



BLUE STAR



**PROCESS CHILLERS
WHEN PRECISION COOLING
IS CRITICAL.**



Blue Star, India's leading air-conditioning company, has been providing expert cooling solutions for nearly eight 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.

Within the chiller, this translates into precise water temperatures at all times, and an ability to work in any ambient condition.

Blue Star Process Chillers are specifically designed keeping process needs in mind. Moreover, they include 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 air-cooled Process Chillers enable simplified pipe routing and also ensure that the industrial process is not interrupted at any point of time.

Precise temperature control is not the only benefit:

- 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:

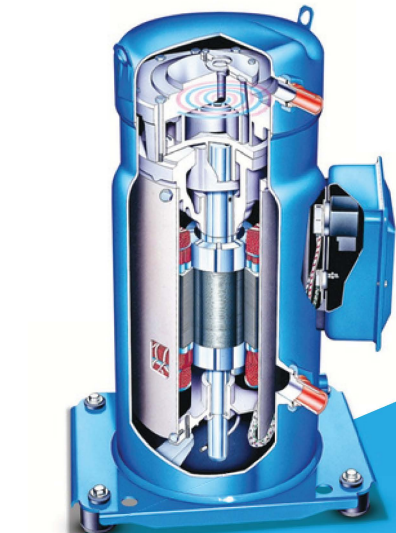
- Precise water temperature control, independent of ambient conditions
- Quick reaction to any sudden load changes, ensuring steady operating conditions
- Re-utilisation of the chilled water thereby avoiding wastage

KEY FEATURES



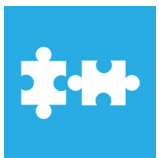
Highly efficient scroll compressor

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 come 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 to its reliability; and it allows for capacity modulation by switching on only as many compressors as required at any time to suit part-loads, thereby increasing efficiency.



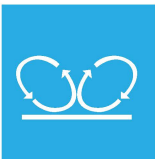
Quick to install

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



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. This, coupled with the buffer tank and corresponding pump in the same cabinet, ensures high reliability of the system, supplying a constant quantity of water at the desired temperature. Blue Star also offers stainless steel tanks for specific applications where the process demands such a construction.



High-efficiency heat transfer

The condenser 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.



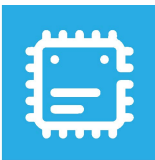
Hot gas bypass arrangement

An in-built 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 galvanised steel coated with pure polyester UV-resistant powder coating tested to withstand 500 hours of salt spray. Rigid base frames cater to the full weight of the chiller during handling and installation. All refrigerant lines are made of copper and the complete hydronic run, including water low switch, strainer, auto air vent, and thermos-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. They 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.



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 to ensure fail-safe operation:

- Low/high-pressure suction and discharge side protection
- Overload protection
- SPPR (Single Phase Prevention)
- Float valve

Low noise design

All condenser fans are re-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.



BPCO Series

The Blue Star Process Chiller Open Loop (BPCO) series is equipped with in-built buffer tank which acts as a storage-cum-makeup water tank to account for any leakage from the system. These chillers are also provided with an in-built pump which requires only the inlet and outlet chilled water pipes to be connected at site.

Capacity Range and Application Guideline

With the buffer tank being open in the system (open loop) these chillers are ideal for various industrial applications like Plastic Injection Moulding, Pharma, Chemical and other manufacturing industries.

Technical Specifications of Special Packaged Aircooled Chiller (BPCO-R1) with R-22 Refrigerant

Available in 10, 13, 22 TR

Plastic Injection Moulding, Pharma, Chemical, Manufacturing & Others

Description		Units	Models					
			BPCO – 03R1	BPCO – 05R1	BPCO – 08R1	BPCO – 10R1	BPCO – 15R1	BPCO – 22R1
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	mm	1240	1240	1410	1410	1775	2286
	Width	mm	450	450	755	755	935	1380
	Height	mm	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	mm2 Al		4	4	6	10	16	35
	mm2 Cu		2.5	2.5	4	6	10	16
Compressor								
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								
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			Aluminium/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			Grundfoss					
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	20	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"

****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 0.00010 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 (BPCO–R2) with R–407C Refrigerant

Description	Units	Models		
		BPCO – 05R2	BPCO – 10R2	BPCO – 15R2
Nominal Capacity**	TR/kW	4.7/16.5	9.4/33.0	14.1/49.6
Nominal Dimensions	Length	mm	1240	1410
	Width	mm	450	755
	Height	mm	1370	1275
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	mm2 Al	4	10	16
	mm2 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 1/4"	1 1/2"
Outlet	Inch	1"	1 1/4"	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 0.00010 F.ft². hr/Btu
3) 35°C (95°F) Ambient Temperature
*Specifications are subject to change due to continuous product development



BPCC Series

The Blue Star Process Chiller Closed Loop (BPCC) series is equipped with a pressurised expansion tank in-lieu of an open buffer tank. The pressurised tank accounts for any expansion of water in the system during on/off cycles. These chillers are also provided with an in-built pump which requires only the inlet and outlet chilled water pipes to be connected at site.

Capacity Range and Application Guideline

The BPCC Series chillers suit the cooling requirements of MRI scan machines. These chillers can also be installed for other similar cooling requirements.

Technical Specifications BPCC Series

Available in 10, 13, 22 TR

MRI Scan Cooling & Others

DESCRIPTION		UNITS	BPCC- 10 R1	BPCC - 13RA	BPCC - 13R1B	BPCC - 22R1
Nominal Cooling Capacity		kW (TR)	35 (10)	45 (13)	46 (13.0)	77.35 (22)
Nominal Dimensions	Length	mm	1775	1775	1775 (70)	2286
	Width	mm	935	935	935 (37)	1380
	Height	mm	1505	1505	1505 (59.25)	1986
Net Weight / Unit (Approx.)		Kg.	680	695	710	1250
Refrigerant / Charge		Kg.	R22 / 8.0	R22 / 9.5	R22 / 11.7	R22 / 18.0
Hermetic Compressor (scroll)			Copeland, ZR81 x 2#	Danfoss, SM120 x 2#	Copeland, ZR108KC-TFDx2#	ZR19 x 2# or Danfoss SM-185
Power Supply		V/PH/Hz	400V, 3-ph, 50 Hz	400V, 3-ph, 50 Hz	400V, 3-ph, 50Hz	400V, 3-ph, 50 Hz
Fan Motor		Kw (HP)	0.37 (0.5)	0.37 (0.5)	1/2	1.2 (1.6)
Speed		RPM	910	910	900	700
Fan Dia.		mm (inch)	610 (24)	610 (24)	610 (24)	914 (36)
Cooler (Brazed Plate Type) Qty.		No.	1 (Dual Refrigeration)	1 (Dual Refrigeration)	1 (Dual Refrigeration)	2
Chilled Water Pump			Multistage Centrifugal In-line, Grundfoss Make	Multistage Centrifugal In-line, Grundfoss Make	Centrifugal, Monoblock Grundfoss Make	Multistage Centrifugal In-line, Grundfoss Make
Model			CR3-9	CR3-11	3	CR10-5
Min. Head Pressure		Mtr	26	27	36.8	47
Max. Flow rate		Lit./Min.	70	75	133	123
Expansion			Membrane Pressure type	Membrane Pressure type	Membrane Pressure type	Membrane Pressure type
Pre-loading Pressure		bar	2	2	2	2
Max. Operating Pressure		bar	8	8	8	8
Other Accessories			Strainer, NRV, Auto Air Vent, Flow Modulating Valves for inlet & outlet	Strainer, NRV, Auto Air Vent, Flow Modulating Valves for inlet & outlet	Strainer, Auto Air Vent, Angle valve for Pressure measurement	Strainer, NRV, Auto Air Vent, Flow Modulating Valves for inlet & outlet
Water Connections		No.	1 Each	1 Each	1 Each	1 Each
Size			1-5/8" DD Copper	2-1/8" DD Copper	1-1/2"	2-1/8" DD Copper
Incoming Supply Cable Size			16 mm2 AL	25 mm2 AL	25 AL. Dr 16 CU.	35 mm2 AL

Rating Conditions

The ratings are based on 12.2°C (54°F) chilled water inlet and 6.7°C (44°F) chilled water outlet for Cooler with 0.00010F.ft2.hr/ Btu fouling factor and 35°C (95°F) ambient temperature.

Operating Range

Outlet temperature from the chiller 6 to 12°C & Inlet temperature condition will be 19 to 22°C.

BPCOS Series

The Blue Star Process Chiller Open Loop with stainless steel hydronics (BPCOS) series is equipped with a stainless–steel buffer tank. These chillers are provided with an in–built stainless–steel pump and the interconnecting piping between the pump and tank are also made of stainless steel.

Capacity Range and Application Guideline

The BPCOS Series chillers are ideal for the food and beverage industry where the chilled water is directly used to cool the components involving manufacturing and processing of consumable items like biscuits, chocolates, etc.

Technical Specifications BPCOS–04 Series

Available in 4 TR

Food and Beverage industry and other similar industries

NOMINAL CAPACITY	UNIT	4 TR
Model		BPCOS 04
Size Length	mm	1420
Size Depth	mm	790
Size Height	mm	1270
Net Weight	Kg.	286
Operating weight	Kg.	690
Electric power supply	V/PH/Hz	400/3/50
Compressor		
Type		Scroll
Make		Copeland
Input Power	Watts	5170
Qty.	Nos.	1
Evaporator		
Type		Brazed Plate heat exchanger
Qty.	Nos.	1
Construction material		Stainless steel
Storage Tank		
Capacity	Liter	400
Material		Stainless Steel – 304 grade
Insulation, Thickness, Density	Lb/Ft ³	Close cell foam, 20 mm. thk., 0.1
Condenser		
Type		3/8" OD inner grooved tubes, 0.14mm thk hydrophobic coated slit fins
Rows	Nos.	14 / 3
Air Flow	CFM	2850
Fan Dia. x Qty.	MM. x Nos.	450 x 1
Motor Make, Type, Power supply & Speed	V/Ph/Hz, RPM	EBM, External rotor, 230/1/50, 1310
Input Power	Watts	610
Qty.	Nos	1
Chilled Water Pump		
Type		Centrifugal
Make / Model		Grundfoss
Flow Rate	Lit./ Hr.	300
Pressure head	meter	28
Input Power	Watts	200
Total (input) Load Electrical	Watts	5980
Safety Devices		High pressure switch, Low pressure switch, Flow switch, Antifreeze protection
Electrical Safety		Crank case heater, Overload for pump, Circuit breaker for compressor, SPGR
Connections		
• Outlet	BSP	1" (F)
• Inlet	BSP	½" (F)
• Overflow	BSP	½" (F)
• Drain	BSP	1" (M)

Notes

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