DAIKIN

DAIKIN APPLIED (UK) LTD

Air to water
Polyvalent series

EWYS-4Z

Simultaneous heating and cooling
with R-513A refrigerant

Simultaneous heating and cooling with R-513A refrigerant

The range in numbers

1 **Single system providing heating & cooling**

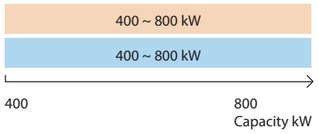
2 **Sound configurations**

EWYS-4ZXS Standard Sound
EWYS-4ZXR Reduced Sound

10 **Main reasons to choose it**

Capacity range

From 400 up to 800 kW in both heating and cooling



Operating range

	Min	Max
Heating water	30°C	60°C
Chilled water	-8°C	20°C
Outdoor ambient temperature	-18°C	50°C

Product overview

Outdoor installation | VFD Single Screw Compressor | Tubes and Fins Air Section | Brushless Fans | Direct Expansion Shell and Tube Evaporator | Direct Expansion Shell and Tube Condenser

The product is equipped with **Daikin Inverter-Driven Single-Screw Compressors** with Variable Frequency Drive (VFD) and Variable Volume Ratio (VVR), operating with **R-513A refrigerant**, which has a very low Global Warming Potential (GWP). Its capacity range is from 400 to 800 kW in both cooling and heating modes, with a Total Energy Efficiency Ratio (TER) of up to 7.89. It operates in ambient temperatures from -18°C to +50°C, with chilled water temperatures ranging from -8°C (with a water/glycol mixture) to +20°C, and heating water temperatures from +30°C to +60°C. As a result, the EWYS-4Z can be extensively used across various applications, from industrial to commercial buildings, hotels, and hospitals. It ensures reliable operation and optimal performance in a wide range of locations and weather conditions.

A reduced noise configuration is also available, featuring noise attenuation through lower fan speeds and a specially designed soundproof compressor cabinet. Enhanced insulation on refrigerant pipes and special connections at the compressor's suction significantly reduce vibration transmission. It is also equipped with two **Shell & Tube** heat exchangers on the waterside. Thanks to its design, the Daikin polyvalent unit can simultaneously meet cooling and heating needs year-round, adapting to varying climatic conditions without requiring seasonal changeover. It independently controls the two refrigerant circuits based on actual demand.

Product Benefits

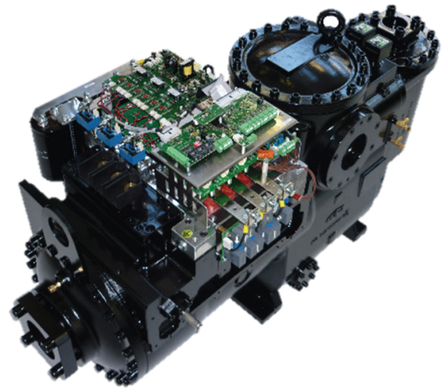
10 Good reasons to choose it

EFFICIENT OPERATION TO LIMIT RUNNING COSTS

- **VFD regulation and VVR control** Chilled and hot water by operating in both air-to-water and water-to-water all year round. The VFD modulates unit capacity efficiently at part load, while the VVR adjusts compressor operations to match any conditions, minimizing energy losses.
- **starting current**
  There are no current spikes at the start-up. The starting current is always lower than the current absorbed in the maximum operating conditions (FLA).
- **High power factor** It maintains a displacement power factor always greater than 0.95.
- **Quick comfort conditions & low water content required**
  The variation of the output power in direct relation to the cooling and heating requirements of the system allows it to reach the set-point conditions in less than one minute, allowing it to operate properly with the same amount of water as in the loop of a cooling-only inverter chiller.

OUTSTANDING RELIABILITY

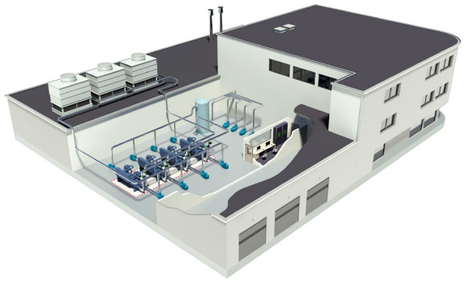
- **rigerant circuits**
  Two separate and independent refrigerant circuits ensuring maximum safety and ease of maintenance
- **Single-screw compressors** Daikin single-screw compressors feature highly balanced mechanical loads, which reduce component stress, extend the life of the unit, improve reliability, and minimise vibration and noise emissions. The excellent volumetric efficiency of the compressors makes them ideal for variable-speed applications.
- **Refrigerant-cooled VFD technology** Daikin refrigerant-cooled VFD technology is not affected by environmental conditions (ambient temperature, altitude or air quality) ensuring unparalleled reliability.



INTEGRATION OF MULTIPURPOSE UNIT IN A LARGER HVAC SYSTEM

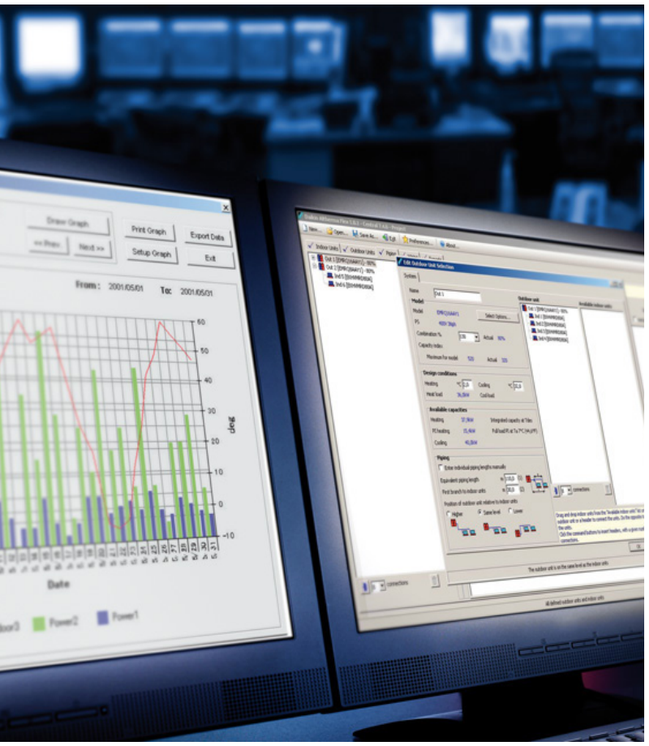
Intelligent Chiller Manager

Daikin Intelligent Chiller Manager (iCM) allows control of up to 8 units within a system and manages the sequencing and capacity of each unit to achieve the overall required capacity while minimizing energy consumption. This ensures capacity management of the units without the need for an additional control panel, utilizing the unit's software functionalities. This approach provides a highly cost-effective plant solution, prioritizing reliability over efficiency.



Cascade system

Daikin iCM ensures proper integration of EWYS-4Z units into a system with distinct types of units, such as a 4-pipe system with EWYS-4Z and a chiller with heat recovery or a heat pump with a changeover valve for mode-switching. In both cases, a full Daikin HVAC system can be designed. In the second case, the integration with water-to-water heat pumps (under the same system control) allows for full decarbonization of heating even where terminals would still be radiators. Indeed, a Daikin cascade system can be designed for the provision of heating water **up to 75 °C**, considering EWYS4Z in combination with a single screw compressor's water-sourced heat pumps, eventually also equipped with VFD, and available under various refrigerant options (R-1234ze, R-513A, R-134a).



Daikin on Site

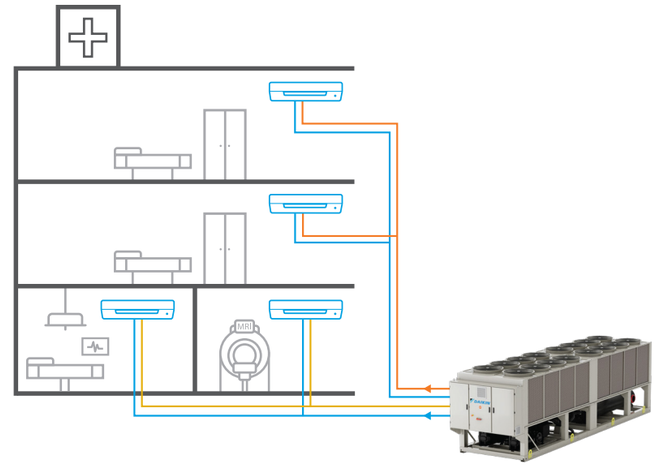
EWYS-4Z is equipped with Daikin on Site, a cloud-based remote monitoring system that ensures the proper functionality of cooling and heating plants. This remote system allows facility managers to easily identify problems and find the right solutions whenever an alarm occurs. The platform allows for real-time evaluation of parameters, making it possible to adjust settings and intervene remotely when needed. The unit is equipped with a modem and a GSM card, providing an autonomous internet connection.

Product Applications

Cooling + Heating

Space Cooling & Heating

- Centralized heating and simultaneous need for cooling. Units can be managed in master / slave up to an array of 4 modules per master
  - Hospitals and offices
  - Replacement and new buildings
- Possible terminals:
  - Heating
    - Radiators (up to 60 °C)
    - Heating floor (30-35 °C)
    - Fan coils (45 °C)
  - Cooling
    - Fan coils (7 °C)



Cooling + Heating + Domestic Hot Water

Space Cooling & Heating + Domestic hot water

- Centralized heating, and simultaneous need for cooling. Units can be managed in master / slave up to an array of 4 modules per master
  - Hospitals and offices
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  - Heating
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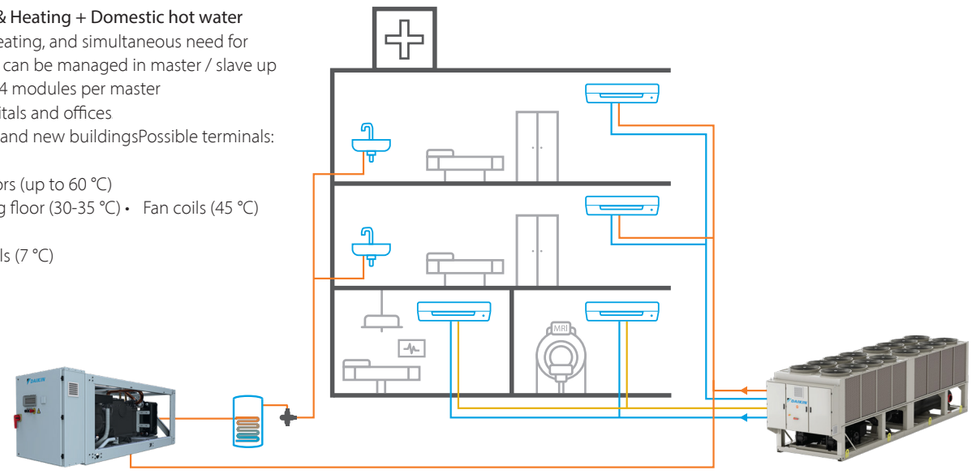


Product options and accessories

Options

Option	Description	EWYS-4ZXS	EW-YS4Z-XR
OPT08	Brine version	x	x
OPT 20	Evaporator victaulic kit	STD	STD
OPT 21	Evaporator flange kit	x	x
OPT 26	Condenser double flanges kit	x	x
OPT 29	20mm evaporator insulation	STD	STD
OPT 36	Condenser victaulic kit	STD	STD
OPT 33	20mm condenser insulation	STD	STD
OPT 61	Discharge line shut-off valve	STD	STD
OPT 62	Suction line shut-off valve	X	X
OPT 63	High pressure side manometers	X	X
OPT 64	Low pressure side manometers	X	X
OPT 78	One centrifugal pump (low lift)	X	X
OPT 79	One centrifugal pump (high lift)	X	X
OPT 80	Two centrifugal pump (low lift)	X	X
OPT 81	Two centrifugal pump (high lift)	X	X
OPT 91	Double pressure relief valve with diverter	X	X
OPT 43	Condenser coil guards	X	X
OPT 44	Evaporator area guards	X	X
OPT 45	Cu-cu condenser coil	X	X
OPT 49	Alucoat fins coil	STD	STD
OPT V117	Blygold coil treatment	X	X
OPT 121	Refrigerant leak detection	X	X
OPT 76-b	Sound proof system (compressor)	X	STD
OPT 234	Condenser for low flow in heating mode	X	X
OPT 10	Double setpoint	STD	STD
OPT 11	Compressor thermal overload relays	STD	STD
OPT 13	Phase monitor	STD	STD

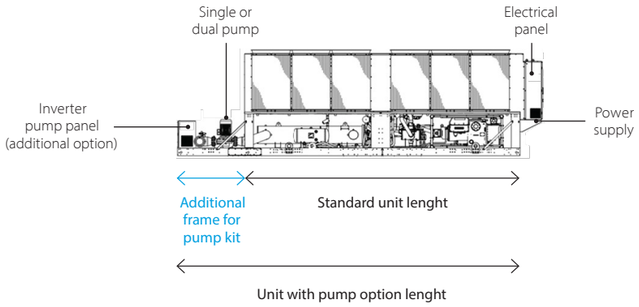
Option	Description	EWYS-4ZXS	EW-YS4Z-XR
OPT 67	Ambient outside temperature sensor and setpoint reset	STD	STD
OPT 68	Hour run meter	STD	STD
OPT 69	General fault contactor	STD	STD
OPT 90	Setpoint reset, demand limit and alarm from external device	STD	STD
OPT 95	Compressors circuit breakers	X	X
OPT 96	Fans circuit breakers	STD	STD
OPT 97	Main switch interlock door	STD	STD
OPT 102	Ground fault relay	X	X
OPT 114	Nordic kit	X	X
OPT 110	Rapid restart	X	X
OPT 120e	Inverter kit for 1 centr pump low lift	X	X
OPT 120f	Inverter kit for 1 centr pump high lift	X	X
OPT 120g	Inverter kit for 2 centr pump low lift	X	X
OPT 120h	Inverter kit for 2 centr pump high lift	X	X
OPT 143	Variable primary flow	X	X
OPT 144	Diff pressure transd (shipped loose)	X	X
OPT 142	High ambient kit (operation 46°c)	X	X
OPT 128	Master / slave	STD	STD
OPT 184	iCM standard	X	X
OPT 180	ModBus RTU MSTP	X	X
OPT 181	BACnet MSTP	X	X
OPT 182	BACnet IP	X	X
OPT 155	Daikin on Site modem (with antenna) + mobile app HMI	X	X
OPT 220	Mobile app HMI (access point only)	STD	STD

Accessories

Option	Description	EWYS-4Z
EKTSMS	Temperature sensor for master/slave configuration	X
EKDIPM05 (a)	Intelligent pump manager for icm 5 pumps	X
EKDIPM10 (a)	Intelligent pump manager for icm 10 pumps	X
EKDISM (a)	Intelligent secondary manager for iCM	X
EKDICMADV	iCM advanced panel	X
EKCM200J	ModBus RTU communication module	X
EKCMBACMSTP	BACnet / MSTP communication module	X
EKCMBACIP	Bacnet / IP communication module	X
EKDOSMWO	Daikin on site modem without M2M card	X
EKRUPCS	Local / remote display HMI	X
EKDAPCONT	Containerization of one unit	X

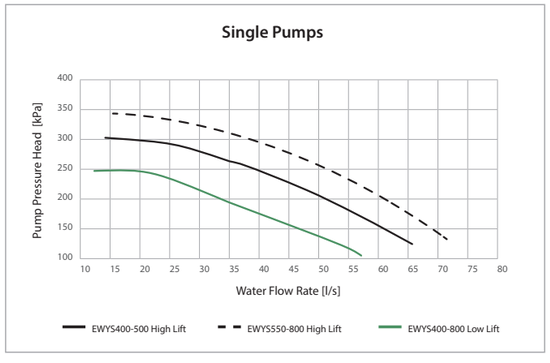
STD: Provided as standard X: On demand SO: Specify at order entry

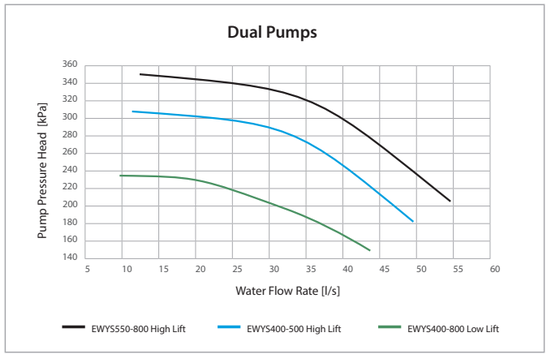
Hydronic kit physical data



EWYS-4ZXSB2 / EWYS-4ZXRB2 with Hydronic kit		400	450	500	550	600	650	700	800
Unit length	mm			8230	8230				

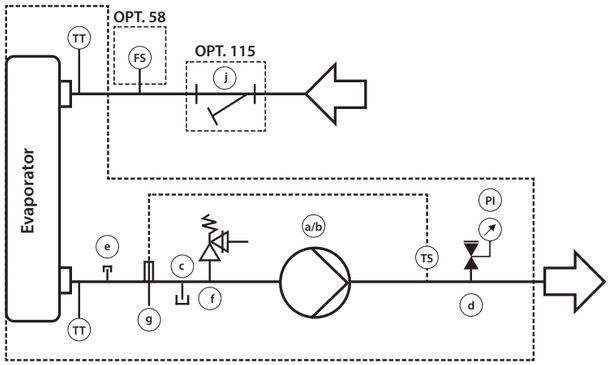
Pump curves





Hydronic kit picture & table

Options



Legend	
a	Single
pump b	Twin pump
c	Drain ½" NPT
d	Automatic filling valve
e	Plugged fitting ¼" NPT
f	Safety valve
g	Electrical heater
j	Water filter
TT	Temperature Sensor
TS	Temperature Switch
PI	Pressure Gauge
FS	Flow Switch

Plant water content

All cold and hot water systems need adequate time to react to a load change. In case of multipurpose unit, the machine follows the set-point on cold side as well as the se-point on hot side. The control of the heating and cooling capacity of the unit is achieved by managing the load of the compressors (with VFD) and by cycling each circuit independently between the following operating modes: cooling only, cooling + heating, and heating only. The potential for short cycling usually exists when the cooling and heating loads falls below the minimum unit's capacity or in systems with insufficient water volumes.

Design considerations for systems water volume are the minimum cooling and heating load; the minimum cooling and heating unit's capacity; the time for each circuit to perform the switch of operating mode; on heating side also the defrost effects needs to be considered.

The water content is necessary to ensure the stability of plant operation and accurate temperature control. To determine the right value all the component of the systems should be considered as well as the plant layout and control strategy in place.

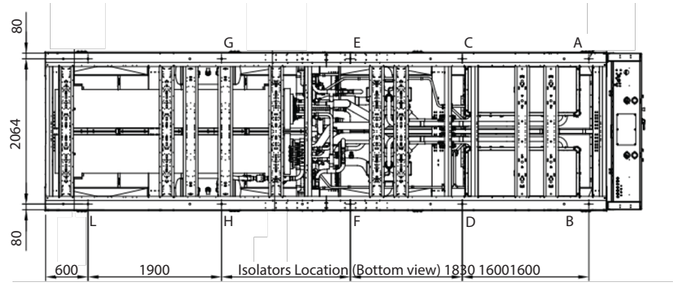
Assuming that there are no sudden load changes and that the chiller plant has reasonable turndown, a rule of thumb of "6,5 litres per kW" is considered for comfort cooling and comfort heating application. The water content is calculated on the bases of the "6.5 lt/kW" rule, is intended as the useful water volume always flowing through both cold and hot heat exchangers.

Note that in presence of any bypass that cause short circuit of the supply water with the return the resulting useful volume will be lower and lead to system instability.

For process cooling and/or heating applications, the request is typically for very high accuracy and stability of the supplied water temperatures. In all those cases the minimum water content to be considered should be increased from the "6.5 lt/kW". In that situation a deeper analysis must be carried by the system designer with full awareness of the whole system characteristic and final user's expectations.

To comply with the minimum water volume could be necessary to add a buffer water tank to the circuit. The solution is to use a "two-attack" buffer tank installed on the return from the system to the unit.

Isolator loads



	EWYS400-4Z		EWYS450-4Z		EWYS500-4Z		EWYS550-4Z		EWYS600-4Z		EWYS650-4Z		EWYS700-4Z		EWYS800-4Z	
	XSB2	XRB2	XSB2	XRB2	XSB2	XRB2	XSB2	XRB2	XSB2	XRB2	XSB2	XRB2	XSB2	XRB2	XSB2	XRB2
A	1250	1290	1250	1290	1070	1110	1070	1110	985	1025	955	955	790	860	790	860
B	1250	1290	1250	1290	1070	1110	1070	1110	985	1025	955	955	790	860	790	860
C	1000	1040	1000	1040	810	850	810	850	1025	1065	980	1020	1370	1440	1370	1440
D	1000	1040	1000	1040	810	850	810	850	1025	1065	980	1020	1370	1440	1370	1440
E	1020	1020	1020	1020	1130	1130	1130	1130	855	855	930	930	955	960	955	960
F	1020	1020	1020	1020	1130	1130	1130	1130	855	855	930	930	955	960	955	960
G					780	780	780	780	785	785	1160	1160	1040	1040	1040	1040
H					780	780	780	780	785	785	1160	1160	1040	1040	1040	1040
I									820	820	770	770	1260	1260	1260	1260
L									820	820	770	770	1260	1260	1260	1260

Product technical data

Product technical data

Technical specifications				EW-	EW-	EW-	EW-	EW-	EW-	EW-	EW-
Cooling capacity	Nom.		kW	393.1	440.8	495.2	532.1	584.5	644.4	682.5	765.7
Heating capacity	Nom.		kW	403.1	442.9	506.1	536.1	588	650.4	680.4	790.2
Capacity control	Method			Stepless						Capacity control	
	Minimum capacity		%	17					12	11	10
Power input	Cooling	Nom.	kW	135.55	151.48	166.73	189.36	196.80	221.44	221.59	256.09
	Heating	Nom.	kW	126.76	136.28	153.83	163.94	178.72	201.36	201.90	235.91
EER				2.90	2.91	2.97	2.81	2.97	2.91	3.08	EER 2.99
COP				3.18	3.25	3.29	3.27	3.29	3.23	3.37	COP 3.35
SCOP				3.21	3.24	3.4	3.31	3.46	3.3	3.36	SCOP 3.49
SEER				4.55	4.55	4.85	4.71	4.91	5.01	5.14	SEER 5.11
Dimensions	Unit	Depth	mm	5,825	5,825	6,725	6,725	7,625	8,525	8,525	8,525
		Height	mm	2,465	2,465	2,465	2,465	2,465	2,465	2,465	Dimensions 2,465
		Width	mm	2,285	2,285	2,285	2,285	2,285	2,285	2,285	2,285
Weight	Operation weight		kg	6,540	6,560	7,560	7,560	8,935	9,540	1,0785	1,0820
	Unit		kg	6,075	6,095	6,870	6,870	7,850	8,435	9,405	Weight 9,430
Casing	Colour			I	Ivory White						Casing
	Material			Galvanized Steel Sheet							
Water heat exchanger	Type			Shell & Tubes							
	Water flow rate	Cooling Nom.	l/s	18.8	21.1	23.7	25.5	28	30.8	32.7	36.6
		Heating Nom.	l/s	19.4	21.3	24.4	25.8	28.4	31.4	32.8	Water heat exchanger 38.1
	Water pressure drop	Cooling Nom.	kPa	37.6	46	38.6	43.8	43.9	31.5	39.1	33.9
		Heating Nom.	kPa	38.2	45.2	34.4	38.2	36.1	26.5	31.1	29.9
	Water volume		l	126		214		369	361		Air heat exchanger 468
Air heat exchanger	Type			Tube & Fins							
Fan 14 16	Quantity	Max		10		12					Fan 12 14 16
	Type										
Compressor 2	Quantity										
	Type			Inverter Screw							
	Oil	Charged volume		28						38	
Operation range				-8							

Technical specifications				EW-	EW-	EW-	EW-	EW-	EW-	EW-	EW-
Cooling capacity	Nom.		kW	350.3	380.8	434.2	485	534.3	578.4	613.2	672.3
Heating capacity	Nom.		kW	363.6	404.4	447.6	499.1	549.8	612.6	650.7	708.4
Capacity control	Method			Stepless							
	Minimum capacity		%	20	18	17	14	14	13	12	11
Power input	Cooling	Nom.	kW	121.21	137.97	149.21	175.09	190.14	201.53	212.92	240.97
	Heating	Nom.	kW	110.52	117.56	129.36	145.51	162.18	182.32	187.52	202.40
EER				2.89	2.76	2.91	2.77	2.81	2.87	2.88	2.79
COP				3.29	3.44	3.46	3.43	3.39	3.36	3.47	3.50
SCOP				3.2	3.22	3.32	3.29	3.3	3.27	3.33	3.38
SEER				4.63	4.55	4.78	4.82	5.07	5.15	5.05	5.13
Dimensions	Unit	Depth	mm	5,825	5,825	6,725	6,725	7,625	8,525	8,525	8,525
		Height	mm	2,465	2,465	2,465	2,465	2,465	2,465	2,465	2,465
		Width	mm	2,285	2,285	2,285	2,285	2,285	2,285	2,285	2,285
Weight	Operation weight		kg	6,705	6,725	7,725	7,725	9,100	9,705	1,1075	1,1110
	Unit		kg	6,240	6,260	7,035	7,035	8,015	8,600	9,690	9,715
Casing	Colour			Ivory White							
	Material			Galvanized Steel Sheet							
Water heat exchanger	Type			Shell & Tubes							
	Water flow rate	Cooling Nom.	l/s	16.8	18.2	20.8	23.2	25.6	27.7	29.3	32.1
		Heating Nom.	l/s	17.5	19.5	21.6	24.1	26.5	29.6	31.4	34.2
	Water pressure drop	Cooling Nom.	kPa	30.7	35.8	30.7	37.4	37.6	26.1	32.5	27
		Heating Nom.	kPa	31.7	38.4	27.6	33.6	32	23.8	28.7	24.6
	Water volume		l	126	126	214	214	369	361	468	468
Air heat exchanger	Type			Tube & Fins							
Fan 14 16	Quantity	Max		10							
	Type			Brushless							
Compressor 2	Quantity										
	Type										
	Oil	Charged volume	l								
Operation range	Water side	Evaporator	Min.	°CDB							
			Max.	°CDB	20						
		Condenser	Min.	°CDB	30						
			Max.	°CDB	60						

Sound power & pressure data

Cooling mode

		EWYS-4ZXSB2								EWYS-4ZXRB2							
		400	450	500	550	600	650	700	800	400	450	500	550	600	650	700	800
Sound pressure level @ 1 m from the unit (rif. 2 x10-5 Pa)	63 Hz	78	78	78	79	78	80	80	80	68	66	67	67	69	68	69	70
	125 Hz	75	75	75	76	75	77	77	77	65	63	64	64	66	65	66	67
	250 Hz	75	74	75	76	75	77	77	77	64	63	64	64	65	65	66	67
	500 Hz	78	77	77	78	78	79	80	80	67	66	67	67	68	67	69	69
	1000 Hz	73	72	72	73	73	74	75	75	62	60	61	62	63	62	64	64
	2000 Hz	68	67	68	69	68	70	70	70	57	56	57	57	58	58	59	60
	4000 Hz	60	60	60	61	60	62	62	62	50	48	49	49	51	50	51	52
	8000 Hz	53	52	52	53	53	54	55	55	42	41	42	42	43	42	44	44
	Sound pressure Lp @ 1 m	78	77	77	78	78	79	80	80	67	66	67	67	68	67	69	69
	Sound power Lw	99	98	99	99	100	101	102	102	88	87	88	88	89	89	91	91

i) The above data are referred to the unit without additional optional.
ii) The above data are referred the unit installed in compliancy with installation prescription.
iii) All the data are subject to change without notice. For updated information on project base refer to Chiller Selection Software and unit's certified drawing.
iv) Sound data in the Octave band spectrum and sound pressure over 1 m are based on calculation, thus intended as general guideline, and not considered binding.

Data referred to standard conditions: Air to water - Cooling Only; evaporator water in/out = 12/7°C; ambient = 35.0°C, unit at full load operation in Cooling Only; operating fluid: Water; fouling factor = 0 °C/W Sound Power levels are measured in accordance with ISO 9614 Sound Pressure levels are measured in accordance with ISO 3744

For all Daikin Applied UK, Daikin Applied Service, Rental Solutions, & Spares enquiries call us on:
0345 565 2700

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