DRASCO
ENGINEERING SOLUTIONS

Cryostream 2 – LN2 / pressurized air heat exchanger:

Industry leading efficiency, power density and reactivity

Provides a cryogenic, controlled airstream powered by liquid nitrogen (LN2).

Higher productivity for Semicon Industry:
Extremely short cool down time of less than 5 minutes means your machine is ready for operation in record time!

New possibilities for Biotech Industry:
With up to 40K/min cooling rate, temperature specific programmable via recipe, the performance is far superior to electric cooling systems. In addition, installation space requirements and acquisition costs are much lower. No external cooling necessary!

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The fastest and most efficient LN2 heat exchanger on the market! We work with a continuous, proportional controlled LN2 stream which is not only vaporized but exhausted close to ambient temperature. Discontinuity in in LN2 supply (pressure fluctuations, gas bubbles etc.) have no effect to cold air output temperature. You get a reliable, continuous stream of cryogenic air and in addition a continuous stream of exhaust N2 which can be used for drying applications. In order to minimize thermal losses, all parts are completely housed with tailor made CNC milled Airex high performance insulation parts with at least 70mm of remaining wall thickness.

The Core part is an one-piece aluminium 3D printed Drasco blackbox heat exchanger. Compared to the predecessor model with seperate vaporizer and two heat exchanger stages, the complete thermodynamic process is happening in our new developed high-end system. Power density has increased dramatically and necessary system space is much lower. The thermodynamic efficiency is even better than at our already excellent predecessor model. In addition losses are reduced because of the much smaller outer surface. The possible cool rate gradient is 300% higher!

If you have different requirements like oil instead of air, more airflow, more channels – no problem. We can adapt our design to your specifications.

Contact us! Together we will create an effective solution!

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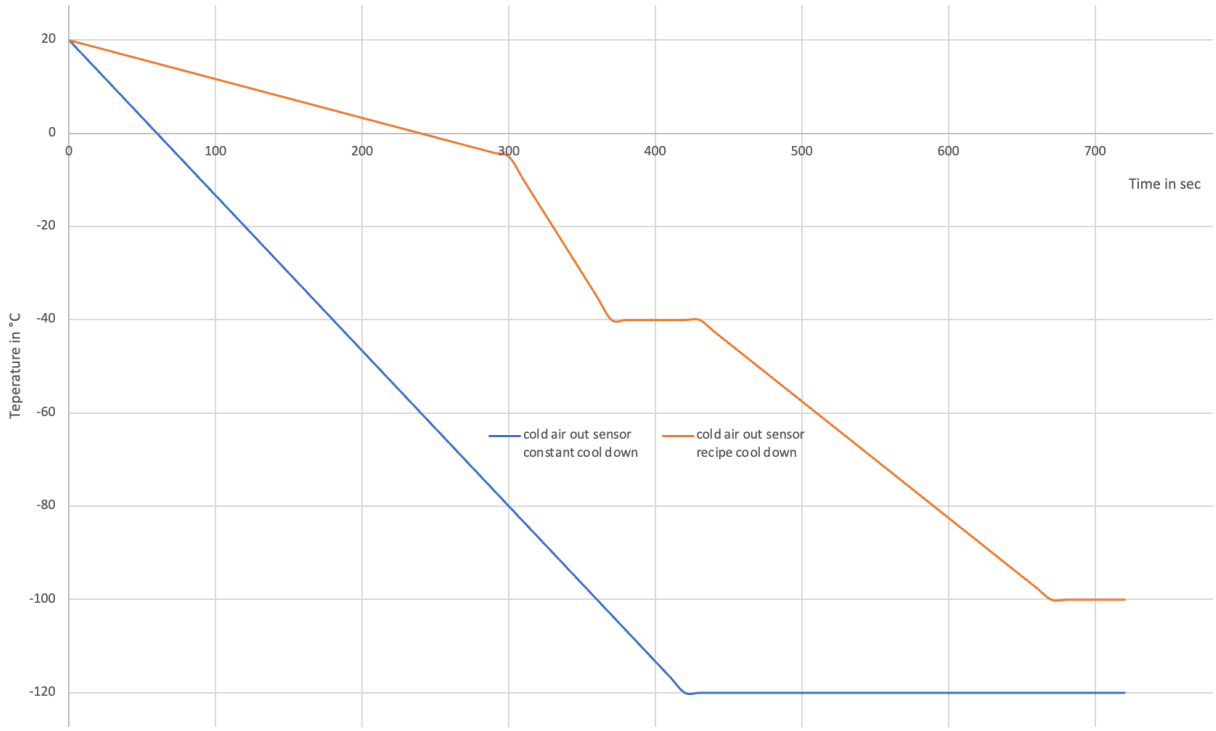
Example cool down curves:
referring to cold air output of Cryostream2

Blue: Constantly controlled with a gradient of 20K/min and -120°C set temperature.

Orange: Customer specific cooling recipe (example)
+20°C to – 5°C: 5K/min
-5°C to -40°C: 30K/min
hold at -40°C for 1 minute
-40°C to -100°C: 15K/min



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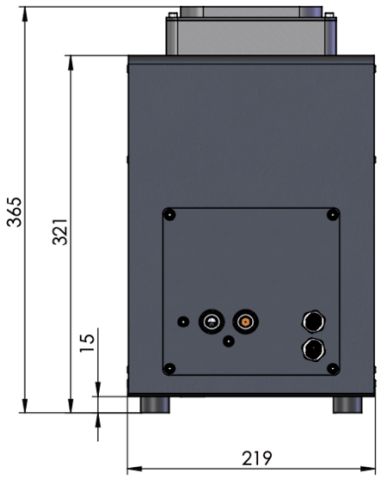

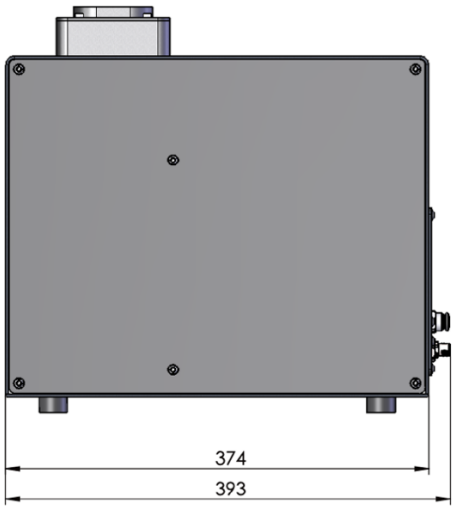

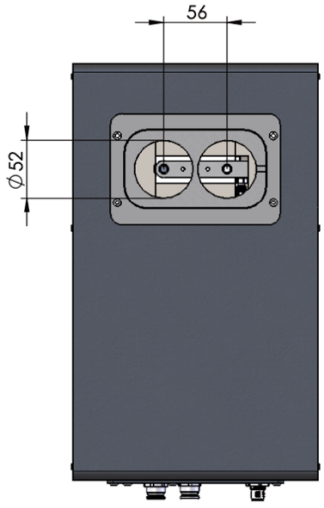

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Produkt Spezification "CRYOSTREAM2"

rev. 2021-10-01

	specification	comment
system dimension (w x d x h)	393mm x 219mm x 375mm	
system mass	8.6 kg	
electrical interface	1x Phoenix Contact 1419700 1x Phoenix Contact 1419687	
max. required electrical current	24V DC / 2.4A	
pneumatic interface cold side	LN2 input: pipe connection for Ø8 pipe cold air output: tube screw on fitting for Ø8x1 PTFE tube	
pneumatic interface ambient side	N2 out: push in fitting Ø10 for standard pneumatic tube dry air in: push in fitting Ø10 for standard pneumatic tube	
dry air supply	2 - 5 bar filtered min. 40µm dryed min. -60°C dew point	**!Caution** Higher pressure than 5 bar can damage the heat exchanger!
LN2 supply	1.5 bar - 4 bar	with less than 2 bar cool down speed may be slower **!Caution** LN2 cirquit is overpressure protected @5bar. Do not connect supply with higher pressure directly. In this case LN2 would leak permanently through overpressure valve and could also damage the heat exchanger
LN2 consumption	< 3.5 l/h	for 80 l/min cold air @-120°C more during cool down phase, depending on programmed gradient and air flow
allowed environmental conditions	+10 °C bis +30 °C max. 20°C dew point	e.g. 55% rh @ 30°C or 75%rh @ 24°C
performance - min. temperatur	-130°C	measured at cold air out sensor
performance - max. Durchfluss	160 l/min	cold air output flow contact us if you need higher air flows
performance - temperature stability	±2°C	depending on control software
performance - initial cool down time	< 5min	from +20°C to -120°C
LN2 overpressure protection	5 bar	
min. allowed N2 out temperature	0°C	"vaporizer out" temperature sensor - to be checked via software
underlying standard	CE	

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