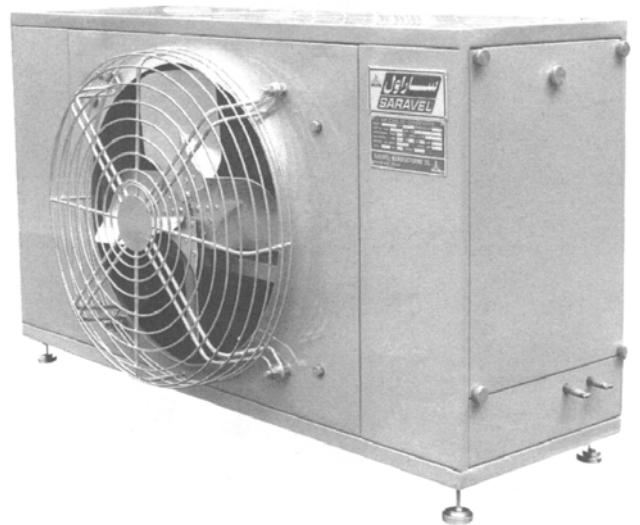
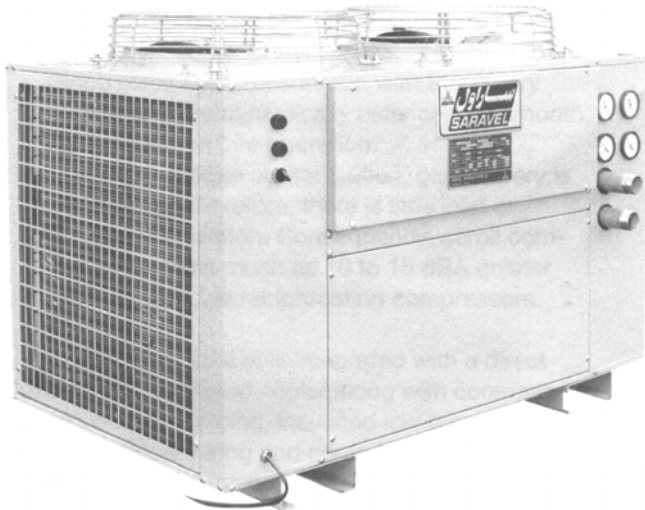
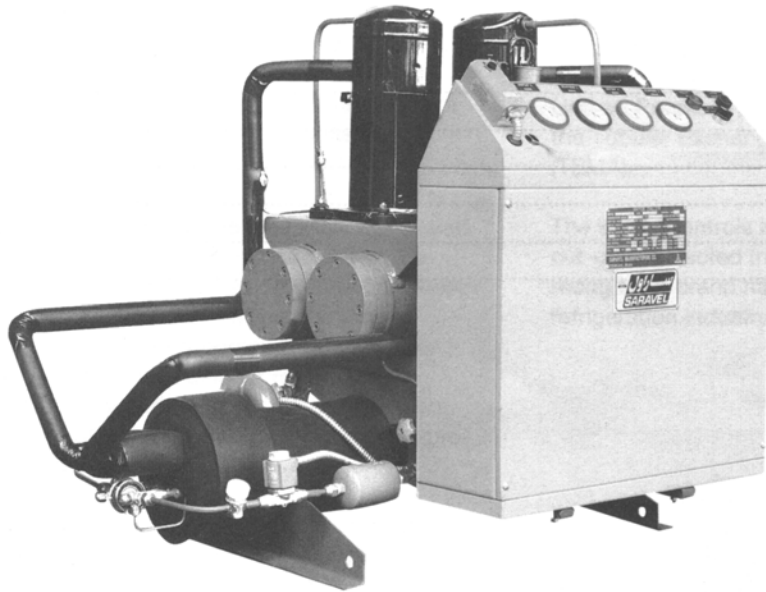




CAT-SMCH-99(3)
SUPERSEDES CAT.NO.910-96



SARAVEL Minichill[®]

PACKAGED LIQUID CHILLERS



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INTRODUCTION

SARAVEL MiniChill® liquid chiller is a new innovative concept in residential air-conditioning. The energy efficient and compact design makes MiniChill®, ideal for apartment complexes and residential units where each unit can independently provide its own air conditioning. Units are available in 3 and 6 ton capacities with packaged and split options in air cooled and water cooled models. All 3 ton units are single phase-220v-50Hz while 6 ton units are 3 phase-380v-50Hz.

At the heart of the MiniChill® is a hermetically sealed scroll compressor which is comprised of two machined, involute spirals that mesh together, as shown in Figures 1 and 2. One orbits about the other, forming pockets that get progressively smaller as they travel from the outer to inner regions of the involute, compressing the gas. Scroll compressors offer a number of advantages over vane and reciprocating designs. Among them:

- Scroll compressors do not have inlet or discharge valves because the meshed scrolls physically separate the inlet and discharge ports. This eliminates associated valve losses which ordinarily result in lower efficiency in reciprocating compressors. The lack of valves also results in quieter operation, and fewer parts ensure higher reliability.
- Unlike vane and reciprocating designs, the scroll compressor has no clearance volume to re-expand which generates losses.
- Since scroll compressors run with true rotary motion and are dynamically balanced for smooth, quiet, vibration free operation.
- Due to the unique orbital motion, gas delivery is continuous. Therefore, there is little inlet or discharge pulsation. Consequently, scroll compressors are as much as 10 to 15 dBA quieter than comparable reciprocating compressors.

The scroll compressor is integrated with a direct expansion type liquid cooler along with complete interconnecting piping, insulated low temperature lines, electrical wiring and control panel. The noiseless operating of the scroll compressor makes it possible to install the MiniChill®, system in any new or existing housing or apartment complex.

The direct expansions cooler designed for highest efficiency features, the refrigerant flows in the tubes and a series of baffles direct water over the refrigerant tubes. The evaporator and low temperature lines are completely protected with closed-cell insulation for thermal insulating, condensation prevention, and vapor seal.

The water cooled condenser is a shell and tube heat exchanger with integrally finned tubes. The condenser is sized sufficiently to hold the total refrigerant charge on pump down operation.

Both the evaporator and the condenser are designed and constructed according to the ASME-Division VIII Unfired Pressure Vessel Code and the Standards of the Tubular Exchanger Manufacturers Association (TEMA).

The safety controls include high and low pressure cut-outs, selected from the most reliable and recognized brand names in the air-conditioning and refrigeration industry.

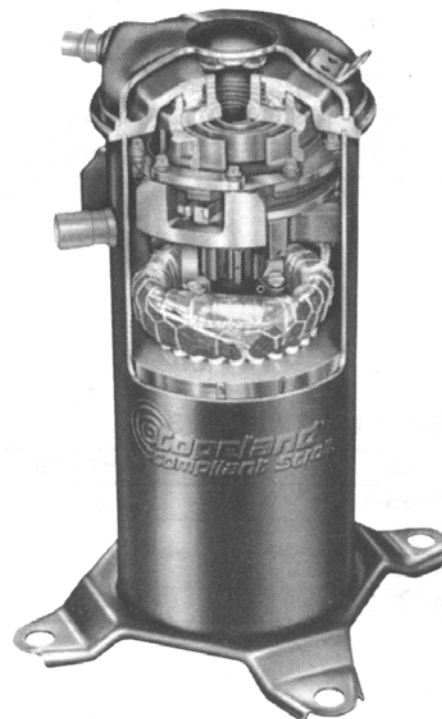


FIGURE 1. SCROLL COMPRESSOR

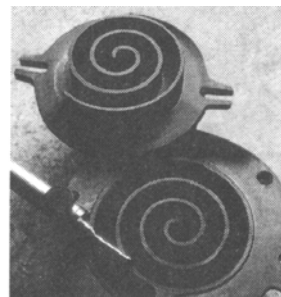


FIGURE 2. INVOLUTE SPIRALS



PHYSICAL DATA

TABLE 1. WATER COOLED TYPE

MODEL	C. T. °F	CAP. Btu/Hr	TOT.IN KW	TOT. AMP.	GPM		P.D. (ft. Water)	
					EVAP.	COND.	EVAP.	COND.
NCW-3S-1	95	30370	1.67	8.1	6.1	7.6	2.5	1.3
	100	29650	1.78	8.5	6.0	7.4	2.4	1.3
	105	28930	1.88	9.0	5.8	7.2	2.3	1.2
NCW-6S-2	95	60740	3.34	16.2	12.2	15.2	4.0	1.3
	100	59300	3.56	17.0	12.0	14.8	3.9	1.3
	105	57860	3.76	18.0	11.6	14.4	3.7	1.2

Ratings are based on: leaving Water Temp. = 45°F

TABLE 2. AIR COOLED (SPLIT & PACKAGED TYPE)

MODEL	AMP. T ° F	CAP. BTU/HR	TOT. IN KW	TOT. AMP.	EVAPORATOR		CONDENSER COIL			PROPELLER FAN			
					GPM	P.D. (ft.w.)	NO.	ROW	FA (ft ²)	NO.	DIA (inch)	RPM	MOTOR HP
NCA-3S-1 & NCA-3P-1	95	27440	3.0	13.9	5.5	2.0							
	105	25800	3.3	15.1	5.2	1.8	1	2	9.5	1	18	1415	0.75
	125	23900	3.6	16.7	4.8	1.5							
NCA-6S-2 & NCA-6P-2	95	54880	6.0	27.8	11.0	3.2							
	105	51600	6.6	30.2	10.4	2.9	1	2	19.6	2	18	1415	0.75
	125	47800	7.2	33.4	9.6	2.5							

Ratings are based on: leaving Water Temp. = 45°F

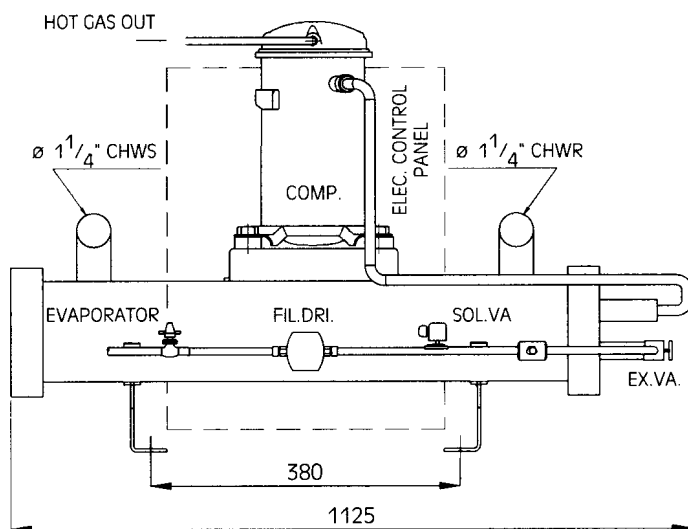
TABLE 3. SPLIT UNIT WEIGHTS

MODEL	WEIGHT (KG)
NCW-3S-1	135
NCW-6S-2	195
NCA-3S-1	110
NCA-6S-2	140

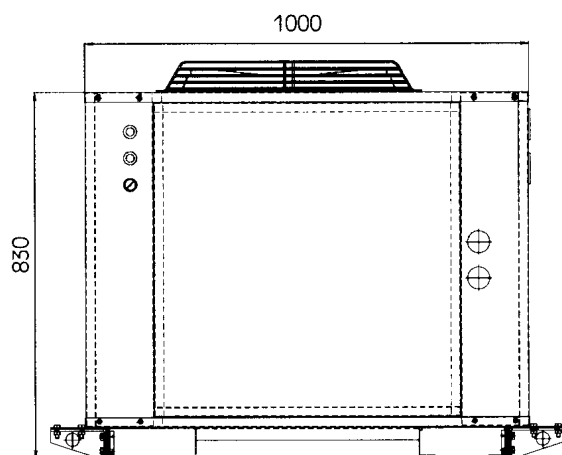
TABLE 4. PACKAGED UNIT WEIGHTS

MODEL	WEIGHT (KG)
NCA-3P-2	160
NCA-6P-2	230

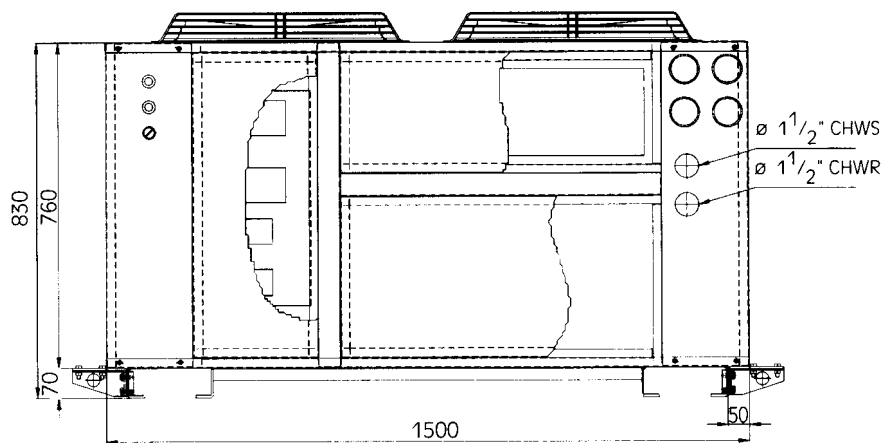
UNIT DIMENSIONS



MODEL NCA-3S-1



MODEL NCA-3P-1



MODEL NCA-6P-2

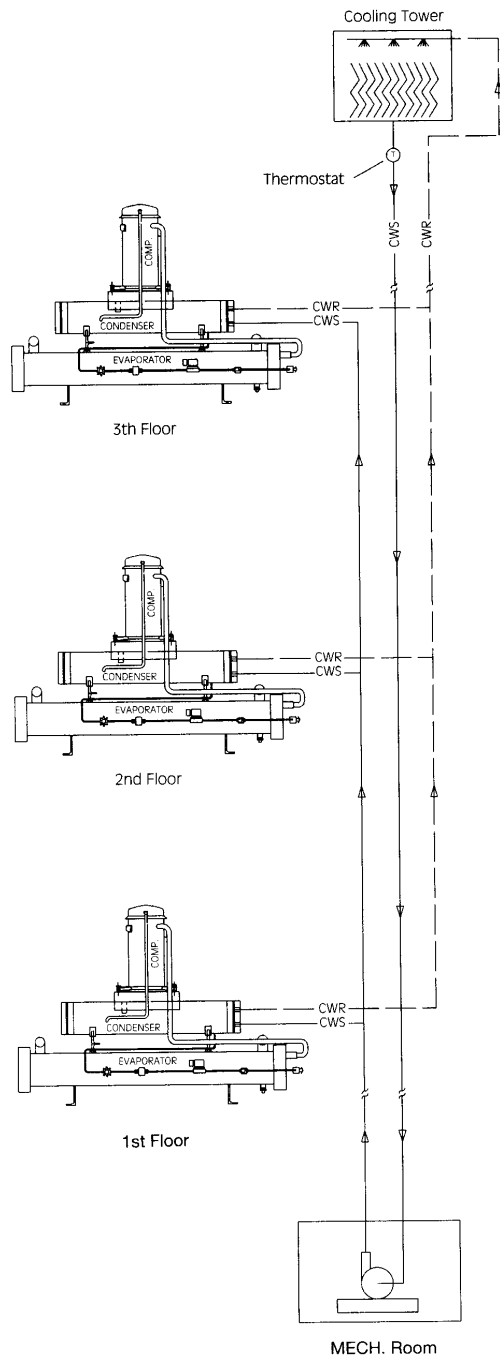


FIGURE 3. MULTI STORY APPLICATIONS

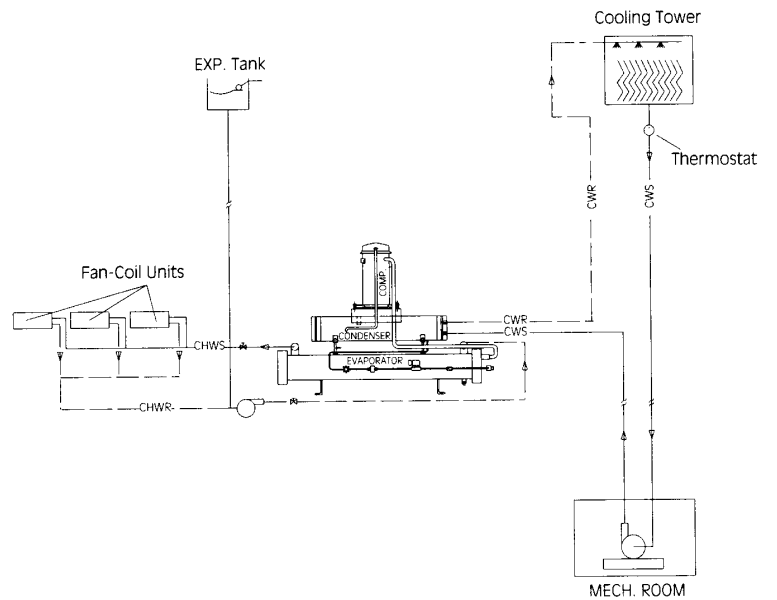


FIGURE 4. SINGLE STORY APPLICATIONS

LENGEND

CWS – Condenser Water Supply
CWR – Condenser Water Return
CHWS – Chilled Water Supply
CHWR – Chilled Water Return

INSTALLATION DETAILS

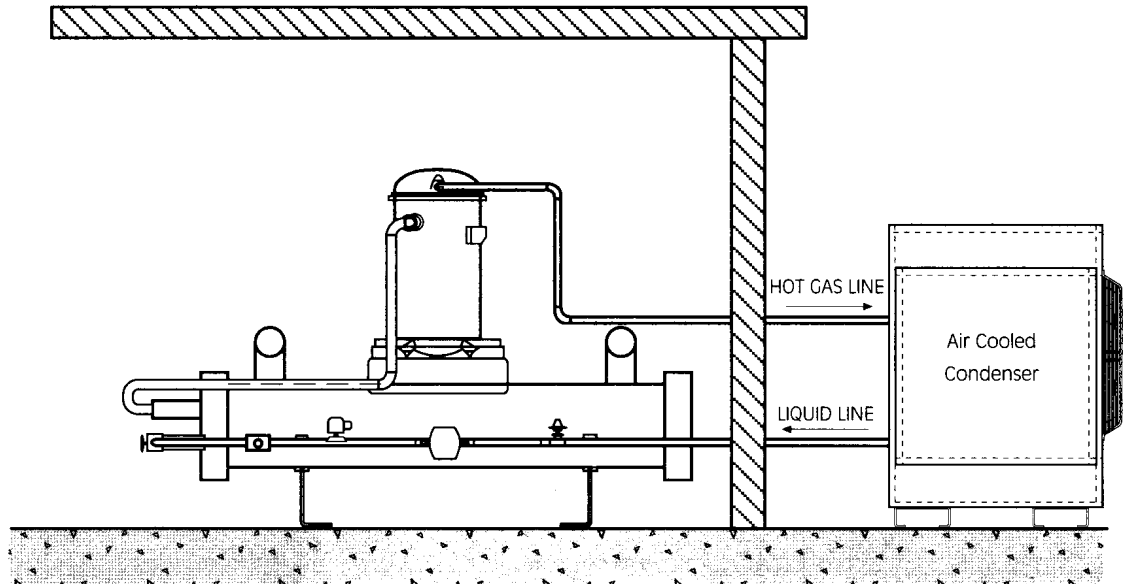


FIGURE 5. AIR COOLED SPLIT UNIT PROPOSED INSTALLATION

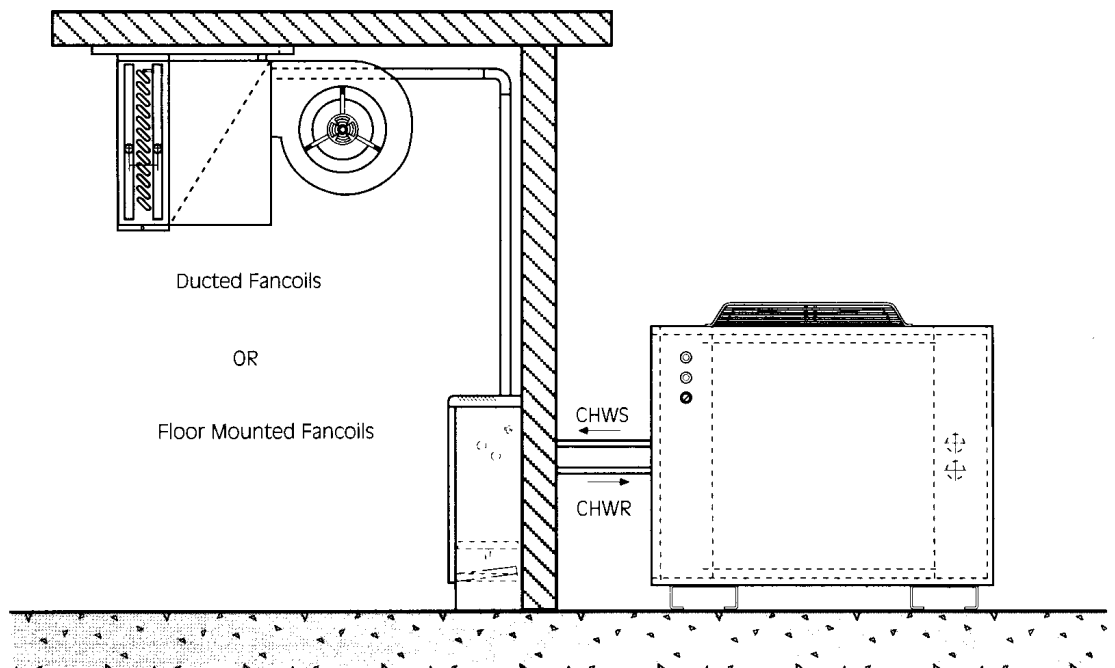


FIGURE 6. AIR COOLED PACKAGED UNIT PROPOSED INSTALLATION



ENGINEERING SPECIFICATIONS

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GENERAL

SARAVEL MiniChill®, liquid chiller shall be completely factory assembled including all interconnecting refrigerant piping and internal wiring of controls and fan motor starting equipment. The packaged units shall be shipped with operating refrigerant charge. The unit shall include the following:

conditions sensed via multistage thermostat.

Optional control strategies may be implemented as Per engineering specifications. Please contact SARAVEL Corp. Sales Office.

EVAPORATOR

The evaporator shall be shell and tube, direct expansion type with refrigerant in the tubes and liquid to be chilled in the shell. The evaporator shall be designed, constructed, and tested according to TEMA and ASME Section VIII, Div. 1 .

CONDENSER

In case of air-cooled packaged units, the condenser shall be air-cooled with copper tubes expanded into corrugated aluminium fin plates. The coil shall be multi-circuited designed for minimum pressure drop.

In water cooled versions the condenser shall be cleanable, shell and tube type, with integrally finned copper tubes and removable steel heads. The condenser shall be designed, constructed, and tested according to TEMA and ASME Section VIII, Div. 1 .

COMPRESSOR

The compressor(s) shall be hermetic compliant scroll and operate on 1Ø-220V-50Hz or 3Ø-380V-50Hz. Optional electrical controls are available for all models.

FAN-MOTOR

The fan-motor shall be 1Ø-220V-50Hz for 3 Ton units and 3Ø-380V-50Hz for 6 Ton units for air cooled packaged unit versions. Optional arrangements shall be made for special requirements.

The fans shall be heavy duty high quality aluminium propeller designed for minimum noise.

CONTROLS

All controls shall be 1Ø-220V-50Hz and shall protect the compressor against high discharge and low suction pressures.

Fan and compressors shall be sequenced with Adequate time delay in response to charge load



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