APPENDIX F: ASHP DETAILS

EW-HT /0202

Software version: ELCA World 1.4.5.0
Database version: 1.5.5.0
User: Jason Burrows
Print data: 30/09/2020 12:14
Calculation type: EN 14511 - EN 14825

Code		EW-HT /0202
Version		
Size		0202
UNIT DESCRIPTION		Water to water heat pumps, heating only, very high temperature water production
Power supply	V/ph/Hz	400/3/50

PERFORMANCE AT DESIGNED CONDITIONS

RUNNING CONDITIONS

HEAT EXCHANGER USER SIDE

Fluid inlet temperature (heating mode)	°C	60.00
Fluid outlet temperature (heating mode)	°C	65.00
Fluid type		WATER
Glycol	%	0
Fouling factor	m²K/kW	0.000

HEAT EXCHANGER SOURCE SIDE

Fluid inlet temperature (heating mode)	°C	45.00
Fluid outlet temperature (heating mode)	°C	40.00
Fluid		WATER
Glycol	%	0
Fouling factor	m²K/kW	0.000

HEATING (EN14511)

Total heating capacity	kW	95.60
Compressors power input (heating mode)	kW	16.5
Total power input	kW	17.80
COP	kW/kW	5.380

SCOP

SCOP Official (Reg. 813/2013 EU)

MEDIUM TEMPERATURE

Type climate		Average
Temperature application	°C	55
Type flow		Fixed
Type Temperature		Variable
Bivalent temperature	°C	-7.0
PDesign	kW	50.0
Qhe	kWh	29970
SCOP		3.45
Performance ηs	%	130
Seasonal efficiency class		A++

EW-HT /0202

Software version: ELCA World 1.4.5.0
Database version: 1.5.5.0
User: Jason Burrows
Print data: 30/09/2020 12:14
Calculation type: EN 14511 - EN 14825

EXCHANGERS

HEAT EXCHANGER USER SIDE

Typology		PLATE
Quantity	N°	1
Fluid type		WATER
Glycol	%	0
Fouling factor	m²K/kW	0.000
Type of connections		[B1] - Male threaded pipe (EN 10226 - R: external taper thread)
Diameter of connections		2"
Min flow	l/s	1.306
Max flow	l/s	5.528
K pressure drop		234
Water content	l	5.50

HEATING

Fluid inlet temperature (heating mode)	°C	60.00
Fluid outlet temperature (heating mode)	°C	65.00
Water flow	l/s	4.617
Pressure drop at the heat exchanger	kPa	64.7
Available unit head	kPa	0.00

HEAT EXCHANGER SOURCE SIDE

Typology		PLATE
Quantity	N°	1
Fluid		WATER
Glycol	%	0
Fouling factor	m²K/kW	0.000
Type of connections		[B1] - Male threaded pipe (EN 10226 - R: external taper thread)
Diameter of connections		2"
Min flow	l/s	1.222
Max flow	l/s	5.694
K pressure drop		333
Water content	l	4.50

HEATING

Fluid inlet temperature (heating mode)	°C	45.00
Fluid outlet temperature (heating mode)	°C	40.00
Water flow	l/s	3.833
Pressure drop at the heat exchanger	kPa	63.4
Available unit head	kPa	0.00

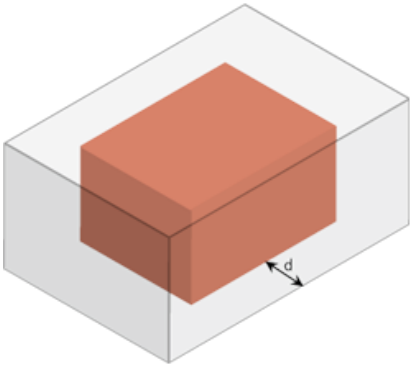
EW-HT /0202

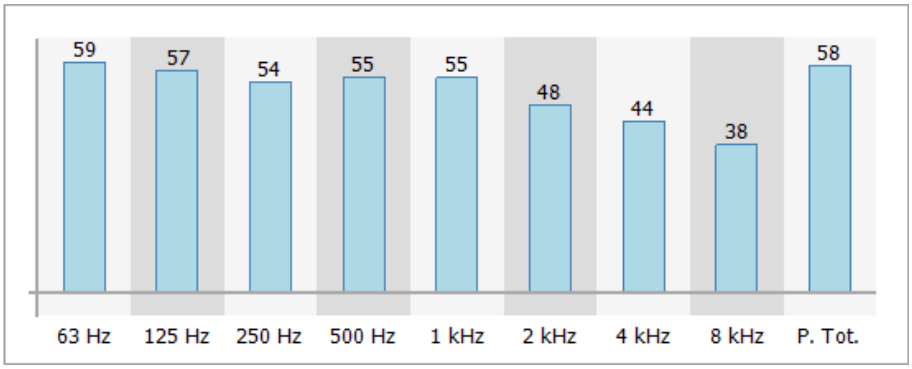
Software version: ELCA World 1.4.5.0
Database version: 1.5.5.0
User: Jason Burrows
Print data: 30/09/2020 12:14
Calculation type: EN 14511 - EN 14825

NOISE DATA

SOUND DATA INDOOR HOT

Frequencies	Hz	63	125	250	500	1000	2000	4000	8000
Sound power (spectrum)	dB	75	73	70	71	71	64	60	54
Sound power level in heating	dB(A)					74			
Sound pressure level (spectrum)	dB	59	57	54	55	55	48	44	38
Sound Pressure	dB(A)					58			





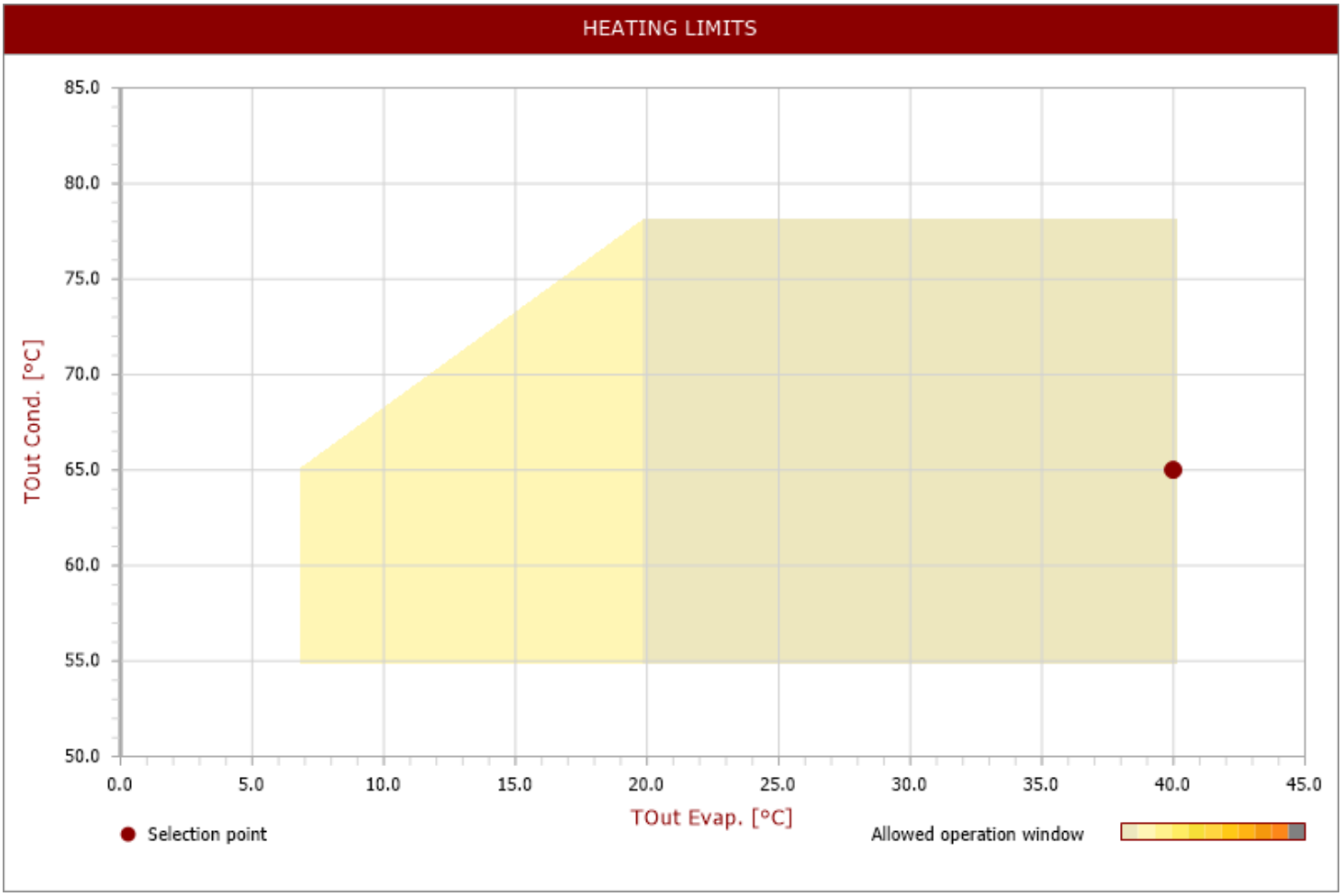
Note

Distance	m	1
Note		Average sound pressure level at 1 m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level. Sound power on the basis of measurements taken in compliance with ISO 9614.

EW-HT /0202

Software version: ELCA World 1.4.5.0
Database version: 1.5.5.0
User: Jason Burrows
Print data: 30/09/2020 12:14
Calculation type: EN 14511 - EN 14825

OPERATING LIMITS



ELECTRICAL DATA

Power supply	V/ph/Hz	400/3/50
F.L.I. - Max absorbed power	kW	24.20
F.L.A. - Max absorbed current	A	43
S.A. - Inrush current	A	139

EW-HT /0202

Software version: ELCA World 1.4.5.0
Database version: 1.5.5.0
User: Jason Burrows
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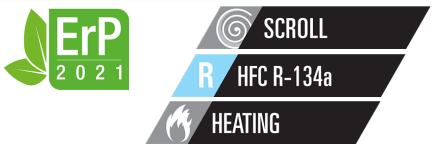

WEIGHT & DIMENSIONS

A	mm	1223
B	mm	877
H	mm	1496
Operating weight	kg	390
R1	mm	600
R2	mm	600
R3	mm	800
R4	mm	600

EW-HT /0202

Software version: ELCA World 1.4.5.0
Database version: 1.5.5.0
User: Jason Burrows
Print data: 30/09/2020 12:14
Calculation type: EN 14511 - EN 14825

TECHNICAL DOCUMENTATION - REGULATION (EU) No 813/2013 - Heat pumps for space heating

EW-HT /0202			
Air-to-water heat pump:	yes / no		no
Water-to-water heat pump:	yes / no		yes
Brine-to-water heat pump:	yes / no		no
Low-temperature heat pump:	yes / no		no
With supplementary heater:	yes / no		no
Mixed unit with heat pump:	yes / no		no
Temperature application (1)	(low 35°C/ medium 55°C)		medium 55°C
Water flow rate	fixed / variable		fixed
Outlet temperature	fixed / variable		variable
Parameters are declared for average/warmer/colder climate conditions (1)	average / warmer / colder		average
Rated heat output at Tdesignh	**Prated = Pdesignh**	**[kW]**	**50**
Seasonal space heating energy efficiency	**ηs**	**[%]**	**130**
Seasonal space heating energy efficiency class	**-**	**-**	**A++**
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj			
Declared capacity for heating with outdoor temperature Tj = – 7 °C	Pdh	[kW]	44.3
Declared capacity for heating with outdoor temperature Tj = +2 °C	Pdh	[kW]	26.9
Declared capacity for heating with outdoor temperature Tj = +7 °C	Pdh	[kW]	23.6
Declared capacity for heating with outdoor temperature Tj = +12 °C	Pdh	[kW]	23.6
Declared capacity for heating with outdoor temperature Tj = Bivalent temperature	Pdh	[kW]	44.3
Declared capacity for heating with outdoor temperature Tj = Operation limit temperature	Pdh	[kW]	44.3
For air-to-water heat pumps: Tj = – 15 °C (if TOL < – 20 °C)	Pdh	[kW]	-
Bivalent temperature	Tbiv	[°C]	-7
Degradation coefficient	Cdh	-	0.90
Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Declared coefficient of performance with outdoor temperature Tj = – 7 °C	COPd	-	3.53
Declared coefficient of performance with outdoor temperature Tj = +2 °C	COPd	-	3.67
Declared coefficient of performance with outdoor temperature Tj = +7 °C	COPd	-	3.72
Declared coefficient of performance with outdoor temperature Tj = +12 °C	COPd	-	3.72
Declared coefficient of performance with outdoor temperature Tj = Bivalent temperature	COPd	-	3.53
Declared coefficient of performance with outdoor temperature Tj = Operation limit temperature	COPd	-	3.53
For air-to-water heat pumps: Tj = – 15 °C (if TOL < – 20 °C)	COPd	-	-
For air-to-water HP : Operation limit temperature	TOL	[°C]	-
Heating water operating limit temperature	WTOL	[°C]	65
Power consumption in modes other than active mode			
Off mode	POFF	[kW]	0.000
Thermostat-off mode	PTO	[kW]	0.320
Standby mode	PSB	[kW]	0.210
Crankcase heater mode	PCK	[kW]	0.210
Supplementary heater			
Nominal heating capacity	Psup	[kW]	5.77
Other items			
Capacity control	fixed / variable		variable
Sound power level, indoors	LWA	[dB(A)]	74
Sound power level, outdoors	LWA	[dB(A)]	-
Annual electricity consumption for heating	QHE	[kWh]	29970
Outdoor heat exchanger			
For air-to-water HP: Rated air flow rate, outdoors	Qairsource	[m³/h]	-
For water-/brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	Qwater/brine source	[m³/h]	9

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

(1) The parameters are declared for application at medium temperature, except in the case of low temperature heat pumps. For low temperature heat pumps, the parameters are declared for application at low temperature.

NOTE: Techical data referred to selected unit.

i-FX-Q2-G05 /XL-CA /0602

Software version: ELCA World 1.4.5.0
Database version: 1.5.5.0
User: James Askey
Print data: 13/10/2020 11:41
Calculation type: EN 14511 - EN 14825

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ErP 2021

HEATING EC FAN SCREW R R513A

Code		i-FX-Q2-G05 /XL-CA /0602
Version		XL-CA
Size		0602
UNIT DESCRIPTION		INTEGRA unit for 4-pipe systems, air source, VSD screw compressors and EC fans, for outdoor installation
Power supply	V/ph/Hz	400/3/50

PERFORMANCE AT DESIGNED CONDITIONS

RUNNING CONDITIONS

CHILLED WATER HEAT EX. USER SIDE

Fluid inlet temperature (cooling mode)	°C	12.00
Fluid outlet temperature (cooling mode)	°C	6.00
Fluid type		WATER
Glycol	%	0
Fouling factor	m²K/kW	0.000

WARM WATER HEAT EX. USER SIDE

Fluid inlet temperature (heating mode)	°C	40.00
Fluid outlet temperature (heating mode)	°C	45.00
Fluid		WATER
Glycol	%	0
Fouling factor	m²K/kW	0.000

OUTDOOR CONDITION

Air temperature (cooling mode)	°C	35.0
Air temperature (heating mode)	°C	-4.0

COOLING (EN 14511)

Cooling capacity	kW	507.6
Compressors power input	kW	169.9
Fans power input (cooling mode)	kW	7.20
Total power input	kW	178.1
EER	kW/kW	2.850
ESEER EN 14511 (referiment)	kW/kW	4.830

COOLING WITH HEAT RECOVERY (EN 14511 VALUE)

Cooling capacity	kW	525.9
Recovery heat exchanger capacity	kW	674.7
Total power input	kW	158.3
TER	kW/kW	7.587

HEATING (EN14511)

Total heating capacity	kW	338.8
Compressors power input (heating mode)	kW	129
Fan power input (heating mode)	kW	8.40
Total power input	kW	135.0
COP	kW/kW	2.510

SCOP

SCOP Official (Reg. 813/2013 EU)

i-FX-Q2-G05 /XL-CA /0602

Software version: ELCA World 1.4.5.0
Database version: 1.5.5.0
User: James Askey
Print data: 13/10/2020 11:41
Calculation type: EN 14511 - EN 14825

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HEATING EC FAN SCREW R513A

LOW TEMPERATURE

Type climate		Average
Temperature application	°C	35
Type flow		Variable
Type Temperature		Variable
Bivalent temperature	°C	-7.0
PDesign	kW	376
Qhe	kWh	182960
SCOP		4.25
Performance ηs	%	167
Seasonal efficiency class		-

SCOP Editable (EN 14825)

LOW TEMPERATURE

Type climate		Colder	Average	Warmer
Temperature application	°C	0.00	35.00	0.00
Type flow		-	Variable	-
Type Temperature		-	Variable	-
Bivalent temperature	°C	0.0	-7.0	0.0
PDesign	kW	0.00	376	0.00
Qhe	kWh	0	182960	0
SCOP		0.00	4.25	0.00
Performance ηs	%	0	167	0
Seasonal efficiency class		-	-	-

Note

Any SCOP values different from what is reported in commercial documentations are due to the different configuration of the unit and/or different calculation parameters input by the user.

PART LOAD DATA

COOLING PARTIAL LOADS

Load	%	100.0	90.0	80.0	70.0	60.0	50.0	40.0	30.0	20.0	10.0
Outdoor air temperature	°C	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
Cooling load	kWh	508	457	406	355	305	254	203	152	102	51
Fans power input (cooling mode)	kW	7.20	7.20	7.20	6.96	6.41	6.00	6.00	6.00	2.61	1.45
Total power input	kW	177.9	153.6	129.3	108.2	90.90	74.20	59.50	44.80	30.50	17.00
Temp. evaporator inlet	°C	12.00	11.40	10.80	10.20	9.60	9.00	8.41	7.81	7.41	7.41
Temp. evaporator outlet	°C	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Evaporator water flow	l/s	20.26	20.26	20.26	20.26	20.26	20.26	20.26	20.26	20.26	20.26
EER	kW/kW	2.850	2.970	3.140	3.280	3.350	3.420	3.410	3.400	3.330	2.990

HEATING PART LOAD

Load	%	100.0	90.0	80.0	70.0	60.0	50.0	40.0	30.0	20.0	10.0
Outdoor air temp.	°C	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0
Heating load	kWh	339	305	271	237	203	169	136	102	68	34
Total power input	kW	134.9	122.0	109.2	96.30	83.40	70.60	57.90	45.30	32.70	20.00
Condenser input temperature	°C	40.00	40.50	41.00	41.50	42.00	42.38	42.38	42.38	42.38	42.38
Condenser output temperature	°C	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Condenser fluid flow	l/s	18.28	18.28	18.28	18.28	18.28	18.28	18.28	18.28	18.28	18.28
COP	kW/kW	2.510	2.500	2.480	2.460	2.440	2.400	2.340	2.240	2.080	1.690

PART LOAD DATA INTEGRA

Refrigeration load	%	0.0	10.0	20.0	30.0	40.0	50.0	60.0	70.0	80.0	90.0	100.0
Heating load	%	100.0	90.0	80.0	70.0	60.0	50.0	40.0	30.0	20.0	10.0	0.0
Air temp.	°C	-4.0	-0.1	3.8	7.7	11.6	15.5	19.4	23.3	27.2	31.1	35.0
Cooling capacity	kW	0.000	50.80	101.5	152.3	203.1	253.8	304.6	355.3	406.1	456.9	507.6
Heating capacity	kW	338.8	304.9	271.1	237.2	203.3	169.4	135.5	101.6	67.80	33.90	0.000
Total power input	kW	134.9	105.5	78.70	60.30	58.50	62.20	66.80	78.80	98.50	132.8	177.9
TER	kW/kW	2.510	3.370	4.730	6.460	6.950	6.800	6.590	5.800	4.810	3.700	2.850

i-FX-Q2-G05 /XL-CA /0602

Software version: ELCA World 1.4.5.0
Database version: 1.5.5.0
User: James Askey
Print data: 13/10/2020 11:41
Calculation type: EN 14511 - EN 14825

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HEATING EC FAN SCREW R513A

EXCHANGERS

CHILLED WATER HEAT EX. USER SIDE

Typology		SHELL&TUBE
Quantity	N°	1
Fluid type		WATER
Glycol	%	0
Fouling factor	m²K/kW	0.000
Type of connections		[H] - Grooved coupling with weld end counter-pipe user side
Diameter of connections		8"
Min flow	l/s	16.39
Max flow	l/s	51.94
K pressure drop		3.38
Water content	l	275

COOLING

Fluid inlet temperature (cooling mode)	°C	12.00
Fluid outlet temperature (cooling mode)	°C	6.00
Water flow	l/s	20.26
Pressure drop at the heat exchanger	kPa	18.0
Available unit head	kPa	0.00

COOLING + HEAT RECOVERY

Water flow	l/s	21.07
Pressure drop at the heat exchanger	kPa	19.5

WARM WATER HEAT EX. USER SIDE

Typology		SHELL&TUBE
Quantity	N°	1
Fluid		WATER
Glycol	%	0
Fouling factor	m²K/kW	0.000
Type of connections		[H] - Grooved coupling with weld end counter-pipe user side
Diameter of connections		8"
Min flow	l/s	16.08
Max flow	l/s	52.92
K pressure drop		2.57
Water content	l	296

i-FX-Q2-G05 /XL-CA /0602

Software version: ELCA World 1.4.5.0
Database version: 1.5.5.0
User: James Askey
Print data: 13/10/2020 11:41
Calculation type: EN 14511 - EN 14825

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HEATING | EC FAN | SCREW | R513A

HEATING

Fluid inlet temperature (heating mode)	°C	40.00
Fluid outlet temperature (heating mode)	°C	45.00
Water flow	l/s	18.28
Pressure drop at the heat exchanger	kPa	11.1
Available unit head	kPa	0.00

FANS

Fans type		EC FAN
Fans number	N°	12
Fans power input	kW	0.60
F.L.I.	kW	1.780
F.L.A.	A	3

COOLING

Fans number	N°	12
Fans power input	kW	0.60
Air flow	m³/s	46.48
Available static pressure	Pa	0

HEATING

Quantity	N°	12
Fans power input	kW	0.70
Air flow	m³/s	49.42
Fan available static pressure	Pa	0

COMPRESSORS

Compressor type		SCREW
Compressors nr.	N°	2
No. Circuits	N°	2
Refrigerant		R513A
Number of capacity steps	N°	0
Min. capacity step	%	
Regulation		STEPLESS
Oil charge	kg	36.0
Refrigerant charge	kg	307
F.L.I. - Max absorbed power	kW	2x108
F.L.A. - Max absorbed current	A	2x176
L.R.A. - Locked rotor amperes for single compressor	A	1x20+1x20

i-FX-Q2-G05 /XL-CA /0602

Software version: ELCA World 1.4.5.0
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Print data: 13/10/2020 11:41
Calculation type: EN 14511 - EN 14825

Check ongoing validity of certificate:
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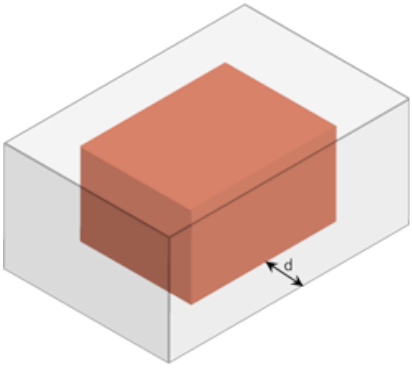
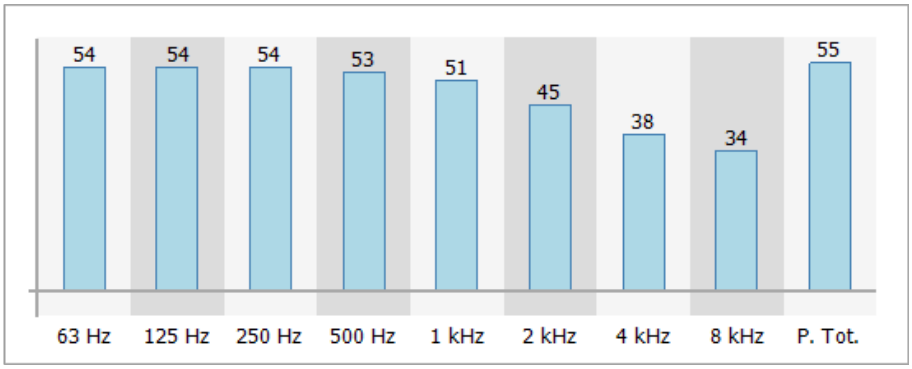
HEATING EC FAN SCREW R513A

NOISE DATA

SOUND DATA COLD

Frequencies	Hz	63	125	250	500	1000	2000	4000	8000
Sound power (spectrum)	dB	87	87	87	86	84	78	71	67
Sound power level in cooling	dB(A)					88			
Sound pressure level (spectrum)	dB	54	54	54	53	51	45	38	34
Sound Pressure	dB(A)					55			





SOUND DATA OUTDOOR HOT

Sound power level in heating	dB(A)	89

Note

Distance	m	10
Note		Average sound pressure level at 10 m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level. Sound power on the basis of measurements taken in compliance with ISO 9614.

i-FX-Q2-G05 /XL-CA /0602

Software version: ELCA World 1.4.5.0
Database version: 1.5.5.0
User: James Askey
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Calculation type: EN 14511 - EN 14825

Check ongoing validity of certificate:
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HEATING EC FAN SCREW R513A

OPERATING LIMITS

ELECTRICAL DATA

Power supply	V/ph/Hz	400/3/50
F.L.I. - Max absorbed power	kW	237.0
F.L.A. - Max absorbed current	A	387
S.A. - Inrush current	A	-

i-FX-Q2-G05 /XL-CA /0602

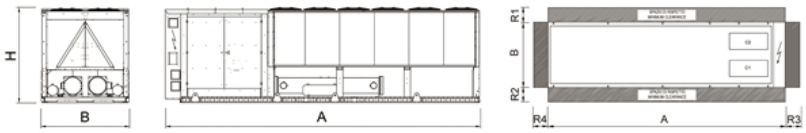
Software version: ELCA World 1.4.5.0
Database version: 1.5.5.0
User: James Askey
Print data: 13/10/2020 11:41
Calculation type: EN 14511 - EN 14825

Check ongoing validity of certificate:
www.eurovent-certification.com

HEATING
EC FAN
SCREW
R513A

WEIGHT & DIMENSIONS

A	mm	8900
B	mm	2260
H	mm	2530
Operating weight	kg	9530
R1	mm	2000
R2	mm	2000
R3	mm	1500
R4	mm	1500



i-FX-Q2-G05 /XL-CA /0602

Software version: ELCA World 1.4.5.0
Database version: 1.5.5.0
User: James Askey
Print data: 13/10/2020 11:41
Calculation type: EN 14511 - EN 14825

TECHNICAL DOCUMENTATION - REGULATION (EU) No 813/2013 - Heat pumps for space heating

i-FX-Q2-G05 /XL-CA /0602			
Air-to-water heat pump:	yes / no		yes
Water-to-water heat pump:	yes / no		no
Brine-to-water heat pump:	yes / no		no
Low-temperature heat pump:	yes / no		yes
With supplementary heater:	yes / no		no
Mixed unit with heat pump:	yes / no		no
Temperature application (1)	(low 35°C/ medium 55°C)		low 35°C
Water flow rate	fixed / variable		variable
Outlet temperature	fixed / variable		variable
Parameters are declared for average/warmer/colder climate conditions (1)	average / warmer / colder		average
Rated heat output at Tdesignh	**Prated = Pdesignh**	**[kW]**	**376**
Seasonal space heating energy efficiency	**ηs**	**[%]**	**167**
Seasonal space heating energy efficiency class	**-**	**-**	
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj			
Declared capacity for heating with outdoor temperature Tj = – 7 °C	Pdh	[kW]	333
Declared capacity for heating with outdoor temperature Tj = +2 °C	Pdh	[kW]	203
Declared capacity for heating with outdoor temperature Tj = +7 °C	Pdh	[kW]	136
Declared capacity for heating with outdoor temperature Tj = +12 °C	Pdh	[kW]	158
Declared capacity for heating with outdoor temperature Tj = Bivalent temperature	Pdh	[kW]	333
Declared capacity for heating with outdoor temperature Tj = Operation limit temperature	Pdh	[kW]	316
For air-to-water heat pumps: Tj = – 15 °C (if TOL < – 20 °C)	Pdh	[kW]	-
Bivalent temperature	Tbiv	[°C]	-7
Degradation coefficient	Cdh	-	0.90
Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Declared coefficient of performance with outdoor temperature Tj = – 7 °C	COPd	-	2.92
Declared coefficient of performance with outdoor temperature Tj = +2 °C	COPd	-	4.01
Declared coefficient of performance with outdoor temperature Tj = +7 °C	COPd	-	5.78
Declared coefficient of performance with outdoor temperature Tj = +12 °C	COPd	-	6.88
Declared coefficient of performance with outdoor temperature Tj = Bivalent temperature	COPd	-	2.92
Declared coefficient of performance with outdoor temperature Tj = Operation limit temperature	COPd	-	2.74
For air-to-water heat pumps: Tj = – 15 °C (if TOL < – 20 °C)	COPd	-	-
For air-to-water HP : Operation limit temperature	TOL	[°C]	-10
Heating water operating limit temperature	WTOL	[°C]	50
Power consumption in modes other than active mode			
Off mode	POFF	[kW]	0.000
Thermostat-off mode	PTO	[kW]	0.400
Standby mode	PSB	[kW]	0.222
Crankcase heater mode	PCK	[kW]	0.200
Supplementary heater			
Nominal heating capacity	Psup	[kW]	60.6
Other items			
Capacity control	fixed / variable		variable
Sound power level, indoors	LWA	[dB(A)]	-
Sound power level, outdoors	LWA	[dB(A)]	89
Annual electricity consumption for heating	QHE	[kWh]	182960
Outdoor heat exchanger			
For air-to-water HP: Rated air flow rate, outdoors	Qairsource	[m³/h]	177912.04
For water-/brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	Qwater/brine source	[m³/h]	-

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

(1) The parameters are declared for application at medium temperature, except in the case of low temperature heat pumps. For low temperature heat pumps, the parameters are declared for application at low temperature.

NOTE: Techical data referred to selected unit.

Chillers

Product Information

e-Series Modular Chiller (90-1,080kW)
Cooling Only or Heat Pump

Making a World of Difference

The **e-series chiller** allows for up to six individual units to be connected together to provide a system capacity from 90kW to 1,080kW. Using this modular approach reduces space requirements and simplifies lifting and installation. The e-series chiller is available as a cooling only or heat pump version, suitable for both comfort and process cooling applications.

Key Features

- Two high efficiency advanced DC inverter-driven scroll compressors are incorporated within each 90kW module and four within the 150/180kW modules. This allows the unit to operate between 8% ~ 100% of capacity, producing exceptional part load efficiencies
- Two-stage cooling circuit - both compressors (or pair of compressors) serve separate plate heat exchangers located in the centre of the unit
- Reduced plant space - each size module can be positioned in a row of up to six connected units using the same internal header
- Internal header pipe - the in-built internal header pipes simplify design, installation and maintenance and also reduces space requirements, making the e-series range modular and suitable for almost any situation
- High performance compact air heat exchanger - the use of U-shaped or Y-shaped heat exchangers allows for a greater surface area, maximising efficiency whilst also keeping the units much narrower than conventional chillers. Blue Fin anti-corrosion coating on the heat exchanger is also provided as standard on the 90kW module

MITSUBISHI ELECTRIC

Cooling | Heating | Ventilation | Controls

e-series

Product Information

Chillers

e-Series Modular Chiller (90-1,080kW)
Cooling Only or Heat Pump

Making a World of Difference

MODEL				**EACV-P900YA-N** Cooling Only	**EACV-P1500YBL-N** Cooling Only	**EACV-P1800YBL-N** Cooling Only
POWER SOURCE				3-phase 4-wire 380-400-415v, 50/60Hz	3-phase 4-wire 380-400-415v, 50/60Hz	3-phase 4-wire 380-400-415v, 50/60Hz
COOLING CAPACITY *1 WATER			kW	90.0	150.0	180.0
			kcal/h	77,400	129,000	154,800
			BTU/h	307,080	511,800	614,160
	Power Input		kW	27.27	45.1	59.01
	EER (Pump input is not included)			3.30	3.33	3.05
	IPLV *3			6.34	6.55	6.33
	Water Flow Rate		m^3/h	15.5	25.8	31
COOLING CAPACITY (EN14511)*2 WATER			kW	90	148.6	177.8
			kcal/h	77,400	127,779	152,874
			BTU/h	307,080	506,955	606,517
	Power Input		kW	29.2	46.52	61.25
	EER			3.08	3.19	2.90
	Eurovent Efficiency Class			B	A	B
	ESEER *4			4.71	4.74	4.45
	SEER (ηsc) (BS EN14825)			4.88 (192%)	4.62 (181%)	4.58 (180%)
	Water Flow Rate		m^3/h	15.5	25.8	31.0
	Minimum Water Circuit Volume		L	420	800	800
COOLING CAPACITY BRINE (ethylene glycol 35WT%)*5 *6			kW	56.73	N/A	N/A
			kcal/h	48,788	N/A	N/A
			BTU/h	193,563	N/A	N/A
	Power Input		kW	25.98	N/A	N/A
	Current Input 380 - 400 - 415V		A	43.9 - 41.7 - 40.2	N/A	N/A
	EER (Pump input is not included)			2.18	N/A	N/A
	EER (Includes pump input based on EN14511)			2.10	N/A	N/A
	SEPR (ηsc) (BS EN14825)			6.11 (241%)	N/A	N/A
	Brine (ethylenegylcol 35WT%) Flow Rate		m^3/h	11.5	N/A	N/A
CURRENT INPUT	Cooling Current 380 - 400 - 415V *1		A	46.0 - 43.7 - 42.2	77 - 73 - 70	77 - 73 - 70
	Maximum Current Input		A	61	111	111
WATER PRESSURE DROP *1	Water		kPa	135	114	164
	Brine (ethylene glycol 35WT%)*5		kPa	106	N/A	N/A
TEMP RANGE	Cooling Water		℃	Outlet water 5 ~ 25	Outlet water 5 ~ 30	Outlet water 5 ~ 30
	Cooling Brine (ethylene glycol 35WT%)*5		℃	Outlet brine -10 ~ 25	N/A	N/A
	Heating		℃	N/A	N/A	N/A
	Outdoor		℃	-15 ~ 43 *6	-15 ~ 43	-15 ~ 43
CIRCULATING WATER VOLUME			m^3/h	15.5	25.8	31
SOUND PRESSURE LEVEL (measured in anechoic room) at 1m *1			dB(A)	65	66	68
SOUND POWER LEVEL (measured in anechoic room) *1			dB(A)	77	84	86
DIAMETER OF WATER PIPE (Standard piping)	Inlet		mm	100A housing type joint	150A housing joint type	150A housing joint type
	Outlet		mm	100A housing type joint	150A housing joint type	150A housing joint type
EXTERNAL FINISH				Polyester powder coated steel plate	Polyester powder coated steel plate	Polyester powder coated steel plate
EXTERNAL DIMENSION	Width x Depth x Height		mm	2250 x 900 x 2450	3400 x 1080 x 2350	3400 x 1080 x 2350
WEIGHT	Inside Header Piping "-N" Model		kg	1022	1256	1256
DESIGN PRESSURE	R410A		MPa	4.15	4.15	4.15
	Water		MPa	1	1	1
HEAT EXCHANGER	Water Side			Stainless steel plate and copper brazing	Stainless steel plate and copper brazing	Stainless steel plate and copper brazing
	Air Side			Plate fin and copper tube	Plate fin and copper tube	Plate fin and copper tube
COMPRESSOR	Type			Inverter scroll hermetic compressor	Inverter scroll hermetic compressor	Inverter scroll hermetic compressor
	Maker			Mitsubishi Electric Corporation	Mitsubishi Electric Corporation	Mitsubishi Electric Corporation
	Starting Method			Inverter	Inverter	Inverter
	Quantity			2	4	4
	Motor Output		kW	11.7 x 2	11.7 x 4	11.7 x 4
	Case Heater		kW	0.045 x 2	N/A	N/A
	Lubricant			MEL32	MEL32	MEL32
	Starting Current		A	8.5	19.1	19.1
	Max Running Current		A	61	111	111
FAN	Air Flow Rate		m^3/min	77 x 6	265 x 4	265 x 4
			L/s	1,283 x 6	4,417 x 4	4,417 x 4
			cfm	2,719 x 6	9,357 x 4	9,357 x 4
	Type, Quantity			Propeller fan x 6	Propeller fan x 4	Propeller fan x 4
	Starting Method			Inverter	Inverter	Inverter
	Motor Output		kW	0.19 x 6	0.94 x 4	0.94 x 4
PROTECTION	High Pressure Protection			High pres. sensor & High pres. switch at 4.15MPa (601psi)	High pres. sensor & High pres. switch at 4.15MPa (601psi)	High pres. sensor & High pres. switch at 4.15MPa (601psi)
	Inverter Circuit			Over-heat protection, Over-current protection	Over-heat protection, Over-current protection	Over-heat protection, Over-current protection
	Compressor			Over-heat protection	Over-heat protection	Over-heat protection
REFRIGERANT	Charge (kg)	R410A (GWP 2088)		19 x 2	15 x 4	15 x 4
	CO_2 Equivalent (t)			79.3	125.3	125.3
	Control			LEV	LEV	LEV

*1 Under normal cooling conditions at outdoor temp 35ºCDB/24ºCWB outlet water temp 7ºC inlet water temp 12ºC. Outlet brine temp -5ºC inlet brine temp 0ºC. Pump input not included.
*2 Under normal cooling conditions at outdoor temp 35ºCDB/24ºCWB outlet water temp 7ºC inlet water temp 12ºC. Pump input is included based on EN14511.
*3 IPLV IS is calcuated in accordance with AHRI 550 - 590.
*4 ESEER is calculated in accordance with EUROVENT conditions.
*5 Under normal cooling conditions at outdoor temp 35ºCDB/24ºCWB outlet brine temp -5ºC inlet water temp 0ºC.
*6 Only EACV-P900YA-N capable of water flow temps to -10ºC.

* Please always make water circulate, or take the circulation water out completely when not in use for long periods.
* The water circuit must be closed circuit.
* Due to continuous improvement, the above specifications may be subject to change without notice.

Product Information

Chillers

e-Series Modular Chiller (90-1,080kW)
Cooling Only or Heat Pump

Making a World of Difference

MODEL			**EAHV-P900YA-N** Heating/Cooling	**EAHV-P1500YBL-N** Heating/Cooling	**EAHV-P1800YBL-N** Heating/Cooling
POWER SOURCE			3-phase 4-wire 380-400-415v, 50/60Hz	3-phase 4-wire 380-400-415v, 50/60Hz	3-phase 4-wire 380-400-415v, 50/60Hz
COOLING CAPACITY *1 WATER		kW	90.0	150.0	180.0
		kcal/h	77,400	129,000	154,800
		BTU/h	307,080	511,800	614,160
	Power Input	kW	30.6	45.1	59.01
	EER (Pump input is not included)		3.30	3.33	3.05
	IPLV *5		6.34	6.55	6.33
	Water Flow Rate	m^3/h	15.5	25.8	31
COOLING CAPACITY (EN14511)*2 WATER		kW	90	148.6	177.8
		kcal/h	77,400	127,779	152,874
		BTU/h	307,080	506,955	606,517
	Power Input	kW	29.2	46.52	61.25
	EER		2.94	3.19	2.90
	Eurovent Efficiency Class		B	A	B
	ESEER *6		4.71	4.74	4.45
	SEER (ηsc) (BS EN14825)		4.88 (192%)	4.62 (181%)	4.58 (180%)
	Water Flow Rate	m^3/h	15.5	25.8	31.0
	Minimum Water Circuit Volume	L	780	1450	1450
HEATING CAPACITY *3		kW	90.0	150	180
		kcal/h	77,400	129,000	154,800
		BTU/h	307,080	511,800	614,160
	Power Input *3	kW	25.71	44.59	55.68
	COP		3.50	3.36	3.23
	Water Flow Rate	m^3/h	15.5	25.8	31.0
HEATING CAPACITY (EN14511)*4		kW	90.0	151.42	182.24
		kcal/h	77,400	130,221	156,726
		BTU/h	307,080	516,645	621,803
	Power Input *3	kW	27.6	46.01	57.92
	COP		3.25	3.29	3.15
	Eurovent Efficiency Class		A+	A	B
	SCOP Low/Medium		3.66 (143%) / 2.89 (113%)	3.24 (127%) / 2.85 (112%)	3.24 (127%) / 2.85 (112%)
	Water Flow Rate	m^3/h	15.5	25.8	31.0
CURRENT INPUT	Cooling Current 380 - 400 - 415V *1	A	46.0 - 43.7 - 42.3	77 - 73 - 70	77 - 73 - 70
	Heating Current 380 - 400 - 415V *3	A	43.4 - 41.2 - 39.7	76 - 72 - 69	76 - 72 - 69
	Maximum Current Input	A	61	111	111
WATER PRESSURE DROP *1	Water	kPa	135	114	164
TEMP RANGE	Cooling Water	℃	Outlet water 5 ~ 25	Outlet water 5 ~ 30	Outlet water 5 ~ 30
	Heating	℃	Outlet water 30 ~ 55	Outlet water 30 ~ 55	Outlet water 30 ~ 55
	Outdoor	℃	-15 ~ 43	-15 ~ 43	-15 ~ 43
CIRCULATING WATER VOLUME		m^3/h	15.5	25.8	31
SOUND PRESSURE LEVEL (measured in anechoic room) at 1m *1		dB(A)	65	66	68
SOUND POWER LEVEL (measured in anechoic room) *1		dB(A)	77	84	86
DIAMETER OF WATER PIPE (Standard piping)	Inlet	mm	100A housing type joint	150A housing joint type	150A housing joint type
	Outlet	mm	100A housing type joint	150A housing joint type	150A housing joint type
EXTERNAL FINISH			Polyester powder coated steel plate	Polyester powder coated steel plate	Polyester powder coated steel plate
EXTERNAL DIMENSION	Width x Depth x Height	mm	2250 x 900 x 2450	3400 x 1080 x 2350	3400 x 1080 x 2350
WEIGHT	Inside Header Piping "-N" Model	kg	1022	1326	1326
DESIGN PRESSURE	R410A	MPa	4.15	4.15	4.15
	Water	MPa	1	1	1
HEAT EXCHANGER	Water Side		Stainless steel plate and copper brazing	Stainless steel plate and copper brazing	Stainless steel plate and copper brazing
	Air Side		Plate fin and copper tube	Plate fin and copper tube	Plate fin and copper tube
COMPRESSOR	Type		Inverter scroll hermetic compressor	Inverter scroll hermetic compressor	Inverter scroll hermetic compressor
	Maker		Mitsubishi Electric Corporation	Mitsubishi Electric Corporation	Mitsubishi Electric Corporation
	Starting Method		Inverter	Inverter	Inverter
	Quantity		2	4	4
	Motor Output	kW	11.7 x 2	11.7 x 4	11.7 x 4
	Case Heater	kW	0.045 x 2	N/A	N/A
	Lubricant		MEL32	MEL32	MEL32
	Starting Current	A	8.5	19.1	19.1
	Max Running Current	A	61	111	111
FAN	Air Flow Rate	m^3/min	77 x 6	265 x 4	265 x 4
		L/s	1,283 x 6	4,417 x 4	4,417 x 4
		cfm	2,719 x 6	9,357 x 4	9,357 x 4
	Type, Quantity		Propeller fan x 6	Propeller fan x 4	Propeller fan x 4
	Starting Method		Inverter	Inverter	Inverter
	Motor Output	kW	0.19 x 6	0.94 x 4	0.94 x 4
PROTECTION	High Pressure Protection		High pres. sensor & High pres. switch at 4.15MPa (601psi)	High pres. sensor & High pres. switch at 4.15MPa (601psi)	High pres. sensor & High pres. switch at 4.15MPa (601psi)
	Inverter Circuit		Over-heat protection, Over-current protection	Over-heat protection, Over-current protection	Over-heat protection, Over-current protection
	Compressor		Over-heat protection	Over-heat protection	Over-heat protection
REFRIGERANT	Charge (kg) R410A (GWP 2088)		19 x 2	15 x 4	15 x 4
	CO_2 Equivalent (t)		79.3	125.3	125.3
	Control		LEV	LEV	LEV

*1 Under normal cooling conditions at outdoor temp 35ºCDB/24ºCWB outlet water temp 7ºC inlet water temp 12ºC. Pump input not included.
*2 Under normal cooling conditions at outdoor temp 35ºCDB/24ºCWB outlet water temp 7ºC inlet water temp 12ºC. Pump input is included based on EN14511.
*3 Under normal heating conditions at outdoor temp 7ºCDB/6ºCWB outlet water temp 45ºC inlet 40ºC. Pump input not included.
*4 Under normal heating conditions at outdoor temp 7ºCDB/6ºCWB outlet water temp 45ºC inlet 40ºC. Pump input power is included, based on EN14511.
*5 IPLV IS is calcuated in accordance with AHRI 550 - 590.
*6 ESEER is calculated in accordance with EUROVENT conditions.

* Please always make water circulate, or take the circulation water out completely when not in use for long periods.
* The water circuit must be closed circuit.
* Due to continuous improvement, the above specifications may be subject to change without notice.

Product Information

Chillers

e-Series Modular Chiller (90-1,080kW)
Cooling Only or Heat Pump

Making a World of Difference

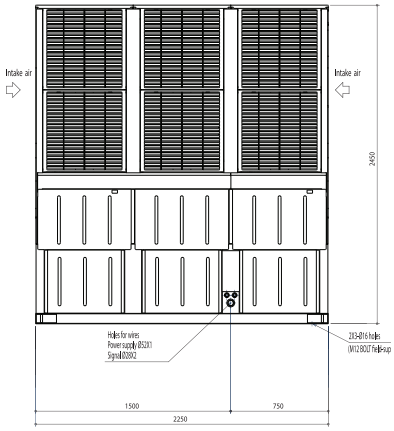
SYSTEM CONFIGURATIONS

MAXIMUM CAPACITY	90kW	150kW	180kW	270kW	300kW	360kW	450kW
COOLING ONLY	EACV-P900YA-N	EACV-P1500YBL-N	EACV-P900YA-N x2	EACV-P900YA-N x3	EACV-P1500YBL-N x2	EACV-P900YA-N x4	EACV-P900YA-N x5
			EACV-P1800YBL-N			EACV-P1800YBL-N x2	EACV-P1500YBL-N x3
HEATING / COOLING	EAHV-P900YA-N	EAHV-P1500YBL-N	EAHV-P900YA-N x2	EAHV-P900YA-N x3	EAHV-P1500YBL-N x2	EAHV-P900YA-N x4	EAHV-P900YA-N x5
			EAHV-P1800YBL-N			EAHV-P1800YBL-N x2	EAHV-P1500YBL-N x3

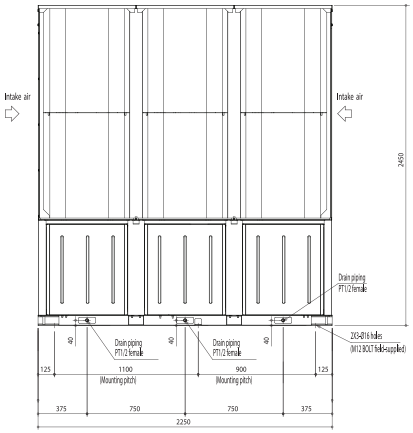
MAXIMUM CAPACITY	540kW	600kW	720kW	750kW	900kW	1,080kW
COOLING ONLY	EACV-P900YA-N x6	EACV-P1500YBL-N x4	EACV-P1800YBL-N x4	EACV-P1500YBL-N x5	EACV-P1500YBL-N x6	EACV-P1800YBL-N x6
	EACV-P1800YBL-N x3				EACV-P1800YBL-N x5	
HEATING / COOLING	EAHV-P900YA-N x6	EAHV-P1500YBL-N x4	EAHV-P1800YBL-N x4	EAHV-P1500YBL-N x5	EAHV-P1500YBL-N x6	EAHV-P1800YBL-N x6
	EAHV-P1800YBL-N x3				EAHV-P1800YBL-N x5	

EA(C)(H)V-P900YA-N DIMENSIONS

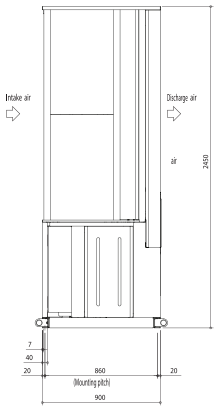
Front View



Rear View

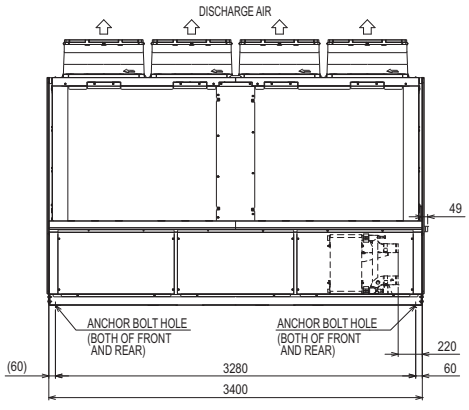


Side View

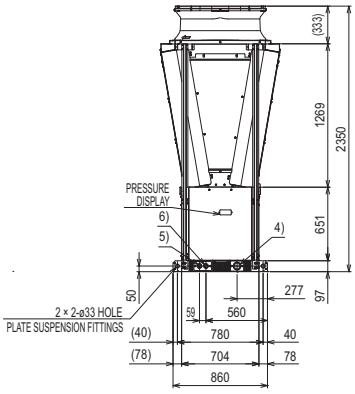


EA(C)(H)V-P1500/1800YBL-N DIMENSIONS

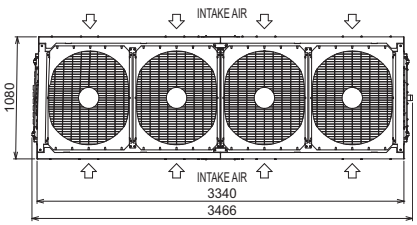
Front View



Side View



Upper View



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Changes for the Better

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Telephone: Dublin (01) 419 8800 Fax: Dublin (01) 419 8890 International code: (003531)

Note: The fuse rating is for guidance only. Please refer to the relevant databook for detailed specification. It is the responsibility of a qualified electrician/electrical engineer to select the correct cable size and fuse rating based on current regulation and site specific conditions. Mitsubishi Electric's air conditioning equipment and heat pump systems contain a fluorinated greenhouse gas, R410A (GWP:2088), R32 (GWP:675), R407C (GWP:1774) or R134a (GWP:1430). *These GWP values are based on Regulation (EU) No 517/2014 from IPCC 4th edition. In case of Regulation (EU) No.626/2011 from IPCC 3rd edition, these are as follows. R410A (GWP:1975), R32 (GWP: 550), R407C (GWP:1650) or R134a (GWP:1300).

Green Gateway
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Effective as of November 2018