Sabro

R-134a

Water Cooled Screw Chillers

(63 RT - 490 RT)

Sabro technologies is a wholly owned subsidiary of **Sabro group Pvt.,Ltd.,** specializing in research, development and manufacturing of Screw type Products.

The company sells **Water cooled Screw Chillers**-with-optimum-COP(HIGH ENERGY EFFICIENCY RATIO).

Adhering to the principle of integrity, innovation and excellence, the company constantly creates new products every year according to the market demands. The Water cooled Screw Chillers have the features of high energy efficiency ratio, optimum reliability, higher efficiency, and high automation etc., which continues to lead the domestic refrigeration energy industry, opening a new era of high efficiency screw type of products.

Sabro Water cooled Package SCREW Chillers **(WFSC)** are the most efficient **Screw Chillers** of their class, generally suitable for central air conditioning application such as multi-story buildings, motels, hotels, hospitals, restaurants, arcades, shopping malls, pharmaceuticals, offices and industries complexes etc.

Each water cooled screw chiller unit consists of single/multiple evaporator shells, single/multiple condenser shells, one or more accessible semi-hermetic twin screw compressors, star-delta soft starters - VFD, high efficiency evaporator and complete refrigerant piping + essential electrical & refrigerant controls.

- **High-performance screw compressor.**
- **Operation & monitoring are convenient.**
- **Full Safety protection function to make condenser/chiller shells run safely.**

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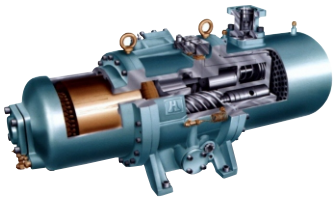
www.sabrotechnology.com

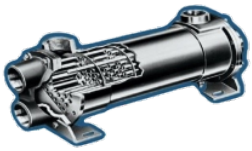
SABRO Compact Screw Chillers
WFSC Series - R-134a



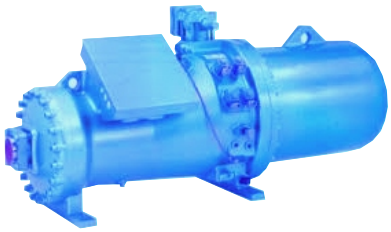
Features

1- Using R134a refrigerant
2- Positive pressure refrigerant, no need for exhaust device, the design of ventilation is simple
3- Using Hanbell semi-closed double screw compressor
4- Using high efficiency falling film (spray) evaporator
5- Using independent oil return system (ejector pump oil return), which guarantees timely oil return at any loading condition
6- The machine adopts fixed orifice plate as flow control device which has no moving parts. The refrigerant flow can be adjusted in time without delay under variable load and variable conditions, so as to ensure stable operation of the package.
7- The microcomputer control system of the unit uses Hi-Tech UI, which clearly shows the operation data, and the operation is very convenient.

High reliability

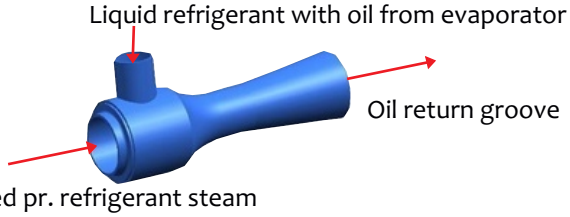


1- Professional design
Hanbell specializes in the research and development of the technology of screw compressors. Its main product screw refrigeration compressor is used in large commercial central air conditioning and refrigeration equipment etc.. After
years of development, Hanbell has become one of the most powerful compressor manufacturers in HVAC engineering field. Hanbell screw compressor occupies a larger share in the domestic market of the screw compressor. Since 2006, Hanbell's market share has always been way ahead in the same industry.



2- Authoritative certification
The company has the most advanced water cooled chiller test bench which is certified by the National Quality Supervision and Inspection Center of compressor & refrigeration equipment (Hefei General Machinery Research Institute). The test bench in strictly established accordance with the national standard GB/T10870-2014, GB/T18430.1-2007 and GB/T 19409-2013. Each machine will go through a full set of strict performance test before delivery to ensure the performance of the package.

3- Reliable oil return device-ejector pump
The package uses an ejector pump as oil return component, and it uses medium pressure flash stream as the power, which completes oil return at the low pressure side without the energy loss of the package.



Technical specifications of Water cooled screw flooded chiller (single compressor)

Model Number			WFSC-234-S	WFSC-260-S	WFSC-280-S	WFSC-298-S	WFSC-323-S	WFSC-348-S	WFSC-380-S	WFSC-406-S
Nominal cooling capacity		Tons(RT)	66.5	74	80.4	85	92	98.6	108	115
		KW	234	260	283	298	323	346.7	380.7	405.7
		kCal/h x1000	201	224	243	257	278	211	326	348
Power input		KW	44.5	48.1	53.8	57.8	60.5	65.8	71.0	73.1
Rated current		Amps.	79.9	85.2	92.2	98.1	105	112.4	121.2	125
Power supply		Voltage	380-415-3-50Hz							
Energy efficiency ratio		EER (COP)	17.9 (5.25)	18.5 (5.40)	17.9 (5.26)	17.64 (5.15)	18.24 (5.33)	18 (5.26)	18.25 (5.36)	19 (5.54)
Capacity steps		%	25-50-75-100 OR step less as optional							
Compressor	Type		Semi-hermetic twin screw							
	Quantity		One	One	One	One	One	One	One	One
	Starting Method		y-Δ	y-Δ	y-Δ	y-Δ	y-Δ	y-Δ	y-Δ	y-Δ
	Rated speed (RPM)		2950	2950	2950	2950	2950	2950	2950	2950
Refrigerant			134a	134a	134a	134a	134a	134a	134a	134a
No. of refrigerant circuit			One	One	One	One	One	One	One	One
Refrigerant control			Orifice + electronic expansion valve							
Evaporator (cooler)	Type		Shell and Tube Flooded							
	Water passes		2	2	2	2	2	2	2	2
	Water flow rate EWFR	USGPM	159.6	177.6	193	204	221	237	259	276
		m^3/h	36.2	40.3	43.8	46.3	50.2	53.8	59	62.3
	Water pressure drop	KPa/feet	34/11	36/12	38/13	41/14	43/14	45/15	45/15	46/15
	Water side working pressure	MPa/PSI		1/145	1/145	1/145	1/145	1/145	1/145	1/145
	Water connection	mm	DN76	DN76	DN102	DN102	DN102	DN102	DN102	DN102
		Inch	3	3	4	4	4	4	4	4
Condenser	Type		Shell and tube							
	Water passes		2	2	2	2	2	2	2	2
	Water flow rate CWFR	USGPM	199.5	222	241.2	255	276	296	324	345
		m^3/h	45.3	50.42	55	58	62.7	67.2	73.6	78
	Water pressure drop	KPa/feet	36/12	38/13	40/13	43/14	44/14	47/16	48/16	48/16
	Water side working pressure	MPa/Psi	1/145	1/145	1/145	1/145	1/145	1/145	1/145	1/145
	Water connection	mm	DN76	DN76	DN102	DN102	DN102	DN102	DN102	DN102
		Inch	3	3	4	4	4	4	4	4
Dimensions (mm)		Length	3450	3450	3450	3450	3650	3640	3640	3640
		width	1500	1500	1500	1500	1550	1550	1550	1600
		height	1600	1600	1600	1600	1650	1650	1650	1700
Operating weight		Kg	2800	3000	3200	3450	3450	3450	3550	3550
Protection devices	High pressure cut out, low pressure cut out, power phase protection, anti -freeze protection, frequent start protection, over current protection, over heat protection Comp., water flow protection, reverse phase protection,									
Operating limits	Leaving Chilled water temp.		5°C-15°C (41°F – 59°F)							
	Entering condenser water temp.		20°C-35°C (68°F – 95°F)							

Specifications are based on standard conditions,
(ECWT/LCWT)Entering/leaving chilled water 12.7 °C/7.2 °C (55°F/45 °F)
(CEWT/CLWT)Entering/leaving condenser water 30 °C/35 °C (85°F/95 °F)
(FF)Fouling factor 0.0005Btu/hr/S qft/ °F
Specification s are subject to change keeping in view improvement in product.

Technical specifications of Water cooled screw flooded chiller (single compressor)

Model Number			WFSC-430-S	WFSC-490-S	WFSC-545-S	WFSC-585-S	WFSC-684-S	WFSC-785-S	WFSC-860-S
Nominal cooling capacity		Tons(RT)	121	139	155	166	194.5	223	245
		KW	427.3	490.3	544	585	684	783	862
		kCal/h x1000	366	420	469	502	588	674	741
Power input		KW	79	90.5	99.5	107.4	122	142	154.5
Rated current		Amps.	136.4	157	172	186.4	210	251	270
Power supply		Voltage	380-415-3-50Hz						
Energy efficiency ratio		EER (COP)	18.4 (5.4)	18.4 (5.41)	18.7 (5.46)	18.54 (5.45)	19.13 (5.6)	19 (5.5)	19 (5.6)
Capacity steps		%	25-50-75-100 OR step less as optional						
Compressor	Type		Semi-hermetic twin screw						
	Quantity		One	One	One	One	One	One	One
	Starting Method		y-Δ	y-Δ	y-Δ	y-Δ	y-Δ	y-Δ	y-Δ
	Rated speed (RPM)		2950	2950	2950	2950	2950	2950	2950
Refrigerant			134a	134a	134a	134a	134a	134a	134a
No. of refrigerant circuit			One	One	One	One	One	One	One
Refrigerant control			Orifice + electronic expansion valve						
Evaporator (cooler)	Type		Shell and Tube Flooded						
	Water passes		2	2	2	2	2	2	2
	Water flow rate EWFR	USGPM	290.4	333.6	372	398.4	467	535	588
		m^3/h	66	76	84.5	89.3	106	121.5	133.5
	Water pressure drop	KPa/feet	50/17	53/18	56/19	58/19	60/20	63/21	65/22
	Water side working pressure	MPa/Psi	1/145	1/145	1/145	1/145	1/145	1/145	1/145
	Water connection	mm	DN125	DN125	DN125	DN150	DN150	DN150	DN150
		Inch	5	5	5	6	6	6	6
Condenser	Type		Shell and tube						
	Water passes		2	2	2	2	2	2	2
	Water flow rate CWFR	USGPM	363	417	465	498	583.5	669	735
		m^3/h	82.4	95	105.6	113	132.5	152	167
	Water pressure drop	KPa/feet	52/18	55/18	58/19	59/20	60/20	62/21	66/22
	Water side working pressure	MPa/Psi	1/145	1/145	1/145	1/145	1/145	1/145	1/145
	Water connection	mm	DN125	DN125	DN125	DN150	DN150	DN150	DN150
		Inch	5	5	5	6	6	6	6
Dimensions (mm)		Length	3640	3640	3640	3640	3640	3640	3640
		width	1600	1600	1700	1700	1800	1800	1850
		height	1850	1850	1900	2000	2200	2200	2200
Operating weight		Kg	4000	4800	5500	5900	6200	6500	7000
Protection devices	High pressure cut out, low pressure cut out, power phase protection, anti -freeze protection, frequent start protection, over current protection, over heat protection Comp., water flow protection, reverse phase protection,								
Operating limits	Leaving Chilled water temp.		5°C-15°C (41°F – 59°F)						
	Entering condenser water temp.		20°C-35°C (68°F – 95°F)						

Specifications are based on standard conditions,

(ECWT/LCWT)Entering/leaving chilled water 12.7 °C/7.2 °C (55°F/45 °F)

(CEWT/CLWT)Entering/leaving condenser water 30 °C/35°C (85°F/95 °F)

(FF)Fouling factor 0.0005Btu/hr/S qft/ °F

Specification s are subject to change keeping in view improvement in product.

Technical specifications of Water cooled screw flooded chiller (double compressor)

Model Number (WFSC)			850-D	980-D	1088-D	1170-D	1370-D	1570-D	1725-D
Nominal cooling capacity @65HZ		Tons(RT)	243	278	309	332	389	445	490
		KW	854	980	1087	1169	1368	1566	1724
		KCal/hx1000	735	841	934	1004	1177	1346	1482
Power input (each comp.)		KW	79 +79	90 + 90	99 + 99	107+107	122+122	142+142	155+155
Rated current (each)		Amps.	136+136	157+157	172+172	187+187	211+211	252 +252	270+270
Power supply		Voltage	380-415-3-50Hz						
Energy efficiency ratio		EER COP	18.4 5.4	18.5 5.4	18.7 5.5	18.6 5.5	19.1 5.6	18.8 5.5	18.9 5.6
Capacity control		%	25-50-75-100% OR step less as optional						
Compressor	Type		Semi-hermetic twin screw						
	Quantity		two						
	Starting Method		Y-Δ						
	Rated speed		2950RPM						
Refrigerant			134a						
No. of refrigerant circuit			Two						
Refrigerant control			Orifice + electronic expansion valve						
Evaporator (cooler)	Type		Shell and tube flooded						
	Water passes		2						
	Water flow rate EWFR	USGPM	583	667	742	797	943	1068	1176
		m^3/h	134.4	151.5	168.5	181	214	242.5	267
	Water pre. drop	Kpa/feet	55/18	58/19	60/20	60/20	65/22	70/23.5	72 / 24
	Water side working Pre.	Mpa/PSI	1.0MPa/145						
	Water connection	MM	DN150	DN150	DN200	DN200	DN200	DN200	DN 200
		Inch	6	6	8	8	8	8	8
Condenser	Type		Shell and tube						
	Water passes		2	2	2	2	2	2	2
	Water flow rate CWFR	USGPM	729	834	927	996	1167	1335	1470
		m^3/h	165.6	189.4	210.5	226	265	303	334
	Water pre. drop	Kpa/feet	58/19	62/21	65/22	70/23	70/23	74/25	80/26
	Water side working pre.	Mpa/PSI	1.0MPa/145						
	Water connection	MM	DN150	DN150	DN200	DN200	DN200	DN200	DN 200
		Inch	6	6	8	8	8	8	8
Dimensions MM (inches)		Length	4600 (181)			4650(183)			
		width	1750 (69)			1800 (72)			
		height	2000 (79)			2210 (87)			
Operating weight APP.		Kg	6500	6850	7200	7400	7800	8500	9200
Protection devices	High pressure cut out, low pressure cut out, power phase protection, anti freeze protection, frequent start protection, over current protection, over heat protection Comp., water flow protection, reverse phase protection,								
Operating limits	Leaving Chilled water temp.		5°C-15°C (41°F – 59°F)						
	Entering condenser water temp.		20°C-35°C (68°F – 95°F)						

Specifications are based on standard conditions,
(ECWT/LCWT)Entering/leaving chilled water 12.7 °C/7.2 °C (55°F/45 °F)
(CEWT/CLWT)Entering/leaving condenser water 30 °C/35 °C (85°F/95 °F)
(FF)Fouling factor 0.0005Btu/hr/S qft/ °F
Specification s are subject to change keeping in view improvement in product.

Technical specifications of Water cooled inverter screw flooded chiller (single compressor)

Model Number (WFSC)			220-SV	260-SV	304-SV	370-SV	420-SV	500-SV	556-SV	760-SV
Nominal cooling capacity @65HZ		Tons(RT)	63.4	74.8	86.4	104.8	119.5	140.8	158.0	216
		KW	223	263	304	368.6	420	495	556.0	760
		KCal/hx1000	192	226	261	317	361	426	478	653
Power input		KW	45	51.2	59.1	71.0	80.4	94	104	142.4
Rated current		Amps.	76	87	101	122	137.2	160	179	242.5
Power supply		Voltage	380-415-3-50Hz							
Energy efficiency ratio		EER	16.98	17.5	17.5	17.7	17.8	17.97	18.2	18.2
		COP	4.9	5.13	5.14	5.19	5.22	5.26	5.34	5.34
Capacity control			(Modulating) variable speed							
Compressor	Type		Semi-hermetic twin screw							
	Quantity		one							
	Starting Method		By inverter, speed up 0HZ to 65HZ							
	Rated speed @ 65HZ		3840RPM							
Refrigerant			134a							
No. of refrigerant circuit			one							
Refrigerant control			Orifice + electronic expansion valve							
Evaporator (cooler)	Type		Shell and tube flooded							
	Water passes		2							
	Water flow rate EWFR	USGPM	152	179.5	207	252	287	338	380	518
		m^3/h	43.5	40.8	47.0	57.2	65.2	76.8	86.3	117.6
	Water pre. drop	Kpa/feet	34/11	36/12	41/14	45/15	47/16	53/18	56 / 19	63/21
	Water side working Pre.	Mpa/PSI	1.0MPa/145							
	Water connection	MM	DN76	DN76	DN102	DN102	DN125	DN125	DN 125	DN150
		Inch	3	3	4	4	5	5	5	6
Condenser	Type		Shell and tube							
	Water passes		2	2	2	2	2	2	2	2
	Water flow rate CWFR	USGPM	190	224	259	314	358	422	474	648
		m^3/h	43.2	50.9	58.8	71.3	81.3	95.8	108	147
	Water pre. drop	Kpa/feet	36/12	38/13	43/14	48/16	48/16	55/18	60/20	62/21
	Water side working pre.	Mpa/PSI	1.0MPa/145							
	Water connection	MM	DN76	DN76	DN102	DN102	DN125	DN125	DN 125	DN150
		Inch	3	3	4	4	4	5	5	6
Dimensions MM (inches)		Length	3450 (136)			3640 (136)		3640 (136)		
		width	1500 (59)			1550 (61)		1700 (67)		
		height	1600 (63)			1650 (65)		2200 (87)		
Operating weight APP.		Kg	2800	3000	3500	3550	4000	4800	5500	6200
Protection devices			High pressure cut out, low pressure cut out, power phase protection, anti freeze protection, frequent start protection, over current protection, over heat protection Comp., water flow protection, reverse phase protection,							
Operating limits	Leaving Chilled water temp.		5°C-15°C (41°F – 59°F)							
	Entering condenser water temp.		20°C-35°C (68°F – 95°F)							

Specifications are based on standard conditions,
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(FF)Fouling factor 0.0005Btu/hr/S qft/ °F
Specification s are subject to change keeping in view improvement in product.

Technical specifications of Water cooled inverter screw flooded chiller (double compressor)

Model Number (WFSC)			840-SV	915-SV	990-SV	1050-SV	1110-SV	1315-SV	1520-SV
Nominal cooling capacity @65HZ		Tons(RT)	239	260	281	298	316	374	432
		KW	840	915	990	1050	1110	1315	1520
		KCal/hx1000	723	786	850	901	956	1131	1306
Power input (each comp.)		KW	80 +80	80 + 94	94 + 94	94+ 104	104+104	104+142	142+142
Rated current (each)		Amps.	137+137	137+160	160+160	160179	179+179	179 +243	243+243
Power supply		Voltage	380-415-3-50Hz						
Energy efficiency ratio		EER COP	16.93 5.2	17.9 5.25	17.9 5.25	18.0 5.3	18.2 5.33	18.5 5.43	18.25 5.35
Capacity control			(Modulating) variable speed						
Compressor	Type		Semi-hermetic twin screw						
	Quantity		two						
	Starting Method		By inverter, speed up 0HZ to 65HZ						
	Rated speed @ 65HZ		3840RPM						
Refrigerant			134a						
No. of refrigerant circuit			Two						
Refrigerant control			Orifice + electronic expansion valve						
Evaporator (cooler)	Type		Shell and tube flooded						
	Water passes		2						
	Water flow rate EWFR	USGPM	574	624	675	715	758	898	1037
		m^3/h(CMH)	130.4	142	153	162.3	172	204	236
	Water pre. drop	Kpa/feet	55/18	58/19	60/20	60/20	65/22	70/23.5	72 / 24
	Water side working Pre.	Mpa/PSI	1.0MPa/145						
	Water connection	MM	DN150	DN150	DN200	DN200	DN200	DN200	DN 200
		Inch	6	6	8	8	8	8	8
Condenser	Type		Shell and tube						
	Water passes		2	2	2	2	2	2	2
	Water flow rate CWFR	USGPM	717	780	843	894	948	1122	1296
		m^3/h	163	177	191	203	215	255	294
	Water pre. drop	Kpa/feet	58/19	62/21	65/22	70/23	70/23	74/25	80/26
	Water side working pre.	Mpa/PSI	1.0MPa/145						
	Water connection	MM	DN150	DN150	DN200	DN200	DN200	DN200	DN 200
		Inch	6	6	8	8	8	8	8
Dimensions MM (inches)		Length	4600 (181)			4650(183)			
		width	1750 (69)			1800 (71)			
		height	2000 (79)			2210 (87)			
Operating weight APP.		Kg	6500	6850	7200	7400	7600	7900	8200
Protection devices	High pressure cut out, low pressure cut out, power phase protection, anti freeze protection, frequent start protection, over current protection, over heat protection Comp., water flow protection, reverse phase protection,								
Operating limits	Leaving Chilled water temp.		5°C-15°C (41°F – 59°F)						
	Entering condenser water temp.		20°C-35°C (68°F – 95°F)						

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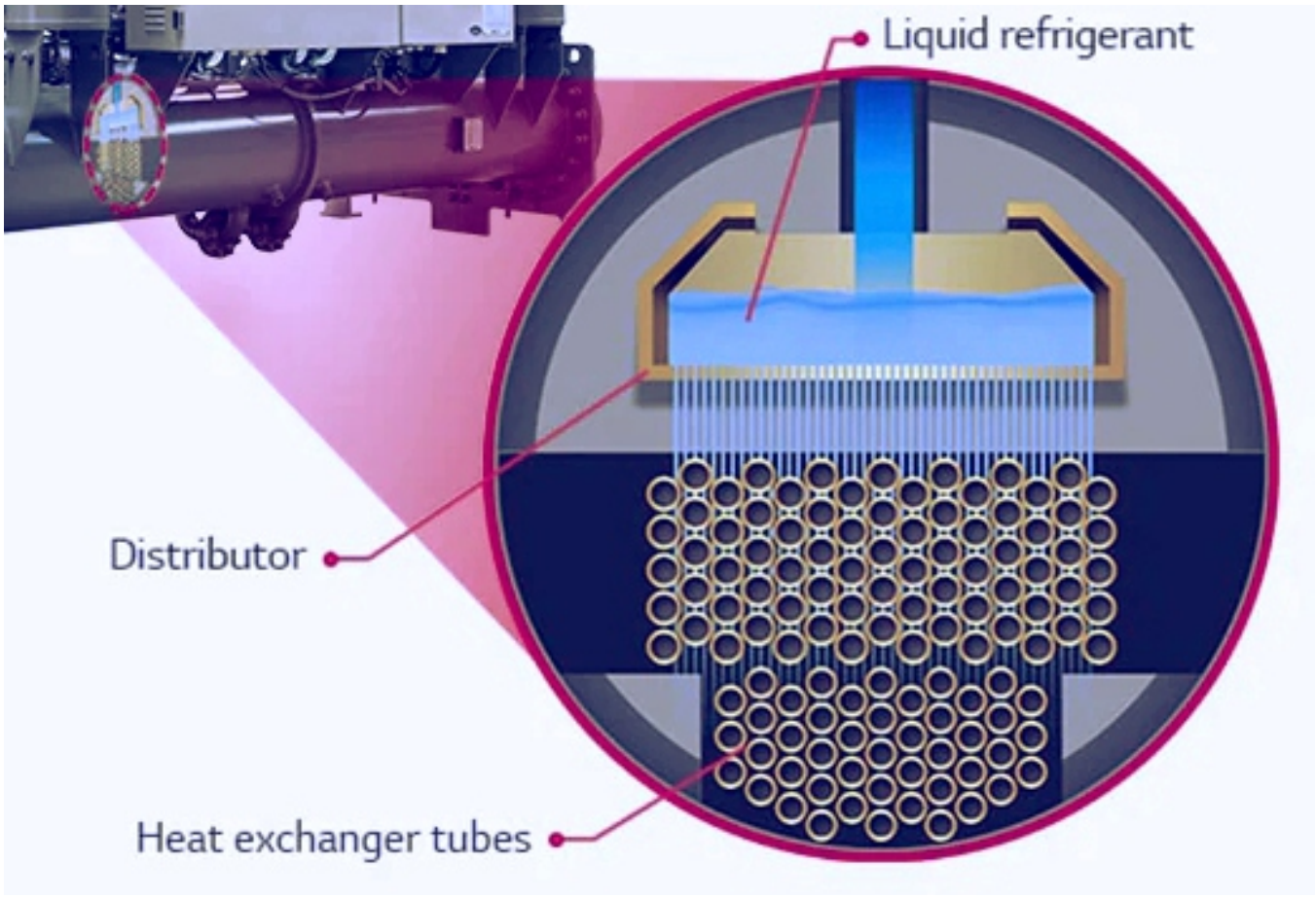
Larger Capacities Models are available On Demand

Shaping Your Future With Cutting Edge HVAC Solutions



Inspired By The Stimulus to Grow through Knowledge, interlaced with the zeal and sheer commitment, of an enthusiastic team and **Gripped by the Obsession of Three Brothers** of turning the dream- into reality, Sabro has evolved, grown and expanded since its inception in 1969.

It was the fruit of commitment, hope and hard work that enabled us to be the pioneers of HVAC manufacturing in Pakistan, exporting to over 22 countries, encapsulating 3 continents. We now thrive as an agile manufacturer for a complete range of HVAC manfacture including Chillers, Self-Contained units, Air-Side Equipment, Mini Split Units & a menagerie of customised HVAC manufacture tailored to suit every HVAC requirement of the customer.

For over five decades, Sabro has been a trusted brand name that has exceeded expectations nationwide & internationally, catering to the needs of both domestic as well international customers.

2014: Obtained BS EN ISO 9001:2008

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AIR CONDITIONING EQUIPMENT