

BLUE STAR SCROLL CHILLERS FIRST IN INDIA WITH STAR RATING.







Next Generation Air Cooled Scroll Chiller



Next Generation Water Cooled Scroll Chiller

INDIA'S FIRST **Star-Rated** Scroll Chillers.

From Blue Star.

Blue Star is India's leading air conditioning and refrigeration solutions company, with nearly eight decades of experience in the industry. Its product range includes the entire gamut of air conditioning products from room ACs to VRFs, a wide range of chillers, and cooling solutions such as water coolers, deep freezers, industrial freezers, cold rooms, even mortuary chambers.

Not only is the Company a leader in various categories of products and services, but it is also known for its innovation and R&D which helps improve existing products, bring the latest technologies into the country, make systems more efficient, more eco-friendly and sustainable, and overall, perform better while consuming less power.

Blue Star has many firsts to its credit over the years: the introduction of Scroll Chillers, energy-efficient Screw Chillers, Oil-free Centrifugal Chillers, Screw Chillers with VFD, a range of innovative VRF systems; and more recently Inverter Scroll Chillers.



INDIA'S FIRST STAR-RATED SCROLL CHILLERS

Blue Star now brings you another first in the industry: Star-rated Scroll Chillers!

Already the market leader in scroll chiller systems in India, Blue Star has now gone a step further by introducing a new range of scroll chillers that comply with the 3–Star efficiency norms of the Chiller labelling programme launched in India.

In keeping with Blue Star's leadership status in the scroll chiller markets, this new star-rated scroll chiller range has been announced well ahead of the mandatory compliance date, for this labelling programme, which is January 1, 2023.

3-STAR RATED SCROLL CHILLERS NOW IN INDIA FROM BLUE STAR!

Blue Star's scroll chillers are already leaders in the Indian marketplace and are well known for their high performance, reliability and efficiency.

Now, Blue Star has taken these chillers one further step ahead. Manufactured using world-class processes and equipment at Blue Star's ISO9001-certified factory at Wada, Mumbai, and available in a wide range of capacities from 10 to 70TR, these machines have now been designed to deliver the desired capacity and efficiency under the stringent ambient conditions prescribed by the Government's Star Labelling Programme.

Blue Star has taken this initiative of designing these chillers to meet the new standards and be certified as **3–Star Rated Scroll Chillers** more than a year ahead of schedule, without waiting for these standards to become mandatory on January 1, 2023.

The 3–Star rating essentially means that these chillers are now the ideal choice for all industrial and process cooling and comfort air conditioning.

Star Rating Efficiency Norms for < 75TR Capacity

	000	ISEER COP					
CHILLER TYPE	СОР	1–STAR	2-STAR	3-STAR	4-STAR	5-STAR	
AIR COOLED	2.4	3.0	3.3	3.6	4.0	4.4	
WATER COOLED	4.2	4.8	5.2	5.6	6.1	6.6	

Above efficiencies required at stringent Indian ambient conditions.

Mandatory compliance starts from January 1, 2023.



CHILLERS THAT PAY FOR THEMSELVES IN A YEAR OR LESS!

Blue Star's new range of 3-Star rated scroll chillers use high-efficiency scroll compressors with IDV technology (Intermediate Discharge Valve) that provides variable compression ratios which minimise losses due to over- and under-compression.

The high-efficiency compressor, together with the redesigned coil that presents an enhanced face area, and the advanced controller used, make this new range of chillers one of the most energy-efficient ones available in the country today. Put together, these 3-Star rated scroll chillers save about 20% power as compared to conventional scroll chillers.

This power saving makes these chillers pay for themselves in less than a year in regular commercial applications that use them for 8 to 10 hours each day. And in applications that use the chillers for longer hours per day, the return on the capital invested would be seen in just a few months!



CHILLER TYPE	AIR-C	OOLED	WATER-COOLED		
ITEM DESCRIPTION	NON STAR Compliant Chiller	BLUE STAR'S NEW 3-STAR RATED CHILLER	NON STAR Compliant Chiller	BLUE STAR'S NEW 3-STAR RATED CHILLER	
ISEER (kW/TR)	1.2	0.975	0.8	0.626	
EFFICIENCY IMPROVEMENT (%)		20		20	

Air-cooled: 60TR; Water-cooled: 52TR

Entire range AHRI Certified

The complete range of air-cooled and water-cooled Scroll Chillers from Blue Star are AHRI Certified.



ADVANCED FEATURES

Apart from the star rating and the power saving design of these chillers, this new range of scroll chillers comes packed with many other advanced features as well.



Rapid cooling mode:

Scroll chillers are widely used for process cooling, pharmaceutical and critical industrial applications. The load in these applications can vary significantly and with each load change, conventional chillers take approximately 10 minutes to reach 100% capacity for the changed load. This delay can significantly impact process cooling requirements.

Blue Star's new Scroll Chillers are designed with a unique rapid cooling mode. In-built logic senses chilled water temperature and compares it to the set point, and accordingly enables faster loading of compressors. This ensures the achievement of 100% cooling within just 2 minutes.





Precise temperature control:

Conventional scroll chillers use manual controllers that allow setting of chilled water temperature only to the nearest degree centigrade.

The new microprocessor-based controller used in Blue Star's new 3–Star rated Scroll Chillers uses smart PID (Proportional Integral Derivative) logic. PID control logic provides precise and continuous feedback which allows the chilled water temperature to be set to the nearest 0.3 degree centigrade, enabling more precise maintenance of process cooling temperature, besides achieving substantial power savings as well.





High reliability:

Based on historic data of compressor on-off cycles, the advanced control logic built into the controller predicts the chilled water differential between the water entering and the leaving temperature of the cooler, and accordingly delays the start or stop of the compressor. This ensures minimum compressor cycling and increases the reliability of the chiller.





Non-stop cooling even at 54°C ambient:

Conventional scroll chillers are designed to operate only up to 45° C ambients and they trip if the ambient crosses 45° C. Keeping in mind the ever-increasing ambient temperatures in India, the new 3-Star rated Scroll Chiller range is designed to work even at ambient temperatures up to 54°C. These chillers can run at unloaded conditions without tripping, right up to 54°C ambients, providing partial cooling.





Wide operating range*:

Scroll chillers are installed in many industries for both air conditioning and process cooling requirements. The chilled water temperature demand varies based on process cooling requirements. These next generation Scroll Chillers are designed to operate over a wide band of chiller leaving temperatures from +15°C to -5° C.

The switching-over to $< +4^{\circ}$ C will need a replacement of only the cooler and LP switch, besides a modification in controller settings, all of which are possible at your site itself. With these small modifications, the same chillers can be made to operate over an even wider range.





Condenser health prediction*:

Periodic de-scaling is required at installations using water cooled scroll chillers, which is not carried out at many sites, leading to loss of performance and reduced life of heat exchangers. The sophisticated controller in our new Scroll Chiller range continuously monitors critical parameters such as the discharge pressure



of the refrigerant, and predicts the cleanliness of the condenser tubes. Based on this input, the controller indicates when de-scaling is required, thus ensuring proper maintenance and longevity.



The new Blue Star range of 3–Star rated scroll chillers comes equipped with a BMS–compatible microprocessor control that allows the chiller to be operated through centralised Building Management Systems.





Advanced Touch Screen*:

The new controller has an elegant looking touch screen with a backlight which helps in the easy operation of the unit and also provides a user-friendly graphical display of various parameters.





Easy and quick installation:

Our next-generation Scroll Chillers are fully charged, pre-wired and comprehensively run-tested at the factory prior to despatch. This reduces installation time at the site and enables speedy commissioning. It also avoids any impact in performance that occurs when refrigerant is charged manually at the site as is the case in most conventional chillers.





Blue Star always lays emphasis on the eco-friendliness and sustainability of its new products and this 3 Star series is no different. Hence, these inverter Scroll Chillers come with 'zero ODP' R-410A refrigerant.



Protection mechanisms:

The new range of Scroll Chillers is equipped with all the important protection mechanisms that can prevent larger failure by sensing errors and either switching off components or warning about them for action by operators. Protection is in-built for the following errors:

- Anti-freeze
- Single phase
- Phase loss
- Overload
- Over-current
- Under-current
- Reverse rotation
- High discharge temperature trip
- Low flow trip



Anti-corrosion condenser fin coating:

Specially treated blue fins are available as an option for air cooled condensers to enhance the life of the chillers. This is especially useful in systems being used in corrosive environments.



Technical Data Sheet for R410A AC Scroll Chiller

	DESCRIPTION	UNIT	XAC2S-010MAR2	XAC2S-020MAR2	XAC1YS-020MAR2	XAC2YS-030MAR2	XAC2YS-035MAR2
1	Estimated Star		2	2	3	3	3
2	Cooling Capacity at AHRI 551 / 591	TR	9.5	19.1	19.1	29.1	34.1
3	Cooling Capacity at IS-16590	TR	8.93	18.0	18.0	27.4	32.1
4	Compressor						
а	Туре		SCROLL	SCROLL	SCROLL	SCROLL	SCROLL
b	Quantity	No	2	2	2	3	3
C	Motor Type		Refrigerant cooled, 3Ph, 2 Pole Squirrel Cage Induction Motor				
d	Operating Speed		2900	2900	2900	2900	2900
е	Power Supply		400V(+/-10%),3Ph,50Hz	400V(+/-10%),3Ph,50Hz	400V(+/-10%),3Ph,50Hz	400V(+/-10%),3Ph,50Hz	400V(+/-10%),3Ph,50Hz
f	Capacity Control		100%,50%	100%,50%	100%,50%	100%,67%,33%	100%,67%,33%
5	Condenser						
а	Tube Material		Inner Grooved Copper				
b	Type of Aluminium Fins		Super Slit				
6	Fan for Air-Cooled Condensor						
а	Fan Dia.	mm	660	660	660	660	660
b	Quantity	No	1	2	2	3	3
7	Condenser Fan Motor						
а	Туре		Totally Enclosed, Pad Mounted.				
b	Quantity	No	1	2	2	3	3
C	Speed	RPM	910	910	910	910	910
8	DX-Cooler						
а	No Of Cooler	No	1	1	1	1	1
b	Tube Type & Material		Inner Grooved Copper Tubes				
C	No of Refrigerant Circuit	No	2	2	1	2	2
d	Water Connection Size In/Out	Inch	1-1/2" NB	3" NB	3" NB	3" NB	3" NB
9	Expansion Valve		Thermostatic Expansion Valve				
10	Overall Dimension						
а	Length (+/- 100mm)	mm	1117	2234	2234	3351	3351
b	Width (+/- 50mm)	mm	1147	1147	1147	1147	1147
C	Height (+/- 50mm)	mm	1685	1685	1685	1685	1685
11	Net Weight (approx.) +/- 20kg	Kg	630	925	925	1300	1350

Rating Conditions: As per AHRI 550/591

(A) AHRI 551/591 Condition

- 1) Entering Cooler Water temp. 12°C, Leaving Cooler Water temp. 7°C
- 2) Ambient Condenser temp. 35°C
- 3) Cooler Fouling Factor=m2·K/kW=0.018

(B) IS-16590 Condition

- 1) Entering Cooler Water temp 12°C, Leaving Cooler Water temp. 7°C
- 2) Ambient Condenser temp. 39°C
- 3) Cooler Fouling Factor=m2·K/kW=0.044

Product development is a continuous process in Blue Star. Hence, product specification and technical data are subject to change without prior notice.

XAC2YS-040MAR2	XAC3YS-050MAR2	XAC3YS-055MAR2	XAC4YS-060MAR2	XAC4YS-065MAR2	XAC4YS-070MAR2
3	3	3	3	3	3
38.2	48.2	53.2	58.2	63.2	68.2
35.9	45.3	50.0	54.7	59.4	64.1
SCROLL	SCROLL	SCROLL	SCROLL	SCROLL	SCROLL
4	5	3/2	5	3/3	3/3
Refrigerant cooled, 3Ph, 2 Pole Squirrel Cage Induction Motor	Refrigerant cooled, 3Ph, 2 Pole Squirrel Cage Induction Motor	Refrigerant cooled, 3Ph, 2 Pole Squirrel Cage Induction Motor	Refrigerant cooled, 3Ph, 2 Pole Squirrel Cage Induction Motor	Refrigerant cooled, 3Ph, 2 Pole Squirrel Cage Induction Motor	Refrigerant cooled, 3Ph, 2 Pole Squirrel Cage Induction Motor
2900	2900	2900	2900	2900	2900
400V(+/-10%),3Ph,50Hz	400V(+/-10%),3Ph,50Hz	400V(+/-10%),3Ph,50Hz	400V(+/-10%),3Ph,50Hz	400V(+/-10%),3Ph,50Hz	400V(+/-10%),3Ph,50Hz
100%,75%,50%,25%	100%,80%,60%,40%,20%	100%,79%,58%,40%,18%	100%,83%,67%,50%,33%,16%	100%,82%,64%,49%,33%,15%	100%,83%,67%,50%,33%,16%
Inner Grooved Copper					
Super Slit					
660	660	660	660	660	660
4	5	5	6	6	6
Totally Enclosed, Pad Mounted.					
4	5	5	6	6	6
910	910	910	910	910	910
2	2	2	2	2	2
Inner Grooved Copper Tubes					
2	3	3	4	4	4
3" NB / 3" NB					
Thermostatic Expansion Valve					
4468	5585	5585	6702	6702	6702
1147	1147	1147	1147	1147	1147
1685	1685	1685	1685	1685	1685
1850	2225	2275	2600	2650	2700

Technical Data for Water Cooled Scroll Chiller R410A

	DESCRIPTION	UNITS	XWC2S-013AR3	XWC2YS-026AR3	XWC2YS-039AR3	"XWC2YS-052AR3	XWC3YS-065AR3
1	Estimated Star		3	3	3	3	3
2	Cooling Capacity at AHRI 551 / 591	TR	13.6	26	38	50	65
3	Cooling Capacity at IS-16590	TR	13.4	25.2	37.5	49.4	64.1
4	COMPRESSOR		Hermetically Sealed Scroll Fixed Type				
а	Quantity	No	2	3	4	4	6
b	Motor Type		Refrigerant Cooled, 3 Ph., 2 Pole, Squirrel Cage Induction Motor	Refrigerant Cooled, 3 Ph., 2 Pole, Squirrel Cage Induction Motor	Refrigerant Cooled, 3 Ph., 2 Pole, Squirrel Cage Induction Motor	Refrigerant Cooled, 3 Ph., 2 Pole, Squirrel Cage Induction Motor	Refrigerant Cooled, 3 Ph., 2 Pole, Squirrel Cage Induction Motor
C	Operating Speed	RPM	2900	2900	2900	2900	2900
d	Power Supply		400 V(+/-10%), 3 PH., 50HZ				
5	CONDENSER :						
а	Qty	Nos	1	1	1	1	1
b	Tube type and Material	Inch	Both side Finned Copper Tubes				
C	Water connection size	Inch	1-1/4	2	2	2-1/2	3
d	No. of Refrigerant circuit	Nos	2	2	2	2	3
6	DX-COOLER						
а	Qty	Nos	1	1	1	1	1
b	Tube type and Material		Integral Finned Cooper Tubes				
C	Water Connection Size	Inch	2	3	3	4	5
d	No. of Refrigerant Circuits	Nos	2	2	2	2	3
7	EXPANSION VALVE		TXV	TXV	TXV	TXV	TXV
8	OVERALL DIMENSIONS :						
а	Length (±100)	mm	1490	2250	2410	2678	3010
b	Width (±50)	mm	1035	1055	1250	1272	1340
C	Height (±50)	mm	1297	1410	1663	1630	1790
9	Net Weight Approx (+/-100)	Kg	660+/- 50	920	1120	1270	1410

11. Rating Conditions: As per AHRI 551/591

(A) AHRI 551/591 Condition

- 1) Cooler Entering Cooler Water temp. 12°C, Leaving Cooler Water temp. 7°C
- 2) Condenser Entering Cooler Water temp. 30°C, Leaving Cooler Water temp. 35°C
- 3) Cooler Fouling Factor=m2·K/kW=0.018
- 4) Condenser Fouling Factor=m2·K/kW=0.044

(B) IS-16590 Condition

- 1) Cooler Entering Cooler Water temp. 12°C, Leaving Cooler Water temp. 7°C
- 2) Condenser Entering Cooler Water temp. 30°C, Leaving Cooler Water temp. 35°C
- 3) Cooler Fouling Factor=m2·K/kW=0.044
- 4) Condenser Fouling Factor=m2·K/kW=0.088

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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.