



Low temperature cooling system Type T-G for applications to -180°C (-292°F)

+/-0°C
KALTGAS

to
-180°C
KALTGAS



Cryogenic cooling system for cooling applications to -180°C (-292° F)

This KALTGAS system is designed to cool items to temperatures as low as -180°C (-292° F), by means of a tempering system that solely uses a flow of ultra cold gas. The system uses cold nitrogen gas to achieve very low temperatures. Liquid nitrogen (LN2) is vaporized in the LN2 storage container, and is then used as a cold gas for tempering. As examples of the many applications, a steady flow of cold gas can be directed at the object to be cooled or can be fed into a sample chamber to cool the whole space.

Applications include:

- Thermal testing of plastics, metals, composites etc.
- Cooling of electronic components
- Cooling of sample chambers
- Rapid freezing of biological samples, food and other materials
- Tempering of test samples during:
 - Tension or torsion tests
 - Notched bar tests
 - Chemical or physical tests
 - Chemical engineering processes

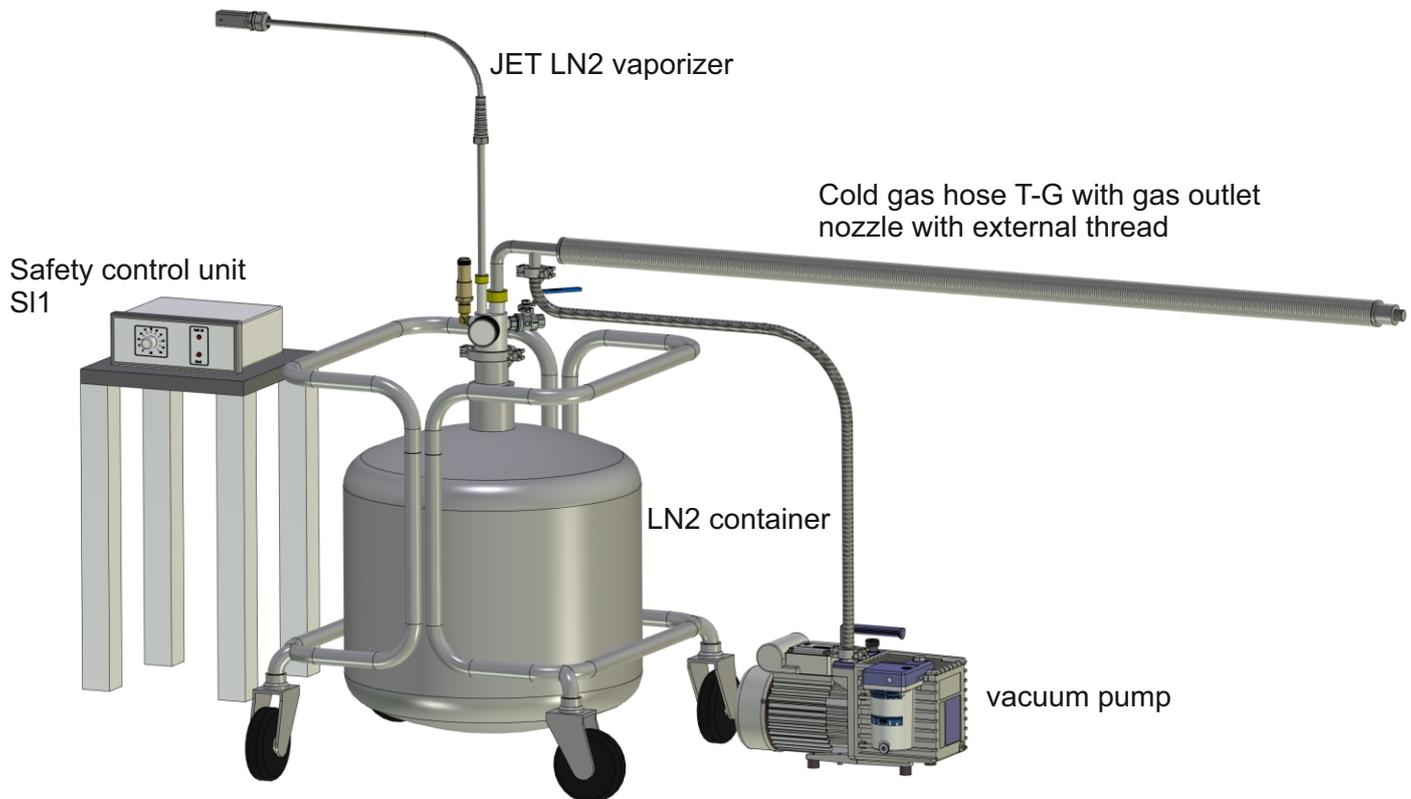
KALTGAS is a tempering system that utilizes the very low temperature of liquid nitrogen as a cooling agent. The Jet vaporizes the liquid nitrogen in a cryogenic container, producing a steady cryogenic gas flow. This LN2 vaporizer (Jet) can be adjusted to minimize liquid nitrogen consumption and to adjust both the cooling rate and the volume of the gas flow. The cryogenic gas flow is then piped through a vacuum insulated flexible metal line (N₂ gas line) to the object you wish to cool. A KALTGAS system needs only a few minutes to produce a cold gas flow with a temperature as low as -180° C (-292° F).

In most cases, this KALTGAS system is only used to produce a cold gas flow. The volume of the gas flow is adjusted with the SL1 safety control unit. Since the controlled system operates without a heat exchanger, it is not possible to maintain precise temperature stability.

To achieve good temperature and control stability, a post-heating module (heat exchanger) must be installed. This module can be connected directly to the line, or installed in a chamber right next to the cold gas flow.

The heat exchanger is designed to heat the cold gas flow to the desired temperature. The final product, a clearly quantified gas flow exiting the heat exchanger at a clearly defined temperature, is ready for use as a cooling agent.

Apart from the high cooling speed, another advantage of KALTGAS systems is their modular design. By swapping out individual modules such as the N₂ gas line, the LN2 vaporizer (Jet) or the heater, it is possible to change the cooling speed, LN2 consumption as well as the application. The basic modules, including the LN2 container and the vacuum pump remain unchanged.



The T-G 50 KALTGAS system includes a safety controller SL1, a KF-NW 50 siphon with an LN2 vaporizer (Jet), a flexible, evacuatable N₂ gas line, a PT100 temperature sensor and a vacuum pump with accessories.

Technical data for **Model T-G50**
 LN2 vaporizer (Jet) = 500 watts / LN2 consumption = 1,1l/h to 11l/h (liters per hour)
 N2 gas line = V2A, length 1.8 meters, flexible, with vacuum pump,
 siphon for LN2 container with KF NW 50
Order No.: Typ T-G 50

Best. Nr: T-G 50-1 (External thread)
Best. Nr: T-G 50-2 (Union nut)
Best. Nr: T-G 50-3 (Johnston coupling)
Best. Nr: T-G 50-4 (Swagelok)
Best. Nr: T-G 50-5 (Internal thread)

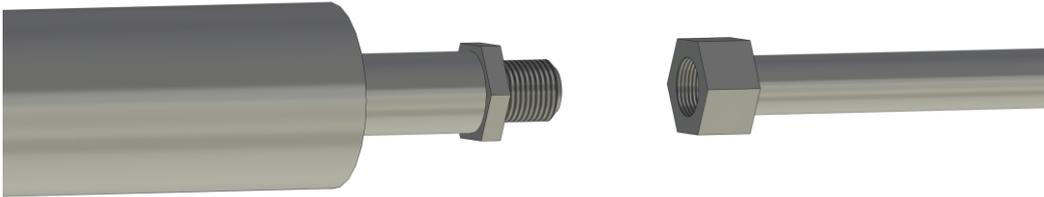
Accessories LN2 container with 20 to 300 liter capacity
 Post-heating module

Further achievements of KALTGAS systems on request.
Technical subject to change.

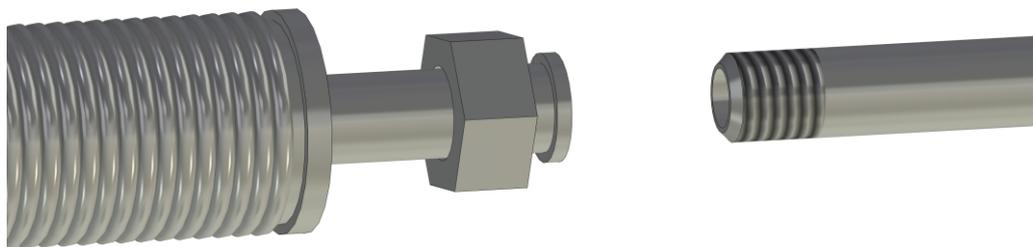
Connection options



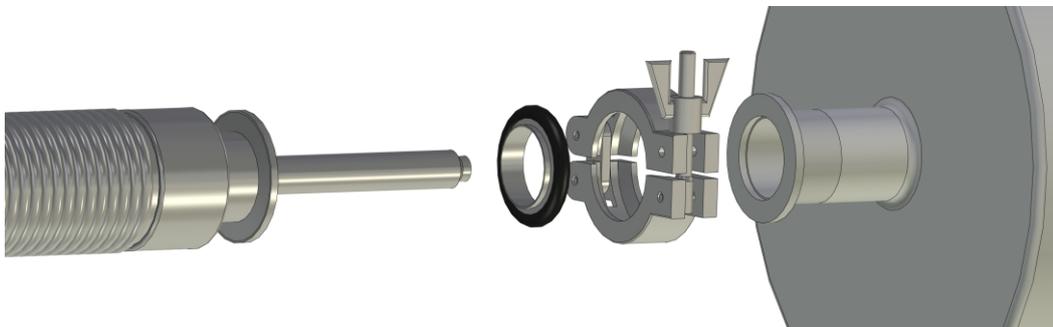
1. External thread (specify thread)



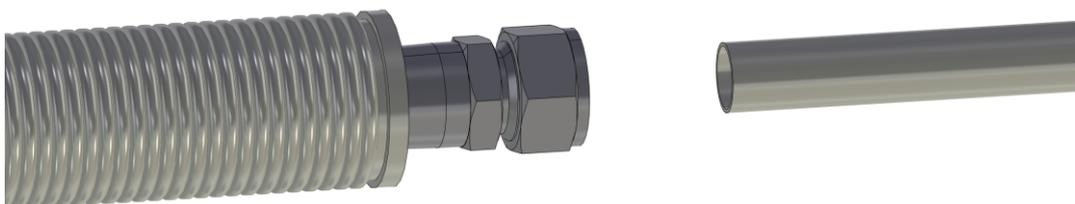
2. Union nut (UNF 3/4" standard kryo connector)



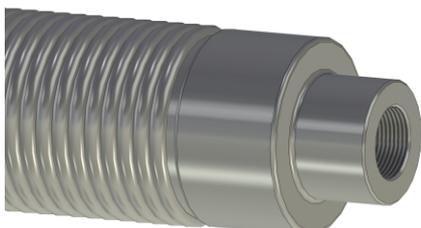
3. Johnston coupling (DN25/DN40) gas outlet pipe (l=80/150/200mm)



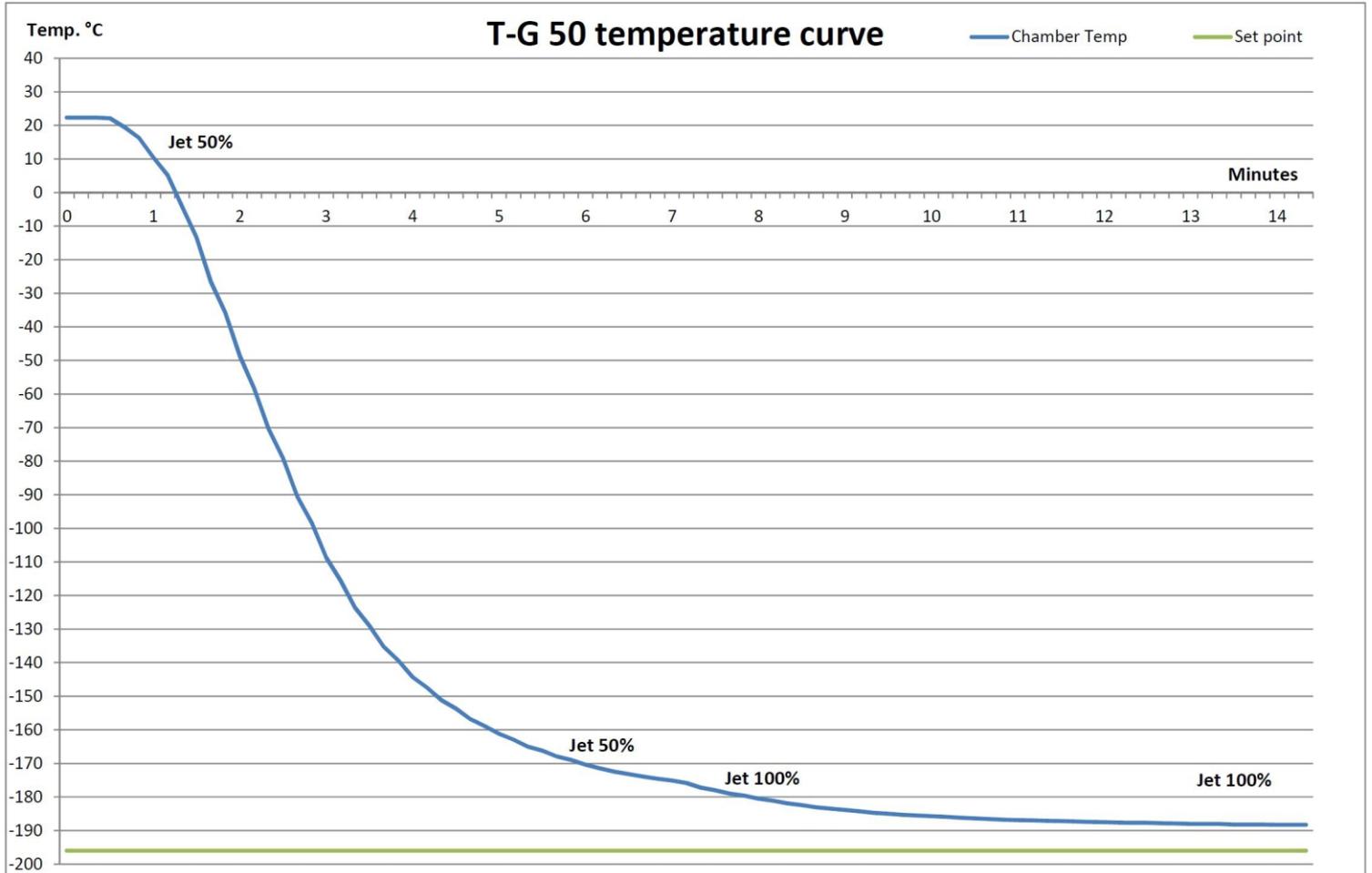
4. Swagelok (Specify pipe diameter)



5. Internal thread (specify thread)



Temperature curve with different JET power



Excel data on request

Measuring point at the gas outlet nozzle





Safety powerful manufactures for easy cryogenic cooling systems SL1

KALTGAS
to
-180°C



SL1 safety control unit

The SL1 safety controller has two functional components.

The first component is the LN₂-evaporator. The gas rate is adjusted with a control knob, with possible manual settings for the gas rate ranging from 0 to 100 %. The resulting volume of cold N₂ gas depends on the Jet power and the specified vaporizer rate. The Jet is available in ratings from 100 to 1000 watts. For an Jet with a rating of 1000 watts, that translates into a maximum N₂ gas production of over 14,000 litres of cold gas per hour. (A Jet with 100 watts evaporates approx. 2 litres of LN₂ per hour, one litre of LN₂ produces approx. 700 litres of N₂ gas.)

The second component is the heating element safety monitor. It monitors the two heating elements for overheating. Should the internal temperature of either of the two heating elements (LN₂ vaporizer (Jet) and heater) rise above the specified safety temperature, the safety controller shuts the KALTGAS system off and sounds an alarm. The only way to turn on the system again is manually.