nano

PURIFICATION SOLUTIONS

C-Series[1]

precision controlled industrial process chillers

cooling capacity: 6000 - 482,000 BTU/hr (0.5 - 40 tons)

C 1

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Leading edge technology and more than 100 years of **experience**...nano-purification solutions, your world-class provider of state-of-the-art compressed air and gas solutions to industry.

Our commitment at n-psi is to work alongside our **customers** and provide unique solutions with the highest quality products to solve your specific challenges.

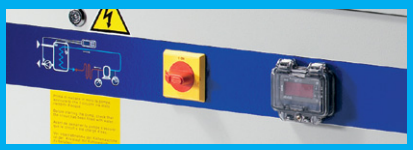
A wealth of experience and leading edge products are only part of the equation. n-psi realize that world-class customer **service** is the most important component to any successful business.

Experience.Customer.Service...**n-psi**

Improved productivity & reduced costs

Process chillers are used in a variety of industrial applications to improve processes, reduce operating costs and increase productivity. Utilization of process chillers is becoming increasingly prevalent due to more stringent environmental water quality standards.

n-psi realize the importance of chilled water in industry and have developed the C-Series[1] line of precision controlled industrial process chillers to meet the increasing demand for high quality complete packaged solutions which meet various industrial applications.



Design

Our experienced team of design engineers are always looking for new and unique technologies and products to bring you the highest level of performance and lowest overall operating cost.

Research & Development

Our R&D team endeavors to provide solutions that go beyond developing an existing product. They are continually researching new technologies which can provide unique advantages over competitive offerings.

Manufacture

The reliable and energy saving nano C-Series[1] industrial process chillers are manufactured in a state of the art facility to the highest standards of build quality to ensure reliability and high levels of performance.

nano C-Series[1] industrial process chillers

The advanced nano C-Series[1] industrial process chillers benefit from the experience of a design that has been perfected over 20 years and repeatedly proven by hundreds of thousands of units in operation around the world. Designed together with industrial users, these chillers have stood the test of time in virtually every industry and application.

The C-Series[1] operates in a closed circuit, offering precise water temperature control and rapid response to changes in ambient and thermal load. This design also eliminates the waste, corrosion and bacterial growth associated with open circuit systems.

In addition, energy efficient and reliable compressors combined with a unique oversized in-tank evaporator provide the lowest operating costs available on the market today.

Experience:

- increased productivity
- decreased production time & cost
- decreased waste
- decreased maintenance, and unplanned down time

Reliability is built in... and backed by a 1 year warranty.

advanced microprocessor controls

Optional remote control

At n-psi we take our control systems seriously. All C-Series[1] industrial process chillers feature easy to use advanced microprocessor controls. The water outlet temperature, operational icon indicators and up to 10 different programmable alarms are indicated on a bright digital LED display.

Need to monitor and control your chiller remotely? No problem. Alarms are stored in history, and alarm indication can be transmitted to an external supervisor system via volt free general alarm contacts.

Better yet, take advantage of our remote control options to monitor and control your unit remotely at distances up to 500 feet.

Not far enough? The microprocessor can also be linked to external supervisor systems either via MODBUS, through the internet, or directly to a cellular phone.

C-Series[1] - innovative, reliable & efficient

energy efficient & reliable compressor

The compressor is the most important part of any refrigeration system. Whether piston (NPC 005 to 050) or scroll (NPC 060 to 400) the compressors are chosen model by model to minimize power consumption, noise, vibration, and moving parts, while maximizing reliability and resistance to liquid refrigerant returns.

integral water pump

For ease of installation, a 43.5 psi pump is standard on all models and mounted within the chiller enclosure. Centrifugal pumps are used on models NPC 015 and larger, and models NPC 015 through NPC 180 feature stainless steel internals. Options for 72.5 psig and dual pumps (for backup) are available on request.

oversized in-tank evaporator

The oversized evaporator maximizes heat transfer and minimizes pressure drop for optimum efficiency. Mounted inside the water tank this innovative design reduces the chillers footprint and ensures steady water temperatures while further improving efficiency and significantly reducing ambient temperature impact.

thermally insulated water tank

The water tank is insulated for maximum efficiency, includes bleed and drain valves, a water level sensor (NPC 015 and larger), a water bypass and anti-freeze warning alarms for reliable and fail safe operation. Choose from atmospheric or pressurized fill kits (NPC 015 and larger).

low maintenance condenser

Condenser coils are conveniently located on only one side of the chiller enclosure. This simplifies installation and minimizes floor space requirements. A removable and washable filter is provided on models NPC 030 and larger. Water cooled condensers are available on request.

multiple circuits for improved operation

Models NPC 150 through NPC 230 have two compressors. Models NPC 280 and larger have four compressors and two refrigeration circuits. These models feature compressor rotation, a compressor unloading function and optional multi-step fan speed control for optimum operation in even the most difficult conditions.

Quality components designed for industrial applications

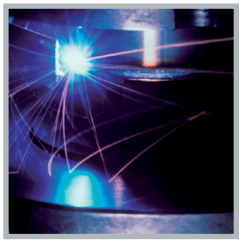
Advanced microprocessor control system & LED display

common industrial applications

plastics

nano C-Series[1] chillers are used extensively in the plastics industry for blow molding, injection molding, sheet and profile extrusion, PET and thermoforming. The reliable and cost effective temperature control they provide improves cycle times reducing operating costs and increasing productivity.

lasers



The precise temperature control capabilities of the nano C-Series[1] industrial process chillers are perfectly suited for the demands of laser welding, cutting, engraving, profiling, optics and medical applications.

chemical & pharmaceutical

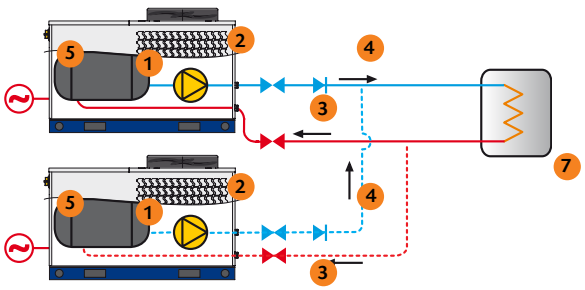
The C-Series[1] improves processes and reduces cycle times across a wide range of chemical and pharmaceutical applications, facilitating precise temperature control and expediting heat rejection.

food & beverage

Whether the process involves mixing, baking, brewing, fermenting, carbonating, bottling, or storing - the nano C-Series[1] provides the cooling and temperature control needed to eliminate product spoilage and improve production.

typical configurations

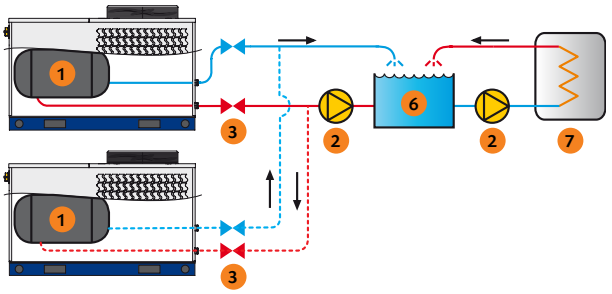
closed circuit installation



1. Accumulation tank
2. Pump
3. Valve
4. Non return valve
5. Expansion tank
6. Open tank
7. User

Expansion tanks are required for all closed circuit installations. When multiple chillers are installed in parallel, the expansion tanks must be automatic.

open circuit installation



Expansion tanks are not required for open circuit installations. Open circuits also typically use an external pump, so the internal pump may not be required.

nano C-Series[1] sizing & specifications

Model	Cooling Capacity (1)		Compressor Absorbed Power (1)	Total Installed Power	Chiller Water Connections	Dimensions (inches)			Weight	Tank Capacity	Water Pump
	BTU/hr	tons	kW	kW	NPT	Width	Depth	Height	lbs	gallons	hp
NPC 005	6,010	0.50	0.86	1.4	1/2"	22.6	26.3	30.9	170	6.1	1/2
NPC 010	11,900	0.99	1.61	3.0	1/2"	22.6	26.3	30.9	184	6.1	1/2
NPC 015 UL	18,580	1.55	2.13	4.0	3/4"	22.0	49.2	29.5	280	15.4	1
NPC 020 UL	24,460	2.04	2.52	4.8	3/4"	22.0	49.2	29.5	291	15.4	1
NPC 030 UL	36,850	3.07	4.33	7.2	1"	26.0	50.4	52.8	441	29.0	1
NPC 040 UL	52,990	4.42	6.05	9.4	1"	26.0	50.4	52.8	485	28.7	1
NPC 060 UL	79,500	6.62	8.88	13	1 1/2"	29.9	73.2	54.7	730	34.8	1 1/4
NPC 090 UL	118,200	9.85	11.86	18	1 1/2"	29.9	73.2	54.7	851	63.9	1 1/4
NPC 120 UL	148,280	12.36	14.72	22	1 1/2"	29.9	73.2	54.7	893	63.9	2 1/2
NPC 130 UL	165,130	13.76	17.87	25	1 1/2"	29.9	73.2	54.7	917	62.9	2 1/2
NPC 150 UL	190,650	15.89	22.42	28	2"	34.1	86.8	78.9	1219	87.5	2 1/2
NPC 180 UL	216,960	18.08	23.34	33	2"	34.1	86.8	78.9	1433	87.5	2 1/2
NPC 210 UL	252,810	21.07	25.62	38	2"	34.1	86.8	78.9	1631	86.9	3
NPC 230 UL	277,880	23.16	32.40	45	2"	34.1	86.8	78.9	1669	86.9	3
NPC 280 UL	345,690	28.81	38.55	55	2 1/2"	49.4	126	84.3	2745	126.6	5 1/2
NPC 330 UL	397,240	33.10	43.75	64	2 1/2"	49.4	126	84.3	2833	126.6	5 1/2
NPC 400 UL	481,890	40.16	51.61	71	2 1/2"	49.4	126	84.3	2965	126.6	5 1/2

(1) Assumes 45°F cooling water supply, 55°F cooling water return and 95°F, ambient temperature.

Model	Inlet Water Temperature		Outlet Water Temperature		Ambient Temperature		Voltage	Compressors	Circuits
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	V/Ph/Hz	Qty	Qty
NPC 005 to NPC 010	23°F	95°F	32°F	86°F	32°F	115°F	230/1/60	1	1
NPC 015 UL to NPC 280 UL			14°F				460/3/60		
NPC 150 UL to NPC 230 UL								2	
NPC 280 UL to NPC 400 UL								4	2

- NPC 005 & 010 models use R404A refrigerant. All other models use R407C.
- Contact support@n-psi.com for water cooled options, or for capacities or voltages not listed above.

Correction Factors	To calculate the cooling capacity for any model at operating conditions other than those above: Cooling Capacity (from table above) x K1 x K2 x K3 x K4 x K5 (from tables below) = Cooling Capacity at new conditions (1)									
Water outlet temperature (°F)	30	35	40	45	50	55	60	65	70	85
K1	0.681	0.787	0.909	1	1.095	1.194	1.271	1.271	1.271	1.271

Ambient temperature (°F)	70	75	80	85	90	95	100	105
K2	1.176	1.143	1.109	1.174	1.038	1	0.961	0.921

Evaporator ΔT (3) (°F)	7.2	8	10	12	14	16	18
K3	0.988	0.994	1	1.007	1.013	1.018	1.026

Condenser ΔT (2) (°F)	10	12.5	15	17.5	20	25
K4	1	0.990	0.980	0968	0.956	0.932

Ethylene glycol (%)	0	10	20	30	40	50
K5	1	0.99	0.98	0.97	0.96	0.93

(1) To be used as a rough guide only. All applications should be confirmed by n-psi. Contact us for sizing assistance.
(2) Assumes no change to condenser inlet water temperature.
(3) Assumes no change to evaporator outlet water temperature.

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