



BLUE STAR

Screw Chillers (IOS) Range



**The optimum solution for
energy-efficient central airconditioning.**



Blue Star, India's largest central airconditioning company, has been providing expert cooling solutions for nearly seven decades now. Solutions that include a wide range of Screw, Scroll and Centrifugal Chillers, serving every conceivable need of the Industry.



Blue Star's new Screw Chillers (IOS) Range

Energy Efficient Solutions

Energy intense and special industrial applications depend on Chillers for precise control of process cooling. Along with Air Handling Units and Fan Coil Units, a Chiller provides the required conditions in typical work spaces. So when it comes to chilled water systems, there are different requirements and one size does not fit all.

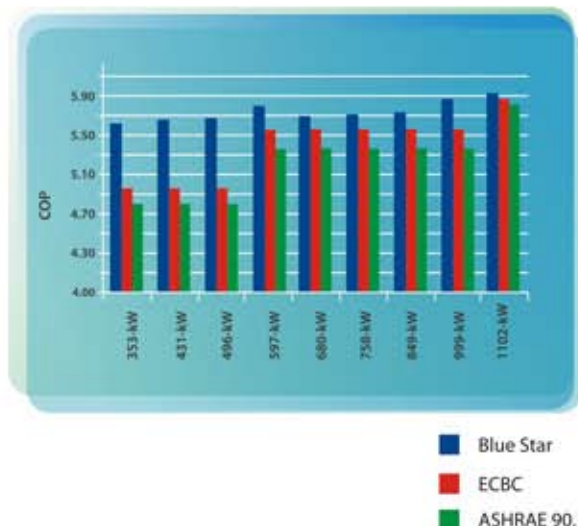
Blue Star has a comprehensive range of Chillers to meet every requirement, offering advanced technologies that optimise performance, whatever the environment.

With energy efficiency becoming the norm, Blue Star has introduced a range of Water-Cooled Flooded Chillers that use environmentally-friendly refrigerant R134a, offer effective capacity control, and provide excellent efficiency making them ideal for applications such as process applications, factories, and pharma applications.

Blue Star's new range of Water-Cooled Flooded Screw Chillers with Integrated Oil Separator (the IOS series) offers excellent energy-efficiency under full load and optimum performance under part load conditions.

Available in a wide range of models with capacities ranging from 100-313TR (353kW-1102kW), the IOS series Chillers offer great advantages as compared to regular Screw Chillers.

Efficiency Comparison





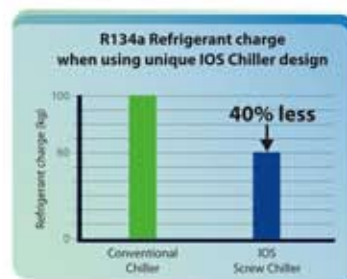
Features

Superior full load performance

The high efficiency design of these units ensures a very high energy performance at full load with COP up to 5.8 (0.60kW/TR) and part load with IPLV up to 6.9 (0.51kW/TR).

Environmentally responsible design with low refrigerant charge

With the global need to reduce HFC gas emission into the atmosphere, the unique design of these Screw Chillers enables reduction of refrigerant charge by as much as 40% as compared to conventional design, reinforcing our commitment to being green in every aspect of our design. These units use a green gas, R134a, which also enables superior heat transfer thereby delivering better efficiency. Further, the low refrigerant charge also ensures low maintenance costs during the service life of the equipment.



Intelligent low footprint, low weight, vertical stack design

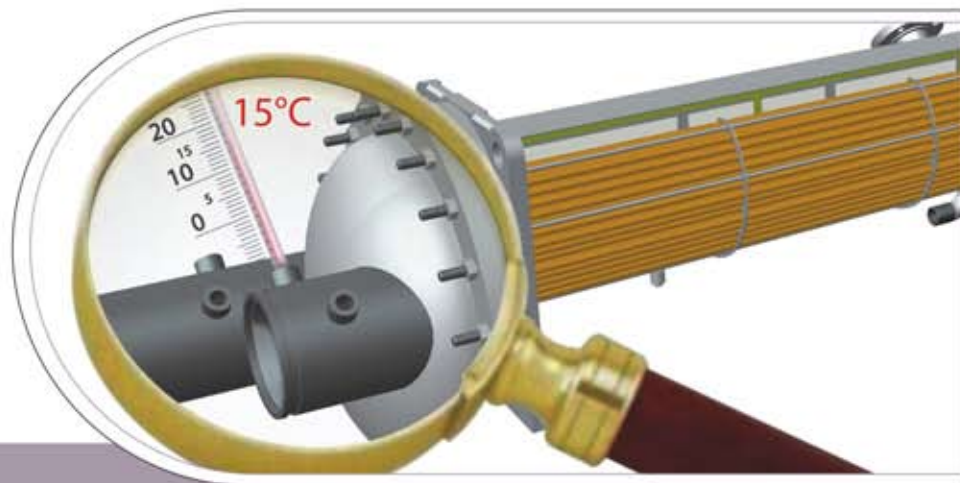
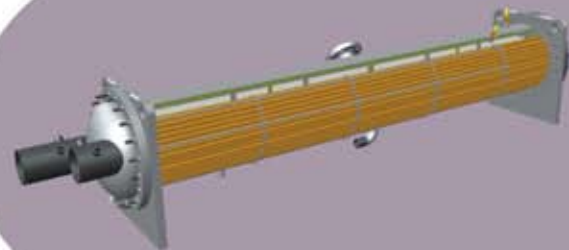
The intelligent low footprint, low weight and vertical stack design ensures that there is a reduction in footprint of 30-40% compared to conventional design, freeing up valuable floor space and allowing easier movement of units to the plant room.

AHRI test lab verified Chillers, ensuring real world savings

The performance of these Chillers can be verified at our certified AHRI test lab under various climatic conditions – a first for both Air-Cooled and Water-Cooled Chillers in India! As a customer therefore, you get verified performance enabling achievement of real world savings.

Low condenser-entry water operations

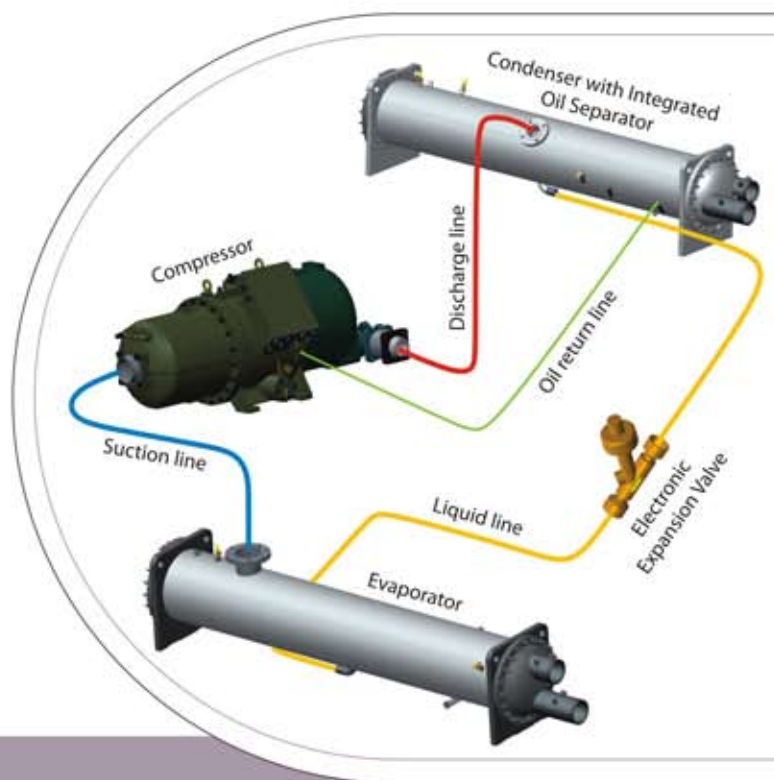
While conventional Screw Chillers require condenser water temperature from the cooling tower to be held artificially high, the IOS series Chillers are uniquely designed to run on water-entering temperature as low as 15°C (depending on chiller-leaving water temperature), thus reducing Plant cost and Chiller energy consumption.





Superior oil management

The discharge gas that enters the condenser is distributed across the length of the heat exchanger and passes through a high density oil separator which is integrated inside the condenser. This unique design enables optimal velocities for the oil separation under various operating conditions and also lends to decrease in unit footprint and weight, besides increasing performance thanks to negligible pressure drops of the refrigerant circuit.



High quality twin screw compressor



The semi-hermetic twin screw compressor has both compressor and motor installed in the same shell connected by a flange, free of oil leakage and easily maintainable. The efficiency of the shaft transmission which controls the motor shaft and the rotor revolutions of the twin screw compressor is high.

Further:



The compressor is specifically designed for optimum Vi ratio ideal for flooded operations



It runs with lower frictional losses



It has a low noise, low vibration design, and



It has a long bearing life and low service costs.



Robust and service-friendly design

The IOS series Chillers are designed for easy access to the compressors for efficient preventive maintenance and routine service.

Screw Chillers (IOS) Range Applications

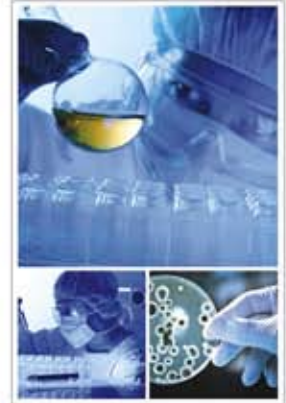
Process-critical applications

Critical process applications like factories and pharma manufacturing applications often need special attention for their cooling requirements as precise control of inside conditions is required for both temperature and humidity.

Further, effective functioning of production equipment is critical and central to the success in manufacturing industry. A disruption to the production line can cause significant revenue loss. International standards, certifications and guidelines (FDA, ISO 14000) guide these manufacturing processes.

Choosing a Chiller for such applications often requires extra care as the product has to be reliable and deliver robust performance over various operating ranges and should lend itself to various operating conditions that prevail during the year in various climatic zones.

Blue Star's simple yet robust equipment, low refrigerant charge, and lower footprint backed by superior service make these Chillers ideally suited to meet most process critical applications. With lower condenser-entering temperatures as low as 15°C, the Chillers can run throughout the year in most critical applications.





Solutions for Green Buildings

Green buildings have become the norm these days. The choice of heating, ventilating and airconditioning (HVAC) products in particular can have a significant impact on such high performance buildings, as the HVAC system directly impacts two categories that have a significant influence on the project getting certified.

Blue Star's IOS range of Screw Chillers can assist building owners to earn LEED® points in the Energy & Atmosphere (EA) credit category and help address the following prerequisites and credit requirements:

EA prerequisite: Fundamental Refrigerant Management/

EA credit: Enhanced Refrigerant Management



These Chillers use R134a which is an environmentally-friendly refrigerant and do not use chlorofluorocarbon (CFC) refrigerants, satisfying the requirements of Fundamental Refrigerant Management. Further, the leakage rates of the systems over the lifecycle of the equipment comply with the requirements of Enhanced Refrigerant Management credit.

Optimize energy performance



The Chillers selected for the project must meet the minimum energy performance to add to credits towards Green Building certification and reduce energy costs of the proposed building as compared to ASHRAE 90.1 code-compliant buildings.

Blue Star's IOS Screw Chillers are designed for efficient full load and optimum part load performance and therefore are ideal fits in Green building designs. These Chillers exceed the energy-efficiency requirements of ASHRAE 90.1. Building simulation programs can help in estimating the savings possible using these Chillers.



Microprocessor Controller

The control panel of the Blue Star IOS series Screw Chillers is specially designed for this Chiller framework. The micro control parts and power section are separated in the control panel for ease of installation and servicing. The microprocessor control panel helps in controlling various Chiller operating parameters accurately.

Control panel features

- Trending facility to analyse Chiller operating data, maximizing energy savings, enhancing machine uptime
- Dynamic data logging of readings (1020 sets of readings)
- Scheduling to facilitate auto operation
- Graphic display, clear and simple language of information
- Direct communication through RS-485 to MODBUS
- Storage of operating data for 99 trippings to facilitate troubleshooting
- Remote monitoring of the Chiller as a standard feature
- Option to upgrade the memory of controller up to 2 GB via a flash card
- Real-time clock with battery back-up for data in memory
- Power supply: 230V AC
- BMS compatibility as a standard feature



Technical Specifications

Description	Units	LCWX1-0350FI	LCWX1-0425FI	LCWX1-0490FI	LCWX1-0600FI
Nominal Cooling Capacity	kW	353	431	496	597
Compressor					
Type		Semi-Hermetic Twin Screw	Semi-Hermetic Twin Screw	Semi-Hermetic Twin Screw	Semi-Hermetic Twin Screw
Quantity	No.	1	1	1	1
Operating Speed	RPM	2950	2950	2950	2950
Electrical Power Supply		360 - 440 V, 3 Ph, 50 Hz			
Condenser					
Type		Shell & Tube Condenser with Integrated Oil Separator	Shell & Tube Condenser with Integrated Oil Separator	Shell & Tube Condenser with Integrated Oil Separator	Shell & Tube Condenser with Integrated Oil Separator
No. of Pass (Water Side)	No.	2	2	2	2
No. of Refrigerant Circuit	No.	1	1	1	1
Water Connection Size In/Out	Inch	5	5	5	6
Evaporator					
Type		Shell & Tube Flooded Evaporator	Shell & Tube Flooded Evaporator	Shell & Tube Flooded Evaporator	Shell & Tube Flooded Evaporator
No. of Pass (Water Side)	No.	2	2	2	2
No. of Refrigerant Circuit	No.	1	1	1	1
Water Connection Size In/Out	Inch	5	5	5	5
Expansion Valve		Electronic	Electronic	Electronic	Electronic
Overall Dimension					
Length	mm	3006	3006	3006	3066
Width	mm	1100	1100	1100	1074
Height	mm	1860	1860	2089	2314
Weight					
Operating Weight	Kg	2398	2553	2804	3585

Note: Specifications are subject to change due to continuous product development

Rating Conditions (As per ARI 550/590 std)

1. Condenser Entering Water Temperature at 85°F at the Flow Rate of 3 USGPM/TR
2. Cooler Leaving Water Temperature at 44°F at the Flow Rate of 2.4 USGPM/TR
3. Condenser Fouling Factor 0.00025 Hr.Sq.ft.Deg.F/BTU
4. Cooler Fouling Factor 0.0001 Hr.Sq.ft.Deg.F/BTU

Description	Units	LCWX1-0680FI	LCWX1-0760FIA	LCWX1-0850FIA	LCWX1-1000FIA	LCWX1-1100FIA
Nominal Cooling Capacity	kW	680	758	849	999	1102
Compressor						
Type		Semi-Hermetic Twin Screw	Semi-Hermetic Twin Screw	Semi-Hermetic Twin Screw	Semi-Hermetic Twin Screw	Semi-Hermetic Twin Screw
Quantity	No.	1	1	1	1	1
Operating Speed	RPM	2950	2950	2950	2950	2950
Electrical Power Supply		360 - 440 V, 3 Ph, 50 Hz				
Condenser						
Type		Shell & Tube Condenser with Integrated Oil Separator	Shell & Tube Condenser with Integrated Oil Separator	Shell & Tube Condenser with Integrated Oil Separator	Shell & Tube Condenser with Integrated Oil Separator	Shell & Tube Condenser with Integrated Oil Separator
No. of Pass (Water Side)	No.	2	2	2	2	2
No. of Refrigerant Circuit	No.	1	1	1	1	1
Water Connection Size In/Out	Inch	6	6	6	8	8
Evaporator						
Type		Shell & Tube Flooded Evaporator	Shell & Tube Flooded Evaporator	Shell & Tube Flooded Evaporator	Shell & Tube Flooded Evaporator	Shell & Tube Flooded Evaporator
No. of Pass (Water Side)	No.	2	2	2	2	2
No. of Refrigerant Circuit	No.	1	1	1	1	1
Water Connection Size In/Out	Inch	5	6	6	6	6
Expansion Valve		Electronic	Electronic	Electronic	Electronic	Electronic
Overall Dimension						
Length	mm	3066	3244	3244	4214	4281
Width	mm	1074	1300	1300	1230	1300
Height	mm	2314	2461	2461	2338	2557
Weight						
Operating Weight	Kg	3626	4797	4837	5890	6780

Note: Specifications are subject to change due to continuous product development

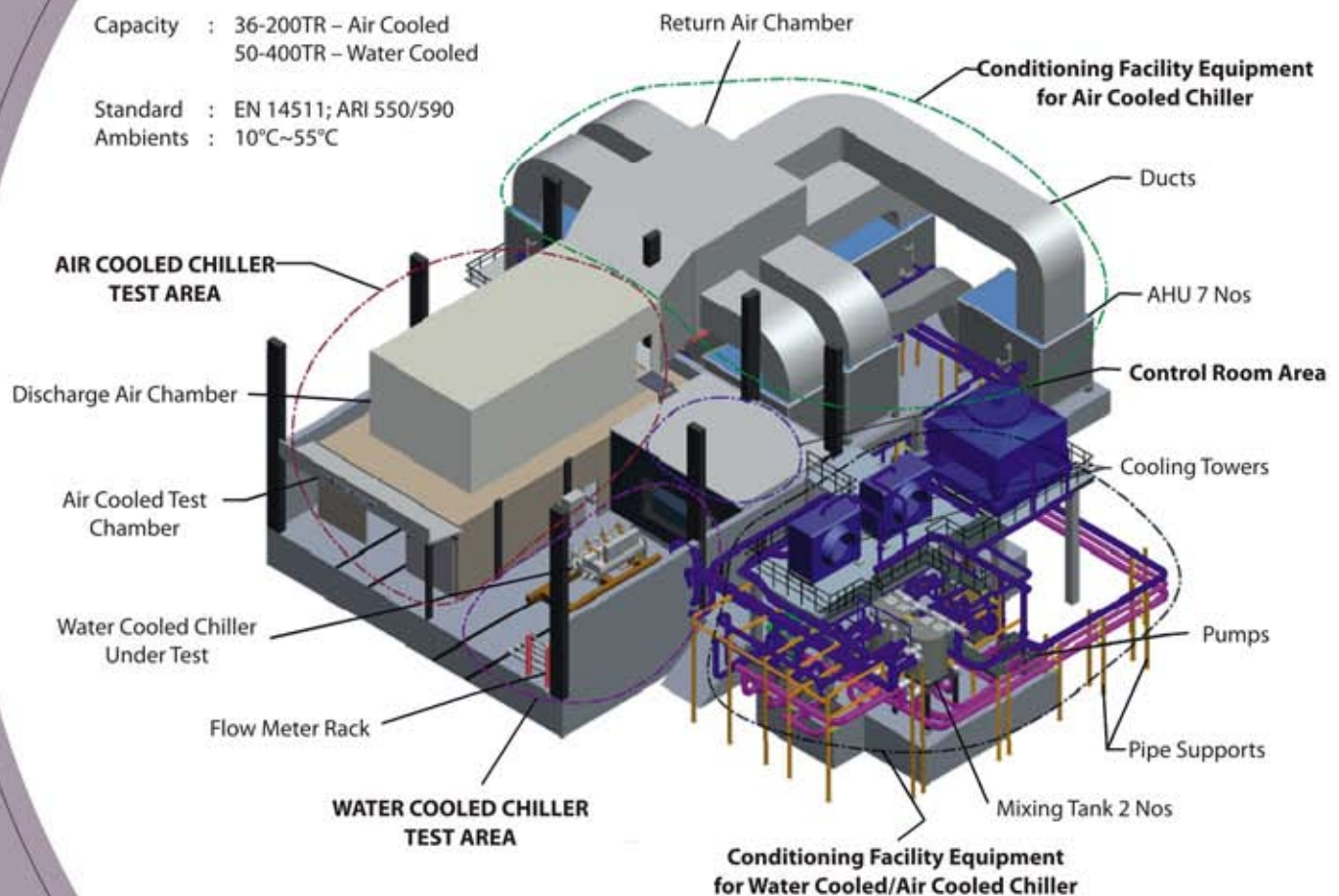
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4. Cooler Fouling Factor 0.0001 Hr.Sq.ft.Deg.F/BTU

Blue Star AHRI Certified Chiller Test Laboratory

Capacity : 36-200TR – Air Cooled
50-400TR – Water Cooled

Standard : EN 14511; ARI 550/590
Ambients : 10°C~55°C





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