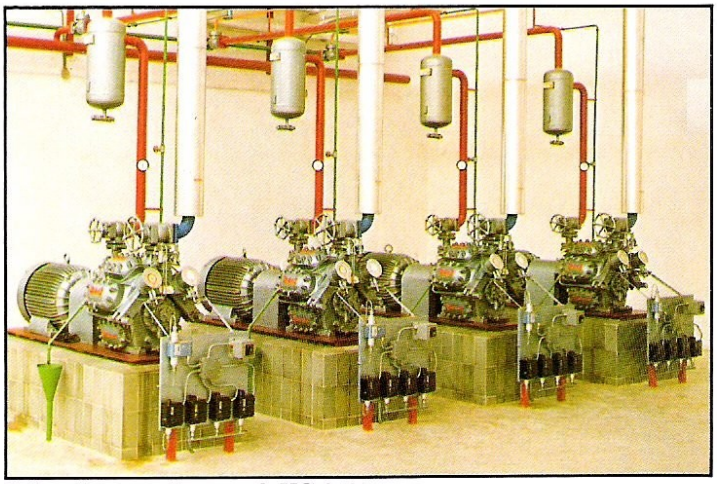
GRAM

Compressors type HC/HCT

HC·75

Compressor HC-75 - available with 2, 4, 6 and 8 cylinders.

Compressor HC 6-75.

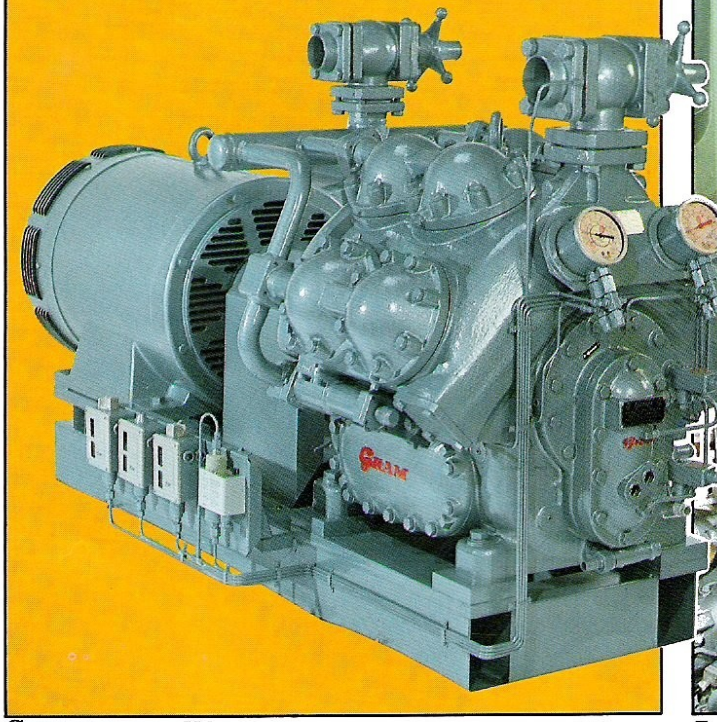


Fish industry in Spain with HC 8-75 compressors.

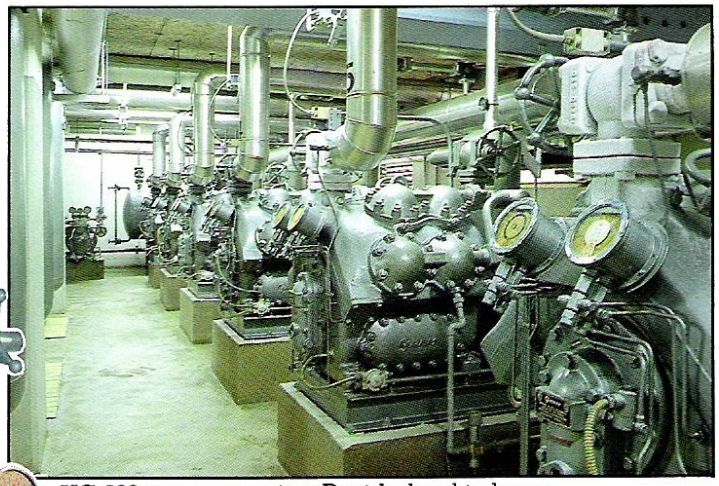
Tube ice factory in Thailand with HC 8-75.

HC·100

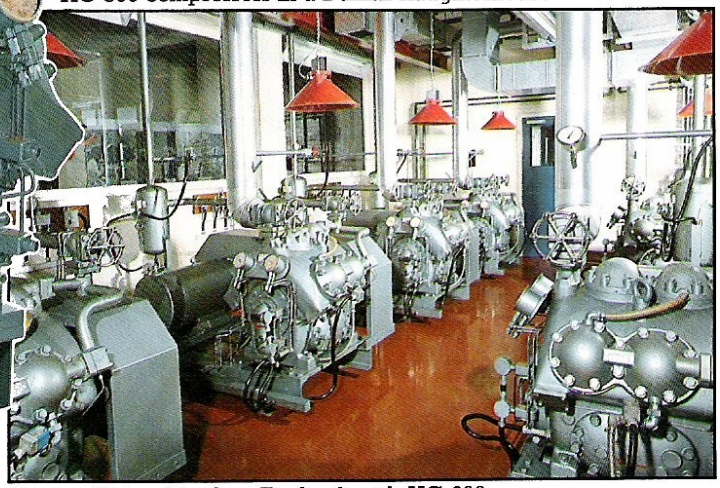
Compressor HC-100 - available with 6 and 8 cylinders.



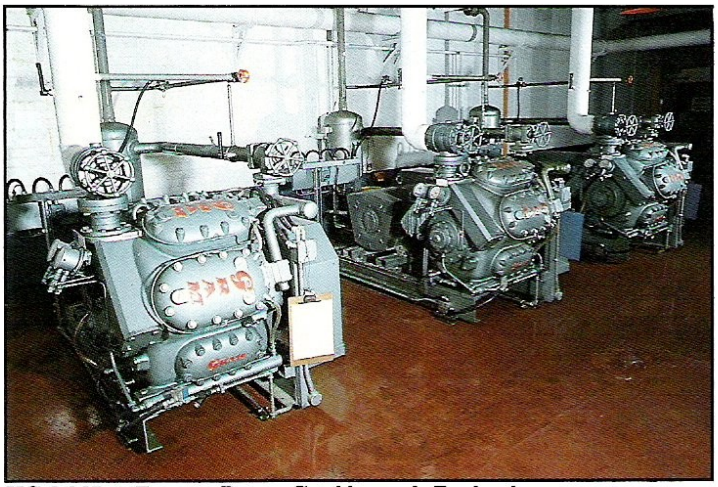
Compressor unit HC-800.



HC-800 compressors in a Danish slaughterhouse.



Express Dairy, Morden, England, with HC-600.

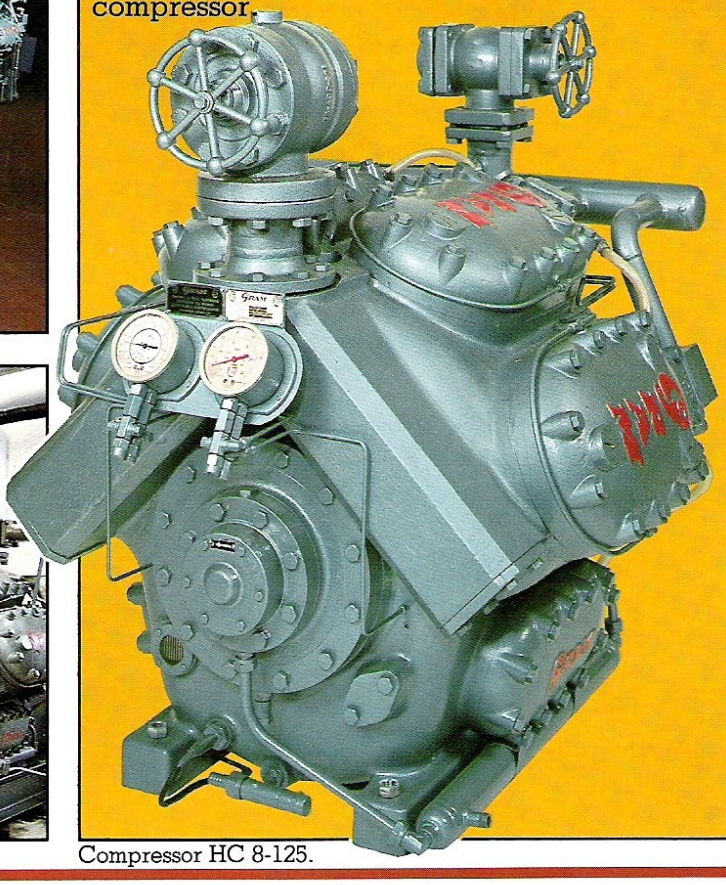


HC 8-125 in Express Dairy, Cricklewood, England.

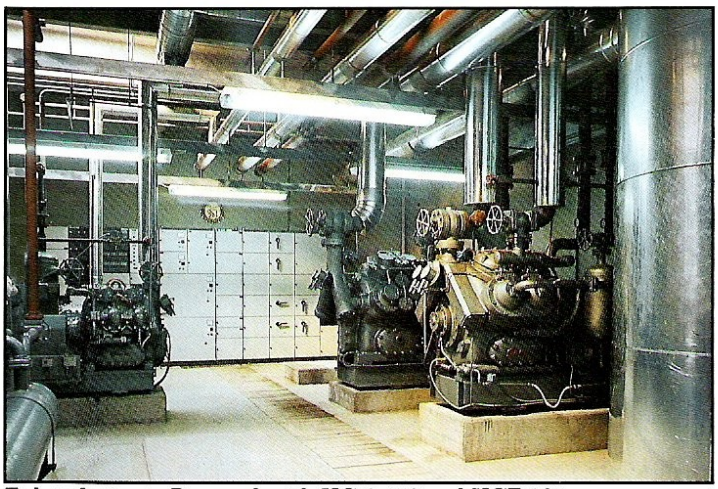
Skating rink plant at Skutskär, Sweden, with HC 8-125.

HC·125

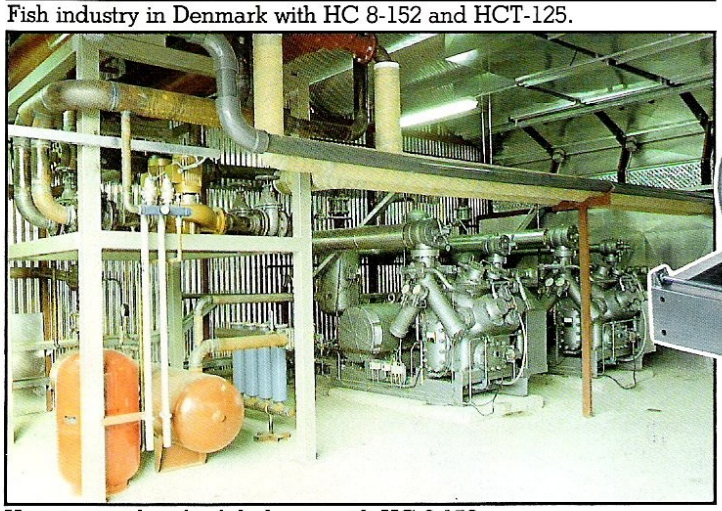
Compressor HC 8-125 - an 8-cylinder compressor.



Compressor HC 8-125.



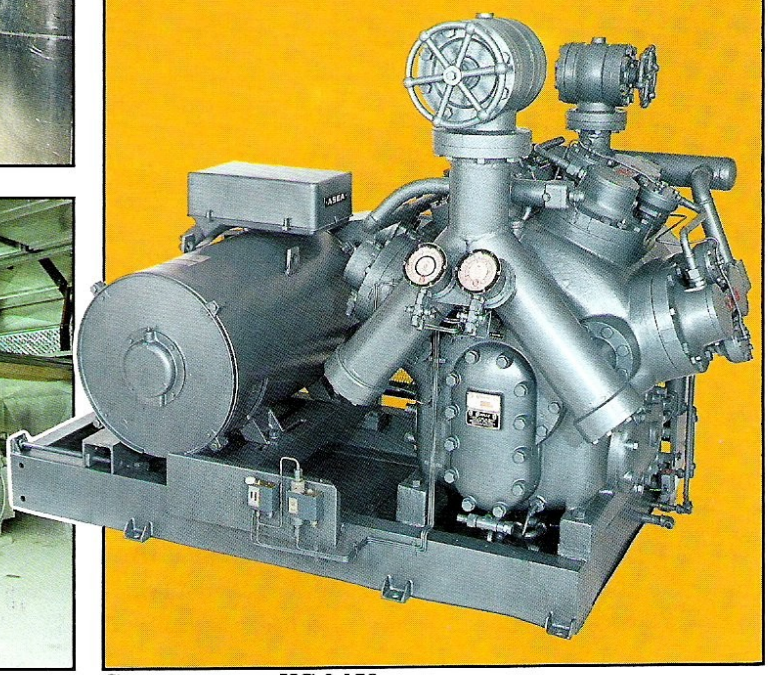
Fish industry in Denmark with HC 8-152 and HCT-125.



Heat pump plant for fish drying with HC 8-152.

HC·152

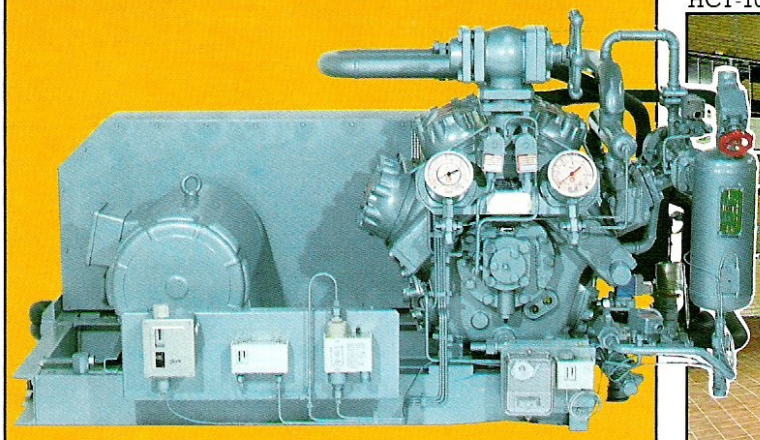
Compressor HC 8-152 - an 8-cylinder compressor.



Compressor unit HC 8-152

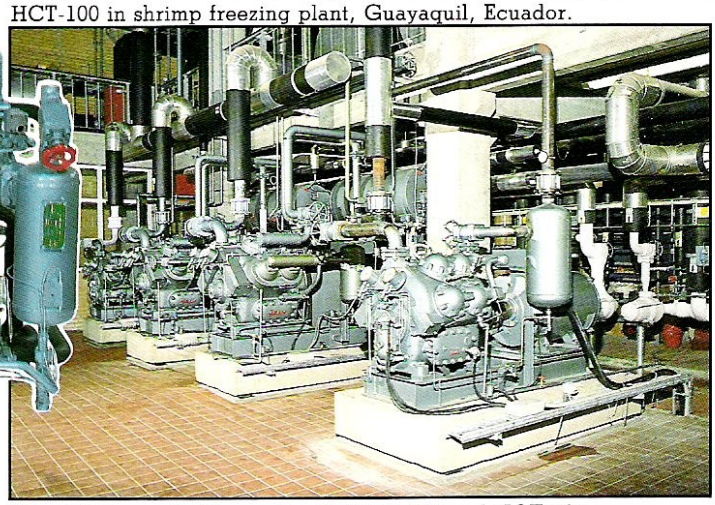
HCT·75
HCT·100

Two-stage compressors with 8 cylinders.



Two-stage compressor unit HCT-75.

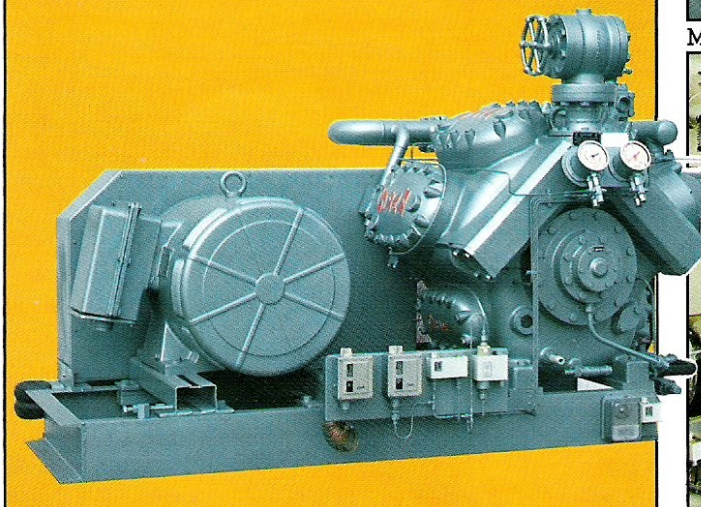
HCT-100 in shrimp freezing plant, Guayaquil, Ecuador.



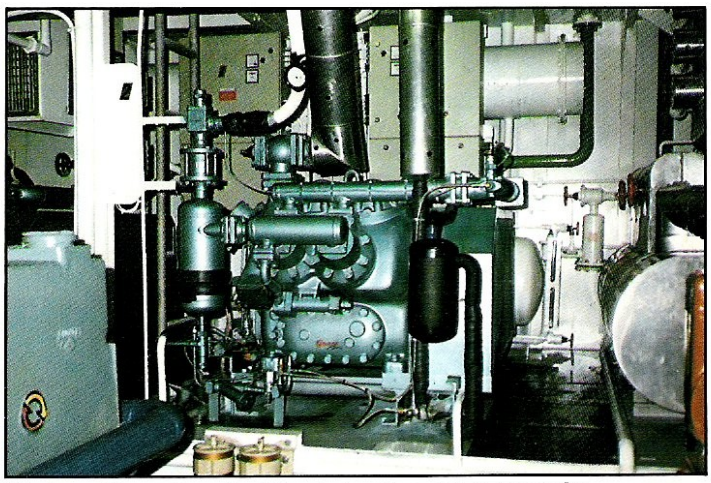
Slaughterhouse in Denmark with HCT-100 and HCT-125.

HCT·125
HCT·152

Two-stage compressors with 8 cylinders.



Two-stage compressor unit HCT-125.



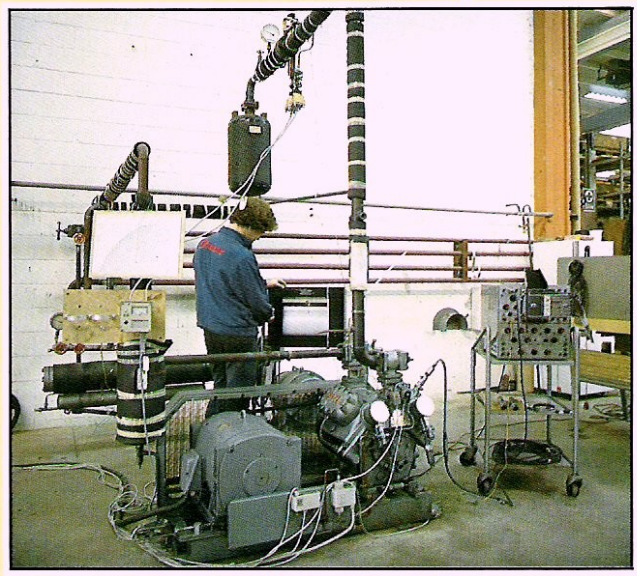
Marine refrigerating plant for shrimp freezing in Australia.

Fish freezing plant with HCT-125.

The Gram Reciprocating Compressor

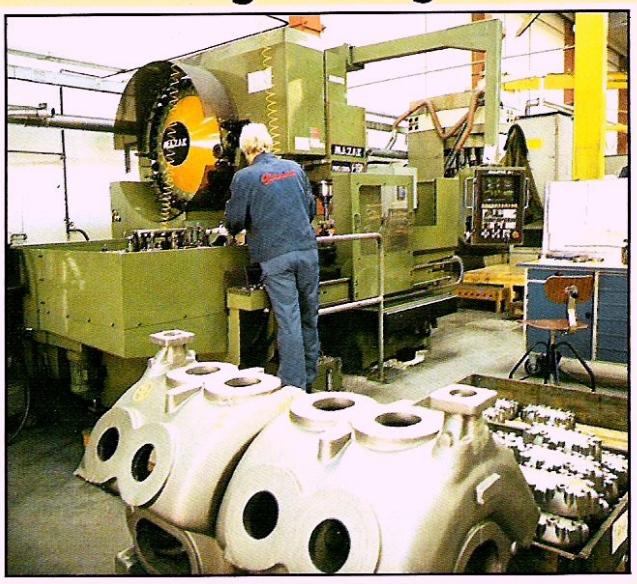
Gram have been innovators of new refrigeration techniques and equipment since the foundation of the Company in 1901. With the continuing development of the heavy duty reciprocating compressor types HC (single stage) and HCT (two stage), Gram is confirming its reputation as a reliable manufacturer of high technology refrigeration equipment.

Research and Development



The Gram Works, in Vojens, comprises a development section and an experimental centre which are constantly engaged in developing improvements, employing the newest technology. Research and development also includes the use of the compressors in heat pump systems, as in this special field pressure and temperature conditions are different from those used in the field of refrigeration.

Modern Engineering Centre



The Gram compressors are manufactured in Vojens, at the modern Gram engineering centre, which is equipped with the latest type CNC (computor numerically controlled), precision machines. The compressors undergo thorough quality control and are trial run before they leave the Factory.

Technical Data

Compressor type	Number of cylinders	Bore mm	Piston stroke mm	*Swept volume m^3/h
HC 2-75	2	75	65	34.4
HC 4-75	4	75	65	68.8
HC 6-75	6	75	65	103.2
HC 8-75	8	75	65	137.6
HC 600	6	100	100	282
HC 800	8	100	100	376
HC 8-125	8	125	100	590
HC 8-152	8	152	120	1040
Two-stage:				
HCT-75	6 LS + 2 HS	75	65	HS/LS: 34.4/103
HCT-100	6 LS + 2 HS	100	100	HS/LS: 94/282
HCT-125	6 LS + 2 HS	100	100	HS/LS: 148/443
HCT-152	6 LS + 2 HS	152	120	HS/LS: 260/780

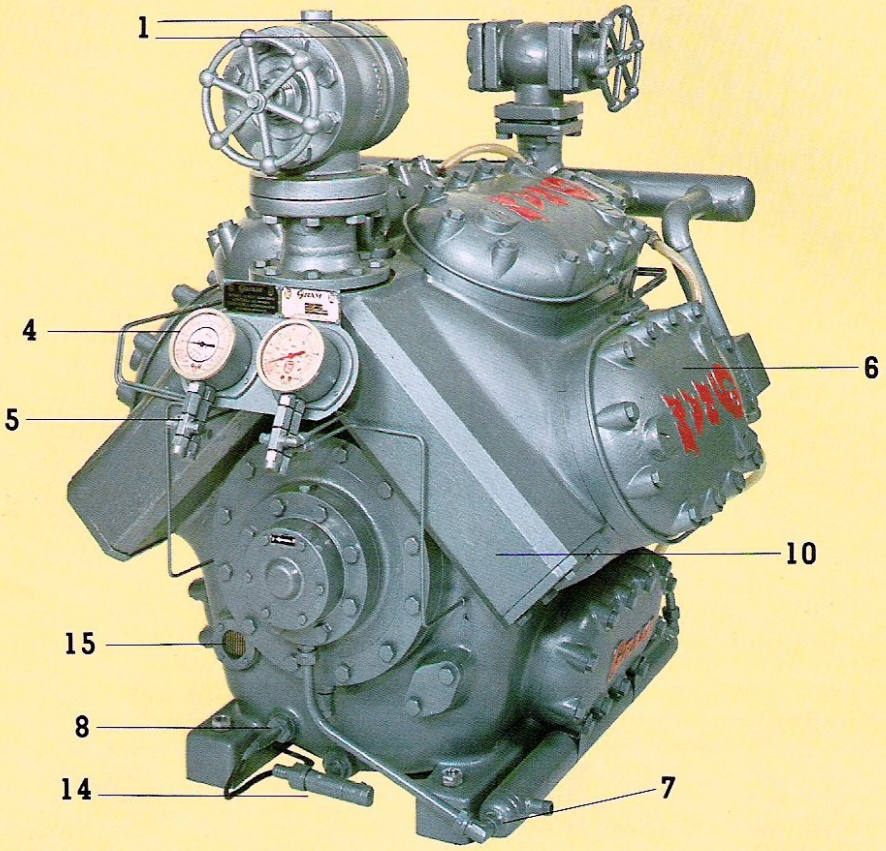
* at 1000 rpm.

Technical Advice

Gram has long experience in working out industrial projects for refrigeration plants and heat pump installations.
Our experts will be glad to assist you in selecting the proper compressor combination.

Specification of the Standard Compressors

The Gram compressors are sturdy, industrial machines, designed for continuous operation in refrigeration plants and heat pump plants.
The HC/HCT range is designed for all refrigerants, both in single-stage version (type HC) and two-stage version (type HCT).
The compressors are manufactured from high grade, close-grained cast iron and can be supplied with certified approval by international classification societies.



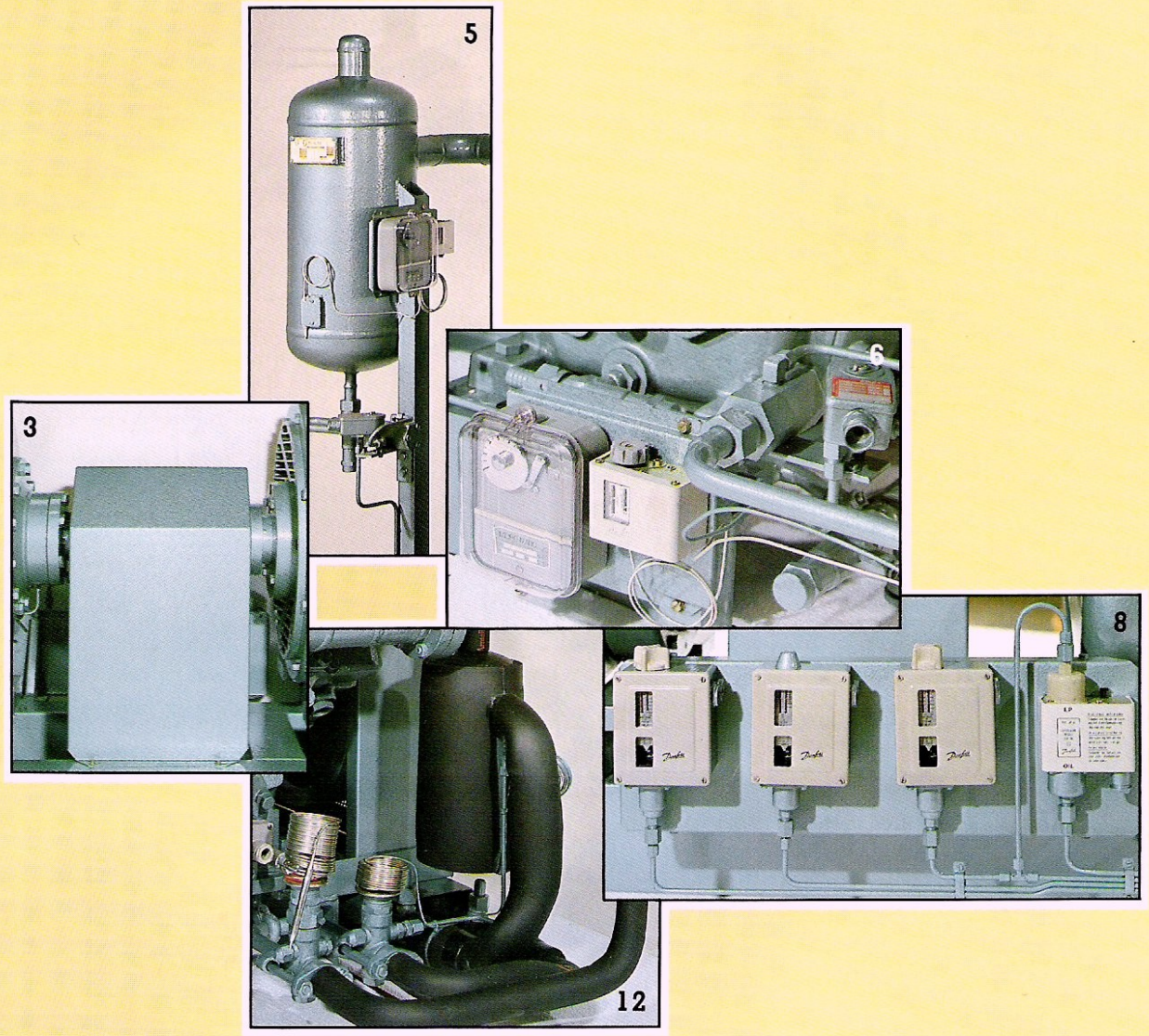
The standard compressors are supplied with:

1. **Stop valves** on the suction and discharge sides of the compressor.
2. **Safety valve** externally integrated and factory-set.
3. **Capacity control equipment** with built-in hydraulic oil cylinder, unloading the compressor cylinders in banks of two.
   The capacity control also serves as a start-unloading device, for the partial unloading of the compressor during start.
4. **Pressure gauge station** mounted on a panel, with pressure gauges for the reading of suction pressure, condenser pressure and oil differential pressure.
   Two-stage compressors are further equipped with a gauge reading for the intermediate pressure.
5. **Pressure gauge stop valve**. Each gauge with an isolation stop valve.
6. **Cylinder head water-cooling**. The HC compressors provided with top covers suitable for water-cooling when necessary.
7. **Crankcase oil cooler** externally mounted, water-cooled included as standard on compressors HC 8-125, HCT 8-125, HC 8-152 and HCT 8-152.
8. **Crankcase heater** electric immersion type, to prevent condensing of refrigerant in the crankcase during stand-still periods.
9. **Submerged oil pump** with pump suction strainer in crankcase sump. Providing oil pressure to bearings, shaft seal and unloading equipment.
10. **Suction strainers** easy to remove and clean or replace.
11. **Cylinder liners** of removable type.
12. **Pistons**. The pistons are of aluminium alloy fitted with compression rings and oil scraper ring.
13. **Shaft seal** of wearless, self-tightening type with O-ring, carbon ring and wearless steel ring.
14. **Oil filling valve** for charging oil to crankcase.
15. **Oil level sight glass** on crankcase is provided.

Capacity Control Possibilities

Compressor type	Refrigerant	Capacity in %
HC 2-75	R12, R22, R502, R717	100
HC 4-75	R12, R22, R502, R717	100-50
HC 6-75 and 600	R12, R22, R502, R717	100-67-33
HC 8-75 and 800	R12, R22, R502, R717	100-75-50-25
HC 8-125 and 8-152	R12, R22, R502, R717	100-75-50-25
All HCT compressors	R717	100-67
All HCT compressors	R12, R22, R502	100-75-50

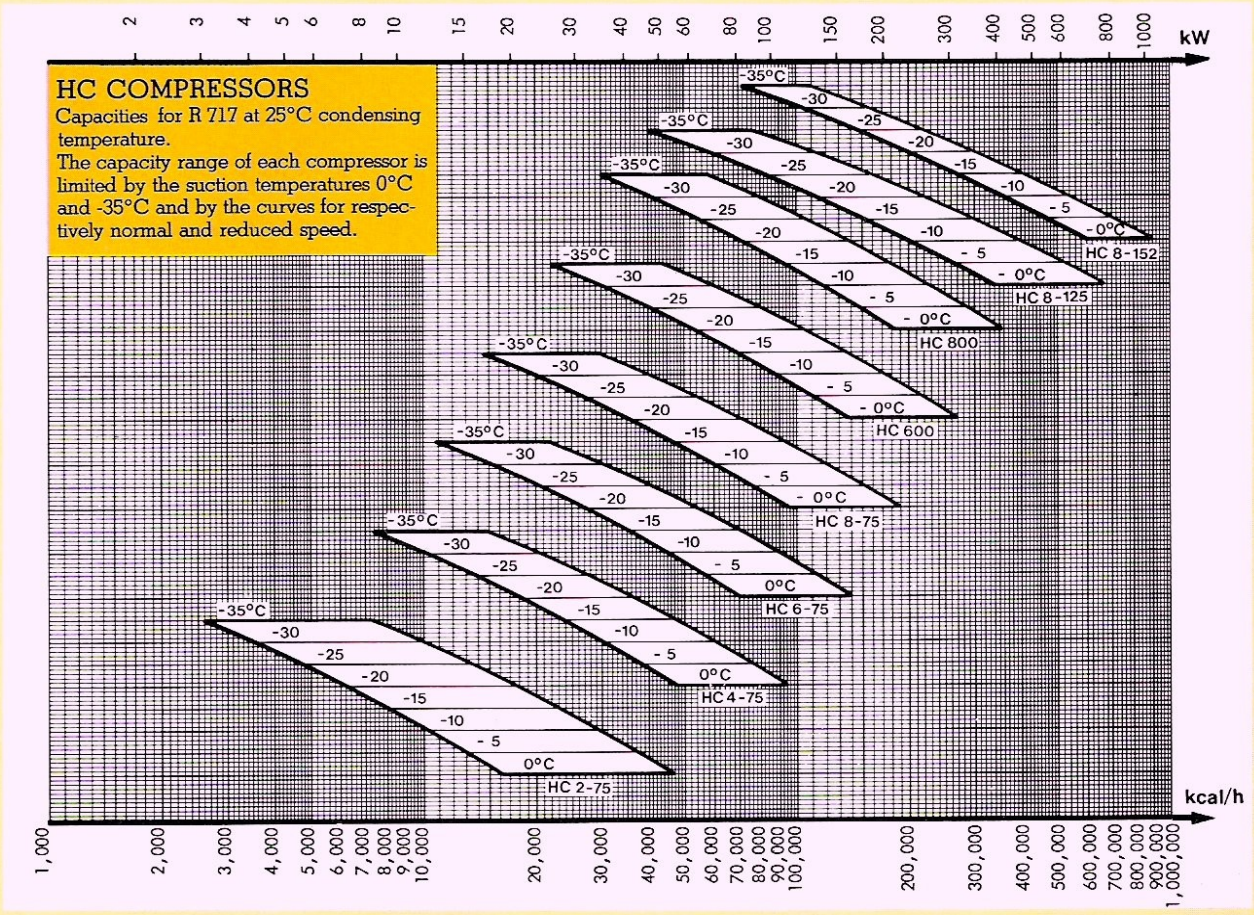
Optional Accessories for HC/HCT Compressors

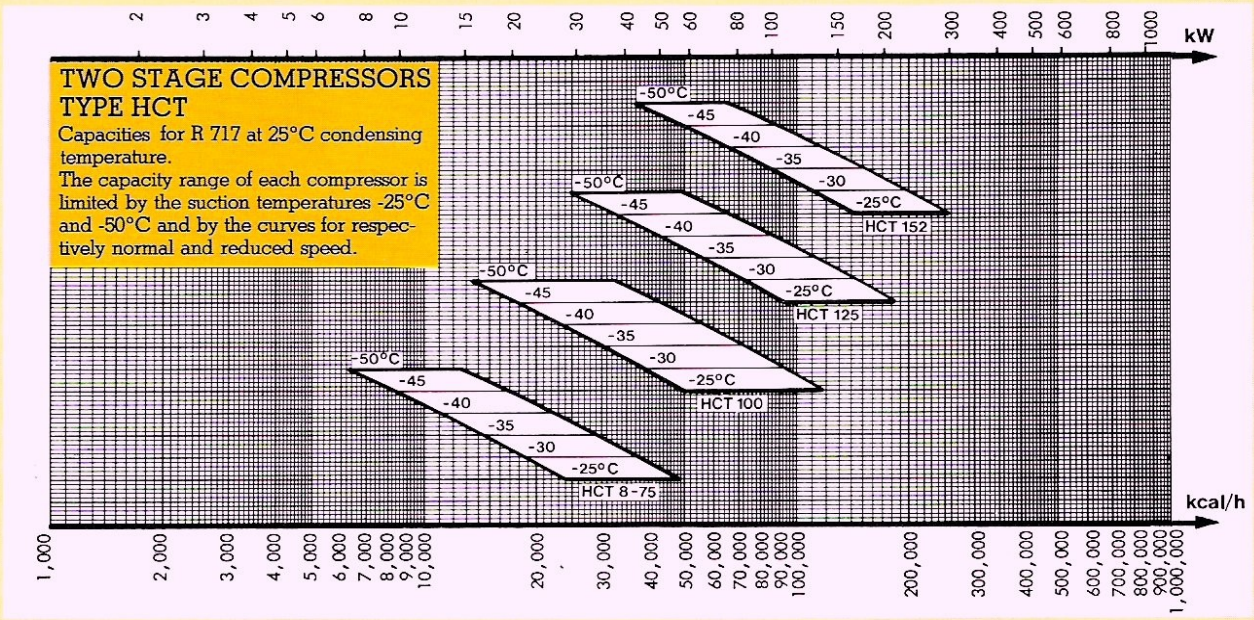


The Compressors are supplied as specified on the previous page, but they can be equipped with optional items to meet specific requirements.

1. **Flywheels** with grooves for standard V-belt sections. Depending on the running speed, flywheels can be supplied with various diameters.
2. **V-belt drive** complete with flywheel, V-belts, motor pulley (taperlock) and guard.
3. **Flexible coupling** for direct drive, including guard.
4. **Baseframe** for the assembly of compressor, electric motor and guard for V-belt drive or direct drive.
5. **Oil separator** with stop valve for manual operation or arranged for automatic oil recovery.
6. **Automatic oil recovery system** from oil separator to crankcase controlled by thermostat, timer and solenoid valve.
7. **Crankcase oil cooler** water-cooled or refrigerant-cooled, internally fitted on HC/HCT-75 and HC/HCT-100 compressors. (HC/HCT 8-125 and HC/HCT 8-152 compressors are, however, always equipped with water-cooled oil cooler as standard).
8. **Pressure control panel** containing safety cutouts for high pressure, low pressure and oil differential pressure and, if required, additional pressure or temperature controls.
9. **Oil equalizing system**. More compressors connected in parallel can be equipped with side covers for external oil equalizing.
10. **Oil level control** can be installed on the compressor giving a controlling impulse at max. and min. oil level in crankcase.
11. **Temperature control** with sensor on the discharge line, protecting against high discharge temperature.
12. **Interstage cooling system**. Two stage compressors are available with two different types of intercooling systems:
    - Injection type gas intercooler with solenoid valve, thermostatic injection valve and thermostat. The assembly normally includes a liquid refrigerant subcooling coil with thermostatic expansion valve and insulated liquid separator.
    - Bubbler type gas intercooler vessel (horizontal), insulated, with low pressure float valve, solenoid valve and built-in liquid subcooling coil.
13. **Compressor unit**. The compressors are also available as complete units, V-belt driven or direct driven, with the required accessories built together and pre-piped.

Selection diagram for HC/HCT compressors





The capacities have been based on:
- Superheat of suction gas: 0°C
- Liquid subcooling, single-stage compressors: 0°C
- Liquid subcooling, two-stage compressors: Intermediate temperature plus 10°C

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