



Q-DRY Refrigerant Air Dryers

Operation & Instruction Manual



WARNING!

This instruction manual must be read prior to installation maintenance or operation of this equipment

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INTRODUCTION

The dryers use mechanical refrigeration to dry compressed air. See Table 1 for rated capacity and other specifications.

To ensure continuing good performance and safe operation, everyone who installs, uses or maintains the dryer must read and carefully follow the instructions in this manual.

SAFETY

The dryers are designed and built with safety as a prime consideration; industry-accepted safety factors have been used in the design. Each dryer is checked at the factory for safety and operation. All necessary adjustments are made before shipment. Follow the maintenance schedules outlined in this manual for good performance and safe operation. Maintenance should be done only by qualified personnel with proper tools.

Carefully read the following safety rules before proceeding with installation, operation or maintenance. The rules are essential to ensure safe dryer operation. Failure to follow these rules may void the warranty or result in dryer damage or personal injury.

1. Compressed air and electricity have the potential to cause personal injury or equipment damage. Before doing any work on the dryer, be sure the electrical supply has been disconnected and the internal pressure of the dryer has been vented to the atmosphere.
2. Never install or try to repair any dryer that has been damaged in shipment. (See Receiving and Inspection for instructions.)
3. Do not remove the covers or loosen or remove any fittings, connections or other devices when the dryer is operating. Air under pressure within the dryer can cause severe injury or death.
4. High voltage in the motor control box is dangerous. The dryer must be installed in accordance with recognized electrical codes. Before performing any work on the electrical system, disconnect power from the dryer.
5. Do not operate the dryer at pressure higher than those specified on the dryer label. Excessive pressure may result in severe injury or death.
6. Use only genuine replacement parts from the dryer manufacturer. Manufacturer bears no responsibility for hazards caused by the use of unauthorised parts.
7. Before operating the dryer, read the instructions thoroughly.



Safety Instructions

Safety instructions in this manual are boldfaced for emphasis. The signal words **DANGER**, **WARNING** and **CAUTION** are used to indicate hazard seriousness levels as follows:

DANGER Immediate hazard which **WILL** result in severe injury or death.

WARNING Hazard or unsafe practice which **COULD** result in severe injury or death.

CAUTION Hazard or unsafe practice which **COULD** result in minor injury or in product or property damage.

RECEIVING AND INSPECTION

Inspect the dryer closely when it is received. Record any indication of careless handling by the carrier on the delivery receipt, especially if the dryer will not be immediately uncrated. Obtain the delivery person's signed agreement to recorded damages to facilitate future insurance claims.

If goods are received short or in damaged condition, notify the carrier and insist on a notation of the loss or damage across the face of the freight bill. Otherwise no claim can be enforced against the carrier.

If concealed loss or damage is discovered, notify your carrier at once and request an inspection. This is absolutely necessary. Unless you do this the carrier will not consider any claim for loss or damage. The carrier will make an inspection and may grant a concealed damage notation. If you give the carrier a clear receipt for goods that have been damaged or lost in transit, you do so at your own risk and expense.

The manufacturer is willing to assist you in collecting claims for loss or damage. Willingness does not make the manufacturer responsible for collecting claims or replacing material. Claim filing and processing is customer's responsibility.

HANDLING

When moving or installing the dryer, lift the dryer by the base, not the cabinet.

STORAGE

The dryer can be stored for a period of one year in a clean, dry, temperature-controlled environment. Consult factory if storage requirement is longer than one year.

INSTALLATION

Ambient Air Temperature

Locate the dryer indoors where the ambient air temperature will be between 2°C and 43°C. Intermittent operation at ambient temperatures up to 43°C will not damage the dryer but may result in a higher dew point or dryer shutdown due to high refrigerant discharge pressure (see Field Service Guide). Call your local distributor if prolonged operation at ambient temperatures above 43°C or below 2°C is unavoidable.

Do not operate air-cooled dryers at ambient air temperatures below 2°C. Such operation may result in low suction pressure, causing freeze-up.

Location and Clearance

Mount the dryer on a level base. Install the dryer in a clean, well-ventilated area to reduce fouling of the condenser coils with dirt and dust.

Vapours and contaminant corrosives to copper and aluminum must not be in the area of the dryer or air compressor intake. Allow at least 6 inches clearance from the front and from the condenser coil service access. Install the dryer with the frame level. Anchor bolts are not required

System Arrangement

Liquid water in the inlet air will adversely affect the performance of the dryer. Install the dryer downstream of an aftercooler or separator so that the temperature of the dryer inlet air does not exceed 60°C and the inlet air does not contain any liquid water.

Most compressed air systems require filters for removal of solid and liquid contaminants. When an oil-removal filter is used, it should be installed downstream of the refrigerated dryer. The dryer will remove some entrained dirt, extending the life of the replaceable filter element. Consult your distributor if a lower outlet air temperature is required.

Piping and Connections

Piping must be furnished by the user unless otherwise specified. Connections and fittings must be rated for the maximum operating pressure given on the dryer data plate and must be in accordance with applicable codes. Support all piping; do not allow the weight of any piping to stress the dryer or filters. Inlet and outlet shutoff valves and a valve bypass are recommended. Piping should be at least the size of the inlet and outlet connections to minimize pressure drop in the air system. See Table 1 for dryer inlet and outlet connections.

Removing Condensate

A separator with an auto float drain valve is supplied with each dryer. The user must install a separate discharge line at the drain connection to carry off condensate to an environmentally approved condensate collection/disposal system.

If clogging is a problem, install a strainer or a particulate filter before the dryer to keep solid particles from entering the dryer. Contact your local distributor for the appropriate particulate filter.

Electrical Connections (See Figure 1)

The dryers are constructed according to NEMA 1 electrical standards. All models are fitted with a power cord for 220~240V/1Ph/50Hz VAC power connection. Refer to Figure 1 for the electrical schematics.



CAUTION

Operation of this product with improper line voltage constitutes abuse and could affect the product warranty.

HOW IT WORKS

Airflow and Refrigeration System (see Figure 2)

The dryers use refrigeration cooling to condense water vapour out of the air stream. Warm saturated air enters the heat exchanger (evaporator/chiller) where it is cooled by an air-to-refrigerant process. This causes water vapour to condense so it can be removed as a liquid. The cold, dry air is reheated as it passes through the reheater. The reheater reduces the heat that the static condenser radiates to the ambient thus eliminating the need for a cooling fan and preventing pipeline sweating at the air outlet for these models.

A constant pressure expansion valve modulates the flow of liquid refrigerant to the chiller. This eliminates freeze-up and assures continuous, automatic dew point control. The valve responds to pressure changes of refrigerant leaving the chiller to maintain the proper cooling rate under all load conditions. The refrigerant valve is adjusted at the factory; operation is fully automatic.

INSTRUMENTATION

ON/OFF Switch

The dryers are equipped with an ON/OFF switch on the front panel. A green light signals when the dryer is on.

Colour Indicator

All dryers are equipped with a colour indicator which indicates dryer conditions as follows:

It is normal for the indicator colour to be in the red zone when the dryer is first turned on and then move to the green zone when the dryer reaches its normal operating temperature. If this indicator is in the red zone during normal operation, turn the dryer off to avoid compressor damage. Refer to the Field Service Guide, for additional information, or call your local distributor.

refer to the maintenance section of this manual.

START-UP

Follow the procedure below to start your dryer. Failure to follow the prescribed start-up procedure will invalidate the warranty. If problems arise during start-up, call your distributor.

Drain connections must be made before the dryer can be operated. The dryers are fully automatic and require no auxiliary controls.

1. Connect inlet and outlet lines to the dryer.
2. Turn the on/off switch to on.
3. After the dryer has been running for 30 minutes:
 - Check the Colour Indicator. If the indicator is in the red zone, unplug the dryer. Refer to the field Service Guide, for additional information, or call your local distributor.
 - Confirm that condensate is discharging from the drain. This can only be done when there is air flow through the dryer.

The dryer is designed to run continuously. Let the dryer run even when the demand for compressed air is interrupted; the dryer will not freeze up.

SHUTDOWN

When the dryer must be shutdown for maintenance or other reasons, use the following procedure.

1. Turn the power on/off switch to off.
2. Disconnect the main power supply.



DANGER

Disconnect supply power to the dryer before servicing the dryer. Dismantling or working on any component of the compressed air system under pressure may cause equipment failure and serious personal injury or death. Before dismantling any part of the dryer or compressed air system, completely vent the internal pressure to the atmosphere.

If mechanical repairs are to be made or service is performed, vent the internal pressure of the dryer to atmospheric pressure. Restart the dryer according to the start-up instructions.

MAINTENANCE

The dryers require little maintenance for satisfactory operation. Good dryer performance can be expected if the following routine maintenance steps are taken.



DANGER

Disconnect supply power to the dryer before performing any maintenance on the dryer.
Before dismantling any part of the dryer or compressed air system, completely vent the internal pressure to the atmosphere.

General

For continued good performance of your refrigerated dryer, all refrigeration system maintenance should be performed by a competent refrigeration mechanic.

NOTE: Before corrective maintenance is done during the warranty period, call your local distributor and proceed according to instructions. Refer to the warranty for limits of your coverage.

Daily Maintenance

Check the separator for condensate discharge. If no discharge is evident, depressurize, dismantle and clean or replace the separator float.

Monthly Maintenance

Inspect the condenser coils. Remove accumulated dust and dirt with a soft brush or with air from an OSHA approved compressed air nozzle that limits the discharge pressure to 2.1 barg.

Electronic Drain Valve Disassembly and Servicing (OPTION)

The valve body is mounted on the frame bottom; a hose connects the valve body to the heat exchanger vessel.



CAUTION

Do not disassemble drain valve timer or attempt to repair electrical parts. Replace timer if defective.

The drain valve discharges condensate through a full-port drain opening. The valve body may need to be cleaned under conditions of gross particulate contamination.

To disassemble the drain valve body for cleaning and other maintenance:

1. Turn power switch off.
2. Disconnect main power supply to dryer.
3. Lock out and tag power supply in accordance with OH&S requirements.



WARNING

If power supply is not disconnected before disassembly, serious personal injury or death and valve damage may result.

4. Remove hoses that connect the drain valve to the drain valve strainer.
5. Remove screw and washer from front of the drain valve.
6. Remove the power supply connector and gasket (with the timer assembly if attached) from the solenoid coil housing. Do not damage or lose the gasket.
7. Remove coil fixing nut and spring washer from top of solenoid coil housing.
8. Lift solenoid coil housing off solenoid core in valve body.
9. Unscrew solenoid core from valve body.

Once the drain valve is disassembled, the following maintenance can be performed.

1. Inspect internal parts of valve body; clean or replace as required.
2. Remove debris from valve body.
3. Wipe solenoid core components with a clean cloth or blow out debris with compressed air from an OSHA approved air nozzle that limits its discharge pressure to 2.1 barg.
4. Check that the inside part assembly is clear and solenoid coil moves freely in housing.
5. If timer is attached to valve body, check electrical continuity across timer assembly.

To reassemble the drain valve, reverse the sequence of the preceding steps. After the drain valve is reassembled, connect the main power supply to the dryer. When the dryer is returned to service, check the drain valve for air or condensate leaks; tighten connections as required to correct leaks. Check the drain cycle; adjust the timer according to the procedure in the drain valve adjustment section.

Returns to Manufacturer

If the dryer or a component of the dryer must be returned to the manufacturer, first call your local distributor for a return authorization number and shipping address. Your distributor will inform you whether the dryer or only a component must be returned. Mark the package with the return authorization number and ship freight prepaid as directed by your local distributor.

FIELD SERVICE GUIDE

Problems most frequently encountered with refrigerated dryers are water downstream of the dryer and excessive pressure drop. Most causes can be identified and remedied by following this guide



DANGER

Closed refrigeration systems are potentially dangerous. Work on the refrigeration system must be done only by a competent refrigeration mechanic. Do not release fluorocarbon refrigerants to the atmosphere. All refrigerants must be recovered per EPA requirements. Do not smoke when a refrigeration leak is suspected. Burning materials may decompose refrigerants, forming a toxic gas or acids that may cause serious injury and property damage. Before dismantling any part of the dryer or compressed air system, completely vent the internal pressure to the atmosphere.

PROBLEM	SYMPTOM	POSSIBLE CAUSE	REMEDY
Water downstream of dryer	No discharge from separator drain trap.	Failure of separator.	Dismantle and clean, repair or replace separator.
	Dryer inlet air temperature too high.	Aftercooler malfunction	Check aftercooler discharge temperature and reduce to dryer design condition (60°C max)
	Refrigerant compressor stopped.	Leak in ref. system.	Consult your local distributor.
		Compressor overheated	Turn dryer off. Wait 30 minutes; turn dryer on. (Motor thermostat self-starting.)
High pressure drop	Low outlet pressure.	Dryer undersized (may also cause water downstream of dryer)	Check airflow and dryer capacity. Reduce airflow or resize and replace dryer.
		Blocked separator	Dismantle and clean or replace separator.
	Lowest process air temperature below 0°C	Dryer icing up (check at separator).	Consult your local distributor.
Colour indicator out of green zone	Indicator in red zone	Inlet air temperature too high	Reduce aftercooler discharge temperature to design conditions (see Table 1).
		Excessive airflow	Check airflow and system capacity. Reduce airflow or resize and replace system.
		Condenser fouled or Clogged	Clean or replace condenser.
		High ambient temp.	Ventilate area.
	Indicator in blow zone	Improper adjustment of Expansion valve.	Remove cap from the exp. valve and turn the screw until the indicator is in the green zone.
	Indicator in blow zone	Improper adjustment of Expansion valve	Adjust the exp. valve until the indicator is in the green zone.

SPECIFICATION

Table 1
SPECIFICATIONS

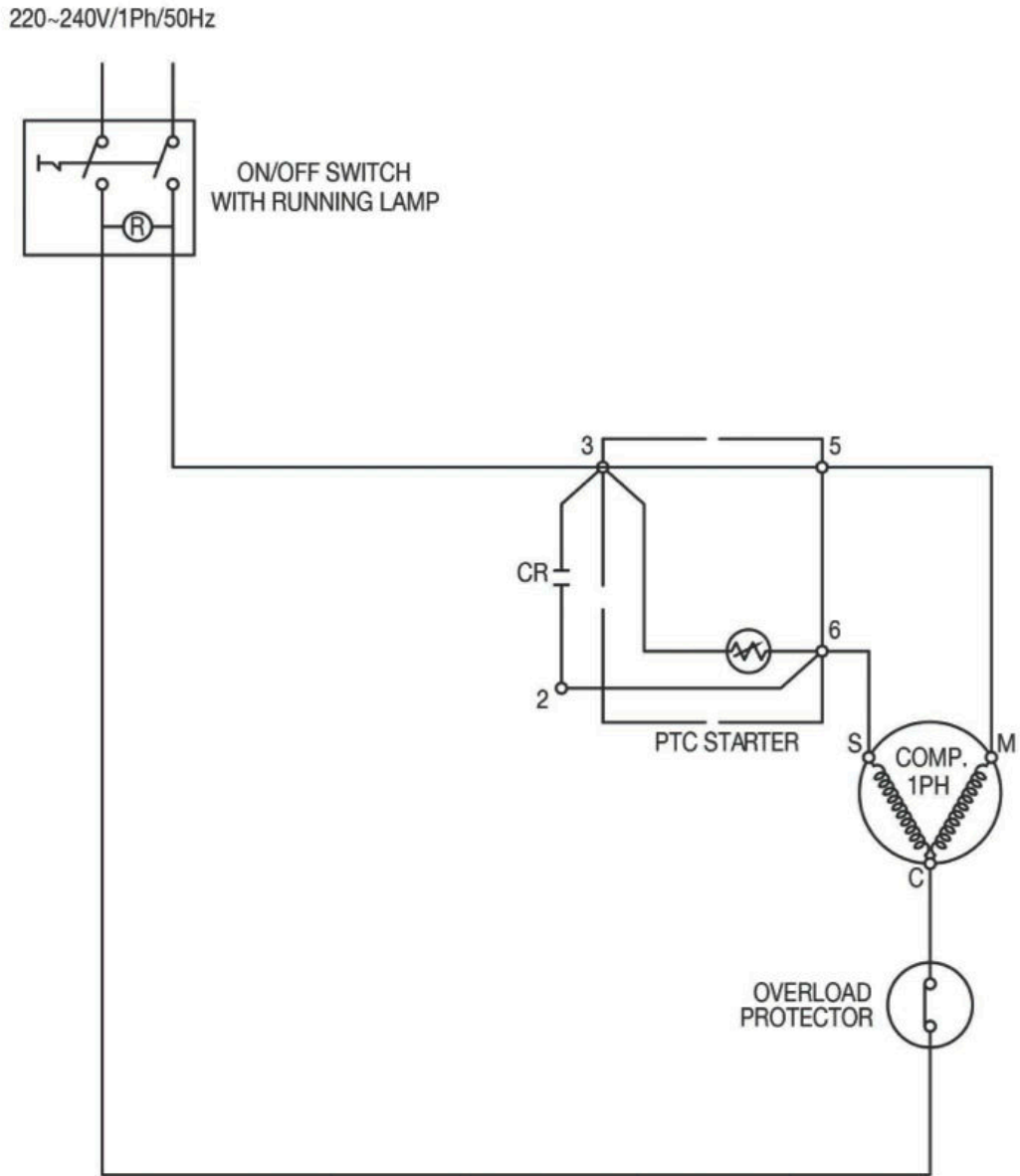
Model	Flow Capacity m ³ /min ⁽¹⁾	Total Power (kW)	Power Supply (VAC 50hz)	Refrigerant Type ⁽²⁾	Dimensions (L x W x H) (mm)	Connection	Weight (Kg)
Q-DRY05	0.5	0.2	230 /1	R134A	382 x 320 x 320	1/2" M BSP	20
Q-DRY10	1.0	0.3			568 x 368 x 394	3/4" M BSP	32
Q-DRY13	1.3	0.4			568 x 368 x 394	3/4" M BSP	32
Q-DRY16	1.6	0.6			568 x 500 x 500	3/4" M BSP	44

1. Rating conditions are 42°C inlet temperature 6.9 bar(g) inlet pressure, 100% inlet relative humidity, 35°C ambient temperature @ 50Hz..
2. Refer to dryer data plate for refrigerant charge.

Table 2
OPERATING CONDITIONS

Model	Maximum Inlet Air Pressure	Minimum Inlet Air Pressure	Maximum Inlet Air Temperature	Minimum Inlet Air Temperature	Maximum Ambient Air Temperature	Minimum Ambient Air Temperature
GXS05 - GXS16	9.9 barg	2 barg	60°C	4°C	43°C	2°C

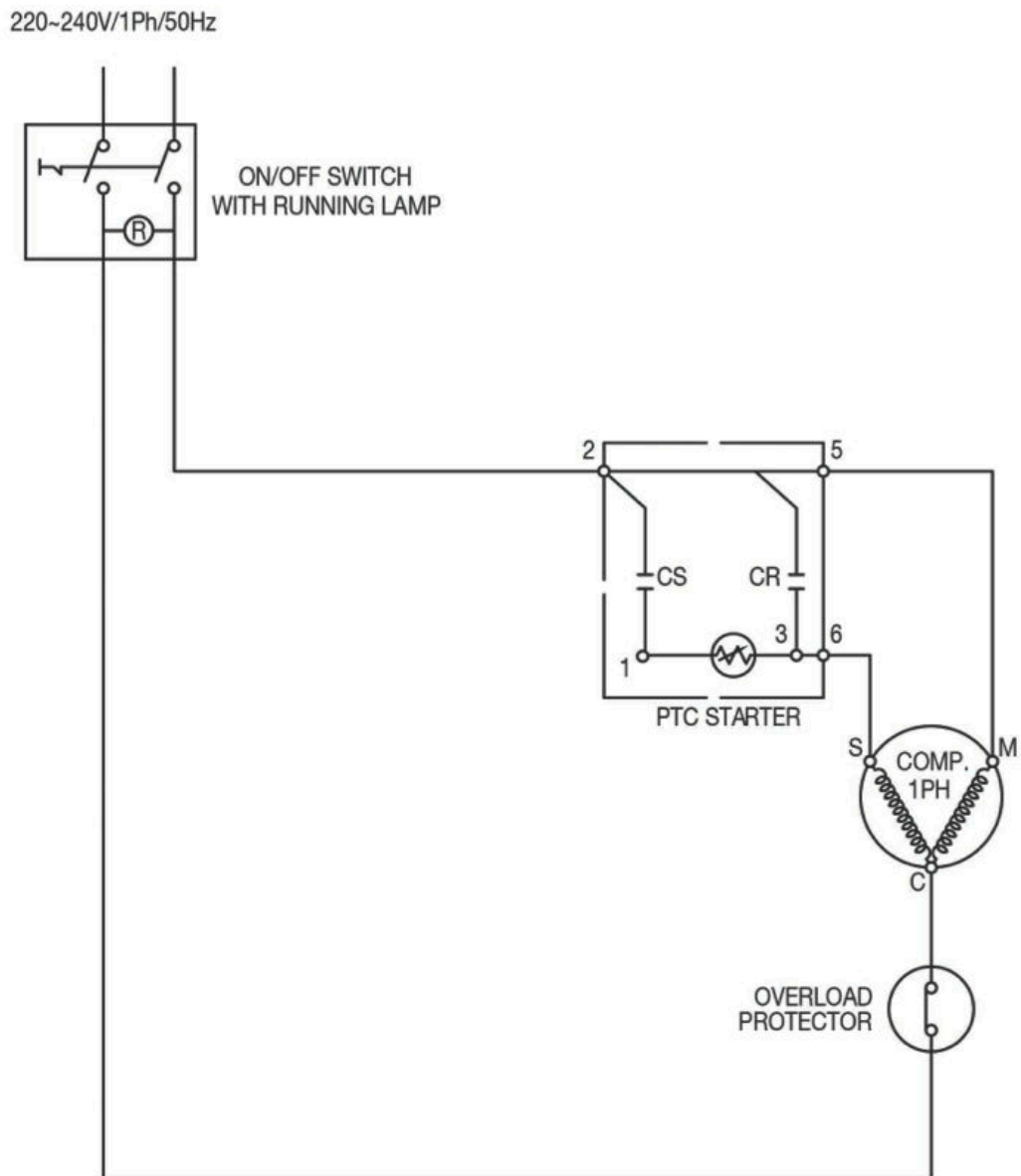
Overload Requirements: 60°C inlet air temperature and 43°C ambient temperature conditions which dryer must continue to operate (will not shut down), although will not deliver claimed dew point performance.



Model Q-DRY-05 - Q-DRY13

Figure 1A

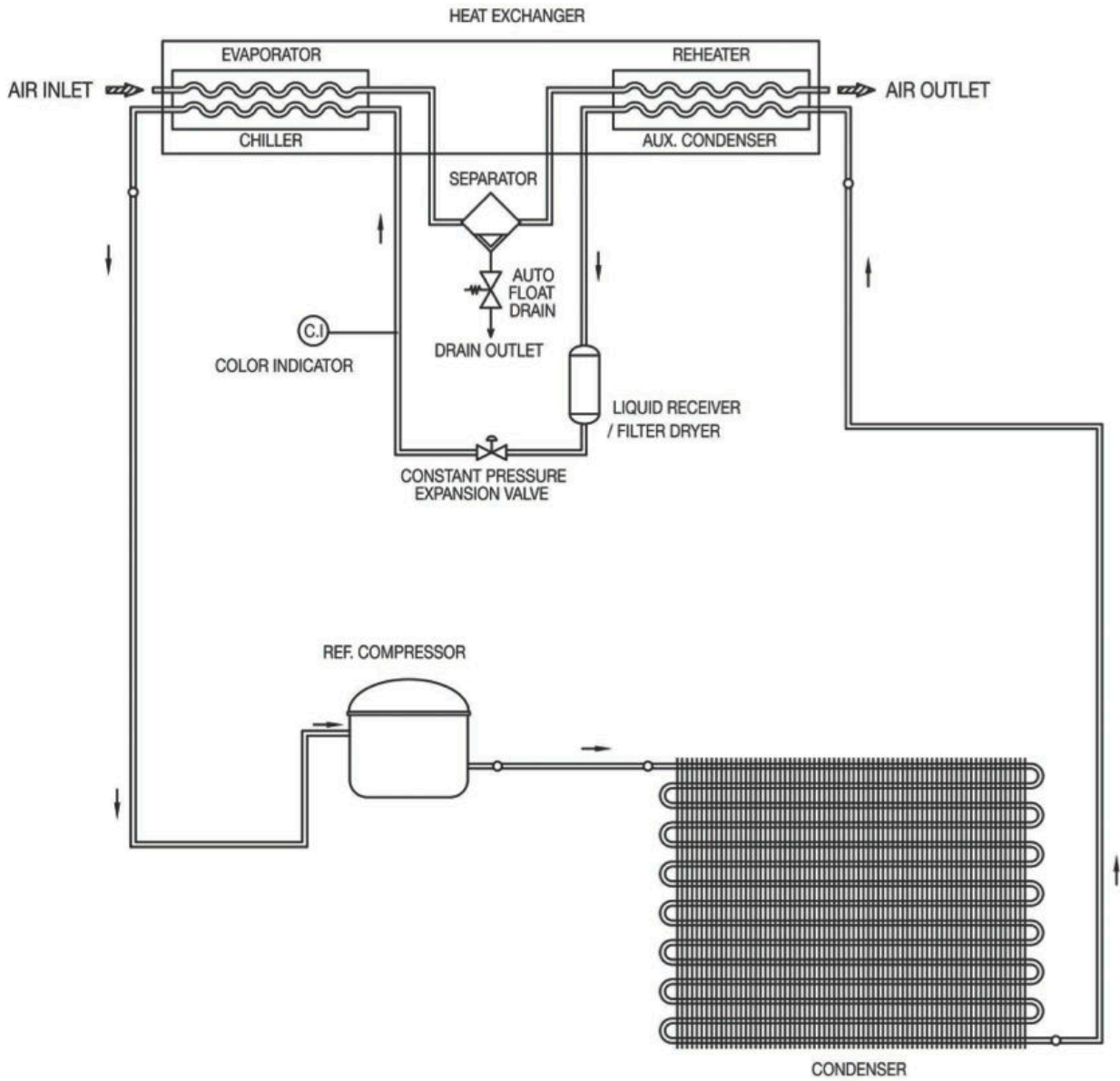
ELECTRICAL SCHEMATIC



Model Q-DRY16

Figure 1B

ELECTRICAL SCHEMATIC



Model Q-DRY05 - Q-DRY16

Figure 2A

AIR AND REFRIGERANT FLOW SCHEMATIC



MASTER Q



MASTER Q