

Environmental Control

Installation, Operations
& Maintenance Manual

Skil-aire™

Do It Up! *A Division of Tithe Corporation*

Excellence In Ceiling and Floor
Air Conditioning Systems

**Floor Mounted
Precision A/C's
6-20 Tons**



Guardian-II™

INTRODUCTION



Thank you for your selection of an Skil-air floor mounted Guardian-II precision air conditioner by Skil-air A/C's.

Skil-air floor mounted air conditioners are designed and constructed using the finest available materials and components for years of trouble free service.

INSPECTION OF EQUIPMENT

Upon receipt of the unit, inspect for visible or concealed damage. Report any damage to the freight carrier, and file a damage claim. Call 800-625-7545 to request a fax of our written freight damage procedure. In the event even slight (cosmetic) damage is noted, IMMEDIATELY perform an inspection of the interior of the units paying particular attention to the major braze points on the coils, the set screws on the pulleys, and the connection to any interior valves. These are the areas most affected by G force impact and are the most common concealed damage sustained. REPORT ANY CONCEALED DAMAGE TO THE FREIGHT CARRIER AS SOON AS IT IS FOUND. If you do not know the carrier, please call customer support at 800-625-7545 with unit serial number, they will provide the carrier's name and phone number to you.

All pulleys and belts must be checked to assure they have not loosened during transit. Set screws must be confirmed for tightness. Remove all foreign objects from the equipment. This includes accessories as they are often packed in the cabinets for shipment. Warranty documentation and Operation and Maintenance manuals are also shipped within the equipment (in their own zip-lock bag) and must be removed.

SELECTION OF INSTALLATION SITE

Before unit is installed, a thorough study should be made of the structure. Careful consideration must be given to the location of wiring, condensate disposal, ductwork, and proper accessibility to the unit for maintenance and servicing. It is recommended that a minimum of 36" clearance space be allowed from the front of the unit unit to accommodate maintenance and servicing.

UNIT MOUNTING

Up-Flow air pattern indoor evaporator sections are designed to be installed directly onto a slab floor. Down-Flow air pattern indoor evaporators are designed to be installed on the optional floor stand for raised floor applications. Condensers and drycoolers are designed to be installed remotely from the evaporator section - indoors or outdoors - see remote condenser or drycooler installation manuals for more information.

Refer to submittal drawings for detailed dimensional data.

Refrigerant Piping Guidelines

All refrigerant piping should comply with ASHRAE, Local and National Code requirements. Use only refrigerant grade pipe, piping joints should be high temperature brazed.

Discharge and suction lines should be sized to maintain sufficient oil return to the compressor by maintaining high gas velocities while keeping the refrigerant pressure drop within recommended ranges.

The risers must be properly sized to ensure proper oil return. Vertical runs require a trap every 20 feet or less of rise; they also should be trapped at the bottom and the top of the riser.

Riser traps should be small as possible to limit excessive oil trapping.

Piping should be adequately supported and should allow for vibration and normal expansion.

All refrigerant **gas** piping high and/or low pressure should slope in direction of refrigerant flow.

The discharge line connection should loop above the condenser hot gas header on remote heat exchangers.

Recommended Refrigerant (R22) Line Sizes						
Equivalent Length ft. (m)	Line Type	BTUH CAPACITY (per circuit)				
		36,000	48,000	60,000	90,000	120,000
50 (15)	Discharge (horizontal)	7/8	7/8	7/8	7/8	1 1/8
	Discharge (vertical)	5/8	5/8	5/8	7/8	7/8
	Suction	7/8	7/8	1 1/8	1 1/8	1 1/8
	Liquid	3/8	3/8	1/2	5/8	5/8
	Flooded Condenser to Receiver	1/2	5/8	5/8	5/8	7/8
100 (30)	Discharge (horizontal)	7/8	7/8	1 1/8	1 1/8	1 1/8
	Discharge (vertical)	5/8	5/8	7/8	7/8	7/8
	Suction	7/8	1 1/8	1 1/8	1 1/8	1 3/8
	Liquid	3/8	1/2	1/2	5/8	7/8
	Flooded Condenser to Receiver	1/2	5/8	5/8	7/8	7/8
150 (45)	Discharge (horizontal)	7/8	7/8	1 1/8	1 1/8	1 1/8
	Discharge (vertical)	5/8	5/8	7/8	7/8	7/8
	Suction	7/8	1 1/8	1 1/8	1 1/8	1 3/8
	Liquid	1/2	1/2	5/8	7/8	7/8
	Flooded Condenser to Receiver	5/8	5/8	7/8	7/8	7/8
200 (60)	Discharge (horizontal)	7/8	1 1/8	1 1/8	1 1/8	1 3/8
	Discharge (vertical)	5/8	7/8	7/8	7/8	1 1/8
	Suction	1 1/8	1 1/8	1 3/8	1 3/8	1 5/8
	Liquid	1/2	5/8	5/8	7/8	7/8
	Flooded Condenser to Receiver	5/8	5/8	7/8	7/8	7/8

ELECTRICAL WIRING

Units are completely internally wired at the factory for normal supply voltages. Check unit specification plates for required voltages wire and fuse sizing.

Power wiring to the evaporator and condenser units must come through fused disconnects. Minimum circuit ampacity and maximum fuse sizes for the condensing unit are shown on the unit nameplates. Power wiring to the evaporator section must be 14 gauge (copper) minimum. Refer to specification plate for

evaporator motor current and fuse size per the National Electric Code.

For low voltage wiring:

18 gauge wire may be used for up to 50 feet lengths
16 gauge wire for up to 100 feet lengths

CONDENSATE DRAINS

Units are equipped with two 3/4" OD drains; one for the evaporator condensate and one for the condensing section when installed in those applications which may permit rain to enter the unit. It is **EXTREMELY IMPORTANT** that the lines attached to these connections contain a TRAP, to ensure positive draining. This equipment is a draw-thru design, which creates a slight negative pressure within the cabinet; therefore, it is highly recommended that the trap be primed with water prior to start-up of the unit.

MicroSkil-200 ADVANCED MICROPROCESSOR CONTROLS

Refer to separate MicroSkil-200 Advanced Microprocessor Controller operations manual for detailed information.

FILTERS

Throwaway filters are supplied with the unit and are an Underwriters Laboratories class 2 pleated extended surface type. Filters should be checked monthly for dirt accumulation and changed when necessary. Replacement filters must be the same as originally supplied. An auto-ship program is available which will provide replacement filters to the installation site on a regularly scheduled basis to provide both the filters and the reminder to change them. **Call 800-625-7545 to arrange for this handy service.**

Remove the filter access panel located on the right front corner of the unit.

AIR FLOW

Units are equipped with adjustable motor and blower combinations for varied static pressures and airflow requirements. The drives have been selected such that, at the mid-position of the adjustable sheaves, the units will supply airflow based on cataloged data.

The drives may be adjusted for different static pressures. If such an adjustment is made, check that the motor current amp draw does not exceed the motor nameplate current by more than ten percent. On units with three phase fan motors, check for proper blower rotation at start-up. If the blower runs backwards, interchange two of the incoming power leads; this will reverse the direction of the motor.

MAINTENANCE PROCEDURES

BLOWERS

Check that the blower wheel is tight on the shaft and does not make contact with the housing. The squirrel cage should rotate freely. Check for restrictions or foreign material in the air circuit.

BELTS

Drive belts should be examined prior to start-up and then monthly for wear and for correct tension. A too tight belt can cause bearing wear; a too loose belt will cause slippage and or noise. If the two legs of the belt are pressed in, midway between the pulley and the sheave, a properly tensioned belt will result in 1inch to 1 ½ inches of movement. Belt tension can be adjusted by means of the adjusting bolt attached to the motor bracket. Larger units may have motors mounted to a support on the bottom pan, which requires loosening of four nuts to adjust the motor location and change belt position.

REFRIGERATION SYSTEMS

All systems contain a liquid line sight glass on each circuit. If bubbles appear in the sight glass, the system is either under-charged with refrigerant, or there may be a restriction in the liquid line up stream of the sight glass. The sight glass contains a moisture indicator, which changes color when moisture is present in the system. **If sight glass appearance is abnormal, servicing is required to determine the cause.**

EVAPORATOR AND CONDENSER COILS

Check semi-monthly the condition of the face of both the evaporator and condenser coils. A dirty condenser coil will cause high condensing pressures, resulting in higher power consumption and possibly system shut down by the high-pressure safety control. A dirty evaporator coil will reduce unit capacity and eventually will cause shut down by the low-pressure safety control.

<<< END >>>

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AT&T

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CHEMICAL BANK

FIRST JERSEY SECURITIES

DAVID YURMAN

BARCLAY BANK OF N.Y.

PUBLIC SERVICE ELECTRIC & GAS

U.S. POST OFFICES

APPLE COMPUTER

HELMSLEY SPEAR

N.Y.U. GRADUATE SCHOOL

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EMIGRANT SAVINGS BANK

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Specifications are subject to change without notice.