

FREQUENTLY ASKED QUESTIONS



How does AIR CYCLE technology work?

[Air Cycle Technology](#) is based on the heating capability of air during compression and cooling down during expansion. Repetition of compression and expansion cycles allows us to reach and maintain ultra-low temperatures down to -110°C . Formally known as Brayton Cycle.

What refrigerant does an AIR CYCLE system use?

[MIRAI Cold refrigeration machines](#) use natural air as a refrigerant, thus, are eco-friendly and compliant with all international standards and regulations.

What is an OPEN CYCLE refrigeration system and how does it work (in a MIRAI Cold machine)?

[MIRAI Cold refrigeration machines](#), operating in an open cycle, supply cooled air directly to the refrigeration chamber. This is the most efficient way to cool air, due to the fact, that the system operates at low pressure and does not require an evaporator with fans, which greatly increases the overall efficiency. Open cycle refrigeration machines are supplied with an automatic humidity extraction device – a snow catcher.

What application is OPEN CYCLE suitable for?

[MIRAI Cold refrigeration machines](#) in an open cycle provide efficient cooling and automatic extraction of humidity from the chamber. Making it a perfect solution for various cooling needs, e.g. storage of biomedical (pharmaceutical) materials, premium food (fish, meat, fruit, or vegetables), and even whole-body cryotherapy chambers.

How does the humidity extraction device work?

[MIRAI Cold refrigeration machines](#), in an open cycle, are equipped with a unique humidity extraction device that extracts ice and humidity from the chamber. It prevents the build-up of ice inside the chamber, thus eliminating the need for defrosting procedures. The humidity extraction device acts as a filter on the suction side before entering the machine. The accumulated snow on the filter is then extracted via a motor-powered chain drive.

What is a CLOSED CYCLE refrigeration system and how does it work (in MIRAI Cold machine)?

[MIRAI Cold refrigeration machines](#) in closed cycle operate as an indirect refrigeration system and are equipped with a heat-exchanger for the secondary cooling medium (e.g. silicone oil).

What application is CLOSED CYCLE suitable for?

[MIRAI Cold refrigeration machines](#) in the closed cycle are designed for cooling of processes in various industries (e.g. freeze-drying/lyophilization and process cooling).

How is the turbo-module lubricated?

[MIRAI Cold refrigeration machines](#) use air bearings, which eliminates the need for oil management systems and allows us to significantly increase reliability and reduce the service needs of our machines.

What maintenance does a MIRAI Cold machine need?

[MIRAI Cold refrigeration machines](#) require regular replacement of air filter in the electric cabinet. Such a replacement may be required once or twice per year, depending on the area of installation.

