

Centrifugal Chillers

Big on reliability and performance.



WATER COOLED CENTRIFUGAL CHILLERS

Wide Range Of Energy-efficient Chillers

Blue Star, India's largest central airconditioning company, has been providing expert cooling solutions for over seven decades now. As a leader in the industry, Blue Star has been manufacturing a wide range of Scroll, Screw and Turbocor chillers that cool many critical spaces such as office complexes, IT parks, hospitals, airports, green buildings, hotels, malls, etc., across the country.

As an addition to its existing product portfolio, the company is proud to launch its new range of state-of-the-art AHRI certified water cooled centrifugal chillers- the LCWC series- to further enhance its flexibility in offering the best solutions for various project requirements.

Available in a wide range of capacities from 300TR to 4000TR, these chillers can be customised to specific needs.



Wide Capacity Range

Blue Star's latest centrifugal chillers are available in a wide range of capacities: from 300TR right up to 4000TR.

- Single Stage (300TR - 2000TR)
- Double Stage (500TR - 1600TR)
- Dual Compressor (2000TR - 4000TR)

The lower capacity chillers operate on 415V/3 phase input power while the higher capacity chillers operate on medium and high voltage input supply.





Project Specific Chiller Design

While the wide capacity range already ensures that Blue Star's centrifugal chillers readily fit almost every requirement, they are not limited to the off-the-shelf capacity models alone. Blue Star also custom designs centrifugal chillers to suit specific project requirements.

Based on specific needs, the company delivers centrifugal chillers exclusively designed for your project requirements using its exhaustive range of coolers, condensers, impellers and motors so that there's a precise match between the capacity and performance requirements of the project.





VFD Option



Blue Star's LCWC series of centrifugal chillers can also be optionally fitted with variable frequency drives (VFDs) in order to enhance power savings.

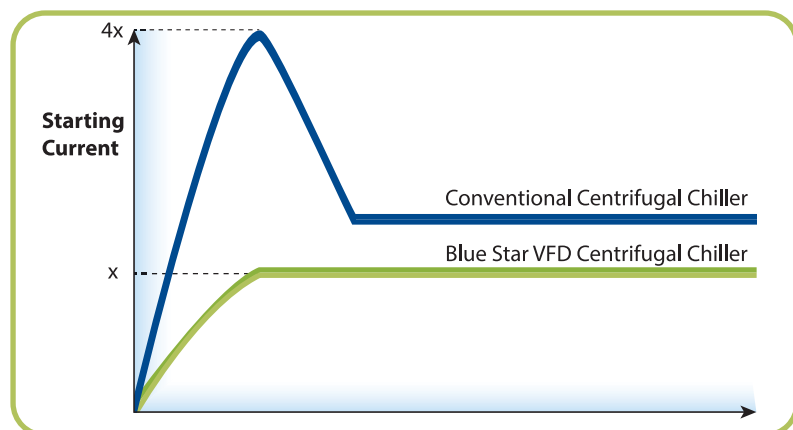
Benefits

When a VFD is installed, the frequency of the compressor is continuously modulated in line with the varying chiller load, thereby achieving precise capacity control and ensuring maximum power savings.

What's more, conventional chillers need higher starting currents, as much as 3 to 4 times more than VFD-fitted chillers.

Hence, VFD-fitted chillers require lower capacity electricals including DG sets, and do not need expensive soft starters that standard chillers need to avoid the initial spike in current.

VFD-fitted centrifugal chillers also provide a high power factor resulting in higher transmission efficiency, thereby further reducing power consumption.





Energy-efficient Chillers

Blue Star's latest range of energy-efficient centrifugal chillers come with unparalleled energy and environmental benefits. The energy efficiency of these chillers are with **one of the industry-highs of 6.5 COP and 9.7 IPLV**. These high efficiencies both at full load and part load help achieve tremendous energy cost reduction and lower life-cycle costs compared to conventional chillers.

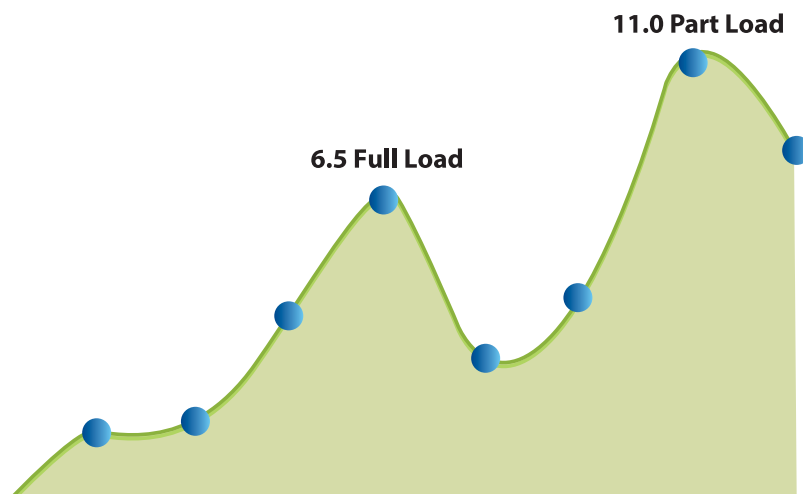
Needless to say, these chillers exceed the energy-efficiency requirements of both ASHRAE 90.1.2010 and ECBC.

ECBC table

Equipment Class		Minimum COP	Minimum IPLV	Test Standard
Centrifugal Water-cooled Chiller	≥ 530 and < 1050 kw (≥ 150 and < 300 tons)	5.8	6.17	ARI 550/590-1998
	≥ 1050 kw (≥ 300 kw)	6.3	6.61	ARI 550/590-1998

ASHRAE 90.1 2010 Table

Equipment Class		Minimum COP	Minimum IPLV	Test Standard
Water-cooled, Electrically Operated, Centrifugal	≥ 300 tons and < 600 tons	≤ 0.576 kw/ton	≤ 0.549 IPLV	AHRI 550/590
	≥ 600 tons	≤ 0.57 kw/ton	≤ 0.539 IPLV	



Blue Star LCWC Chiller Co-efficient Of Performance

* LCWCV VFD Chiller COP at part load condition can reach even 11.



AHRI Certified Chillers

Blue Star's entire range of LCWC series centrifugal chillers is certified by AHRI (Airconditioning, Heating & Refrigeration Institute).

What's more, every chiller that leaves the factory is thoroughly run-tested before despatch to ensure that every unit performs efficiently and to design standards.

These factors ensure that the performance of every chiller meets or exceeds design standards in terms of capacity delivered, power consumption, etc.

Other Significant Certifications

Apart from AHRI, Blue Star's latest LCWC range of centrifugal chillers comply with the following stringent certification requirements for pressure vessels:

- ASME (American Society of Mechanical Engineers)
- NB (American National Board)
- ETL (complying with safety regulations of North America & Canada)
- JKKP (safety regulator of Malaysia)
- EC (European safety regulator, Norway)



High Efficiency Impellers

- Impeller design through advanced 3D Design CFD software from Germany for fluid dynamic simulation
- Impellers tested at 125% speed at factory for reliability at all field loads
- All impellers are dynamically balanced at factory with precision CNC machinery
- The impeller, motor and number of stages are selected tailor-made for each application ensuring the exact capacity is delivered and high efficiency
- Precision cast with special high density aluminium alloy using integer mould technique providing high anti-corrosion ability and light weight
- High back sweep aerodynamically contoured design provides the best part load and full load operating efficiency
- Optimised design resulting in very low noise level during operation



System Components



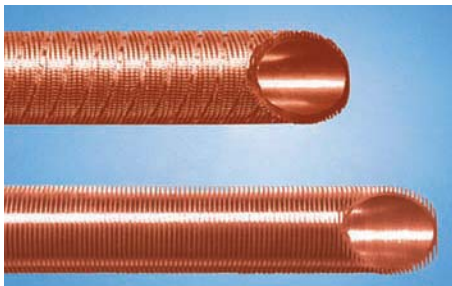
Electronically Controlled Adjustable Inlet Guide Vanes

- The vanes regulate inlet flow to provide high efficiency through a wide, stable operating range
- Chilled water temperature is maintained within $\pm 0.3^{\circ}\text{C}$ of the desired set point without surge or undue vibration

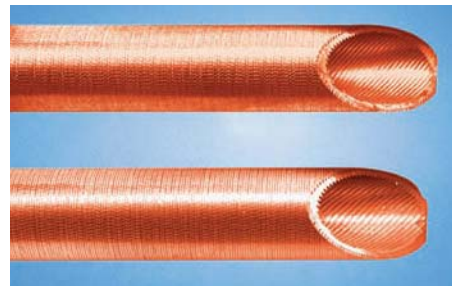
High Efficiency Heat Exchangers

- All the tubes are manufactured with specially designed copper alloy with “lands” sections ensuring higher heat transfer efficiency
- All the tubes are state-of-the-art, high-efficiency, externally and internally enhanced to provide optimum performance by increasing overall heat transfer
- Each tube is individually replaceable to facilitate faster rectification

Condenser tube



Evaporator tube



Emergency Oil Reservoir

- An emergency oil reservoir is provided exclusively to operate during power failure to provide adequate lubrication flow under gravity
- This prevents damage that could occur during the coast-down period in the event that power to the chiller is interrupted

Touch Screen Micro Controller

Blue Star's LCWC range of centrifugal chillers use a state-of-the-art microcomputer control system with a large 10.4 inch touch screen LED display which is user-friendly and easy to operate.

Salient Features:



Adjustment of chiller operation set point



Real time inspection and supervising of chiller operation status



Real time failure inspection



Historical operation data storage



RS-485, Siemens & Modbus communication port



Accurate and stable operation through “Smart Logic” control



Open protocol to interface with Building Management System



Group Control Mode to communicate and control multiple chillers



Simple and clear language of information

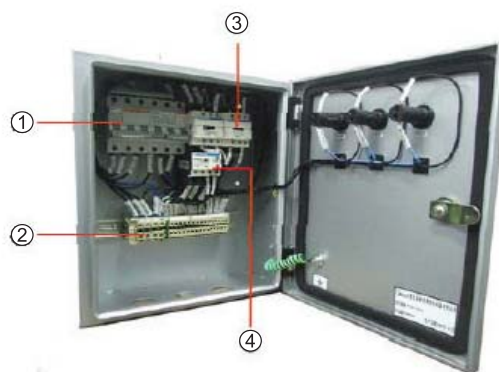
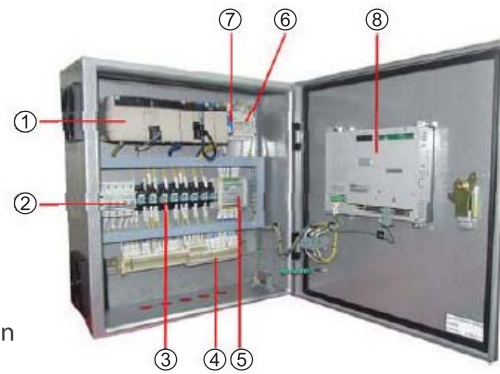


USB port from which trend data can be conveniently downloaded



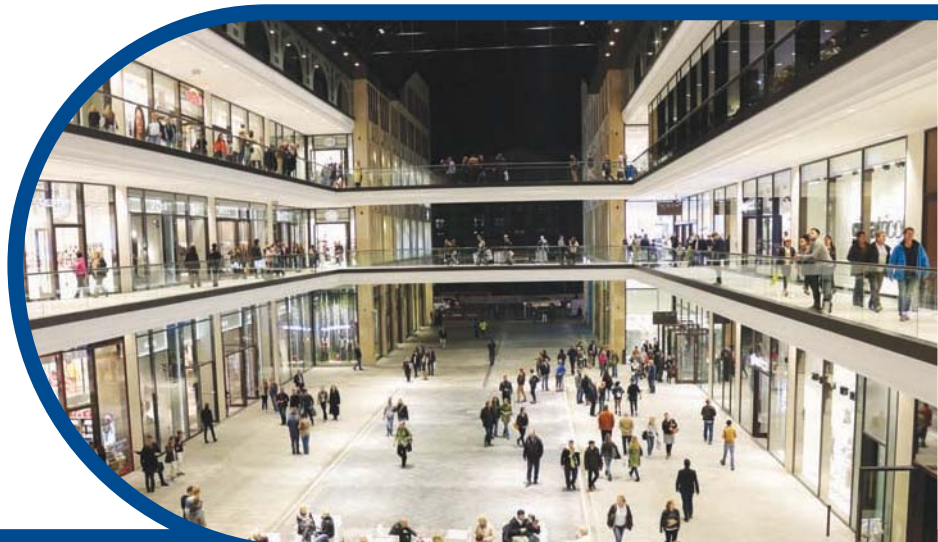
PLC Controller Panel

1. Controller
2. Air switch
3. Relay
4. Terminal
5. Multiplexer
6. Power On/Off
7. Current transducer
8. Touchable LED display screen



Oil Pump Electrical Panel

1. Air switch
2. Terminal
3. Contactor
4. Thermal relay



Other Features



Cupronickel tubes for heat exchangers



Enhanced tube thickness for heat exchangers - 0.889mm



Marine waterboxes



Marine bolt-on waterboxes for condenser, with titanium clad tubesheets for select condenser models



Performance witness test at factory



Heat recovery condenser



ASME U designator



IP 55 class of protection for control panel



Nano coating for corrosion resistance protection of condenser



Nano coating for corrosion resistance protection of cooler



BMS compatibility interface



Plant manager interface



Spring isolator

Standard Operating Range

		Unit	Min.	Max.
Evaporator	Inlet water temp.	°C	8	25
	Outlet water temp.	°C	4	15
Condenser	Inlet water temp.	°C	15.6	34
	Outlet water temp.	°C	22	41



TECHNICAL SPECIFICATION

Description	Units	LCWC300	LCWC350	LCWC400	LCWC450	LCWC500	LCWC550	LCWC600	LCWC650	LCWC700	LCWC750	LCWC800	LCWC850
Cooling Capacity	kW	1055	1230	1406	1582	1758	1934	2110	2285	2461	2637	2813	2989
	TR	300	350	400	450	500	550	600	650	700	750	800	850
Compressor													
Quantity	No.	1	1	1	1	1	1	1	1	1	1	1	1
Type		Semi-Hermetic Centrifugal											
Motor Type: Refrigerant Gas Cooled		Semi-Hermetic, 3Phase Squirrel Cage Motor											
Electrical Power Supply		415 V +/- 10%, 3 PH., 50HZ											
Flooded Cooler													
Type		Shell & Tube											
Water Connection Size In/Out	mm	200	200	200	200	200	200	250	250	250	250	250	300
No. of Refrigerant Circuit	No.	1											
Condenser													
Type		Shell & Tube											
Water Connection Size In/Out	mm	200	200	200	200	200	200	200	200	200	250	250	300
No. of Refrigerant Circuit	No.	1											
Overall Dimensions													
Length	mm	4944	4944	4944	4423	4944	4944	4944	4944	4944	4956	4956	5065
Width	mm	1994	1994	1994	1994	1994	1994	1994	1994	1994	2096	2096	2426
Height	mm	2131	2131	2131	2131	2131	2131	2131	2240	2240	2305	2305	2780
Weight													
Operating Weight (approx.)	Kg.	11189	11205	10764	10175	10947	10679	10841	12869	13017	13510	13804	16702

Note:

A. Rating Conditions:

1. Cooler leaving water temp. 44 Deg. F at flow rate of 2.4 USGPM/TR
2. Cooler fouling factor 0.0001 Hr.Ft2.F/Btu
3. Entering condenser water temp 85 F, at flow rate of 3 USGPM/TR
4. Condenser fouling factor 0.00025 Hr.Ft2.F/Btu

B. Dual compressor & dual stage models are also available on request, up to 4000 TR

C. Specifications subject to change

LCWC900	LCWC950	LCWC1000	LCWC1100	LCWC1200	LWCW1300	LCWC1400	LCWC1500	LCWC1600	LCWC1700	LCWC1800	LCWC1900	LCWC2000
3164	3335	3516	3868	4219	4571	4922	5274	5616	5967	6318	6669	7020
900	950	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
1												
Semi-Hermetic Centrifugal												
Semi-Hermetic, 3Phase Squirrel Cage Motor												
415 V +/- 10%, 3 PH., 50HZ						3 KV/6KV/10KV Medium Voltage						
Shell & Tube												
300	300	300	300	350	350	350	350	400	400	400	400	400
1												
Shell & Tube												
300	300	300	300	350	350	350	350	400	400	400	400	400
1												
5065	5675	5675	5675	5675	5737	5737	5737	5310	5310	5310	5310	5310
2426	2426	2426	2426	2426	2800	2800	2800	3100	3100	3100	3100	3100
2780	2780	2780	2950	2950	2955	2955	2955	3175	3175	3175	3175	3175
16704	18397	18399	19544	19799	21647	22263	23048	24448	24834	25775	26166	26686

Widest Range Of Products



VRF IV Plus

Free Match Inverter VRF
Airconditioning Systems



Packaged ACs & Ducted Splits

Water Cooled Screw Chillers with VFD



Turbocor Chillers

Water Cooled Screw Chillers



Air Cooled Screw Chillers



Air Cooled and Water Cooled Scroll Chillers



Air Cooled & Water Cooled
Condensing Units



Process Chillers



Authorized Dealer



Scan QR Code-Blue Star Customer
Care Mobaile App



viveka@adpsystems.co.in



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