

 AIR CONDITIONING LINE

The FMCS-S: FriconUSA Modular Chiller System, Standard series, air cooled condenser, satisfies a wide range of capacities. The flexible modular design allows it to work independently in capacities between 23 to 37 TR or grouped in different combinations of sizes to form one or various sets and meet the requirements of capacities up to 750 TR per set. The quality, high efficiency up to 10.5 EER and excellent IPLV, according to AHRI Standard 550/590, assure our customers reliability, low operating costs and long equipment life.

The most common applications are for air conditioning in commercial buildings such as offices, schools, hospitals, hotels, malls, large shopping centers, airports, military bases, supermarkets, etc. For other applications see our Process Cooling Chiller line.

By using Bitzer scroll compressors with external Variable Frequency Drive (VFD), on the Master unit, we convert this unit into an incredible Variable Refrigerant Flow system (VRF) resulting in a greater adaptability to the thermal load of the set, stabilizing the fluid temperature and maximizes energy savings at partial load.

Standard ambient operating temperature range: +110°F (+43.3°C) to +40°F (4.4°C)

Extended ambient operating temperature range: +125°F (+51.7°C) to -35°F (-37.2°C)\*

\*See optional packages.

Application / leaving fluid temperature range:

A: Air Conditioning: +55°F (+12.8°C) to +15°F (-9.4°C)

**STANDARD FEATURES & BENEFITS:**

- Bitzer scroll compressor.
- Aluminum structure with galvanized steel reinforcement, high efficiency condenser with reinforced structure and aluminum micro-channel coils. Its low weight and size reduces the costs of transportation, installation and construction.
- EcoFriendly; Air cooled micro-channel condenser coil with reduced internal volume requires between 40% to 60% less refrigerant charge and results in a significant reduction of the charge necessary for normal or flooded operations.
- Wide range of applications at different working ambient temperatures.
- Quiet, high efficiency, external rotor motor, two speed, AC type axial fans for a better operation.
- Galvanized, powder coated, acoustically semi-insulated and weatherproof semi-enclosed compressor cabin.
- Built-in, Direct Expansion (DX) brazed plate evaporator, one circuit with reduced internal volume requires less refrigerant charge.
- Electronic expansion valve, liquid sight glass and solenoid valve.
- Mechanical flow switch.
- Liquid drier with replaceable core.
- Flexible joint on discharge line.
- Refrigerant: R-410a
- Factory pre-charged and individually tested.
- UL 508A listed built-in electrical control panel.

# FMCS-S SERIES, A.1

## MODULAR CHILLER SYSTEM

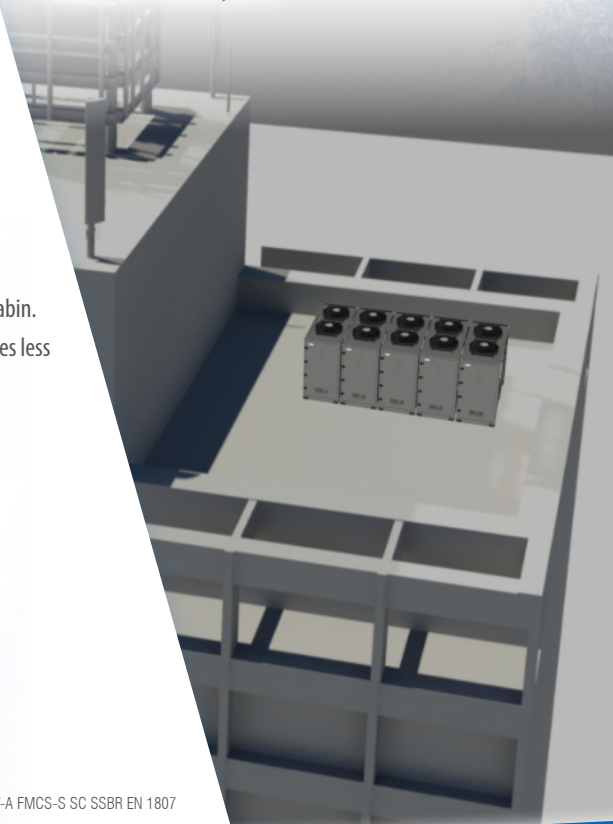
STANDARD SERIES, AIR COOLED CONDENSER

SCROLL COMPRESSORS

23-37 TR 



AIR CONDITIONING (HVAC) FOR BUILDINGS,  
SUPERMARKETS, ETC.



### STANDARD FEATURES & BENEFITS (CONT.):

- Compressor and fan circuit breakers.
- Voltage and phase-loss monitor with protection module for each compressor.
- Control: 208-230V / 1PH / 60HZ
- Power supply voltage 460V / 3PH / 60HZ with single point power connection.
- Electronic Control System; compressor and condenser fans operational management: alarms, measurement of pressure and temperature variables, 132x64 LCD backlit built-in display with 6-button keypad.
- Alarm management: 3 alarms for compressor (overload, high/low pressure) and 1 over-load alarm for condenser fans.
- Fixed high pressure compressor control.
- BMS (Building Management System): ModBus protocol for supervisor or HMI (Human Machine Interface).
- 1-year warranty.

### STANDARD OPTIONS:

- Condenser coil with E-Coating for greater resistance to corrosion.
- Protective mesh for the condenser.
- EC type fans with variable speed (for 575V a VFD is used).
- Evaporator option:
  - Remote evaporator
- External Hydronic Package includes TEFC type motors and NEMA 3R control panel:
  - 1 recirculation pump
  - 1 recirculation pump with VFD
  - 1 recirculation pump & polyethylene buffer tank
  - 1 recirculation pump with VFD & polyethylene buffer tank
  - 2 recirculation pumps
  - 2 recirculation pumps with VFD
  - 2 recirculation pumps & polyethylene buffer tank
  - 2 recirculation pumps with VFD & polyethylene buffer tank
- Different power supply voltage.

### ADDITIONAL OPTIONS:

- VRF (Variable Refrigerant Flow) package to maximize the efficiency and capacity adaptability to the demand:
  - VRF-II\*: VFD (Variable Frequency Drive). Infinite capacity control on the compressor (60~125%).  
*\*Certain limitations apply.*
- HGB (Hot Gas Bypass) package for adjustable capacity reduction (10~100%):
  - HGB-I: PWM (Pulse Wide Modulation).
  - HGB-II: Continuous modulation with electronic hot gas valve.
- FECC (Fully Enclosed Compressor Cabin) package for better soundproofing:
  - FECC-I: Fully enclosed metal compressor cabin.
  - FECC-II: same as FECC-I with internal convoluted acoustic foam panel lining.
- Refrigerant and oil evacuated for non-hazardous shipping.
- LAOP (Low Ambient Operation Package) required for operation below +40°F:
  - LAOP-I: +110°F (+43.3°C) to +10°F (-12.2°C), Includes: split condenser with variable speed fan on the first fan section and electrical antifreeze heater on the evaporator.
  - LAOP-II: +110°F (+43.3°C) to -20°F (-28.9°C), Includes: same as LAOP-I plus liquid receiver and flooded condenser with head pressure control valve.
  - LAOP-III\*: +110°F (+43.3°C) to -35°F (-37.2°C), Includes: same as LAOP-II plus insulated liquid receiver with electric heater, thermally insulated compressor cabin and control panel with ventilated heating.  
*\*Requires FECC-II (Fully Enclosed Compressor Cabin) package.*
- HAOP (High Ambient Operation Package) required for operation above +110°F:
  - HAOP-I: +125°F (+51.7°C) to +40°F (4.4°C), Includes: air exhaust duct to the condenser plenum for cooling of the control panel and filter for the air inlet.
- MDS (Main Disconnect Switch).
- Electronic Control System:
  - BACnet Communication board.
  - Remote LCD display.
  - Local or remote touch screen display.
  - Energy Management Module.
  - CHSM (Chiller System Manager) controls the sequence between multiple sets.
- Extended 5-year compressor warranty (U.S. only).



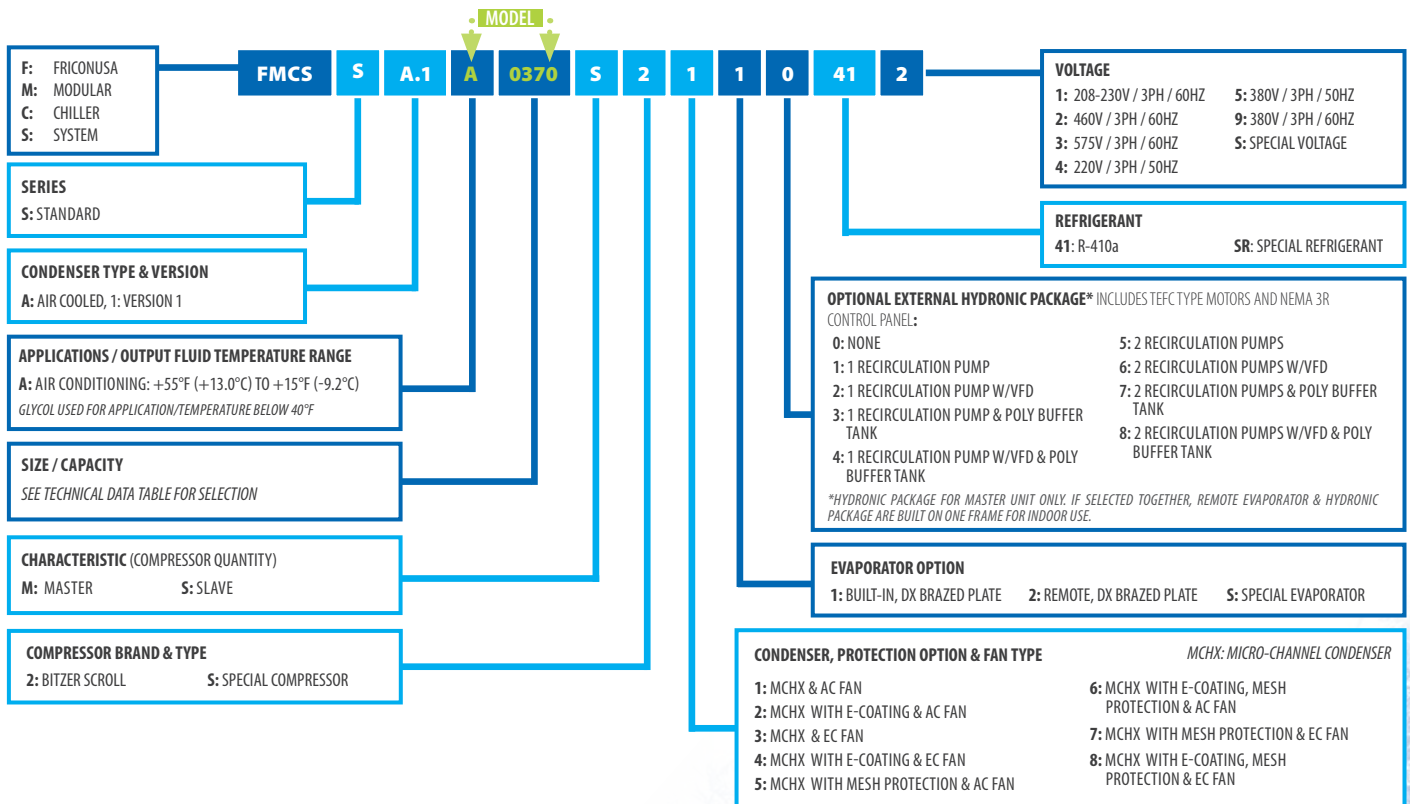


- 1. Compressor
- 2. Micro-channel condenser
- 3. Fans
- 4. Brazed plate evaporator
- 5. Liquid drier
- 6. Electronic expansion valve
- 7. Fluid inlet/outlet
- 8. Electrical control panel
- 9. Electronic Control System
- 10. Access doors
- 11. Suction accumulator (optional)
- 12. Protective mesh (optional)



SUBJECT TO CHANGE ACCORDING TO ACCESSORIES/OPTIONS. PLEASE CONSULT THE FACTORY FOR SPECIFIC INFORMATION.

NOMENCLATURE





## TECHNICAL DATA - APPLICATION / LEAVING FLUID TEMPERATURE RANGE

## SCROLL COMPRESSOR

R-410a

A: AIR CONDITIONING: +55°F (+13.0°C) TO +15°F (-9.2°C)

MODEL	COMPRESSOR		FAN		CAPACITIES IN TR @ 95°F AMBIENT R410A LEAVING FLUID TEMPERATURE								ELECTRICAL DATA 60HZ						MECHANICAL DATA									
													230 VOLT		460 VOLT		575 VOLT		CONNECTIONS AND WATER TANK CAPACITY			REFRIGERANT CHARGE		APROX DRY WEIGHT.		DRAWING REFERENCE		
					SIZE	BITZER	QTY	AC TYPE	WATER				GLYCOL				RLA COMP.	SYSTEM MCA	RLA COMP.	SYSTEM MCA	RLA COMP.	SYSTEM MCA	In/ Out in.	gal.	(l)		LB	(KG)
55°F	50°F	44°F	38°F	32°F					27°F	21°F	15°F	13.0°C	9.8°C	6.5°C	3.4°C	0.2°C										-2.9°C		
A-0230-S	25	1	GSD 80295	2	19000	CAP	27.1	25.0	22.8	20.9	19.1	17.4	15.8	14.1	85.1	117.0	40.7	56.3	32.6	44.6	2	55	(208)	20.5	(10.0)	1,592	(723)	A
						EER	12.0	11.4	10.5	9.9	9.1	8.5	7.8	7.0														
A-0300-S	32	1	GSD 80385	2	22750	CAP	34.4	31.8	29.0	26.9	24.5	22.4	20.3	18.2	106.2	147.2	53.1	73.8	42.5	58.8	2 1/2	55	(208)	26.1	(12.8)	1,655	(752)	A
						EER	11.2	10.5	9.8	9.4	8.6	8.1	7.4	6.7														
A-0330-S	35	1	GSD 80421	2	26500	CAP	37.3	34.4	31.4	28.8	26.4	23.9	21.9	19.7	102.8	146.7	51.4	75.2	41.1	59.0	2 1/2	55	(208)	28.3	(13.9)	1,654	(752)	A
						EER	11.1	10.5	9.7	9.1	8.5	7.8	7.3	6.7														
A-0370-S*	40	1	GSD 80485	2	37000	CAP	43.3	40.0	36.7	33.7	30.7	27.9	25.5	23.1	128.2	181.9	64.1	91.1	51.3	72.9	2 1/2	55	(208)	33.0	(16.0)	1,661	(755)	B
						EER	11.6	11.0	10.2	9.6	8.9	8.2	7.6	7.0														

\* Models with 900mm EC Fan as Standard (for 575V a VFD is used).

Compressor RLA: Rated Load Amperage (RLA) estimated to the full load of the compressor RLA = Maximum Continuous Current (MCC) / 1.56  
Compressor MCC: Maximum Continuous Current (MCC) of the compressor(s)

MCA: Minimum Circuit Amperage (MCA) = RLA of the largest compressor X 1.25 + SUM RLA others compressor(s) + Total FLA Fans + Control panel load  
FLA Fan: Full Load Amperage (FLA) of the fans

## CAPACITY CORRECTION FACTORS

Ambient Temperature in °F	60	65	70	75	80	85	90	95	100	105	110	115*	120*	125*
Capacity Factor R-410A	1.28	1.25	1.22	1.19	1.15	1.10	1.05	1.00	0.98	0.96	0.92	0.88	0.84	0.8

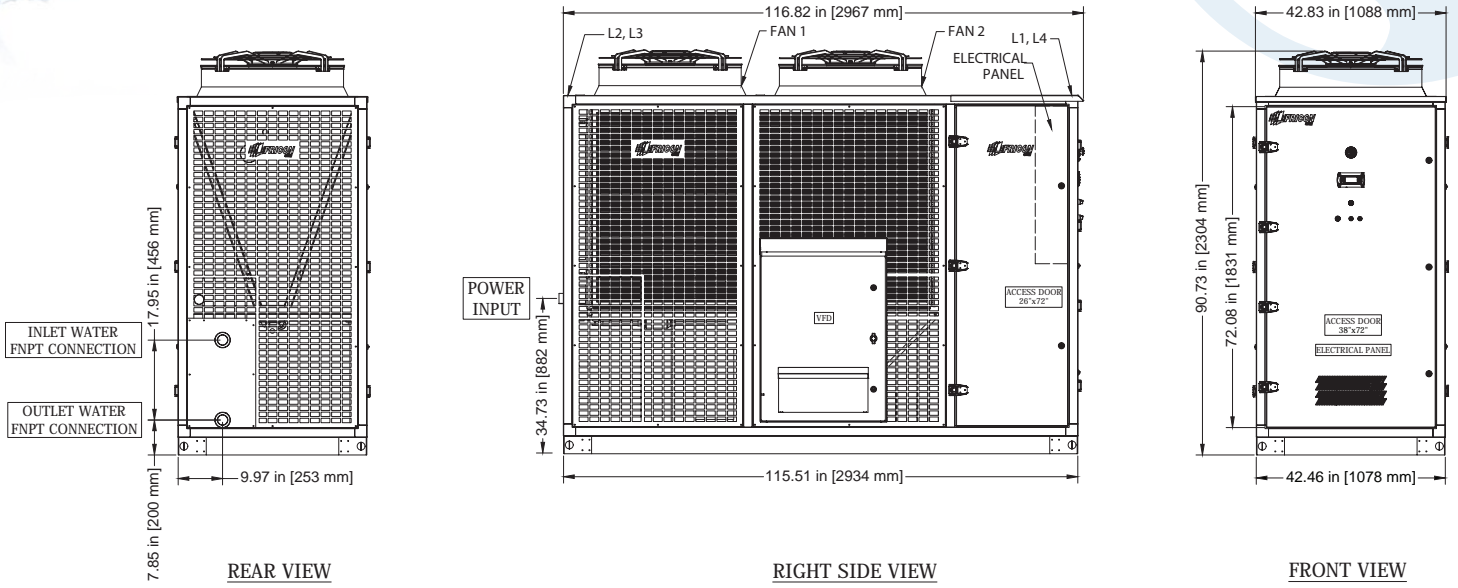
HAOP (High Ambient Operation Package) required for operation above +110°F

‡ Multiply capacity by .83 when used with 50 Hz power.

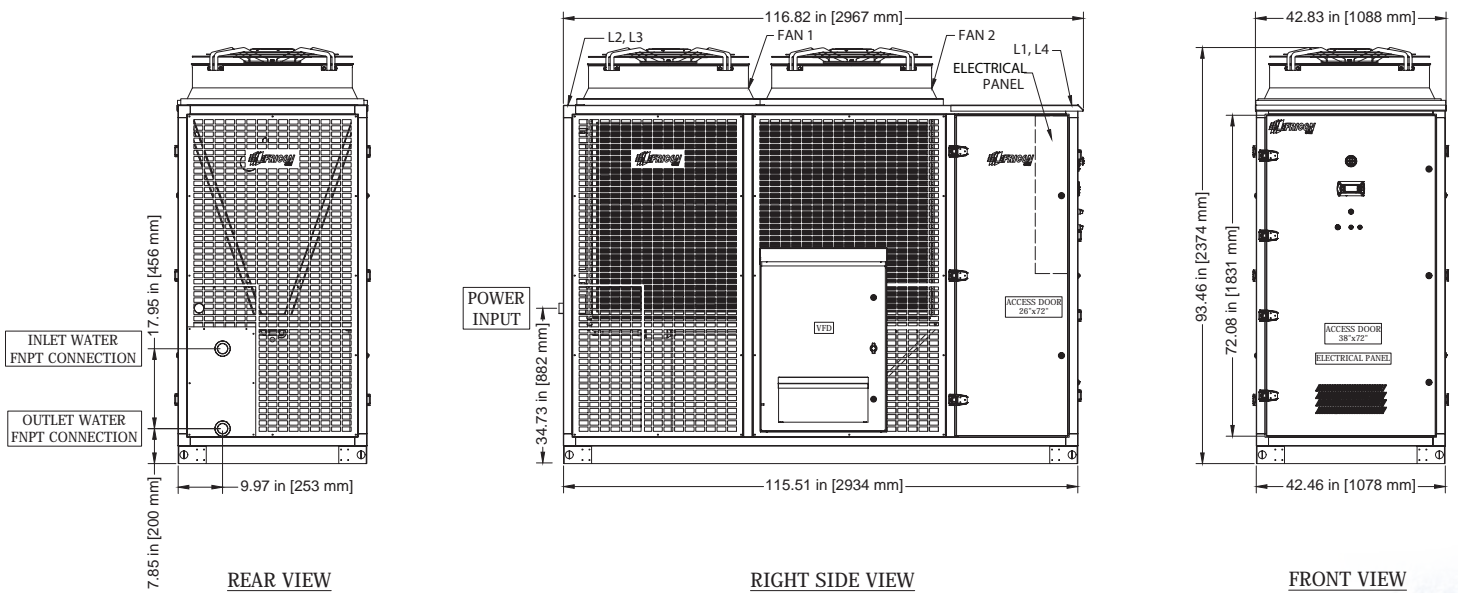
All capacities are calculated at 20°F return gas temperature and dew point values

FRAME TYPE / DRAWINGS REFERENCE

A) Semi-hermetic compressor, 800mm AC type fans



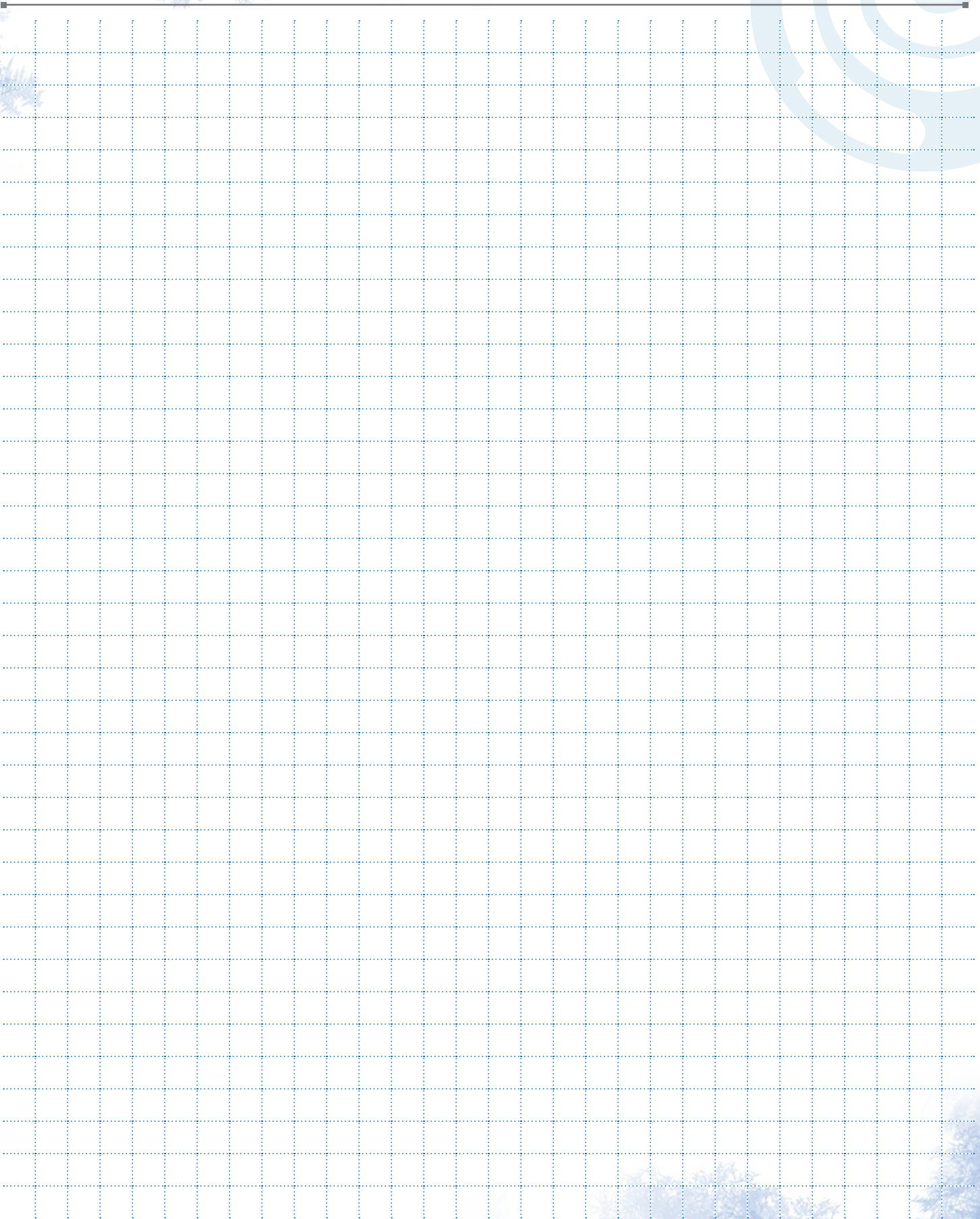
B) Semi-hermetic compressor, 900mm EC type fans







NOTES



FRICONUSA AIR COOLED CHILLERS

