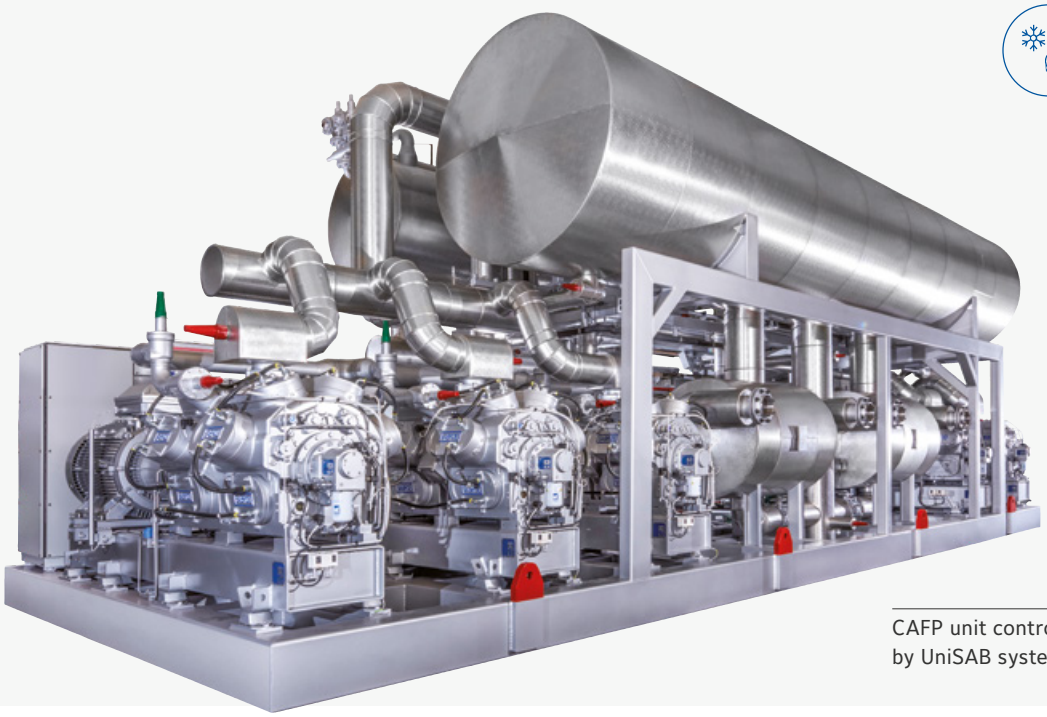
SabroeFreeze



CAFP unit controlled and monitored by UniSAB systems controller

Sabroe CAFP CO_2/NH_3 low-temperature chiller

Compact packaged freezer systems using reciprocating or screw compressors, with a 100–2,500 kW capacity range

The highly customisable Sabroe CAFP freezer systems are using CO_2 on the low-temperature side and NH_3 (ammonia) on the high-temperature side, giving you the best of both worlds.

CO_2 has its strength at low temperatures, and NH_3 at high temperatures. A combination of both provides the user with a system, which is working on natural refrigerants and at the same time ensuring high efficiency and safety. The ammonia charge has been reduced to an absolute minimum and, instead of ammonia, CO_2 is distributed to the user production area. CO_2 has a high volumetric cooling capacity and this goes hand in hand with high efficiency.

These packaged systems are built around Sabroe reciprocating compressors that use CO_2 as refrigerant, which gives them eight times greater cooling capacity than corresponding compressors using ammonia. This in turn makes the low-temperature compressor much smaller, and the whole package considerably more compact than traditional two-stage ammonia-based freezer systems. The compact design means the CAFP package can be installed even when space is limited.

Compared with other solutions for low temperatures, a CAFP unit uses significantly less power in the temperature range down to −54°C.

This results in energy savings of as much as 15 percent compared with traditional two-stage ammonia systems, and up to 45 percent compared with single-stage setups. Alternatively, the higher capacity can be used for a higher throughput on the freezer equipment.

Range

There are six standard models in this range of freezer systems, with capacities ranging from 100 kW to 800 kW. On request, we offer units up to 2,500 kW.
All CAFP units are operationally tested with refrigerant before dispatch. Factory acceptance test (FAT) available.

Features	Benefits
Compact design and technology that require small footprint	Big savings on installation costs
High COP and extremely low power consumption, even at part load	Low operating costs
Use of CO_2 as low-temperature refrigerant reduces piping complexity	Reduces installation costs
Very small ammonia charge, located on the unit itself	No risk of ammonia leaks in production areas, cold stores and working areas
CO_2 is a simple, inexpensive natural refrigerant	Low operating costs

Technical data

Model	Evaporation temperature	Cooling capacity	Power consumption	Compressors R744/R717	Minimum NH_3 charge (approx.)	Minimum CO_2 charge (approx.)	Unit dimensions in mm	Weight	Sound pressure level	COP shaft cooling
	°C	kW	kW		kg	l	L x W x H	kg	dB(A)	
CAFP 80	-50	84	64	HPO 24 / SMC 104 S	120	300	5500 x 2400 x 3000	7000	78	1.3
CAFP 80	-45	108	74	HPO 24 / SMC 104 L					80	1.5
CAFP 80	-40	138	84	HPO 24 / SMC 104 E					79	1.7
CAFP 80	-35	159	87	HPO 24 / SMC 106 S					79	1.8
CAFP 120	-50	125	95	HPO 26 / SMC 106 S	120	350	5700 x 3200 x 3300	10000	80	1.3
CAFP 120	-45	162	110	HPO 26 / SMC 106 L					80	1.5
CAFP 120	-40	203	126	HPO 26 / SMC 106 E					80	1.6
CAFP 120	-35	246	134	HPO 26 / SMC 108 L					82	1.8
CAFP 160	-50	166	127	HPO 28 / SMC 108 S	120	350	5900 x 2900 x 3300	11000	80	1.3
CAFP 160	-45	214	147	HPO 28 / SMC 108 L					82	1.5
CAFP 160	-40	271	167	HPO 28 / SMC 108 E					82	1.6
CAFP 160	-35	337	183	HPO 28 / SMC 112 L					83	1.9
CAFP 200	-50	196	150	HPC 104 / SMC 106 E	180	350	5900 x 3100 x 3800	14000	80	1.3
CAFP 200	-45	255	174	HPC 104 / SMC 108 E					82	1.5
CAFP 200	-40	321	193	HPC 104 / SMC 112 L					82	1.7
CAFP 200	-35	379	206	HPC 104 / SMC 112 L					83	1.8
CAFP 300	-50	300	222	HPC 106 / SMC 112 L	300	800	6300 x 3200 x 3900	16000	82	1.4
CAFP 300	-45	381	258	HPC 106 / SMC 112 E					82	1.5
CAFP 300	-40	468	279	HPC 106 / SMC 116 L					83	1.7
CAFP 300	-35	553	299	HPC 106 / SMC 116 L					83	1.9
CAFP 400	-50	392	293	HPC 108 / SMC 112 E	400	800	6500 x 3700 x 4000	19000	82	1.3
CAFP 400	-45	484	324	HPC 108 / SMC 116 L					83	1.5
CAFP 400	-40	616	370	HPC 108 / SMC 116 E					83	1.7
CAFP 400	-35	729	395	HPC 108 / SMC 116 E					83	1.9

Condenser: water inlet 25°C, outlet 30°C.
Capacities are nominal,
1500 rpm at 50 Hz.
Power consumption applies to compressors only.
Refrigerant charge depends on application.

Dimensions, weight and sound pressure levels are guidelines only.

Sound pressure levels measured in free field, over reflecting plane and one metre distance from the unit.

Standard equipment

- Double control panel including UniSAB systems controller
- CO_2 pump separator including two pumps (one standby)
- Shell-and-tube cascade cooler with double-tube sheet to minimise any risk of CO_2 and ammonia mixing
- Standstill cooling unit, with separate control panel and power supply to limit CO_2 pressure
- Automatic oil recovery system in both circuits
- Water-cooled condenser (plate heat exchanger type) on ammonia side
- Insulation of all cold parts

Options

- Variable-speed drive
- Titanium plates in condenser
- Oversized CO_2 pump separator for high CO_2 evaporator volume
- Oversized CO_2 pumps for higher circulation rate
- Oversized ammonia condenser for higher cooling water temperature
- Fully welded shell-and-tube cascade cooler
- External interstage load, including a brine cooler on the R717 side of the cascade cooler
- Special version for use with remote condenser
- Configurations for use with HFC refrigerants instead of ammonia on high-pressure side

All information is subject to change without notice.

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PUBL-5615 02.2022

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