



BLUE STAR



Process Chillers

When Precision Cooling is critical to your application.





Blue Star, India's leading airconditioning company, has been providing expert cooling solutions for over seven decades now. It has been a pioneer in manufacturing a wide range of Screw, Scroll and Centrifugal Chillers catering to various applications such as hospitals, hotels, green buildings and process industries.

Drawing from this expertise, Blue Star presents a range of aircooled Process Chillers for diverse industrial process application needs.

Process applications, such as those encountered in the pharmaceutical, medical, textile, plastic, packaging, and food-processing industries require precise temperature control at all times. This translates within the chiller into precise water temperatures at all times, and an ability to work under all ambient conditions.

Blue Star Process Chillers are specifically designed keeping process needs in mind. Moreover, it includes an energy-efficient and reliable scroll compressor as well as a stainless steel plate-type heat exchanger.

With an integrated pump, buffer tank and a plug-in design Blue Star aircooled Process Chillers enable simplified pipe routing and also ensure that the industrial process is not interrupted at any point of time. These are not the features that a typical chiller can provide.

Overall, these Process Chillers not only ensure precise temperature control but also offer the following key benefits:

- Increased productivity and reduced production cycle time
- Reduced production costs and minimal wastage
- Reduced maintenance time and fewer interruptions during production
- Enhanced product quality

Since these Process Chillers operate in a closed circuit, they also offer the following advantages:

- Precise water temperature control, independent of ambient conditions
- Quick reaction to any sudden load changes, ensuring steady operating conditions
- Re-utilisation of the chilled water thereby avoiding wastage and reducing health hazards of water-borne bacteria

Blue Star's microprocessor-controlled, aircooled Process Chillers come with the following features:



Highly efficient scroll compressor

Time-tested scroll compressors are used in these chillers, which are highly energy-efficient. This results in higher reliability as well as lower power bills. These compressors are suction gas-cooled, fully hermetic and provided with a crank-case heater.



Multi-compressor advantage

The presence of multiple compressors helps the system in two ways: there is built-in redundancy adding therefore to reliability; and it allows for capacity modulation by switching on only as many compressors as will be required at any time to suit part-loads, thereby increasing efficiency.



Quick to install

Blue Star Process Chillers come pre-fitted with insulated chilled water tank and chilled water pump. The units also come fully wired, refrigerant charged, and tested from factory before dispatch. In the field therefore, only chilled water and electrical connections need to be made before the system is ready for commissioning.



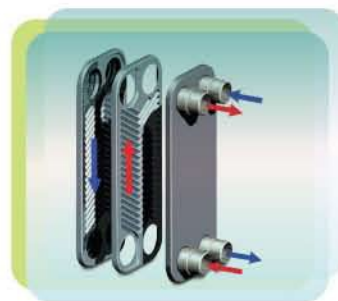
Load balancing system

Generally, the heat load in process applications fluctuates heavily. A load balancing system is therefore implemented in Blue Star Process Chillers to ensure the supply of constant temperature, leaving water at both high and low loads. While the water storage tank takes care of sudden demand for high heat load, the load balancing valve takes care of low loads. This unique combination supplies chilled water to the process at a fairly constant temperature.



Plate-type heat exchanger with water storage tank

The plate-type heat exchanger design makes Blue Star Process Chillers more compact without compromising on the temperature difference that is required to be achieved. This, coupled with the buffer tank and corresponding pump in the same cabinet, ensures high reliability of the system, supplying constant quantity of water at the desired temperature for the process. Blue Star also offers stainless steel tanks for specific applications where the process demands such a construction.



High-efficiency heat transfer

The condensor coils on these chillers have super-slit aluminium fins, with internally finned copper tubes. Fins are optionally coated with anti-corrosive blue-coating. All these measures increase heat transfer and improve efficiency, while preventing corrosion too.





Hot gas bypass arrangement

An inbuilt hot gas bypass arrangement is provided to maintain constant leaving water temperature and to take care of low load conditions. This also prevents liquid flood back under low load conditions and in winter.



Corrosion-resistant structure

The body is made of galvanized steel coated with pure polyester, UV-resistant powder coating, tested to withstand 500 hours of salt spray test. Rigid base frames cater to the full weight of the chiller during handling and installation. All refrigerant lines are fabricated of copper and the complete hydronic circuit, including water flow switch, strainer, auto air vent, and thermo-well are of non-ferrous material to avoid corrosion.



Intelligent microprocessor controller

All the chillers are provided with imported microprocessor controllers. These controllers are specifically developed for Process Chiller applications. The controller can be wired to an On/Off switch so that the operator can easily switch the machine on or off from a distant location. Remote alarm monitoring can also be optionally provided. The controller thus aids in monitoring the chiller from a remote location if needed.





Salient features of the controller

- Precise temperature control of water at inlet and outlet
- Complete alarm management
- Auto loading/unloading of compressor
- Auto-restart of unit after power restoration
- Time delays for compressor and evaporator pump
- Single-phase and phase-reversal protection
- Password protection at various levels
- Built-in anti-freeze protection



Fail-safe operation

Controlled by an advanced microprocessor controller, the system has the following features that ensure fail-safe operation:

- Low and high pressure suction and discharge side protection
- Overload protection
- SPPR
- Float valve



Low noise design

All condenser fans are designed for silent, efficient operation, thereby ensuring that the entire chiller is noise-free and quiet.



Fully tested units

All chillers are wired, charged and tested after manufacturing, prior to dispatch. Settings of the microprocessor and safety devices are also verified.

Technical Specifications of Special Packaged Aircooled Chiller (SPAC-NR2) with R-407C Refrigerant

Description	Units	Models		
		SPAC-05NR2	SPAC-10NR2	SPAC-15NR2
Nominal Capacity **	TR / kW	4.7 / 16.5	9.4 / 33.0	14.1 / 49.6
Nominal Dimensions	Length	1240	1410	1775
	Width	450	755	935
	Height	1370	1275	1505
Net Weight/Unit	kg	196	535	620
Operating Weight/Unit	kg	256	655	770
Refrigerant		R-407C		
Power Supply		400V/3 Ph/50 Hz, AC		
Incoming Cable Size	mm ² Al	4	10	16
	mm ² Cu	2.5	6	10
Compressor				
Type		Scroll		
Input Power (each Compressor)	kW	5.3	5.3	8.1
Qty	Nos.	1	2	2
Evaporator				
Type		Plate-Type Heat Exchanger		
Qty	Nos.	1	1 (Dual)	1 (Dual)
Construction Material		Stainless Steel		
Air Cooled Condenser				
Fan Dia x Qty	Inch x Nos.	18" x 2	22" x 2	24" x 2
Fan Material		Aluminium/G.I.		
Motor Make, Type & Speed	RPM	GE, Totally Enclosed 900 TPM		
Motor Input Power (each Fan)	kW	0.13	0.42	0.5
Qty	Nos.	2	2	2
Chilled Water Pump				
Type		Centrifugal, Monoblock		
Make		Grundfoss		
Rated Flow Rate	LPM/USGPM	45.5 / 12	91 / 24	136.4 / 36
Rated Head	Mts	38	48	60
Max Flow Rate	LPM/USGPM	70 / 18.5	105 / 27.7	250 / 66.0
Maximum Pressure Head	Mts.	45	65	65
Pump Power Input	kW	0.6	1.6	2.8
Pump Max Input Power	Watts	6.15	13.04	20
Total (input) Load Electrical	kW	6.2	13.0	20.0
Safety Devices		High Pressure Switch, Low Pressure Switch, Flow Switch, Antifreeze Protection, Alarm with Buzzer		
Electrical Safety		Crankcase Heater, Overload for Pump, Circuit Breaker for Compressor, (Single phase/Phase reverse protection for scroll compressors)		
Tank Capacity	Lts	60	120	160
Chilled water connection				
Inlet	Inch	1"	1 ¼"	1 1/2"
Outlet	Inch	1"	1 ¼"	1 1/2"

**Rating Conditions:

- 1) Cooler Leaving Water Temperature 6.7°C (44°F) and Cooler Entering Temperature 12.2°C (54°F)
- 2) Cooler Fouling Factor 0.0001° F.ft².hr/Btu
- 3) 35°C (95°F) Ambient Temperature

#Specifications are subject to change due to continuous product development



Technical Specifications of Special Packaged Aircooled Chiller (SPAC-N) with R-22 Refrigerant

Description	Units	Models					
		SPAC-03N	SPAC-05N	SPAC-08N	SPAC-10N	SPAC-15N	SPAC-22*
Nominal Capacity **	TR / kW	3 / 10.5	5 / 17.6	7.5 / 26.4	10 / 35	15 / 52.7	22 / 77.35
Nominal Dimensions	Length	1240	1240	1410	1410	1775	2286
	Width	450	450	755	755	935	1380
	Height	1370	1370	1275	1275	1505	1986
Net Weight/Unit	kg.	180	196	485	535	620	1250
Operating Weight/Unit	kg.	240	256	605	655	770	1280
Refrigerant		R-22					
Power Supply		400V/3 Ph /50 Hz, AC					
Incoming Cable Size	mm ² Al	4	4	6	10	16	35
	mm ² Cu	2.5	2.5	4	6	10	16
Compressor		Scroll					
Type		Scroll					
Input Power (each Compressor)	kW	3.4	5.3	3.9	5.3	8.1	12.2
Qty	Nos.	1	1	2	2	2	2
Evaporator		Plate-Type Heat Exchanger					
Type		Plate-Type Heat Exchanger					
Qty	Nos.	1	1	1 (Dual)	1 (Dual)	1 (Dual)	2
Construction Material		Stainless steel					
Air Cooled Condenser							
Fan Dia x Qty.	Inch x Nos.	18" x 2	18" x 2	22" x 2	22" x 2	24" x 2	36" x 2
Fan Material		Aluminum/G.I.					
Motor Make, Type & Speed	RPM	GE, Totally Enclosed 900 TPM				HM,TE 900	HM,TE 700
Motor Input Power (each Fan)	kW	0.13	0.13	0.42	0.42	0.5	1.6
Qty	Nos.	2	2	2	2	2	2
Chilled Water Pump							
Type		Centrifugal, Monoblock					Multistage Inline
Make		Grundfos					
Rated Flow Rate	LPM/USGPM	27.3 / 7.2	45.5 / 12	68.2 / 18	91 / 24	136.4 / 36	200 / 52.4
Rated Head	Mts	50	38	48	48	60	34
Max Flow Rate	LPM/USGPM	40 / 10.6	70 / 18.5	105 / 27.7	105 / 27.7	250 / 66.0	216 / 57.2
Maximum Pressure Head	Mts	67	45	55	65	65	52
Pump Power Input	kW	0.6	0.6	1.2	1.6	2.8	1.7
Pump Max Input Power	Watts	1320	1510	1930	1930	3180	3180
Total (input) Load Electrical	kW	4.3	6.2	9.8	13.0	20.0	29.3
Safety Devices	High Pressure Switch, Low Pressure Switch, Flow Switch, Antifreeze Protection, Alarm with Buzzer						
Electrical Safety	Crankcase Heater, Overload for Pump, Circuit Breaker for Compressor, (Single phase/Phase reverse protection only for scroll compressors)						
Tank Capacity	Lts	60	60	120	120	160	NA
Chilled water connection							
Inlet	Inch	1"	1"	1 1/4"	1 1/4"	1 1/2"	2"
Outlet	Inch	1"	1"	1 1/4"	1 1/4"	1 1/2"	2"

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