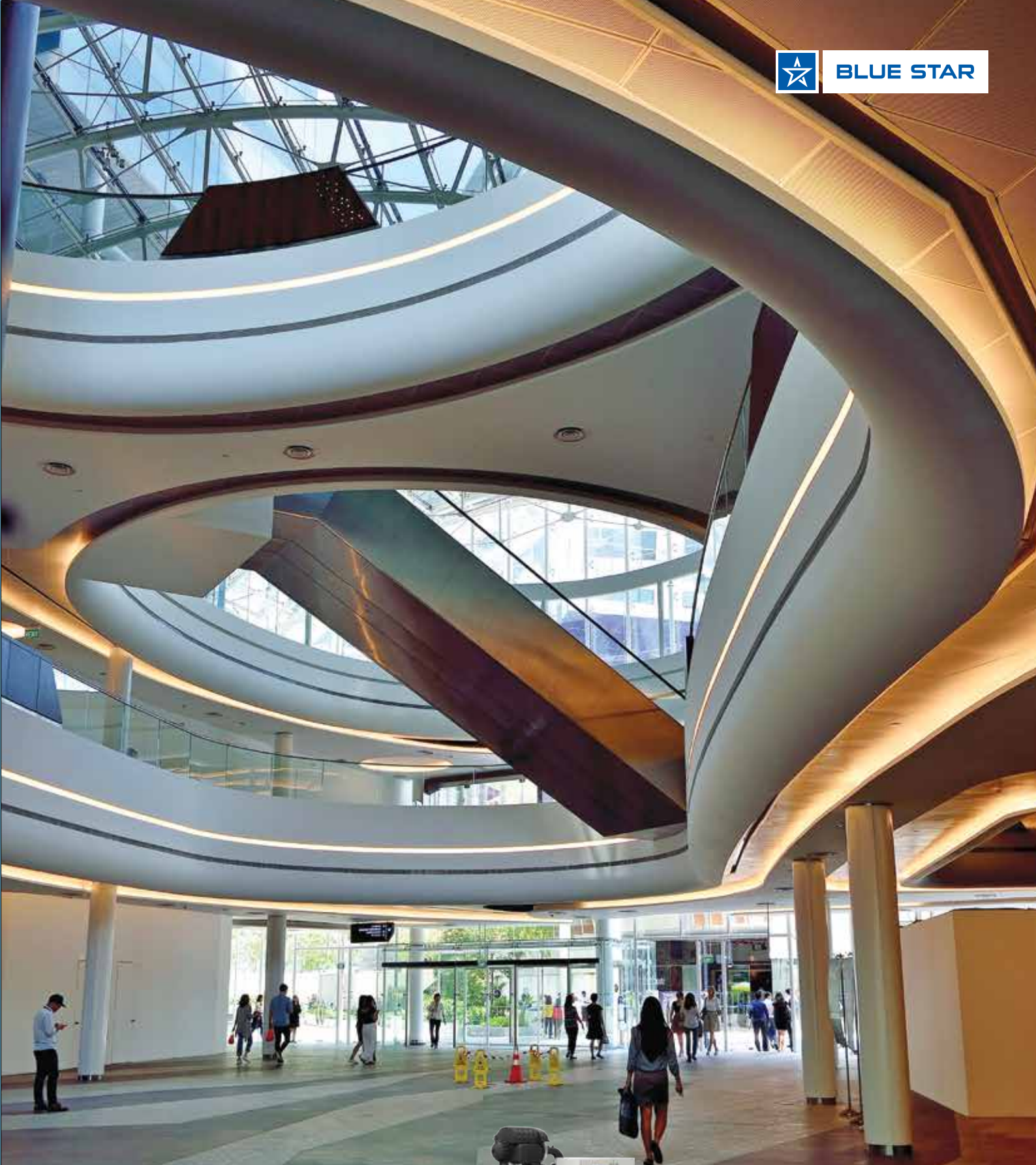




BLUE STAR



CONFIGURED
OIL-FREE CHILLERS



THE NEW BENCHMARK
FOR CHILLER EFFICIENCY



CONFIGURED OIL-FREE CHILLERS

Blue Star, India's largest central air conditioning 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 centrifugal chillers which are used in many applications such as hospitals, airports, green buildings, hotels, and malls, across the country.

The continued thrust on research and product development has now enabled Blue Star to launch a new series of state-of-the-art AHRI-certified water-cooled oil-free magnetic levitation centrifugal chillers.

These new chillers offer you industry-leading energy-efficiency, application versatility, control precision, reliability, ease of installation, and operational cost-effectiveness. The chillers are designed to deliver proven performance plus a host of other benefits required for industrial and commercial applications like hotels, hospitals, office buildings, malls, and industries.

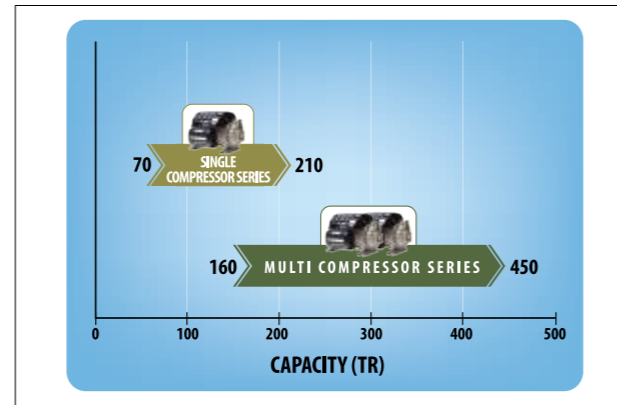
MADE IN INDIA - MADE FOR INDIA

The new-generation oil-free magnetic levitation centrifugal chillers are manufactured at Blue Star's own ISO9001-certified factory equipped with a chiller test bench certified by the Air Conditioning, Heating and Refrigeration Institute (AHRI). These chillers are designed to deliver higher efficiencies even at higher condenser water temperatures and with moderate water quality, a common occurrence in India.

WIDE CAPACITY RANGE

Blue Star's oil-free chillers are offered in a wide range of capacities starting from 70TR to 450TR with single/multiple compressors. Operating power requirements are standard 415V, 50Hz, 3 Phase power supply.

Performance of entire range of chillers is validated by reputed AHRI - Air Conditioning, Heating and Refrigeration Institute.



AHRI CERTIFICATION

Blue Star's new-generation configured series Turbocor chillers are manufactured at Blue Star's sophisticated ISO 9001 certified factory. The entire range of chillers is certified by the international rating body AHRI (Air conditioning, Heating and Refrigeration Institute). Blue Star's factory has India's only precision testing facility certified by AHRI to test and rate all the chillers manufactured by us.



INDUSTRY BEST ENERGY EFFICIENCY

Blue Star's new configured series magnetic levitation chillers are designed for high performance both at full load and part load.

- Exceptional IPLV values up to 11.7 COP unachieved in the industry
- Very high COP up to 6.4 COP shall provide maximum efficiency in full load.



ECONOMIZER

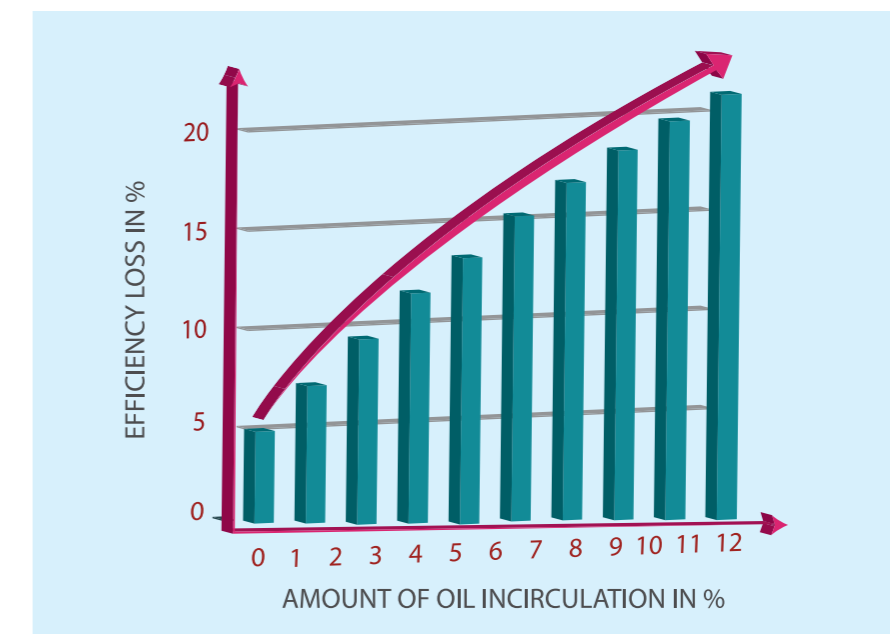
The new Blue Star configured series magnetic levitation centrifugal chillers are equipped with economisers. These plate type heat exchangers help in further sub-cooling of liquid refrigerant. The economiser system enhances the unit's refrigeration effect by providing more kcal/kg of refrigerant circulated. This yields about 5% higher cooling capacity and higher COP as compared to conventional chillers.

OIL-FREE ADVANTAGE

Blue Star's magnetic levitation centrifugal compressors do not need oil for compressor lubrication. Oil used in conventional chillers have the following detrimental effects:

- Forms a coat on heat exchangers
- Reduces heat transfer efficiency
- Excess charge of oil during repair/servicing speeds up performance deterioration

Efficiency drop due to oil is estimated to be around 8% for every 3.5% oil content in the refrigerant as per an ASHRAE (American Society of Heating Refrigeration and Air conditioning Engineers) study.



In the ten (10) chillers tested in the ASHRAE study, the average overcharge of oil in the system was 12.88%, this equated to an average energy loss of about 21%.

In Blue Star's new series of oil-free chillers, the entire oil circuit including oil pump, filter, oil cooler, etc, is eliminated providing following benefits:

- Higher efficiency as oil related performance deterioration is eliminated
- Significant reduction in maintenance

PRECISE MAGNETIC LEVITATION TECHNOLOGY

Blue Star's new configured oil-free series chillers are equipped with two-stage centrifugal compressors with magnetic bearings and in-built VFD with state-of-the-art automatic controls, providing the following benefits:

- The compressor shaft levitates in air while running thereby ensuring no mechanical contact with other parts, completely eliminating wear & tear and frictional losses.
- The VFD precisely controls the compressor speed to match the varying capacity required and operating conditions, thus providing maximum chiller efficiency.
- In the event of power failure, the compressor motor acts as a generator, providing power for the bearing control system ensuring smooth de-levitation of the shaft.
- Two stage compression aids in achieving high full load and part load efficiency.

PROJECT SPECIFIC CHILLER DESIGN

- The new configured series chillers can be selected for most typical applications and project requirements.
- Unlike conventional methods, the new range is not limited to only some of the capacity models.
- The configured magnetic levitation centrifugal chiller is designed exclusively for each project requirement from its exhaustive range of coolers, condensers and compressors to precisely match the capacity and performance requirement of a typical project.



Cooler



Condenser



Compressor





EXCEEDS REGULATORY NORMS

International Standards – ASHRAE 90.1.2016 Energy Efficiency Norms:

CHILLER TYPE	CAPACITY RANGE	PATH A (Kw/TR)		PATH B (Kw/TR)	
		COP	IPLV	COP	IPLV
Water-cooled Screw	> 75TR	0.75	0.6	0.78	0.5
Water-cooled Screw	75 - 150TR	0.72	0.56	0.75	0.49
Water-cooled Screw	150 - 300TR	0.66	0.54	0.68	0.44
Water-cooled Screw	300 - 600TR	0.61	0.52	0.625	0.41

The newly configured oil-free chillers exceed above standards

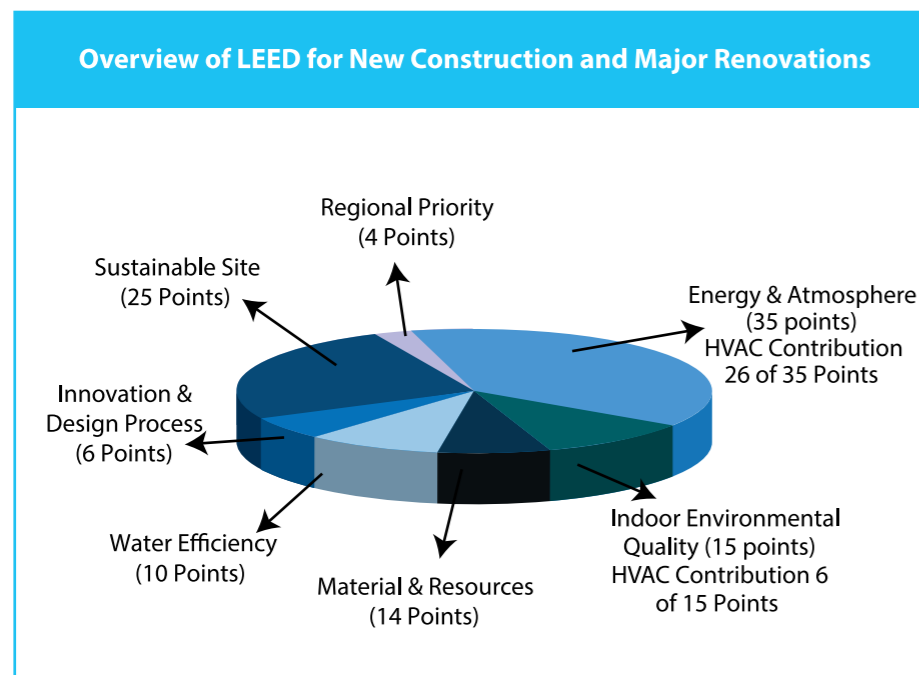
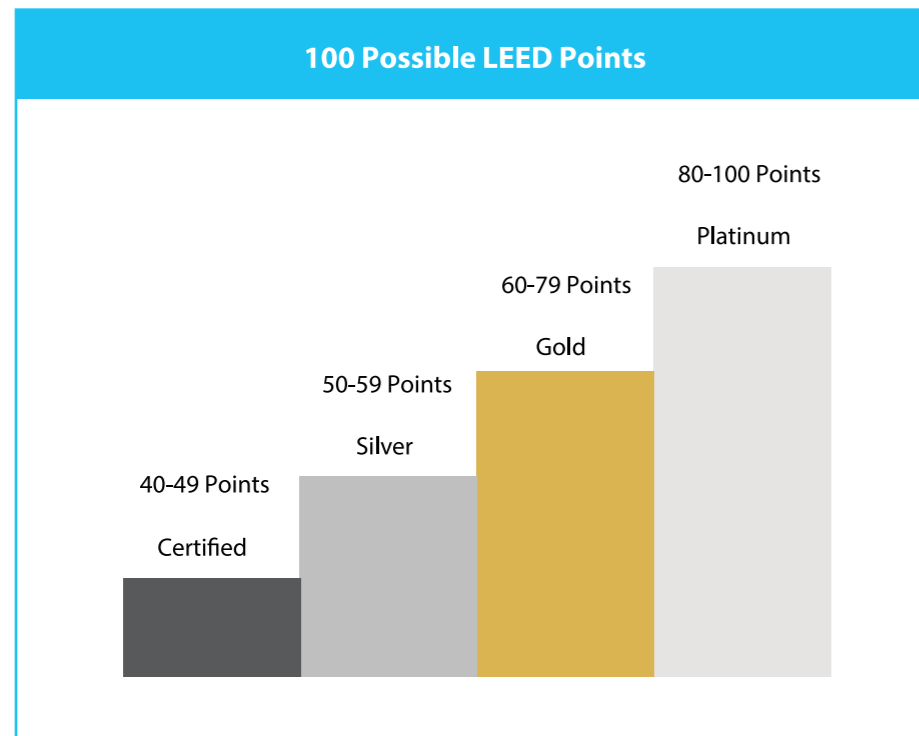
Domestic Standards – ECBC 2017 Energy-Efficiency Norms:

Category	Capacity Band (TR)	ECBC		ECBC+		Super ECBC	
		Full Load kw/TR	IPLV kw/TR	Full Load kw/TR	IPLV kw/TR	Full Load kw/TR	IPLV kw/TR
Air-cooled	74 and less	1.25	1.00	1.17	0.88	NA	NA
Air-cooled	75 and above	1.17	0.95	1.10	0.70	NA	NA
Water-cooled	74 and less	0.75	0.61	0.68	0.51	0.61	0.49
Water-cooled	75 to 149	0.72	0.59	0.61	0.49	0.59	0.44
Water-cooled	150 to 299	0.65	0.54	0.61	0.47	0.56	0.42
Water-cooled	300 to 449	0.61	0.52	0.57	0.43	0.54	0.40
Water-cooled	450 and above	0.56	0.50	0.54	0.39	0.52	0.39

All above efficiencies are at AHRI conditions. The new configured oil-free chillers exceed above standards.

IDEAL FOR GREEN BUILDINGS

- The air conditioning system uses about 40% of the annual building energy consumption. Selection of the right air conditioning system is therefore one of the main aspects to consider when designing a green building.
- A green building is a building that is environmentally sustainable and has been designed, constructed and is operated to minimise impact on the environment.
- The choice of heating, ventilation and air conditioning (HVAC) products in particular can have a significant impact on LEED certification, as the HVAC system directly impacts two categories that together influence 40% of the available points.



EA Prerequisite 2 : Minimum Energy Performance

Blue Star's chillers exceed the energy-efficiency requirements of ASHRAE 90.1.2010, thereby complying with the prerequisite standard.

EA Prerequisite 3 : Fundamental Refrigerant Management

These Chillers does not use chlorofluorocarbon (CFC) refrigerants satisfying the prerequisite statement.

EA Credit 4: Enhanced Refrigerant Management

LEED awards systems that minimise the Ozone Depletion Potential (ODP) and Global Warming Potential (GWP) of the system. Our chillers are equipped with R-134a and qualify for this credit.

EA Credit 1 : Optimized Energy Performance

The new generation configured oil-free series are designed to exceed the part load performance as per ASHRAE 90.1 and therefore satisfies this LEED credit.



Indian Green Building Council





HIGH RELIABILITY – LOW MAINTENANCE

- The new range of oil-free chillers has only one moving part – the Compressor.
- There is no contact between the compressor and other parts when operated
- Virtually no wear and tear
- Advanced control algorithm prevents excessive compressor cycling
- Automatic compressor unloading in case of abnormally high condensing pressure or discharge temperature and abnormally low suction pressure
- Elimination of oil results in reduced maintenance requirements
- Vertical stack design provides easy access to key components



SILENT OPERATION

- Since the compressor – the only moving part – runs in the air, ultra-low noise levels are achieved
- Chiller sound levels are as low as 70dBa @ a 1-metre distance
- No need for any additional acoustic enclosures



Conventional Chiller

Oil-free Chiller



LOW STARTING CURRENT

The new series of Blue Star's magnetic levitation chillers just needs starting currents as low as 2 amps, thereby significantly reducing the size of the associated generator and other electrical components.



Conventional Chiller

Oil-free Chiller



QUICK RESTART

These chillers can re-start within half a minute of power resumption. This exclusive feature is very useful for critical industrial applications such as data centres.



Conventional Chiller

Oil-Free Chiller



VERSATILE APPLICATION

- Conventional screw chillers cannot deliver high chilled water temperature due to limitation in motor cooling and oil viscosity
- The new series is free from oil making it suitable for achieving higher cooler leaving temperature.
- Chilled water leaving temperature up to 20°C can be achieved which is ideal for applications like data centres.



SIMPLE AND FAST INSTALLATION

Blue Star's new-generation oil-free series is designed with compact dimensions for easy and quick installation

- 1.2m - wide chiller can pass through a standard door opening and requires minimum floor space in plant room
- Simple electrical connections including easily accessible main disconnect switch and 400/24V transformer supply to the integrated control circuit
- Victaulic connections on the evaporator and condenser
- Practical reference marks for entering and leaving water connections
- Possibility to reverse the heat exchanger water inlet and outlet at the factory
- Systematic factory operation test before shipment
- All compressor components are easily accessible on site minimising down-time
- Discharge line shut-off valve and liquid line service valve for easy maintenance



Victaulic connections



ENVIRONMENT FRIENDLY

- These chillers use R-134a refrigerant which has zero ozone depletion potential
- R-134a has no expiry date as per the Kyoto Protocol
- Leak-proof refrigerant circuit is ensured as there are no capillary tubes and flare connections



COMPACT AND LIGHTWEIGHT

The critical parts like compressors, coolers, condensers, etc, of these newly configured oil-free chillers are not only efficient but also compact, which enables the chiller to be compact as a whole. These chillers are as much as 30-50% lower in size and weight compared to conventional chillers.

The compact design helps to free up valuable floor space.



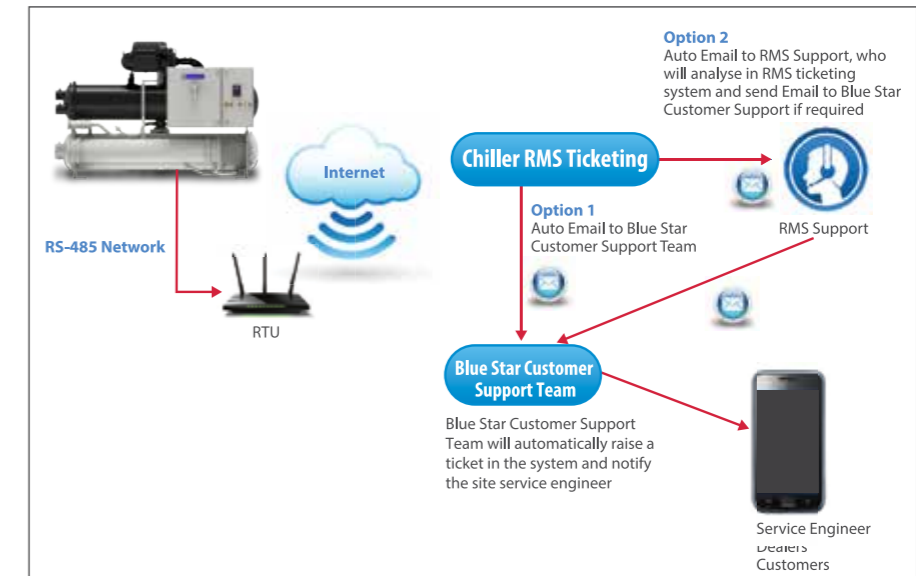
ASME STAMPING

Blue Star's newly configured series screw chillers are available with a U Stamp for the pressure vessels in compliance with ASME (American Society of Mechanical Engineers), a renowned third party certifying organization for safety of pressure vessels.



The data captured and sent by RMS to the Central Service Team enables analysis by the local service team so as to be equipped with the necessary solutions to resolve any issues speedily. This ensures:

- Very quick response time
- Faster turnaround time
- Lower down time of the system

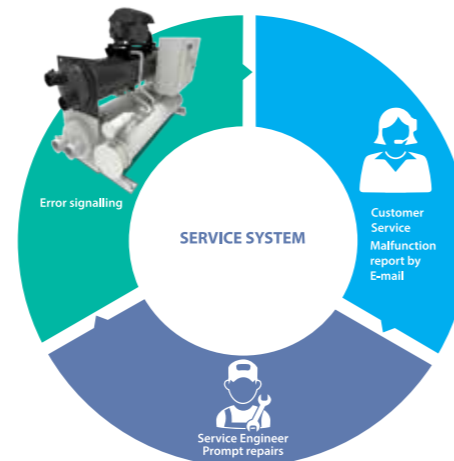


REMOTE MONITORING SYSTEM

The Blue Star configured oil-free chillers are designed to operate through an advanced GPRS-based Remote Monitoring System, which is available as an option to all users.






















The RMS has the following advantages:

- Close monitoring of the site irrespective of the location
- 24x7 automatic monitoring
- Automatic notification in the form of SMS or e-mail in case of any error
- Auto call login for service



ADVANCED CONTROLLERS:

The new oil-free series chillers are equipped with internationally reputed and advanced MCS controllers, with the following advanced features:

- | | | | |
|---|--|---|--|
|  <p>Precise temperature control of +/- 0.5°C</p> |  <p>Overload protection</p> |  <p>BMS compatibility</p> |  <p>Self-diagnosis control system</p> |
|  <p>Anti-freeze and no-flow protection</p> |  <p>Over-current protection</p> |  <p>User-friendly machine interface</p> |  <p>Stored past history and alarm</p> |
|  <p>Compressor run-time balancing</p> |  <p>HP / LP protection</p> |  <p>Alarm output</p> |  <p>Display unit flexibility</p> |
|  <p>Auto backup mode</p> |  <p>Compressor run hours</p> |  <p>Efficient operating zone algorithm</p> |  <p>Demand restriction</p> |
|  <p>Single phasing / phase loss protection</p> |  <p>Password protection</p> |  <p>Efficient oil separator</p> |  <p>DLT protection</p> |
| | | |  <p>Oil level protection</p> |



WIDEST RANGE OF PRODUCTS



VRF V Plus 100% Inverter



VRF Sprint - Pre-piped VRF System



VRF IV S - Side Discharge VRF System



Packaged ACs & Ducted Splits



Inverter Ducted System



Water - Cooled Centrifugal Chillers



Water - Cooled Screw Chillers Configured Series



Water - Cooled Screw Chillers with VFD



Air - Cooled Configured Screw Chiller - High Efficiency Series



Air - Cooled and Water - Cooled Scroll Chillers



Air - Cooled & Water - Cooled Condensing Units



Process Chillers



BLUE STAR

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24X7 CUSTOMER CARE
(Toll Free) 1800 209 1177
1860 266 6666

For more information, please contact **BLUE STAR LIMITED** - **Ahmedabad**: 301 & 302, (3rd floor), Abhishree Avenue, (Near) Nehru Circle, SM Road, Ambawadi, Ahmedabad - 380015. Tel: (079) 40224000 • **Bengaluru**: Anjuman Kay A RR Tower, No 28, Ward No 77, Mission Road, Bengaluru - 560027. Tel: +91 (80) 4185 4000 • **Bhubaneshwar**: 3A Satya Nagar, 2nd floor, Bhubaneshwar - 751007. Tel: (0674) 2572403/2573670 • **Chandigarh**: 4th floor, Adarsh Mall, Plot No. 50, Industrial & Business Park, Phase II, Chandigarh - 160002. Tel: (0172) 5024000 • **Chennai**: KRM Plaza, No. 2, Harrington Road, Chetpet, Chennai - 600031. Tel: (044) 42444000 • **Ghaziabad**: C 53A, Third floor, Rajnagar District Centre (RDC), Raj Nagar, Ghaziabad - 201001, Uttar Pradesh. Tel: (0120) 2821400 • **Goa**: 210, 2nd floor, Gera's Imperium 1, Patto, Panjim, Goa - 403001. Tel: (0832) 2438171/2437287 • **Guwahati**: Oasis Plaza, 1st Floor, Dr. B. Baroah Road, Ulubari Kamrup, Guwahati - 781007. Tel: (0361) 2468496 • **Gurugram**: 6th floor, Vatika Atrium, Golf Course Road, Sector 53, Gurugram - 122002. (Haryana). Tel: (0124) 4094000 • **Indore**: Office No. 502, Maloo-01 26/C, Scheme No. 94/C Ring Road, Indore - 452010. Tel: (91) (731) 4001211/4001311 • **Jaipur**: A-19, 1st floor, Main Sahakar Path, Near Sahakar Bhavan, Jaipur - 302001. Tel: (0141) 2744033-35 • **Jamshedpur**: 2nd Floor, Sai Apartment, Opposite Thakur Pyara Singh Ground, Kasidhi, Sakchi, Jamshedpur - 831 001 Tel: (91) (657) 222 1530 • **Kochi**: 2nd floor Millennium Plaza, MKK Nair Road, Alinchuvadu Junction, Kochi - 682024. Tel: (0484) 4499000 • **Kolkata**: 7, Hare Street, Kolkata - 700001. Tel: (033) 22134100 • **Ludhiana**: SCO 16-17, Feroze Gandhi Market, Fortune Chambers, 3rd floor, Ludhiana - 141001. (Punjab) Tel: (0161) 5001404 • **Lucknow**: 177/4, Faizabad Road, Lucknow - 226007 Tel: (0522) 403400 • **Mumbai**: Blue Star House, 9-A Ghatkopar Link Road, Saki Naka, Mumbai - 400072. Tel: (022) 66684100 • **Nagpur**: 219, Bajaj Nagar, 1st floor, South Ambazari Road, Nagpur - 440010. Tel: (0712) 2249000/6624000 • **Patna**: Ambition Business Centre, Laxmikant Niketan Parisar, 4th floor, 'B' Block, Room No. 405, Jamal Road, Patna - 800001 • **Pune**: 201/A, Nityanand Complex, 1st floor, 247/A, Bund Garden Road, Pune - 411001. Tel: (020) 41044000/26169332 • **Raipur**: Alaska Corporates, 3rd floor, Opp. VIP Road, Jivan Vihar Colony, G E Road, Raipur, Chhattisgarh - 492006. Tel: (0771) 6544000 • **Secunderabad**: Ashoka Raghupati Chambers, No. 1-10-60 to 64, 4th Floor, S P Road, Begumpet, Hyderabad, Telangana - 500 016. Tel: (040) 4400 4000 • **Thane**: 2nd Pokhran Road, Majiwada, Thane - 400601 Tel: (022) 6715 4500 • **Thiruvananthapuram**: TC IV/962, 'Chandrika', Sree Chitra Nagar, PipeLine Road, Kawdiar, Thiruvananthapuram - 695003. Tel (0471) 2720025/65 • **Vadodara**: Ramakrishna Chambers, 7th floor, Productivity Road, Alkapuri, Vadodara - 390007. Tel: (0265) 2330334/6614100 • **Visakhapatnam**: D. No. 49-24-65/1, Near Sankarmatam Road, Madhura Nagar, Visakhapatnam - 530016. Tel: (0891) 2748405/2748433 • **Vijayawada**: No. 40-1-62, Nagas Hafeez Plaza, Opposite to grand modern supermarket, Near BENZ Circle, M G Road, Vijayawada 10. Tel: (0866) 2484004



Blue Star products comply with RoHS regulations as per E-Waste (Management & Handling) Rules, 2016. For disposal of E-Waste, kindly visit our website www.bluestarindia.com or call our customer care 1800 209 1177 (Toll Free) or 1860 266 6666.