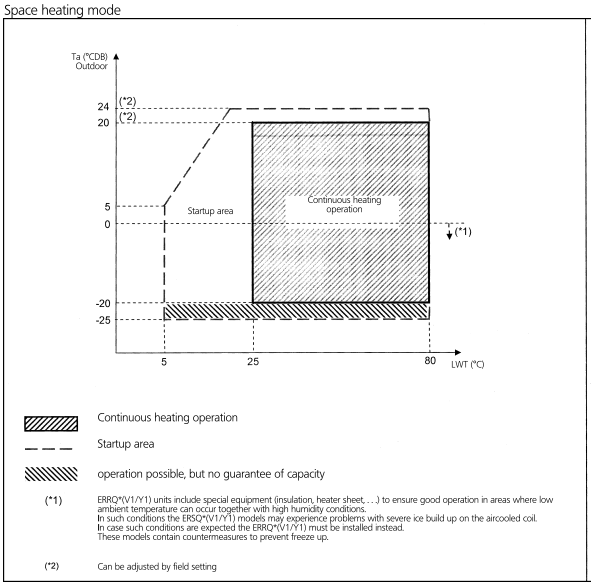
9 Operation range

9 - 1 Operation Range

EKHBRD-ACV1

Space heating mode



Continuous heating operation

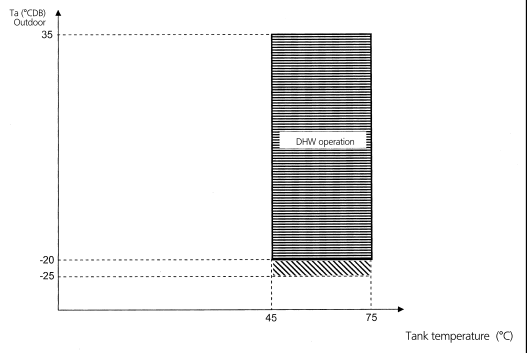
Startup area

operation possible, but no guarantee of capacity

(*1) ERRQ*(V1/Y1) units include special equipment (insulation, heater sheet, . . .) to ensure good operation in areas where low ambient temperature can occur together with high humidity conditions.
In such conditions the ERSQ*(V1/Y1) models may experience problems with severe ice build up on the aircooled coil.
In case such conditions are expected the ERRQ*(V1/Y1) must be installed instead.
These models contain countermeasures to prevent freeze up.

(*2) Can be adjusted by field setting

Domestic hot water mode



Domestic hot water operation

operation possible, but no guarantee of capacity

Remark:
Operation range is only valid for EKHBRD*AC* + ER(R/S)Q*.
For EKHBRD*AC* + EMRQ* see operation range EMRQ*.

3TW58843-1C

These products are not within the scope of the Eurovent certification program

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