CORE

TechEdge

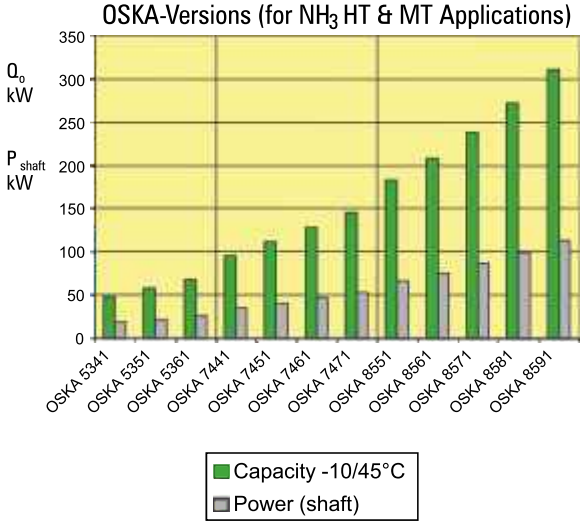
Advantage

www.tempkool.com

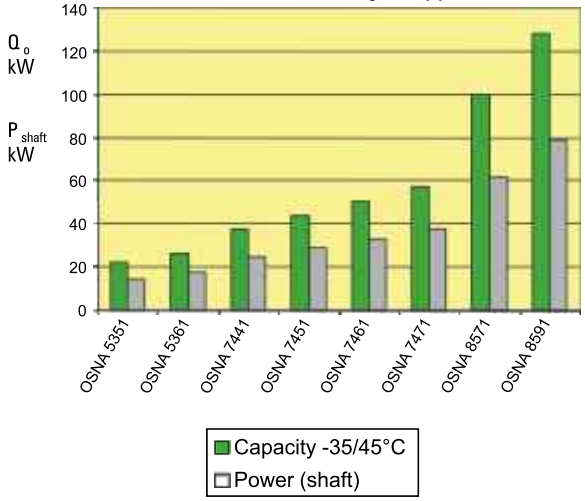
TEMPKOOL

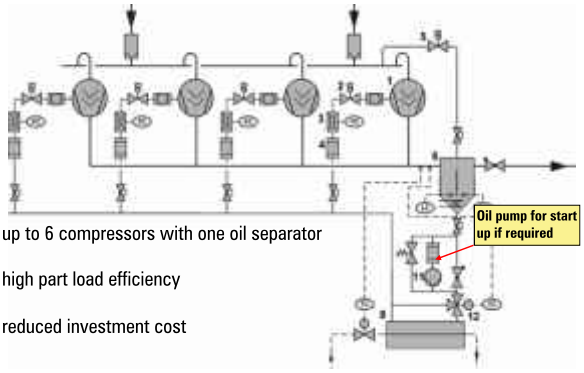
MartiN Series Ammonia Systems of *TEMPKOOL* are built with Bitzer make open drive screw compressors. For high and midium temperature applications, OSKA Versions are used while for low temperature applications. For Booster application, OSKAB models are deployed with additional oil pump.

OSKA-Versions (for NH_3 HT & MT Applications)



OSNA-Versions (for NH_3 LT Applications)



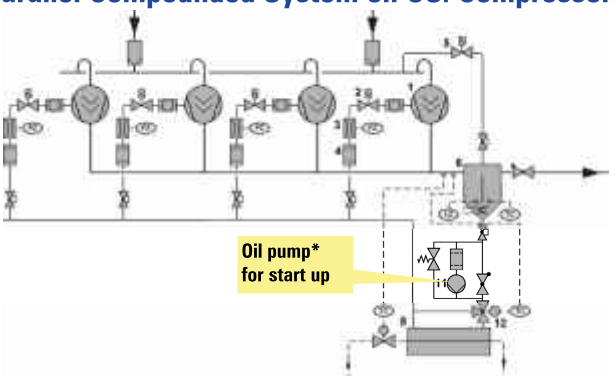


⑨ up to 6 compressors with one oil separator

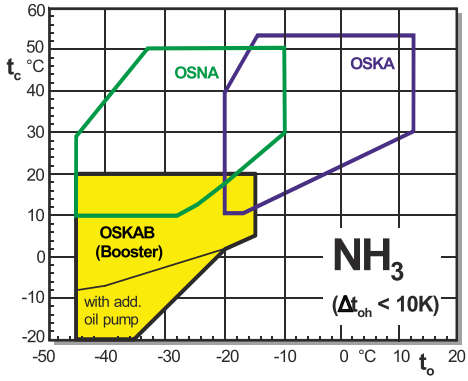
⑨ high part load efficiency

⑨ reduced investment cost

Parallel Compounded System on OS. Compressors

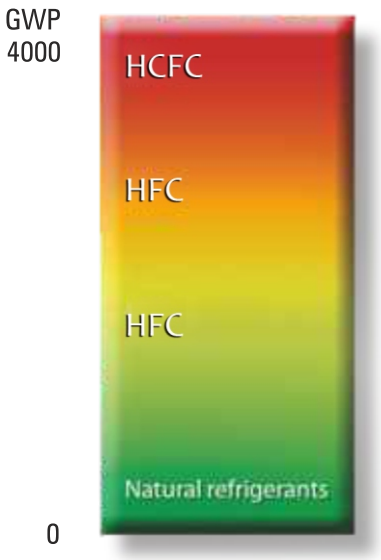


Compressors for Ammonia Application Open Drive Screw Compressors

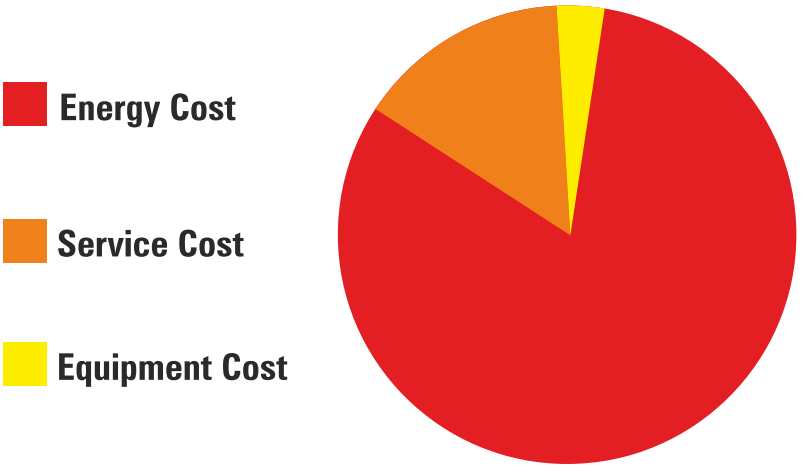


TEMPKOOL

Natural Refrigerant As Green And Power Saver



Global Warming Potential



Cost Comparison

Ammonia Open Drive Screw Rack.

Ammonia Application Chart				
Chiller Application	Refrigerator	Optimum Heat Exchanger Design		
		5 to 50 Tons of Refrigeration	60 to 200 Tons of Refrigeration	250 to 1500 Tons of Refrigeration
Cooling Water Steady Load	Ammonia	Dry Expansion Plate	Flooded Plate or Dry Expansion Plate	Flooded Plate
Cooling Water Transfer Fluids with Viscosities <5 cP Steady Load	Ammonia	Dry Expansion Plate	Flooded Shell-and-Tube or Flooded Plate	Flooded Shell-and-Tube or Flooded Plate
Cooling Water Transfer Fluids with Viscosities <6 cP Steady Load	Ammonia	Dry Expansion Plate or Flooded Plate	Flooded Plate or Shell-and-Tube Thermosyphon	Flooded Plate or Shell-and-Tube Thermosyphon
Process Fluids, Dirty (Dirty Water, Chemicals, Fouling Fluid) Steady or Batch	Ammonia	Flooded Shell-and-Tube	Flooded Shell-and-Tube	Flooded Shell-and-Tube
Batch Cooling Water or Heat Transfer Fluids	Ammonia	Flooded Shell-and-Tube or Flooded Plate	Flooded Shell-and-Tube or Flooded Plate	Flooded Shell-and-Tube or Flooded Plate

Table to determine what type of heat exchanger design is best for process cooling applications that use ammonia as a refrigerant.

Options Unlimited

Multi compressor systems are generally skid mounted and factory dry-run tested, built for **Indirect/Glycol chilling** or direct **Overfed cooling/freezing** for large/Institutional requirements.

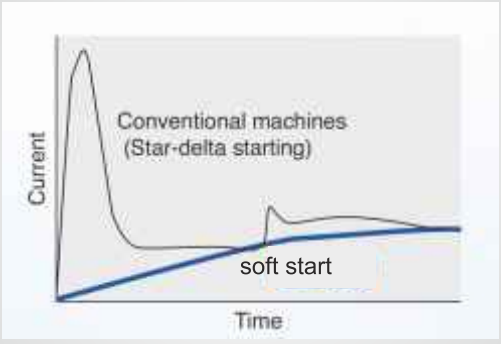
Conventional on-site Installation, usually **OVERFED** type with Single and/or Two stage Open Drive Reciprocating compressors, driven by Electricity or Generator or directly by an engine. Cooling methods are generally **CONVECTION** type which may also be **FORCED** one.

Open Drive Ammonia Screw compressor from Bitzer, Germany, consists of only two screws and four bearings as moving parts without any gears, with optional Economizer operation. Built with start unloader, Check Valve, Internal pressure Relief valve, Suction-side fine Filter, Discharge gas temperature sensor, Electronic Oil flow switch & Oil fine Filter. Compressor capacity can be reduced from 100% to 10% in a wide operating envelop from $+10^{0}$ C to -40^{0} C. Self aligned, using flange and foot mounting motor, eliminates the need for initial and periodic motor alignment.

Options Unlimited

Quad separation technology with minimum Refrigerant charging & integrated oil drain. Short vertical ammonia driving columns, allow small temperature approaches and high system efficiency. Maximum separation gas velocity is restricted to 60% of the re-entrainment velocity, avoiding liquid brought back to the gas flow. Made of SS and complies CE & PED standard. Suits a wide range of Ammonia capacities from 200kW to 1400kW at 0^0C and 50kW to 500kW at -40^0C

MARTiN Screw-Rack Glycol/Dx HFC Chillers are used for Blast Freezing and/or preservation, for a wide range of operating envelop : up to 55°C condensation and up to minus 50°C evaporation duty.

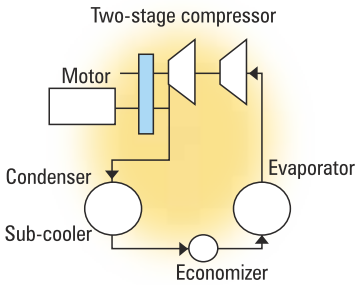


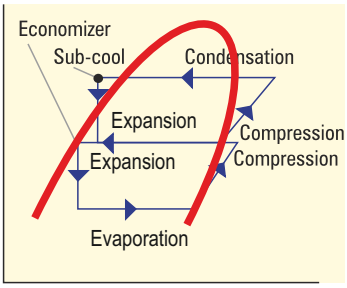
Soft starting mechanism that eliminates stop intervals

Effective energy saving according to the application
Soft starting without inrush currents during startup

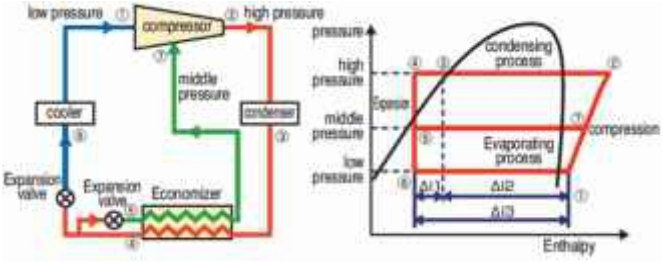
The effect of the mounted inverter can be found during startup of machine. Since conventional Star -delta startup puts the motor under very high load, an interval of approximately 10 minutes is required before restarting. Thanks to the equipped inverter that allows soft starting, the Mart inverter series unit can restart quickly without any interval. The soft starting mechanism permits the compressor to stop even in applications where interruption is not allowed during operation, so doing much for more effective energy saving.
With this mechanism, the power facility can also be downsized.

FUTURE CALLS FOR POWER SAVER





Two Stage Cycle



Economizer Cycle

Custom-made to your specific needs

Based on our comprehensive product programme and extensive know-how, *TEMPKOOL* is able to custom-make the optimal PHE Chiller package for your specific needs. Here, are some of the options, we can provide :

- Capacity range from 100 to 10,000kW.
- Brine temperatures from -35°C to +20°C
- Wide selection of reciprocating or screw compressor types, in single or double version.
- Single-stage, two-stage or economizer operation.
- Stainless steel or SM02 or Titanium PHEs.
- Water or refrigerant cooled oil coolers.
- Different liquid level regulation systems.
- Nitrile Rubber or Polyurethane insulation.
- Liquid separators of vertical or horizontal design.
- Approvals from a number of authorities and international classification societies.

Compressor	EPHE/ CPHE Type	Water +12/+6°C R717/+3°C		Ethylene glycol -4/8°C (30%Weight), R717/-11°C		Ammonia refrigerant volume	Dimensions			Net Weight
		Capacity	Shaft Power	Capacity	Shaft Power		Length	Width	Height	
							L	W	H	
		kW	kW	kW	kW	kg	m	m	m	kg
RECIPROCATING										
Core 106-L	100/100	445	67	235	60	50	2.1	1.5	2.2	3200
Core 108-L	100/100	595	89	315	80	60	2.2	1.6	2.2	3400
Core 112-L*	100/100	890	134	475	120	75	2.9	1.9	2.2	5500
Core 116-L*	100/100	1185	178	630	160	105	2.9	2.0	2.2	6000
SCREW										
MARTiN 110LF	100/100	255	51	150	46	40	1.8	1.0	2.2	2400
MARTiN 128HM	100/100	305	56	185	52	45	2.3	1.8	2.2	3200
MARTiN 128HF	100/100	490	83	285	77	60	2.3	1.8	2.2	3600
MARTiN 163HM	100/100	670	113	395	102	70	2.7	2.2	2.2	5000
MARTiN 163HF*	100/100	1035	169	610	154	95	2.7	2.2	2.2	6000
MARTiN 347H	150/150	1525	220	885	215	145	4.5	2.5	3.0	12500
TWIN MARTiN 163HF**	150/150	2070	2x169	1215	2x154	185	2.8+3.8	2.1	3.1	13500

- The table represents only a few selected models. The figures given are approximate values, based on :

* Compressor speed : Recip. 1480 rpm & Screw 2950 rpm

* Condenser water in/out 29°C/33°C, condensing temperature 35°C

* Double refrigerant connections

** Split unit in two sections.

TEMPKOOL

MARTiN Logic Advantage

TEMPKOOL MARTiN and CORE series Chillers are supplied with an electrical panel mounted on the structure of the chiller, which is segregated into a power section and a control section, for easy maintenance service.

Electrical Features

- Standard Star-Delta Starter with fuse protection.
- Voltage protection device for phase loss, voltage unbalance and over voltage safety.
- All the components are operated on 230 V AC, which eliminates use of power transformer. This reduces excessive heating of the panel.
- Advance MARTiN Logic Controller with predictive logic provides precise control to enhance performance of the chillers.

MARTiN Logic Controller Features

- Easy to read backlit, 4 Row X 20 Column Text Display.
- Facility to switch over from British to SI units and vice versa for temperature and pressure value.
- Graphical display of electrical parameters.
- Manual/Auto mode control.
- Automatic startup on resumption of power after power failure.
- Alarm history for last 100 Alarms with critical parameters at time of alarm.
- Battery backup to retain memory and clock in case of power failures.
- Compressor Lead-Lag and sequencing facility for multi compressor units.
- Internal 7-days, 8 day holiday clock with programable duration.
- Selective lockout facility on alarms to avoid unauthorized operator control.
- Multilevel password protection.
- RS 232/485 communication port for easy integration into building management system.
- BMS compatibility with BAC net, Modbus, J2N2, Lonwork protocols.

Optional Features

PC connectivity and remote monitoring through Modem, Telephone Line. In short, the controller is designed to safeguard the chiller unit, eliminate the need for manual intervention and provide a simple but meaningful human-machine interface.

MARTiN Logic

⚠ Safety Precautions

1) Before operation, make sure to read the instruction manual carefully for your safety and the equipment safety as well.

2) Never attempt to perform unauthorized equipment modifications which could lead to damage or injury.

3) The compressors are designed for specified refrigerant/s only. Never use them with other gases. Doing so could result in accidents or break downs.

The Gamut of Cooling Solution

Centrifugal Turbocor Chiller

Water Cooled R410a Package Chiller

Induced Draft FRP Cooling Tower

Digital Discuss/Stream Chiller

AirCooled HVAC Screw Chiller

Water Cooled Screw Racks

Twin Trio Scroll Rack

Reciprocating Chiller With VFD

Chiller With Digital Scroll

CORE

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Quality made by ROOS TEMPKOOL LTD. An ISO 9001 Company