# Modular Air-cooled Scroll Chiller(Heat Pump)

## **D** Series







D series modular air-cooled scroll chillers can be widely used at newly-built or retrofitted industrial and civil buildings in various sizes, such as hotels, apartments, restaurants, office buildings, shopping malls, theaters, gyms, workshops, hospitals and other places where there are high requirements on noise level and air quality but it is troublesome to install the cooling tower.

ltem		Water side (wa	ater temperature)	Air side (outdoor temperature)			
	Nominal oper	rating condition	Operati	ng range	Nominal opera	Operating range	
	Inlet(°C)	Outlet(°C)	Outlet(°C)	I/O difference(°C)	DB(°C)	WB(°C)	DB(°C)
Cooling	12	7	5~20	2.5~6	35	-	15~45
Heating	40	45	35~50	2.5~6	7	6	-15~24

#### U-shaped Pipe Two-pass Design

The dual flow design of the U-shaped tube can enhance the heat exchange efficiency and effective superheating degree, thus increasing the performance of the unit.

### **Compressor Operation Balance Technology**

The unique compressor operation balance technology makes sure that each compressor operates in turn, which greatly prolongs the lifespan of compressor.

#### Free Master Module Design

Any single unit can operate as the master once connected with the wired controller. It overcomes the problem which would occur to the product of other manufacturer that the whole system would fail to work properly when there's malfunction for the fixed master unit.

## Features

### High-efficiency Shell and Tube Heat Exchanger

As for the shell and tube heat exchanger, water inside it flows along the tube, which leaves large heat exchanging space and effectively prevents clogging caused by foreign matters or scale. As for the plate heat exchanger, the distance between plates is less than 3mm, which is vulnerably clogged owing to the bad water quality and causes the heat exchanger frozen up.



## Advanced Flow Dividing Technology

The pipeline and flow equalization plate are especially designed for D series modular air-cooled scroll chillers, which greatly improve flow dividing uniformity and heat exchange capacity.









Sinclair Chiller

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## **Super Protection Functions**

This series is equipped with advanced microcomputer control system, completed protection functions and powerful error diagnosis function.

Main protection functions: compressor high pressure protection, compressor low pressure protection, compressor overload protection, antifreezing protection, overheating protection, auto antifreezing protection in winter, waterflow switch protection, temperature sensor protection, phase sequence protection, high discharge temperature protection, etc.

### Excellent Compatibility

The units of the same model or different models can be combined freely. For model 65 and model 80, each system can combine up to 16 modules. For model 130 and model 160, each system can combine up to 8 modules.



**3**410A

#### 50Hz

Model	Heat pump		LSQWRF65M/NaD-M	LSQWRF80M/NaD-M	LSQWRF130M/NaD-M	LSQWRF160M/NaD-M	LSQWRF249M/NaD-M*	LSQWRF280M/NaD-M*		
Capacity	Cooling/Heating	kW	60/65	71/79.5	120/130	145/170	249/275	280/325		
	Cooling/Heating	RT	17.06/18.48	20.19/22.61	34.12/36.97	41.23/48.34	70.80/78.20	79.62/92.42		
Capacity steps		%	0-50%	-100%		0-25%-50%	-75%-100%			
EER/COP		W/W	2.84/3.09	2.76/2.94	2.84/2.93	2.74/3.04	2.95/3.25	2.85/3.10		
Power supply		V-Ph-Hz	380-415V~3N~50Hz							
Power input	Cooling	kW	21.1	25.7	42.3	53	84.4	98.2		
Fower input	Heating	kW	21	27	44.4	56	84.6	104.8		
	Туре	-			Constant s	peed scroll				
Compressor	Starting mode	-			Direct	starting				
	Quantity	-	2	2	4	4	4	4		
	Туре	-		Dry expansion evaporator						
	Water flow volume	l/s	2.87	3.39	5.73	6.93	11.89	13.39		
Water side heat		GPM	46	54	91	110	189	212		
exchanger	Pressure drop	kPa	15	20	30	35	75	85		
		ft.WG	4.92	6.56	9.84	11.48	24.60	27.88		
	Connection pipe	-	DN65		DN	80	DN	100		
	Туре	-	Aluminum fin-copper tube							
Air side heat	Fan type and quantity	-	Axial-flow/2	Axial-flow/2	Axial-flow/4	Axial-flow/4	Axial-flow/8	Axial-flow/8		
exchanger	Total fan air flow	l/s	2×0.375×104	2×0.417×104	4×0.375×104	4×0.417×104	8×0.39×104	8×0.43×104		
		CFM	2×0.795×104	2×0.882×104	4×0.795×104	4×0.882×104	8×0.8239×104	8×0.918×104		
	Total fan motor power	kW	2×0.65	2×0.95	4×0.65	4×0.95	8×0.65	8×0.75		
Sound pressure level		dB(A)	70	71	72	74	67	69		
Dimension	Outline(W×D×H)	mm	2040×1000×2230	2040×1000×2230	2226×1650×2230	2226×1650×2230	3980×2260×2450	3980×2260×2450		
	Package(W×D×H)	mm	2120×1080×2230	2120×1080×2230	2306×1730×2230	2306×1730×2230	4040×2260×2450	4040×2260×2450		
Net/Gross/Operating weight		kg	740/745/814	792/797/871	1315/1320/1447	1504/1509/1654	2985/2995/3284	3278/3288/3606		
Loading quantity 40'GP/40'HQ		set	10/10	10/10	6/6	6/6	2/2	2/2		

Notes: This product model is under development. Sinclair reserves the right to modify the specifications without prior notice. Please confirm the final specifications with our sales representatives

#### 60Hz

Model	Heat pump		LSQWRF65M/NaD-F	LSQWRF80M/NaD-F	LSQWRF130M/NaD-F	LSQWRF160M/NaD-F	
O an a ait a	Cooling/Hooting	kW	60/65	75/85	120/135	145/170	
Capacity	Cooling/Heating	RT	17.0/18.5	21.3/24.2	34.1/38.4	41.2/48.3	
Capacity steps		%	0-50-100	0-50-100	0-25-50-75-100	0-25-50-75-100	
EER/COP		W/W	2.79/2.89	2.72/3.04	2.79/3.00	2.71/3.04	
Power supply		V-Ph-Hz		208-230V	~3~60Hz		
Power input	Cooling/Heating	kW	21.5/22.5	27.6/28.0	43.0/45.0	53.5/56.0	
	Туре	_	Hermetic scroll	Hermetic scroll	Hermetic scroll	Hermetic scroll	
Compressor	Starting mode	-	Direct starting	Direct starting	Direct starting	Direct starting	
	Quantity	-	2	2	4	4	
	Туре	-		High-effcient shell an	High-effcient shell and tube heat exchanger		
	Water flow volume	l/s	2.87	3.58	5.73	6.93	
Water side heat		GPM	45.5	57.0	91.0	110.0	
exchanger	Pressure drop	kPa	15	15	30	35	
		ft.WG	4.9	4.9	9.8	11.5	
	Connection pipe	-	DN65	DN65	DN80	DN80	
	Туре	-	High-efficient fin tube type heat exchanger				
Air side heat	Fan type and quantity	—	axial×2	axialx2	axial×4	axial×4	
exchanger	Total fan airflow	l/s	2x0.375×10 <sup>4</sup>	2x0.417x10 <sup>4</sup>	4x0.375×10 <sup>4</sup>	4x0.417×10 <sup>4</sup>	
0	TOTAL IAU AUTION	CFM	2x0.795×10 <sup>4</sup>	2x0.882x10 <sup>4</sup>	4x0.795×10 <sup>4</sup>	4x0.882×10 <sup>4</sup>	
	Total fan motor power	kW	0.65×2	0.75x2	0.65×4	0.75x4	
Sound pressure level		dB(A)	70	71	72	74	
Dimension	Outline(W×D×H)	mm	2040×1000×2230	2024x1000x2230	2278x1830x2278	2278x1830x2278	
DITICIISION	Package(W×D×H)	mm	2120×1080×2230	2120x1080x2230	2358x1910x2278	2358x1910x2230	
Net/Gross/Operating weight		kg	720/775/792	770/775/847	1370/1375/1507	1580/1585/1738	
Loading quantity 40'GP/40'HQ		set	10/10	10/10	6/6	6/6	

#### 50/60Hz

Coaling kW 130 325   Capacity step 78 37 92   Capacity step % 0-25:50-75:100 0-25:50-75:100   EER WW 2.8 3.16   Power suppi VPM 380V-3:60Hz 380V-3:60Hz   Power suppi VPM 380V-3:60Hz 380V-3:60Hz   Power suppi Coling KW 46.4 103   Power suppi Coling - Constat speed scroll Hermetic scroll   Compressor Starting mode - Constat speed scroll Hermetic scroll   Quantity - A 4 4   Vater flow volume Vs 6.19 15.53   Water flow volume Vs 6.19 246   Pressure drop Flow 9.84 27.88   Connection pipe - Aluminum fin-cooper tube Aluminum fin-cooper tube   Air sife Fair type and quantity - Aluminum fin-cooper tube Avial-flow/8   Air sife Vs	Model	Cooling only		LSQWF130MT3/NaD-M	LSQWF325M/NaD-H	
CapacityCountyTR3792Capacity stepsFR3792Capacity steps%0.25-50.75-1000.25-50.75-100EERWW2.83.16Power supplyV/Ph/Hz380V-3-50Hz380V-3-60HzPower inputCoolingkW46.4103Power inputType-Constant speed scrollHermetic scrollCompressorStarting mode-Direct startDirect startQuantity-444Auratify-015.53Water flow volumeGPM98246exchangerFt/WG9.8427.88Connection pipe-DN80DN100Air side heat-Aurinum fin-cooper tubeAluminum fin-cooper tubeAir side heat1/s4×0.417×1048×0.4361×104Air side heat1/s4×0.417×1048×0.9235×104Connection pipe-Aluminum fin-cooper tubeAluminum fin-cooper tubeAir side heat1/s4×0.417×1048×0.9235×104Air side heat1/s4×0.417×1048×0.9235×104Sound pressure-dB(A)72/DimensionQuitine(M×D+H)mm2278×1830×22783980×2260×2450Net/Gross/Operating weightka14/d0/465/16063245/325/3570	Conceity	Cooling	kW	130	325	
Capacity steps%0.0-25-50.75-1000.0-25-50.75-100EERWW2.83.16Power supplyVPh/Hz380V-3-50Hz380V-3-60HzPower inputCoolingKW0.46.40.103Power inputCooling modeIOconstant speed scrollMermetic scrollCompressorStating modeIOconstant speed scrollMermetic scrollCompressorTypeIOconstant speed scrollMermetic scrollWater flow volumeIIOtip expansion evaporatorDirect startWater flow volumeI/sIOtip expansion evaporatorDry expansion evaporatorWater flow volumeI/sIOtip expansion evaporatorDirect startWater flow volumeI/sIIIWater flow volumeI/sIIIWater flow volumeI/sIIII/sIIIII/sIIIII/s </td <td>Capacity</td> <td>TR</td> <td>37</td> <td>92</td>	Capacity		TR	37	92	
EER WRW 2.8 3.16   Power supply VPPh/Hz 380V-3.60Hz 380V-3.60Hz   Power supply Cooling KW 46.4 103   Power input Type - Constant speed scroll Hermetic scroll   Compressor Starting mode  Constant speed scroll Hermetic scroll   Quantity  Or Direct start Direct start Direct start   Mater flow volume  Or Dy expansion evaporator Dy expansion evaporator   Water flow volume  GPM 98 246   water flow volume KPa 30 85   Water flow volume KPa 30 85   Water flow volume  DN80 DN100   Type  Aluminum fin-copper tube Aluminum fin-copper tube   Arriside height  Auti-flow/4 Axial-flow/8   exchanger Type  Aluminum fin-copper tube Aluminum fin-copper tube   Total fan motor powe  Auti-flow/	Capacity steps		%	0-25-50-75-100	0-25-50-75-100	
Power supplyVPh/Hz380V-3-50Hz380V-3-60HzPower inputCoolingKW380V-3-50Hz380V-3-60HzPower inputForgetKW46.4103Power inputTypeConstant speed scrollMemetic scrollCompressorStaring modeObject startDirect startQuantity44Mater flow volume1/sObject startMater flow volume1/sPresure dropKPPresure dropAttri side heriAttri side heriAttri side heriAttri side heriAttri side heriAttri side heri	EER		W/W	2.8	3.16	
Power inputCoolingkW46.4103PopeimageimageimageimageimageStarting modeimageimageimageimageimageCompressorCaunityimageimageimageimageAutorimageimageimageimageimageWater side headimageimageimageimageimageWater side headimageimageimageimageimageWater side headimageimageimageimageimageWater side headimageimageimageimageimageWater side headimageimageimageimageimagePressure dropifsimageimageimageimageAtir side headimageimageimageimageimageAtir side headimage <td colspan="2">Power supply</td> <td>V/Ph/Hz</td> <td>380V-3-50Hz</td> <td>380V-3-60Hz</td>	Power supply		V/Ph/Hz	380V-3-50Hz	380V-3-60Hz	
TypeConstant speed scrollHermetic scrollStarting modeDirect startDirect startQuantity4OttenetTypeDry expansion evaporatorDry expansion evaporatorMater flow volume//s6.1915.53Water flow volume//sGPM98246Pressure dropKPa3085ft.WG9.8427.88Connection pipeAluminum fin-copper tubeDIN100Type and quantityAluminum fin-copper tubeAluminum fin-copper tubeAir side heat exchanger//s4×0.417×1048×0.4361×104Total fan air flow//s4×0.417×1048×0.4361×104Sound pressuredB(A)72/DimensionOttine(W×D×H)mm2278×1830×22783980×2260×2450Net/Grops/Operating weightkg1460/1465/16063245/3255/0570	Power input	Cooling	kW	46.4	103	
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Quantity44NameTypeDry expansion evaporatorDry expansion evaporatorWater side headMater flow volume1/sGPM9.815.53Pressure dropKPa30246246Pressure dropKPa308585Connection pipeDN80DN100Air side headTypeAluminum fin-copper tubeAluminum fin-copper tubeFar type and quantityAluminum fin-copper tubeAluminum fin-copper tubeFar type and quantityAluminum fin-copper tube8×0.4361×104Air side headTotal fan air flowI/s4×0.417×1048×0.4361×104Sound pressureIdB(A)The input power depends on the actury-measured value of the whole unit.DimensionOutline(W×D×H)mm2278×1830×22783980×2260×2450Net/Gross/Operative weightkg1460/1465/16063245/3257/3570	Compressor	Starting mode	—	Direct start	Direct start	
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Pressure dropft.WG9.8427.88Connection pipeDN80DN100Air side heat exchangerTypeAluminum fin-copper tubeAir side heat exchangerType and quartityAluminum fin-copper tubeFan type and quartityAxial-flow/4Axial-flow/8Total fan air flow1/s4×0.417×1048×0.4361×104Total fan motor powerkWThe input power depends on the acture value of the whole unit.Sound pressuredB(A)72/DimensionOutine(W×D×H)mm2278×1830×22783980×2260×2450Net/Gross/Operating weightkg1460/1465/16063245/3255/3570	exchanger	Pressure drop	kPa	30	85	
Image: constant problemImage: constant problemImage: constant problemImage: constant problemAir side hair side hai			ft.WG	9.84	27.88	
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All side heat exchanger I/s 4×0.417×104 8×0.4361×104   exchanger Total fan air flow I/s 4×0.417×104 8×0.4361×104   Total fan air flow CFM 4×0.882×104 8×0.9235×104   Total fan motor power kW The input power depends on the actually-measured value of the whole unit.   Sound pressure evel dB(A) 72 /   Dimension Outline(W×D×H) mm 2278×1830×2278 3980×2260×2450   Net/Gross/Operating weight kg 1460/1465/1606 3245/3255/3570		Fan type and quantity	_	Axial-flow/4	Axial-flow/8	
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Total fan motor power kW The input power depends on the actually-measured value of the whole unit.   Sound pressure Velocity dB(A) 72 /   Dimension Outline(W×D×H) mm 2278×1830×2278 3980×2260×2450   Package(W×D×H) mm 2358×1910×2278 4040×2260×2450   Net/Gross/Operating weight kg 1460/1465/1606 3245/3255/3570	excitatiget	Total farf air flow	CFM	4×0.882×104	8×0.9235×104	
Sound pressure vdl dB(A) 72 /   Dimension Outline(W×D×H) mm 2278×1830×2278 3980×2260×2450   Package(W×D×H) mm 2358×1910×2278 4040×2260×2450   Net/Gross/Operating weight kg 1460/1465/1606 3245/3255/3570		Total fan motor power	kW	The input power depends on the actually-measured value of the whole unit.		
Dimension Outline(W×D×H) mm 2278×1830×2278 3980×2260×2450   Package(W×D×H) mm 2358×1910×2278 4040×2260×2450   Net/Gross/Operating weight kg 1460/1465/1606 3245/3255/3570	Sound pressure level		dB(A)	72	/	
Package(W×D×H) mm 2358×1910×2278 4040×2260×2450   Net/Gross/Operating weight kg 1460/1465/1606 3245/3255/3570	Dimension	Outline(W×D×H)	mm	2278×1830×2278	3980×2260×2450	
Net/Gross/Operating weight kg 1460/1465/1606 3245/3255/3570		Package(W×D×H)	mm	2358×1910×2278	4040×2260×2450	
	Net/Gross/Operation	Net/Gross/Operating weight		1460/1465/1606	3245/3255/3570	
Loading quantity 40'GP/40'HQ set 5/5 2/2	Loading quantity 40'GP/40'HQ		set	5/5	2/2	

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## Modular Air-cooled Scroll Chiller

E Series



Thanks to the compact and flexible modularized structure, E Series Modular Type Scroll Chillers can be widely used for newly-built and retrofitted large and small-sized industrial and civil air conditioning projects, like apartments, hotels, restaurants, office buildings, shopping malls, theaters, gyms, factories, hospitals, etc. It is also the ideal choice for where there is high requirement on noise and ambient environments and it is inconvenient to install the cooling tower.

Item		Water side (water te	Air side (outdoor temperature)			
	Nominal operati	ng condition	Operating	range	Nominal operating condition	Operating range
	Inlet (°C)	Outlet (°C)	Outlet (°C)	I/O difference (°C)	DB (°C)	DB (°C)
Cooling	12	7	5~20	2.5~6	35	0~46

# Features

#### New Appearance Design

•For E series units, it's with beautiful appearance, highlighted outlines, and powerful visual impact. •The zinc-nickle alloy screws have been put into use for higher corrosion resistance and reliability for the whole unit.

#### Wide Operation Range

Ambient operation temperature for E Series Modular unit is 0~46 C and the temperature range of water outlet is 5~20°C;



#### Powerful Compatibility

- Different models can be modularized freely and up to 16 units can be modularized in parallel.
- It can be modularized with any D series model.

## High-efficiency Shell and Tube

•The dual-flow design can greatly improve the heat exchanging effect and the capacity of the unit. •The specially-designed header box and flow distributor can largely improve the evenness of refrigerant vapor-liquid mixture after throttling and then improve the heat exchanging capacity of the shell and tube.



### Low Noise Operation

Thanks to active and passive noise reduction technologies, noise of the model 130 can be lowered to 69dB(A), for creating quiet and comfortable environment for users.





Dry shell-and-tube heat exchanger



#### Compressor Operation Balance Technology

The unique compressor operation balance technology makes sure that each compressor operates in turn, which greatly prolongs the lifespan of compressor.

Free Master Module Design

Any single unit can operate as the master once connected with the wired controller. It overcomes the problem which would occur to the product of other manufacturer that the whole system would fail to work properly when there's malfunction for the fixed master unit.

#### Super Protection Functions

50Hz

This series is equipped with advanced microcomputer control system, completed protection functions and powerful error diagnosis function.

Main protection functions: compressor high pressure protection, compressor low pressure protection, compressor overload protection, antifreezing protection, waterflow switch protection, temperature sensor protection, phase sequence protection, high discharge temperature protection, etc.

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Capacity	Cooling/Heating	kW	65	82	132	162				
		RT	18.48	23.32	37.54	46.07				
Capacity steps		%	0、50、100	0、50、100	0、50、100	0、25、50、75、100				
EER		W/W	3.20	3.19	3.20	3.00				
Power supply		V-Ph-Hz	400V~3N~50Hz	400V~3N~50Hz	400V~3N~50Hz	400V~3N~50Hz				
Power input	Cooling	kW	20.3	25.7	41.2	54.0				
	Туре	—	Constant speed scroll							
Compressor	Starting mode	—		Direct startup						
	Quantity	—	2	2	2	4				
	Туре	—		Dry expansio	n evaporator					
	Water flow volume	m³/h	11.20	14.10	22.70	27.90				
Water side heat		GPM	49	62	100	123				
exchanger	Pressure drop	kPa	45	60	60	60				
		ft.WG	14.76	19.68	19.68	19.68				
	Connection pipe	_	Flange connection							
	Туре	—	Aluminum fin-copper tube							
Air side heat	Fan type and quantity	—	Axial-flow							
All Side fieat	Total fan airflow	m³/h	2×1.2×10 <sup>4</sup>	2×1.4×104	4×1.2×10 <sup>4</sup>	4×1.4×10 <sup>4</sup>				
excitatiget		CFM	2×0.7056×10 <sup>4</sup>	2×0.8239×10 <sup>4</sup>	4×0.7056×10 <sup>4</sup>	4×0.8239×10 <sup>4</sup>				
	Total fan motor power	kW	2×0.65	2×0.75	4×0.65	4×0.75				
Sound pressure level		dB(A)	66	67	70	70				
Dimension	Outline(W×D×H)	mm	2138×1025×2243	2138×1025×2243	2306×1980×2320	2306×1980×2320				
Dimension	Package(W×D×H)	mm	2198×1085×2243	2198×1085×2243	2366×2040×2320	2366×2040×2320				
Net/Gross/Operating weight		kg	730/735/799	770/775/843	1280/1285/1409	1540/1545/1697				
oading quantity 40'GP/40'HO		set	11/11	11/11	5/5	5/5				





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