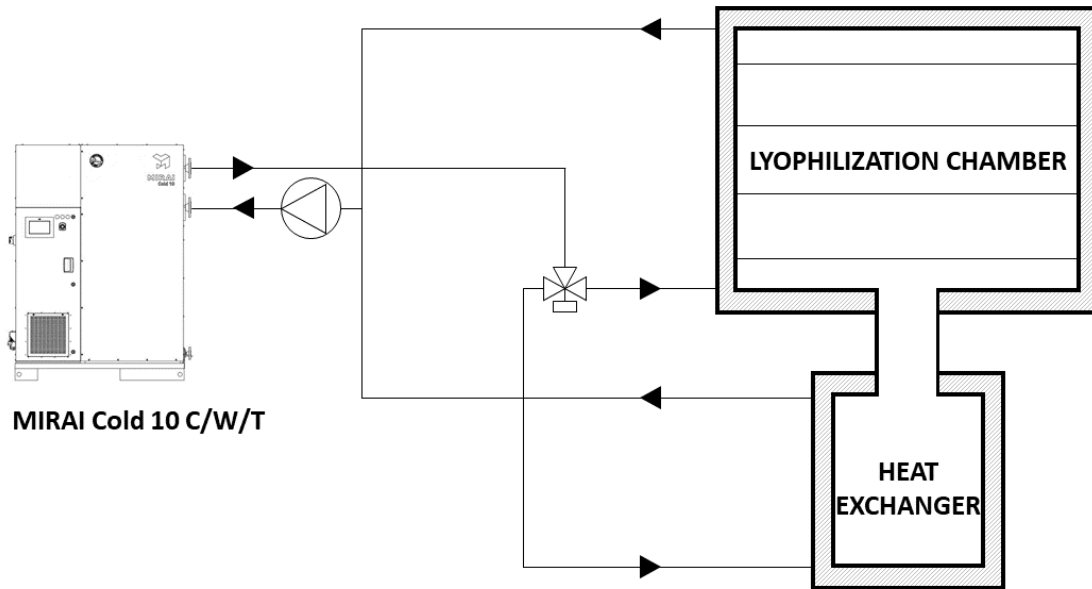


LIST OF REQUIREMENTS AND RECOMMENDATIONS

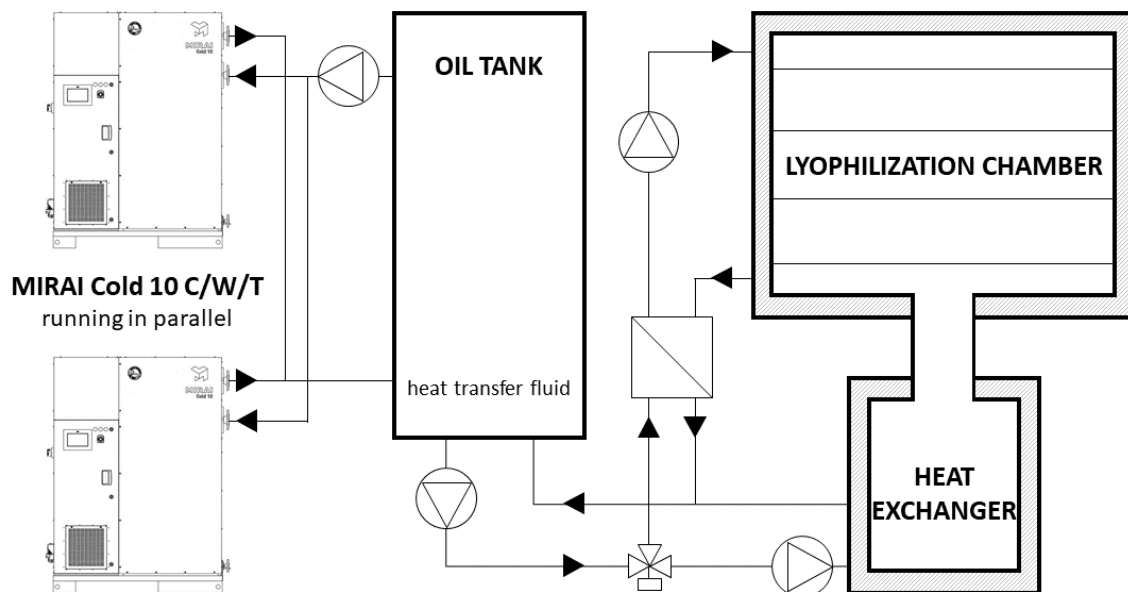
MODELS	MIRAI Cold 10 T (MC 10 C/W/T)
	MIRAI Cold 15 T (MC 15 C/W/T)
	MIRAI Cold 23 T (MC 23 C/W/T)
	MIRAI Cold 80 T (MC 80 C/W/T)
POWER SUPPLY	400 V, 50 Hz, 3 PEN
POWER SUPPLY CABEL MC 10 T, MC 15 T, MC 23 T	Not smaller than 5 x 10 mm ²
POWER SUPPLY CABEL MC 80 T	Not smaller than 5 x 95 mm ²
MAXIMUM CURRENT MC 10 T, MC 15 T, MC 23 T	63 A
MAXIMUM CURRENT MC 80 T	250 A
MACHINE ROOM	Ambient temperature limits from +5 °C to +35 °C
COOLING WATER FOR SYSTEM COOLING	
COOLING WATER TEMPERATURE	From +6 °C to +30 °C
COOLING WATER MASS FLOW RATE	From 1 200 to 20 000 kg/h (for water temp. from +6 °C to +30 °C)
COOLING WATER REQUIREMENTS	Pressure 3 barg
	Min. mass flow 1 200 kg/h for MC 10 T (for water temp. +6 °C)
	Min. mass flow 1 500 kg/h for MC 15 T (for water temp. +6 °C)
	Min. mass flow 1 000 kg/h for MC 23 T (for water temp. +6 °C)
	Min. mass flow 15 370 kg/h for MC 80 T (for water temp. +6 °C)
ADDITIONAL EQUIPMENT NEEDED FOR OPERATION	Dry cooler / chiller (not offered by Mirai Intex)
	Circulation pump (not offered by Mirai Intex)
	Tank (not offered by Mirai Intex)
IMPORTANT NOTES	Copper pipes cannot be used for water connection
	Water purity must be controlled
PRESSURIZED AIR FOR CLOSED AIR CYCLE	
PRESSURE REQUIRED MC 10 T	3-4 bar
PRESSURE REQUIRED MC 15 T, MC 23 T	3-8 bar
PRESSURE REQUIRED MC 80 T	Only internal source, standard equipment
AIR PURITY CLASS ACCORDING TO ISO 8753	1.2.1
EXTERNAL SOURCE	Pressurized air available on site
INTERNAL SOURCE	System Pressurization Unit installed inside MC (optional)
SECONDARY WORKING FLUID (RECOMMENDED)	
SILICONE OIL	Fragoltherm X-T9-A
SILICONE OIL	DOW Syltherm XLT

EXAMPLES OF MIRAI COLD INTEGRATION WITH FREEZE-DRYER

1. DIRECT CONNECTION

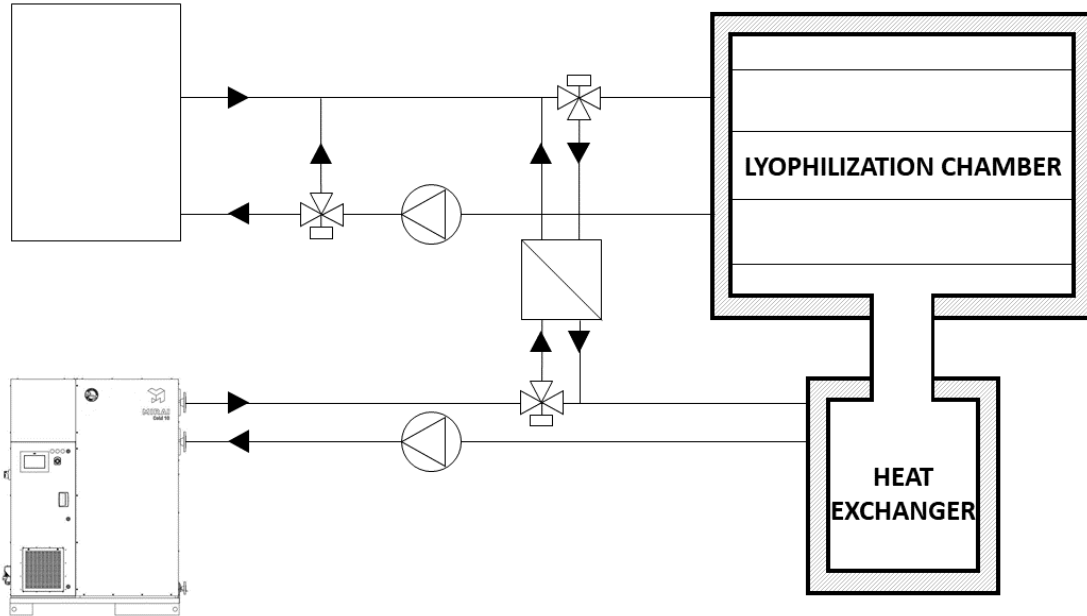


2. ONE OR MORE MACHINES COOLING DOWN SILICONE OIL RESERVOIR



3. COMBINATION OF REFRIGERATION SOLUTIONS FOR LT AND ULT TEMPERATURES

Refrigeration solution
for -40 to -60 °C



MIRAI Cold 10 C/W/T (solution for -80 °C)

Note: all examples provided are for illustration only. Components such as pumps, valves etc. are for general idea only – each system is unique and should be designed according to the specification.