Hyperchill Laser

Industrial Process Chillers for Precision Cooling

Precision chilled water with non-ferrous hydraulic circuit

Hyperchill Laser is designed to meet the needs of many applications requiring stable working conditions with maximum quality and cleanliness of the process fluid.

Compact and reliable machines designed for industrial applications and manufactured with the highest quality and safety standards.

Laser marking, cutting and welding are typical industrial processes where the characteristics of Hyperchill Laser are vital to obtain the desired product quality and to optimise the production process.

Product Features:

High consistency

- Non ferrous hydraulic circuit. Stainless steel tank, evaporator, and water pump maintain the quality of the coolant.
- Very precise outlet water temperature control with two hot gas valves (± 0,5 °C)
- PID software developed and tested to give the highest temperature consistency even at variable loads.
- High pressure pumps supply constant water flow and pressure to the system

Perfect solution, easy to install and manage

- Hydraulic circuit: storage and filling tank, with evaporator and pump provide a compact solution, easy to use and install.
- Electronic controllers with proprietary software provide access to all the vital parameters of the unit and allow special management for specific needs, with remote monitoring available.
- Condensers filters
- Independent condensing plenum
- Full access and easy service design

Low power consumption

- Very low power consumption thanks to oversized condensers and evaporators, and use of compliant scroll compressors (from ICEP007 onwards).

High reliability

- Maximum working ambient temperatue up to 48 °C for ICEP models, up to 45 °C for HLS models, prevents downtime even under extremely harsh conditions.

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The performance of high-powered lasers depends on effective cooling. High-powered lasers generate a significant amount of heat that must be removed from the laser system to avoid overheating critical components. Carbon dioxide (CO_2) lasers, excimer lasers, ion lasers, solid-state lasers, and dye lasers all use liquid cooling to remove excess heat. Laser liquid cooling can help accomplish three goals: maintaining a precise laser wavelength and higher output efficiency, achieving desired beam quality, and reducing thermal stress on a laser system.

Microprocessors: allow complete control of the unit parameters. Proprietary software from ICEP007 onwards allows and wide range of programming and remote monitoring options.

Compliant scroll compressors: (from ICEP007 onwards) with less moving parts and compliant technology provide excellent efficiency, high reliability, and very low noise levels.

Water and refrigerant manometers permit easy control of the working conditions.

Stainless steel plate evaporators, compact and efficient, external to the tank.

Mesh filters: (from ICEP007 onwards) condenser protection from dirt and contamination, reduces maintenance costs and the risk of downtime.

Water pump: available with different head pressures to fit the end user application, can be also configured as twin system for redundancy.

Water tank: generously dimensioned guarantee high reliability and improved temperature control.

Differential pressure switch: protects pump and evaporator in case of flow shut down.

Versions:

- Low ambient temperature (from ICEP007 onwards): additional condensing control for continuous operation in cold ambients (negative temperature). Available for air cooled versions with axial fans.
- Precision control: when very precise water temperature is required (± 0,5 °C).
- Special and multiple pumps: higher (P50-5bar) or lower (P15-1,5bar) head pressure available to suit different hydraulic circuits. Double stand- by pump for higher reliability.
- Antifeeze heating (from ICEP007 onwards): avoids freezing when the unit is switched off. Can also be used as a heater to warm up the system.

Options:

- Water by-pass: externally adjustable allowing the correct flow throught the system to be set.
- Flow switch: to be used as an alarm signal in case of water flow shut down.
- Check valves: external non-return valve + solenoid valve to separate the hydraulic circuit when the unit is switched off.
- Wheels (ICEP002-ICEP014): for easy of transport.
- Remote control kits: base version for remote ON/OFF and general alarm monitoring or advanced version for complete unit management via remote monitoring.
- Water filters for circuit cleanliness and machinery protection.

Technical data

Model		ICEP								HLS						
		002	003	005	007	010	014	020	024	029	039	046	057	076	090	116
Cooling capacity[1]	kW	1,7	3,3	5,2	7,8	10,8	14,6	20,3	23,6	28,1	38,2	45,2	56,4	76,0	90,2	115,5
Compressor abs. Power[1]	kW	0,7	1,3	1,4	1,7	2,5	3,2	4,4	5,4	5,7	7,7	10,1	12,3	15,4	20,3	24,9
Cooling capacity[2]	kW	1,5	2,9	4,57	6,8	9,2	12,4	17,8	20,9	25,6	34,0	43,0	52,9	67,1	79,9	101,3
Compressor abs. Power[2]	kW	0,8	1,48	1,54	1,87	2,8	3,58	5,3	6,5	6,9	9,4	12,6	15,3	18,7	24,2	29,9
Power supply	V/ph/Hz	230/1/50			400/3/50 no neutral											
Protection index		33			54											
Refrigerant		R407c														
Compressors																
Type		hermetic pistons			hermetic scroll											
Compressors/circuits		1/1												2/2		
Max abs. power[1] comp.	kW	0,7	1,3	1,5	2,4	3,8	4,4	5,7	6,6	7,8	11,1	13,7	16,8	11,1	13,7	16,8
Axial fans																
Quantity	n°	1						2					3			
Max. abs. Power[1] fan	kW	0,07	0,12	0,12	0,3	0,3	0,4	0,4	0,4	0,78	0,61	0,61	0,61	0,78	0,78	0,78
Air flow	m^3/h	430	1295	1295	3437	3437	4337	6878	6159	9200	12400	12000	17400	25500	25000	26400
Pump P30																
Max abs. power	kW	0,4	0,4	0,4	0,9	0,9	1,0	1,3	1,3	1,3	1,3	2,3	2,3	2,7	2,7	2,7
Water flow (nom/max)[1]	m^3/h	0,3/1,9	0,6/1,9	0,9/1,9	1,3/4,8	1,8/4,8	2,5/6	3,4/9,6	4,9/9,6	4,8/9,6	6,6/9,6	7,8/18	9,7/18	13,1/27	15,5/27	19,8/27
Head pressure (nom/min)[1]	m H_2O	36/5	32/5	27/5	32/12,8	30/12,8	31/21	30/17,3	29/17,3	27/17	24/17	28/23	27/23	30/18	28/18	25/18
Pump P50																
Max abs. power	kW	0,6	0,6	0,6	0,9	0,9	0,9	1,2	1,5	2,6	3,1	3,1	3,7	4,5	4,5	4,5
Water flow (nom/max)[1]	m^3/h	0,3 / 2,7	0,6 / 2,7	0,9 / 2,7	1,3 / 4,2	1,8 / 4,2	2,5 / 4,2	3,5 / 7,2	4,1 / 7,2	4,8/9	6,6/13	7,8/13	9,7/13	13,1/27	15,5/27	19,8/27
Head pressure (nom/min)[1]	m H_2O	58 / 8	52 / 8	45 / 8	53 / 26	52 / 26	45 / 26	49 / 21	56 / 26	55/38	48/37	47/37	52/46	47/30	45/30	40/30
Dimensions and weight																
Width	mm	520	755	755	756	756	756	756	756	1650	1650	1650	2200	2200	2200	2200
Depth	mm	500	535	535	806	806	806	1206	1206	748	748	748	748	898	898	898
Height	mm	550	801	801	1405	1405	1405	1405	1405	1358	1358	1358	1358	1984	1984	1984
Connections in/out	in	1/2"	3/4"	3/4"	3/4"	3/4"	3/4"	1"	1"	1 ”	1 ¼”	1 ¼”	1 ½”	2”	2”	2”
Tank capacity	l	15	15	22,5	65	65	65	100	100	100	100	100	200	300	300	300
Weight (axial)	kg	40	80	85	160	165	175	220	230	321	355	375	500	750	870	960
Noise level																
Sound pressure (axial)	dB(A)	52	52	52	53	53	50	50	50	53	52	52	56	58	58	58

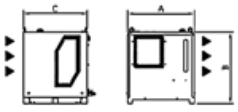
(1) at water inlet/outlet temperature = 20/15 °C, glycol 0 %, ambient temperature 25 °C. Net cooling capacity, without pump heat load.
(2) at water inlet/outlet temperature = 25/20 °C, glycol 0 %, ambient temperature 35 °C. Net cooling capacity, without pump heat load.
(3) referred to free field conditions at a distance of 10m from unit, measured on condenser side, 1 m from ground.

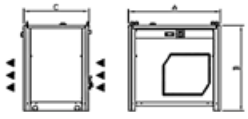
A) Ambient temperature Correction factor (f1)	°C	5	10	15	20	25	30	35	40	45
		1,05	1,05	1,05	1,05	1	0,95	0,89	0,83	0,77

B) Water outlet temp. Correction factor (f2)	°C	5	10	15	20	25
		0,72	0,86	1	1	1

C) Glycol (in weight) Correction factor (f3)	%	0	10	20	30
		1	0,99	0,98	0,97

To obtain the required cooling capacity multiply the value at nominal conditions by the above correction factors (i.e. cooling capacity = Pxf1xf2xf3, where P is the cooling capacity at conditions (1). Hyperchill Laser, in its standard configuration, can operate up to ambient temperatures of max 48 °C for ICEP models, 45 °C for HLS models and min 5 °C and water temperatures of max 30 °C inlet and min. 0 °C outlet. The above correction factors are approximative: for a precise selection always refer to the software selection program.


ICEP002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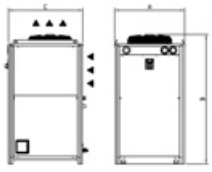
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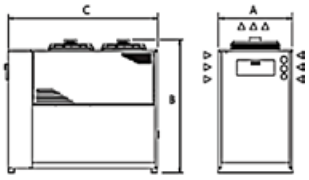
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