

Installation, Operating & Maintenance Manual

Thermo Star
TS50 - TS3000
refrigeration dryer



Ingersoll-Rand®

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APDD 762C



Warnings

Important:

- Keep this manual with the machine throughout its entire service life.
- Carefully read this manual before carrying out any operation on the machine.
- **This machine is designed for PROFESSIONAL USE only. Only use the machine for the purpose for which it is intended. Improper use of the machine absolves the manufacturer from all liability. This manual has been compiled to help the final user perform just those operations which do not require removal of the panels.**

All other operations which involve the removal of covers from instruments or electrical circuit-breakers using special tools must only be carried out by trained personnel due to the danger of rotating parts or live components.

Each machine is equipped with an electric disconnect device which allows the operator to work on the machine in absolute safety. This device must always be used to disconnect the mains supply to avoid any risk of danger during maintenance work (electric shocks, scalding, automatic start-up, moving parts and remote control).

Before servicing the dryer always make sure the compressed air circuit is depressurized.

The key provided to remove the panels must be kept by the head of maintenance.

When requesting technical assistance or ordering spare parts, always quote the model and serial number on the identification plate mounted externally on the unit.

IMPORTANT: This manual is subject to modification. For the most comprehensive and up-to-date information, the user is therefore required to consult the manual supplied with the machine.

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1 Introduction

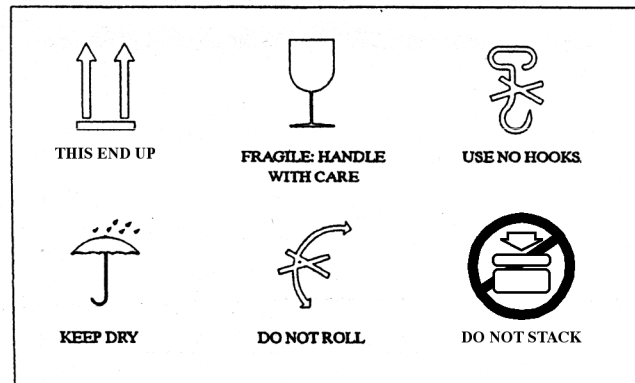
1.1 Foreword

The TS dryers are designed to guarantee high quality compressed air and minimum maintenance.

You must carefully read this manual to obtain maximum performance from your dryer and ensure its correct installation and start-up in compliance with manufacturer instructions.

1.2 Packaging

The dryer is packaged with a strong cardboard box strapped to a wooden pallet. On all four sides of the boxing there are printed all of the instruction symbols (UNI ISO 780) for the movement, transporting and stocking of the product.



1.3 Transport

- Keep the unit in an upright position and do not install outside.
- Use a forklift truck to move the machine.
- Care should be taken to avoid damaging internal components through poor handling during movement, installation or use.
- Unpack the machine as close as possible to the installation site.

1.4 Storage


If stored the packaged units must be kept inside, protected from humidity, direct light and rain.

1.5 Inspection

On receipt of the machine, make sure it has incurred no damage during transit. **If any damage is detected, contact the freight carrier immediately.**

2 Installation (see Fig. 1)

- Do not install the dryer outdoors even if protected by a roof. Never expose the dryer to temperatures below 41° F (5° C) or above 104°F (40°C).
- The compressed air inlet temperature must never exceed 122°F (50°C). For different temperature values to those indicated above, consult the manufacturer.
- For models TS50-TS200 only:** to avoid drawing in dust, position the dryer at least 12 inches (30cm) above the floor using a suitable block-mount.
- Allow for a 60 inches (1.5 meters) gap around the unit to facilitate maintenance and ensure unimpeded air discharge from the condenser. **For models TS700-TS2800 only:** leave a space of at least 80 inches (2 meters) above aircooled machines.
- For most compressed air applications we recommend following the installation plan shown. This layout ensures optimum compressor, filter and dryer performance and also guarantees excellent air quality while minimizing operating costs. **Do not obstruct the dryer air grills.**
- Avoid recirculation of hot condenser air back onto the condenser air inlet.

- g) If the system is prone to instantaneous pressure surges which exceed the dryer's rated capacity, mount a suitable sized receiver near the overpressure source. For more precise information, contact the manufacturer or distributor.
- h) **It is obligatory to install a "1 micron" filter on the dryer intake a side to prevent rust, scale or other pollutants from entering the system and clogging the condensate drain and heat exchangers, thereby causing severe pressure drops. This filter must be close to the dryer inlet.**
- i) **On water cooled units we recommend installing a filter on inlet side to prevent the ingress of debris that will gradually choke the passages, with negative effects on machine performance levels.**
- j)  **Cooling water hardness should not exceed 25° d fr = 14° dH = 18° Clark.** If water is harder in your area, consult the manufacturer.
Condenser cooling water pressure:
 minimum = 43.5 psig (3 barg)
 maximum = 145 psig (10 barg)
 For different pressure settings contact the manufacturer.
- k) Always install a bypass line and shut-off valves to permit maintenance or calibration without interrupting the compressed air flow to the user.
- l) Correctly connect the dryer to the air inlet and outlet connections. If the compressed air network is prone to vibrations, use braided hoses to make the connections. If the main air lines are subject to high levels of pulsation, ensure that the connections are equipped with pulsation dampeners.
- m) Do not connect condensate drains common to other pressurized drain lines in a closed circuit. Make sure the outflow from the condensate drains is unimpeded. The condensate pipe must be connected in such a way that the specified sound pressure level is not exceeded during draining. (see para. 3.5).
- n) The ambient air around the dryer and compressor must not contain solid or gaseous contaminants. All compressed and condensed gases can generate acids or chemical products which may damage the compressor or components inside the dryer. Take particular care with sulphur, ammonia, chlorine and installations in marine environments. For further advice or assistance consult the manufacturer.


o) **Power supply connection** (see Fig. 8):

Model	Standard
TS50-TS100	115V(± 10%) 1~60Hz
TS150-TS325	230V(± 10%) 1~60Hz
TS400-TS3000	460V(± 10%) 3~60Hz


For models TS50-TS150 a power cable type "3xAWG16 SJT" is supplied, complete with "NEMA 5-15P" plug.



Substitution of power cable (see Fig. 3)

Check that the dryer is completely isolated electrically and that the dryer's main switch is in the OFF position.

Disconnect the power cable from the terminal block in the following order: live and neutral (L,N) and then the ground connection .

Remove the cable grommet (39) and extract the power cable (24).

Insert the new cable from the rear of the dryer and into the electrical panel as indicated in the drawing. Connect the ground cable  and the live and neutral cables (L,N) and insert the cable grommet (39).

For models TS150-TS3000 use a cable that complies with regulations in force in the country of installation (connected to terminals "L and N  for single-phase machines and to terminals "L1-L2-L3-GND  for three-phase machines), connected to the junction box, with minimum wire sizes: (see machine electrical schematic in Fig. 8).



Install, upstream from the plant, a residual current circuit breaker IDn = 0.3A with a 3 mm gap between contacts when open.

TT-type power supply system with grounded electric control panel terminal .

2.1 Installation drawing (see Fig. 4)

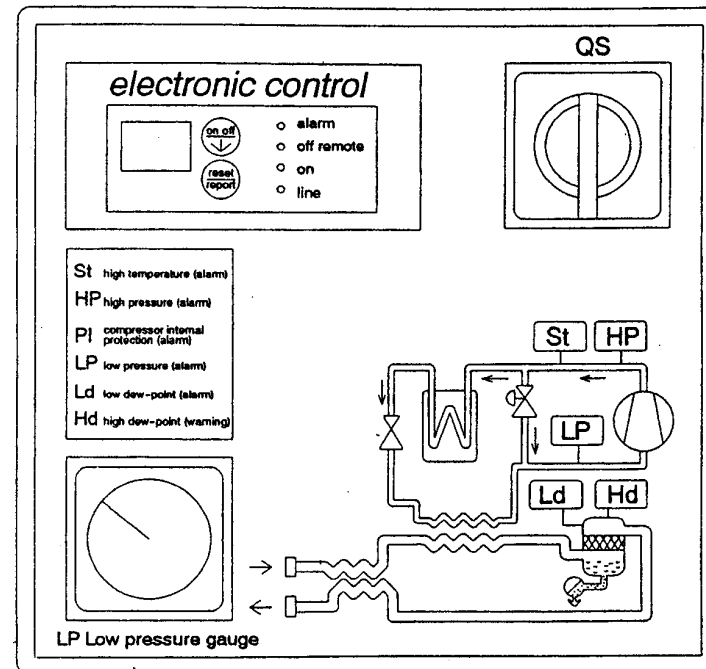
3 Start-up and operation

3.1 Electronic control (models TS250-TS3000)

3.1.1 Introduction

These dryers are equipped with an electronic control mounted on the front of the machine. The front panel (synoptic panel) is covered with a transparent polycarbonate film which illustrates the refrigeration circuit and relative functions (screen printed). The electronic control is located at the top of this panel.

Synoptic panel

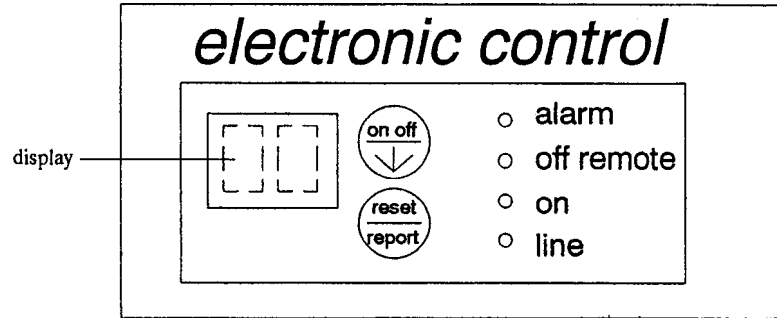


Pos. Description

St	High compressor discharge temperature alarm
HP	High compressor discharge pressure alarm
PI	Compressor internal protection alarm
LP	Low pressure alarm
Ld	Low dew point temperature alarm
Hd	High dew point temperature warning
QS	Main disconnect switch
LP	Low pressure gauge

3.1.2 Front Panel

All operations are controlled and displayed on the electronic control front panel:



Display

- When powered up the display indicates the unit of measure (°C or °F) for the temperature shown.
- During operation the display indicates the dew point temperature (T0).
- When the dryer enters alarm status, the display indicates the relative alarm code.
- In **STATUS REPORT** mode, the display indicates the most recent dryer status events.
- In the case of high dew point conditions, the temperature reading and Hd warning code are displayed alternately.
- In the case of low dew point conditions, the temperature reading and Ld alarm code are displayed alternately.

Keypad



Dryer on/off button.



This button is used when the dryer is not in operation for the following functions:
 SETTING THE LAST SERVICE DATE, inserting the time for "MAINTAIN COLD MASS" and for reading the STATUS REPORT.



Press for 2 seconds to reset the alarm or warning signal once the cause of the alarm has been eliminated. This is also used for the functions: TEMPERATURE SCALE SELECTION, CLEAR REPORT, SETTING LAST SERVICE DATE, and for reading the compressor HOURS COUNTER.

This is used to access the STATUS REPORT.

LEDs

alarm (red)	ALARM red LED illuminated	one or more alarms tripped
	WARNING flashing red LED	one or more warning signals tripped
off remote (yellow)	REMOTE OFF yellow LED illuminated	dryer switched off by remote control
on (green)	ON green LED illuminated	dryer running
line (yellow)	LINE yellow LED illuminated	dryer powered up

3.1.3 Operation

Starting and stopping

When the dryer is powered up (yellow **line** LED illuminated) the unit may be started and stopped using the **on/off** button. Start-up is deferred by a 6-second time delay during which the green **on** LED flashes.

Remote On/Off

The unit may be switched on and off using a remote switch installed by the customer (the electronic control must be switched on for the remote control to operate). The unit switches on/off in accordance with the make/break status of the remote contract (see terminals 6-R4, 230V, 60 Hz)

Open = unit OFF

Closed = unit ON

The remote control is enabled by pressing the remote ON button.

If the dryer is switched **off** using the on/off button on the electronic control the unit STOPS (irrespective of the remote signal).

Remote control warning/alarm contact (energized)

The digital warning/alarm output of the remote control operates as follows:

Contact Status	
closed (energized)	no alarm
open (de-energized)	alarm (dryer stationary)
alternately open/closed	warning (dryer running)

Options exclusively for remote control

The control unit also provides a "MAINTAIN COLD MASS" function. This function consists in causing the compressor to run for a time defined by preset ON and OFF events. The various intervals are defined as follows:

- tC compressor disconnect delay time following opening of the REMOTE OFF contact.
- tA compressor OFF time.
- tb compressor ON time.

To select the time intervals, proceed as follows:

Hold down the ON-OFF button and **switch on** the main disconnect switch.

Press the ON-OFF button to enter the times setup function; the display will show the letters "CC".

- a) **Press** RESET to set interval **tA (alarm LED flashes)**; compressor OFF time minutes will be displayed; **press** RESET to set the required number of minutes.
- b) **Press** ↓ to advance to interval **tb (remote off LED flashes)**; **press** RESET to set the required number of minutes.
- c) **Press** ↓ to advance to interval **tC (on LED flashes)**; **press** RESET to set the required number of minutes.

Press ↓ to store your settings. You can now start the dryer by **pressing** ON-OFF. If the **tC** register is set to zero, the "MAINTAIN COLD MASS" function is not available.

3.1.4 Alarms and warnings

HP - High pressure alarm

If the high pressure switch trips the compressor stops and the alarm message **HP** is displayed. Once the cause of the alarm has been eliminated press the **reset** button to clear the alarm.

ST - High temperature alarm

If the high temperature thermostat trips, the compressor stops and the alarm message **ST** is displayed. Once the cause of the alarm has been eliminated, press the **reset** button to clear the alarm.

Ld - Low dew point temperature alarm

If, when the dryer is running, the temperature falls below 28°F (-2°C), the low dew point temperature alarm is tripped after a 3 minute delay causing the compressor to stop. The alarm message **Ld** and temperature reading are displayed alternately. **This alarm is reset when the temperature rises above the 32°F (0°C) threshold.**

PI - Compressor internal protection alarm

When the compressor motor overheats, this internal thermal protection device intervenes to stop the (scroll) compressor to avoid burn out. (The device automatically resets once it has cooled down.)

Hd - High dew point temperature warning

If, when the dryer is running, the temperature exceeds 59°F (15°C), the high dew point temperature warning alarm is tripped after a 3 minute delay. The compressor continues running and the warning message **Hd** and temperature reading are displayed alternately. **THIS ALARM RESETS AUTOMATICALLY WHEN THE TEMPERATURE RETURNS BELOW 55°F (13°C).**

FS - Full -scale warning

This warning indicates that the temperature reading exceeds the screen display limits. Below 10°F (-9°C) or above 99°F (37°C)

AS - Temperature sensor fault warning

This warning indicates that temperature sensor T0 is faulty (open or short circuited). The compressor continues running but alarm **Ld** and warning **Hd** are disabled so that the dryer can operate in safety - i.e. with pressure switch **HP** and thermostat **ST** operational.

EP - Eprom error

This alarm message indicates that the Eprom memory is faulty. All operations are disabled and the control unit enters alarm status.

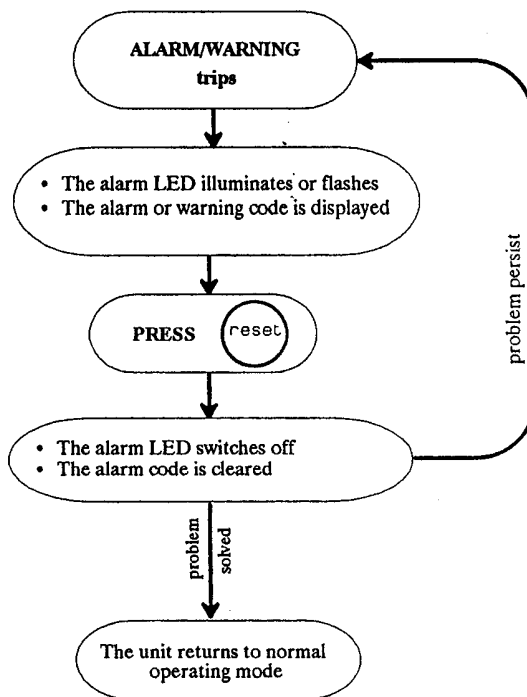
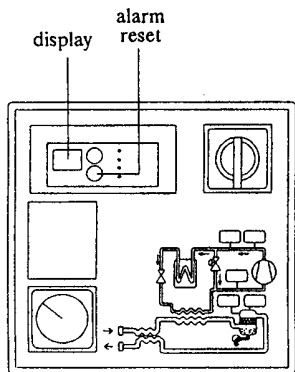
THE ELECTRONIC CONTROL MUST BE REPLACED

Er - Activation error

If the **on/off** button is pressed when the control unit is in **remote off** status (yellow LED illuminated) the error message **Er** is displayed for 2 seconds.

ALARM trip/reset sequence

ALARM trip/reset sequence



3.1.5 General functions

REPORT and HOUR COUNTER MANAGEMENT (USER AREA)

N.B.: The REPORT/HOUR COUNTER option is only enabled when the unit is in STAND-BY (**line LED illuminated**).

Press the REPORT key and hold it down for 6 seconds to access the USER area.

a) **Press** the ON-OFF button to access the REPORT option and display the last 8 alarms and/or warnings generated. Access to this option is confirmed by the code "rE" (REPORT) on the display.

-**Press** the ↓ key to scroll through the last 8 events in chronological order:

- 1 ---last event ---
- 2 ---penultimate event ---
- 3 -----
- 8 --- eighth event ---

b)**Press** the RESET button to skip the Report page and enter the HOUR COUNTER function. The unit can record up to 99,999 operating hours. The counter is advanced at 20 minute intervals. Current operating hours are displayed in three pages at intervals of 2 seconds.

- First page: displays THOUSANDS; the **red alarm LED** flashes at the same time
- Second page: displays HUNDREDS; the **yellow remote off LED** flashes at the same time
- Third page: displays TENS; the **green on LED** flashes at the same time.

The combination of the three pages gives the total machine operating hours. To exit the HOUR COUNTER function **press** the RESET button again.

TEMPERATURE SCALE SELECTION (MANUFACTURER AREA)

This unit can display temperatures in Celsius or Fahrenheit.

- Switch** on the main disconnect switch while **holding down** the ON-OFF button.
- The display will present the code "CF".
- Press** RESET to select the required unit of measure.
- Switch** Off and **switch** On the control unit to store the selected unit of measure.

SETTING THE LAST SERVICE DATE (MAINTENANCE AREA)

Switch On the main disconnect switch while holding down the RESET button: this action opens the CLEAR REPORT function. Entry to the function is confirmed by code "CL" on the display.

Press RESET to enter the SET LAST SERVICE DATE function. The display will show the letters "AA" to indicate the year, while the **red Alarm LED** flashes.

Press the ↓ key to display the letters "MM" for the month, while the **yellow remote OFF LED** flashes.

Press ↓ again to display the letters "GG" for the date; the green ON LED will flash.

Press the ON-OFF button to quit this function.

3.2 Preliminary checks

Before starting up the dryer, make sure:

- The air inlet valves are closed and that there is no air flow through the dryer.
- The main power supply is commensurate with the dryer voltage.
- The dryer is installed in compliance with the installation instructions given in Chapter 2.

3.3 Starting the dryer

- Use the switch or on button to start the dryer.
- Always start up the dryer before activating the air compressor.
- For models TS100-TS3000 only:** set the main disconnect switch QS to ON

so that the yellow power on LED on the control panel illuminates **(models TS250-TS3000)** or the line lamp **(models TS100-TS200)**.
Wait about 5 minutes until the dryer is running at the correct operating temperatures and pressures.

d)

Slowly open the air inlet valve to pressurize the dryer.

e)

f)

Open the outlet valve. The dryer is now operating (drying).

g)

h)

Always leave the dryer running while the air compressor is operating.



For Models TS50-TS200 only: after stopping the dryer, wait at least 3 minutes before starting it again.



For Models TS250-TS3000 only: on units with three - phase scroll compressors fitted, it is highly important to check the direction of rotation of the compressors. If supplied with the wrong phase frequency they will turn in the opposite direction. In this case they are very noisy and risk getting damaged. **SWAP OVER THE PHASES IMMEDIATELY.** Check that the (LP) gauge pressure on the front of the panel decreases.

i)

3.4 Stopping the dryer

a)

b)

Use the switch or off button to stop the dryer.

Stop the dryer 2 minutes after shutting down the air compressor or interrupting the air flow to the dryer.



Compressed air must never enter the dryer when the compressor is not running.

3.5 Sound pressure level

The sound pressure level recorded for these dryers 1 meter from the machine in free field conditions is less than 70 db (A).

3.6 Air and refrigeration circuit diagram (see Fig. 6)

3.7 Operation

- The dryer operates automatically. It is factory set for a dew point of 38°F (3°C) (ISO 7183, Part 2) and therefore requires no further calibration.
- Do not exceed the machines design limits, bypass excess air flow and check the unit model and/or installation.
- For maximum performance from your dryer, follow the maintenance schedule described in Chapter 4.

4 Maintenance

Before accessing live electrical parts, disconnect the power supply to the dryer using disconnect switch QS or disconnect the cable connections.

SAFETY DEVICES

- SK** installed on models *TS50-TS2000*
ST installed on models *TS50-TS3000*
HP installed on models *TS25-TS3000*
PI installed on models *TS2000TS3000*

COMPRESSOR TYPE

- PISTON** compressor on models *TS50-TS100* (single phase)
ROTARY compressor on models *TS150-TS200* (single phase)
SCROLL compressor on models *TS250-TS3000* (three phase / single phase)


4.1 Preventative maintenance

For optimum performance from your dryer follow the periodic maintenance schedule described below.

WEEKLY	CONDENSATE DRAIN Make sure the condensate drains correctly and, if necessary, disassemble and clean the filters, solenoid valves and condensate drain and check the electrical circuit.
MONTHLY	COMPRESSOR Make sure the compressor head temperature is between 59°F (15°C) and 131°F (55°C) when running. If this is not the case, consult section 7, troubleshooting.
EVERY 4 MONTHS	CONDENSER Remove any dust from the condenser fins. COMPRESSOR Make sure compressor power consumption complies with data plate specifications.
YEARLY	CONDENSATE DRAIN Completely disassemble the drain and clean all its components.

4.2 Disassembling the unit

The machine has been designed and constructed to guarantee continuous operation. The long service life of some components such as the fan and compressor depends on good maintenance. The unit must only be disassembled by a refrigerant specialist. Refrigerant liquid and lubricating oil inside the refrigeration circuit must be recovered in compliance with current standards in the machine destination country.

 RECYCLING DISASSEMBLY	
frame and panels	steel/epoxy resin polyester
heat exchanger (cooler)	aluminum
pipes	copper/aluminum
drainage system	brass/PC
heat exchanger insulation	EPS (polystyrene sintered)
pipe insulation	gum synthetic
compressor	steel/copper/aluminum/oil
condenser	steel/copper/aluminum
refrigerant	R407C (HFC)
valve	brass
electrical cable	copper/PVC

The electric control panel is equipped with terminals for the connection of a remote alarm. Do not use solvents to clean the control panel on the front of the unit.

4.3 Refrigerant leaks in the refrigeration circuit

FOREWORD

This unit is delivered in perfect working order already charged as specified in the table shown in Fig. 4.

Refrigerant leaks may be identified by tripping of compressor overload protector (SK/PI) or safety thermostat (ST).

IF A LEAK IS DETECTED IN THE REFRIGERANT CIRCUIT SEEK TECHNICAL ASSISTANCE.

4.4 Refrigerant charging (see Fig. 4)

THIS OPERATION MUST ONLY BE PERFORMED BY A REFRIGERANT SPECIALIST.

WHEN REPAIRING THE REFRIGERANT CIRCUIT, COLLECT ALL THE REFRIGERANT IN A CONTAINER AND DISPOSE OF IN THE APPROPRIATE MANNER.

Characteristics of refrigerant R407

In normal temperature and pressure conditions, the refrigerant is a colorless, class A1/A1 gas with TVL value of 1000ppm (ASHRAE classification).

If a refrigerant leak occurs, thoroughly air out the room before commencing work.

5 Calibration

The dryer is supplied factory set with the values shown in the table illustrated in Fig. 7 and therefore requires no further calibration.

6 Spare parts list (see Fig. 3B)

This spare parts list contains most of the parts available. When ordering spare parts always quote the quantity, part code and machine serial number.

7 Troubleshooting

The following diagram lists the various problems which may occur during the dryer's service life. In the case of serious difficulties, contact a refrigerant specialist.

NOTE: Always bypass the dryer when it is out of service.

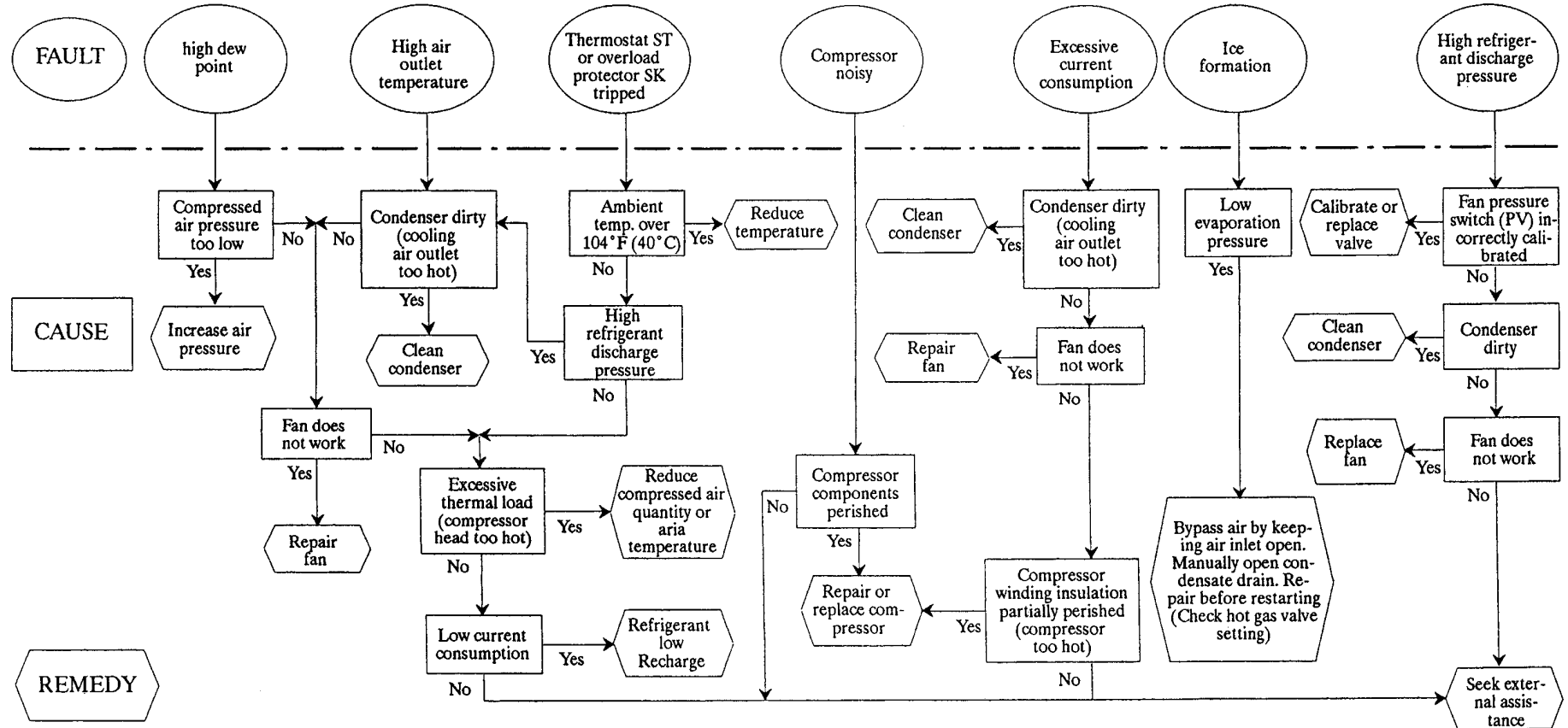
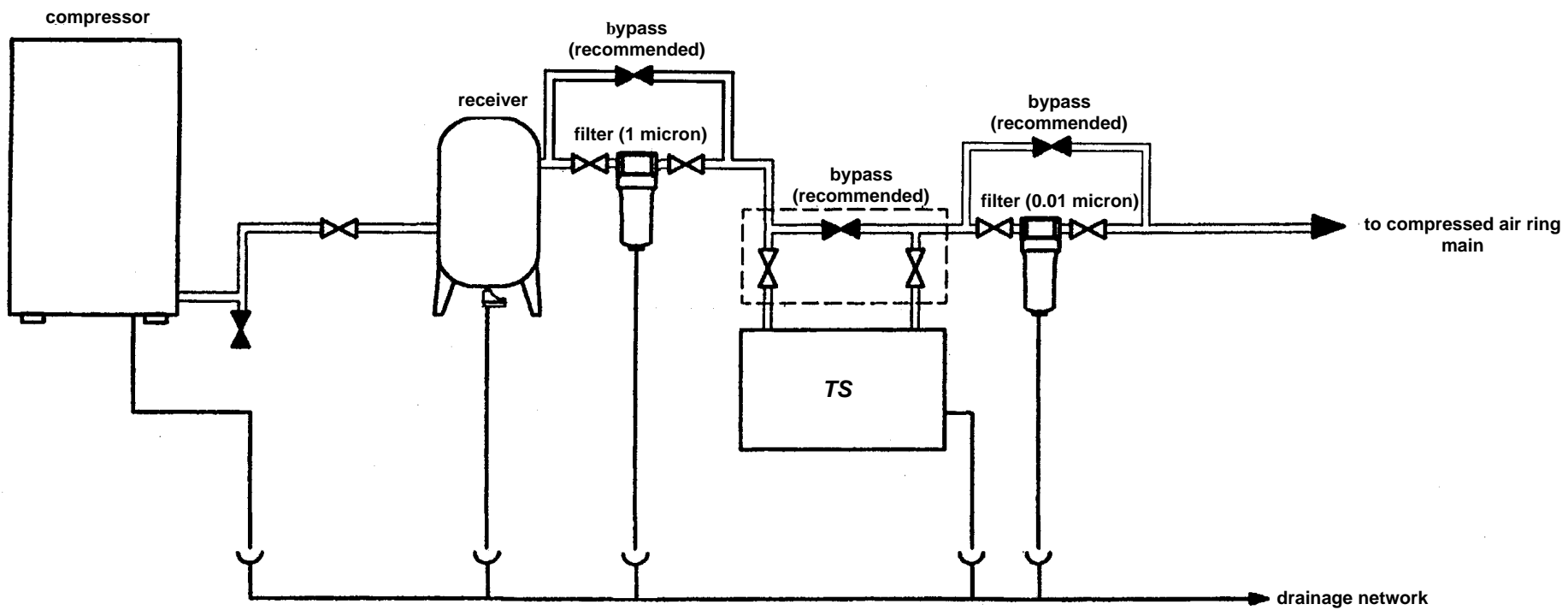


Fig. 1 Installation



Description of labels attached to the dryer (see Fig. 2)



Ingersoll-Rand®

Dryer Package Data

Dryer Model **TS100**
Dryer Package CCN **42493155**
Max Air Pressure **175 (psig) 12 (barg)**
Max. Compressed Air Inlet Temp. **122 °F (50 °C)**
Dryer Cooling System **AIR COOLED**
Min Amb. Air Temperature **41 °F (5 °C)**
Electrical Supply **115V - 1ph - 60Hz**
Dryer Package Max. kW Absorbed Power **1.10**
Min. Circuit Amp Capacity For Dryer Package **10.1**
Refrigerant Type **R407C**
Refrig. Design Pressure (Low) **276 psig (19 barg)**
Refrig. Design Pressure (High) **377 psig (26 barg)**
Factory Refrigerant Charge **1.63 lbs 740 g**
Refrigerant Oil Type **Emkarate RL22HB**
Dryer Package Weight **143 lbs 65 kg**
Date of Manufacture **07/17/2002**
Dryer Serial Number **DR10012990-071702**

Mfg By Ingersoll-Rand
800-A Beaty Street
Davidson, NC 28036 USA
www.air.ingersoll-rand.com



NOTES on the use of Schrader no-return valve
ATTENTION!

- 1) This unit is equipped with freon as for quantity and kind clearly shown in operating manual and unit identification label.
- 2) Any ordinary test and/or freon recharge by means of connections can take place only after refrigerant evacuation. The evacuation must be proportional to dimensions and length of connections used. The use of the valve can be justified only when the dryer is not in working order.
- 3) During the unit guarantee period, the Schrader valve can be used by authorized staff only, otherwise any damage caused by a wrong freon recharge will not be under warranty.

NOTAS en el uso de la válvula sin-retorno Schrader
CUIDADO!

- 1) Esta unidad esta equipada con freón del tipo y cantidad de todos en el manual de operacion y en la calcomania de identificación de la unidad.
- 2) Cualquier prueba o recarga de freón realizado utilizando las conexiones deberá tomar lugar solamente despues de evacuar el refrigerante. La evacuación debe ser proporcional a las dimensiones y longitud de las conexiones utilizadas. El uso de la válvula será justificado solamente cuando el secador se encuentre inoperativo.
- 3) Durante el periodo de garantía de la unidad, la válvula Schrader puede ser utilizada solamente por personal autorizado. De otra forma, cualquier daño causado por una recarga de freón inapropiado estará fuera de garantía.

NOTES sur l'utilisation de la valve anti-retour de marque Schrader.
ATTENTION!

- 1) Cet équipement contient du fréon selon le type et la quantité indiqués dans le manuel de l'utilisateur ainsi que sur l'étiquette d'identification.
- 2) Toute inspection et/ou remplissage de fréon effectués à l'aide de connecteurs doivent être complétés seulement après l'évacuation de média réfrigérant. Le rythme d'évacuation doit être proportionnel aux dimensions et à la longueur des connecteurs utilisés. La valve peut être utilisée seulement dans le cas où le sécheur n'est pas opérationnel.
- 3) Durant la période couverte par la garantie, la valve Schrader ne doit être utilisée que par le personnel de service autorisé. Dans le cas contraire, tout dommage engendré par un remplissage non adéquat du fréon ne sera pas couvert par la garantie. 54619564



Description of labels attached to the dryer (see Fig. 2)

ATTENTION!

NEVER PASS COMPRESSED AIR THROUGH THE DRYER WHEN IT IS STOPPED. ALWAYS START THE DRYER 5 MINUTES BEFORE SLOWLY OPENING THE AIR INLET VALVE. IF THE AIRFLOW IS TO BE STOPPED ONLY SWITCH THE DRYER OFF AFTER CLOSING THE AIR INLET.

CUIDADO!

NUNCA PERMITA EL PASO DEL AIRE COMPRIMIDO ATRAVES DEL SECADOR CUANDO ESTE SE ENCUENTRE APAGADO. SIEMPRE ENCIENDA EL SECADOR 5 MINUTOS ANTES, Y DE PASO AL AIRE ABRIENDO LENTAMENTE LA VALVULA DE ADMISION. SI SE VA A DETENER EL FLUJO DE AIRE, APAGUE EL SECADOR DESPUES DE CERRAR LA VALVULA DE ADMISION.

ATTENTION!

NE JAMAIS FAIRE CIRCULER L'AIR COMPRI-ME DANS LE SECHEUR LORSQUE CELUI-CI N'EST PAS EN MARCHE. TOUJOURS DEMARRER LE SECHEUR 5 MINUTES AVANT D'OUVRIR PROGRESSIVEMENT LA VALVE D'ENTREE D'AIR. SI LE DEBIT D'AIR DEVAIT ETRE INTERROMPU, VEUILLEZ FERMER LA VALVE D'ENTREE D'AIR AVANT D'ARRETER LE SECHEUR.

54618863

C

ATTENTION: SCROLL THREE-PHASE COMPRESSORS

If the compressor is noisy and the pressure on the (LP) gauge does not decrease you should immediately invert two phases.

Please refer to the service manual for more details.

ATENCIÓN: COMPRESOR SCROLL TRIFÁSICO

Si el compresor hace mucho ruido y la presión indicada por el manómetro (LP) no baja, invertir dos fases.

Consultar el manual de instalación.

ATTENTION: COMPRESSEUR SCROLL TRIPHASÉ

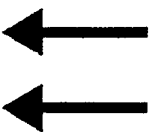
Si le compresseur fait du bruit et si la pression indiquée par la manomètre (LP) ne descend pas, intervertir deux phases.

Se reporter au manuel d'installation.

54618871

D

54618830



(E)

54618798



(F)

54619572

**NOTICE
AVISO
AVIS**

Install an Ingersoll-Rand pre-filter on the dryer intake side to prevent rust, scale or any pollutants from clogging the condensate drains and heat exchangers and causing excessive pressure drops.

Instale un pre-filtro IR en la admisión para evitar la formación de óxido, escama, u otros contaminantes que pueden obstruir el drenaje del condensado y los intercambiadores de calor ocasionando altas caídas de presión.

Il est recommandé d'installer un pré-filtre Ingersoll-Rand à l'entrée du sécheur pour empêcher que la rouille, les écailles métalliques et autres débris ne bloquent les sorties.

54618749

**NOTICE
AVISO
AVIS**

A minimum of three (3) test clearance on all sides is required to obtain satisfactory dryer operation and maintenance. Refer to the instruction/operation manual before performing any maintenance.

Se requiere una separación mínima de tres (3) pies en todos los lados para permitir el funcionamiento y el mantenimiento satisfactorio de la secadora. Consulte el manual del operador o instrucciones antes de efectuar tareas de mantenimiento.

Il doit y avoir un espacement d'au moins 1 mètre de chaque côté afin d'assurer un bon fonctionnement et un entretien satisfaisant du sécheur. Consulter le manuel d'instructions fourni avant d'effectuer toute opération d'entretien.

54618764

**WARNING
ADVERTENCIA
AVERTISSEMENT**

Rotating fan blade. Can cause severe injury. Do not operate without guard in place. Disconnect power before servicing. Lockout/Tagout machine.

Ventilador en rotación. Puede causar daños serenos. No opere sin el protector del ventilador. Desconecte antes de cualquier servicio. Asegure y marque la máquina.

Pala de ventilateur. Peut causer de graves blessures. Ne pas ouvrir le marche sans le garde-protecteur. Couper l'alimentation électrique avant d'effectuer toute opération d'entretien.

54618772

**▲ DANGER
▲ PELIGRO
▲ DANGER**

Shock hazard. May cause injury or death. Disconnect power supply before servicing. See instruction manual.

Peligro de shock eléctrico. Puede causar heridas o muerte. Desconecte la alimentación antes de efectuar cualquier servicio. Vea manual de instrucción.

Risque de secousse électrique. Peut causer de graves blessures ou la mort. Toujours débrancher et débrancher le sécheur avant tout entretien / service. Consulter le manuel d'opération et d'instructions.

54618814

ALTA EN TENSIÓN
RIESGO DE ELECTRICIDAD
MANTENIMIENTO
MANTENIMIENTO
MANTENIMIENTO

(N)

R 407C
54618822

(G)

(H)

(J)

(K)

(M)

(P)

(Q)

(R)

(S)

LIFTING EYE
54625892



54618707

**NOTICE
AVISO
AVIS**

Air Inlet
Entrada de aire
Entrée d'air

54618681

**NOTICE
AVISO
AVIS**

Condensate
drain
Drenaje
del condensado
Drainage
de condensat

54618715

**NOTICE
AVISO
AVIS**

Air outlet
Salida de aire
Sortie d'air

54618699

**NOTICE
AVISO
AVIS**

Electrical
power input
Entrada de la
alimentación
eléctrica
Entrée de
l'alimentation
électrique

54618731

**NOTICE
AVISO
AVIS**

Water out.
Salida de agua.
Sortie d'eau.

54618723

**NOTICE
AVISO
AVIS**

Water in.
Entrada de agua.
Entrée d'eau.

54618780

	▲ DANGER This dryer contains high air pressure which can cause severe injury. Always relieve pressure before servicing.	▲ PELIGRO Este secador contiene aire a alta presión que puede causar heridas serenos. Siempre alivie la presión antes de efectuar cualquier servicio.	▲ DANGER Ce sécheur est sous haute pression ce qui peut causer des blessures sévères ou la mort. Toujours débrancher le sécheur et le débrancher avant d'un faire l'entretien/service.
	Air discharge may contain carbon monoxide or other contaminants which will cause severe injury or death. Do not breathe this air either directly or indirectly in a confined space.	La descarga de aire puede contener monóxido de carbono o otros contaminantes que causarán heridas serenos a muerte. No respire este aire directamente ni indirectamente en un espacio cerrado.	Les émissions d'air risquent de contenir du monoxyde de carbone ou d'autres agents contaminants pouvant entraîner des blessures graves ou la mort. Ne pas respirer cet air directement ou indirectement dans un espace fermé.
	Shock hazard. May cause injury or death. Disconnect power supply before servicing. See instruction manual.	Peligro de shock eléctrico. Puede causar heridas o muerte. Desconecte la alimentación antes de efectuar cualquier servicio. Vea manual de instrucción.	Risque de secousse électrique. Peut causer de graves blessures ou la mort. Toujours débrancher et débrancher le sécheur avant tout entretien / service. Consulter le manuel d'opération et d'instructions.

DECAL SHEET NUMBER 54625918

Fig. 2 Decal location (TS50-TS200)

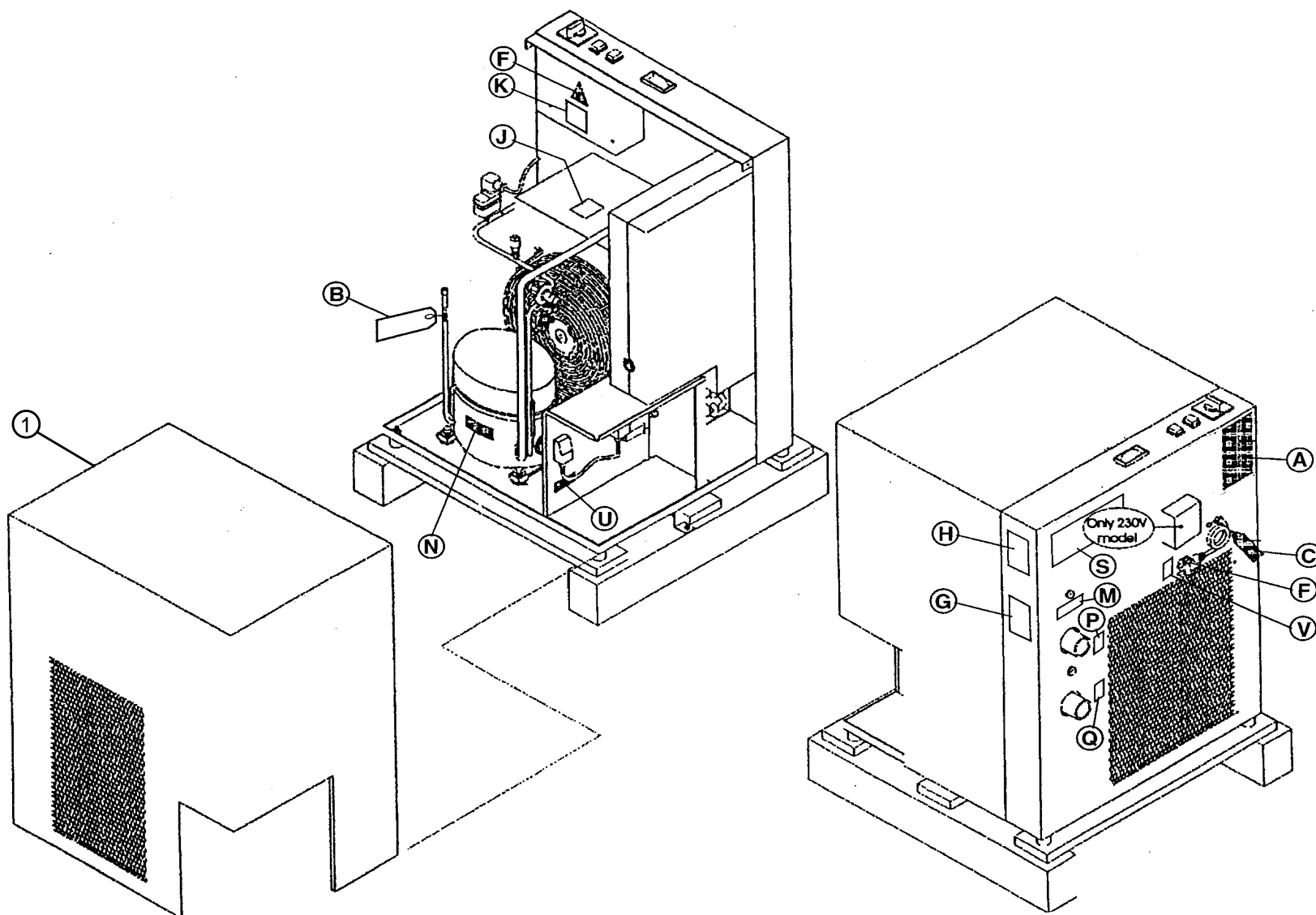
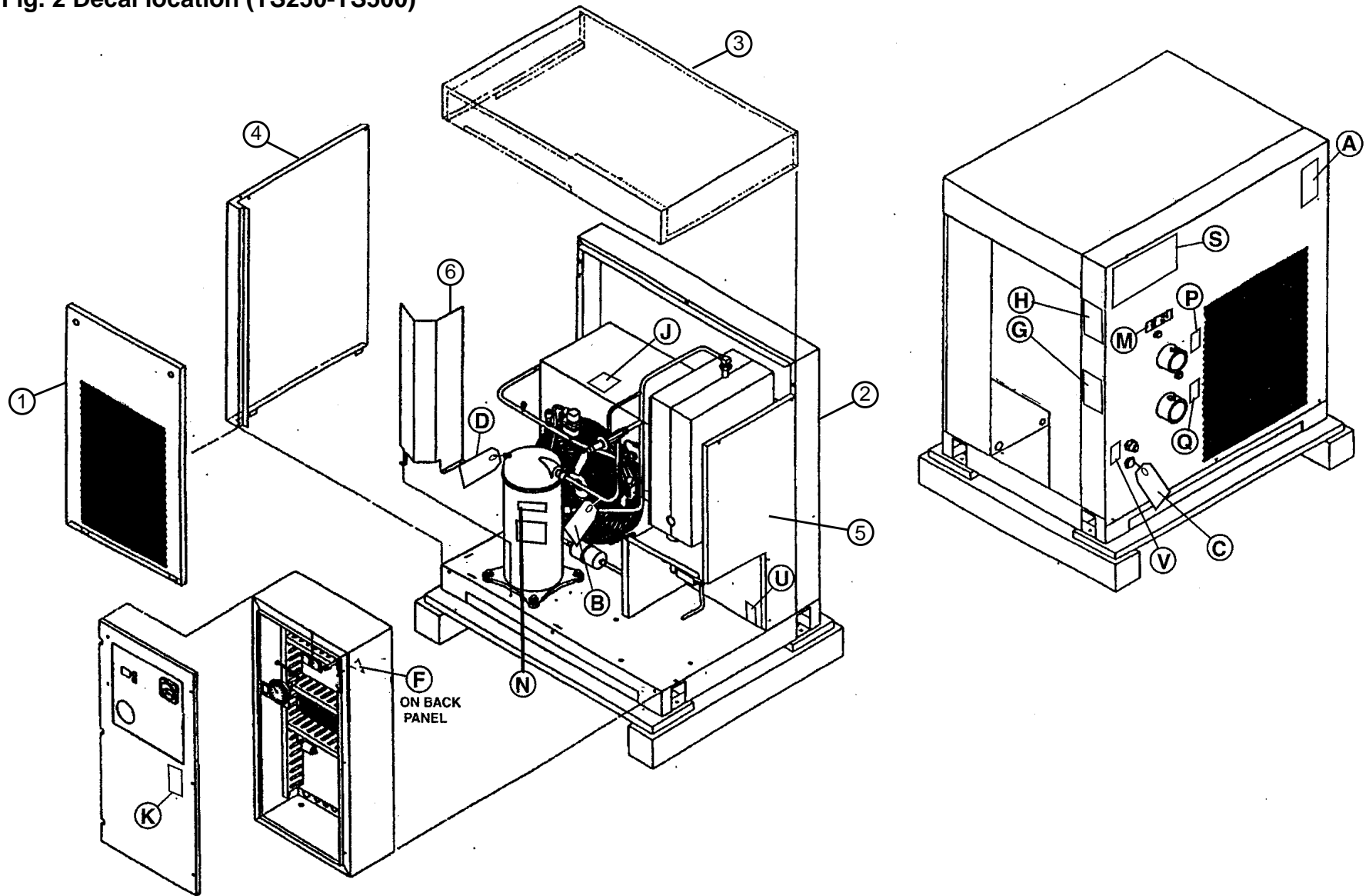


Fig. 2 Decal location (TS250-TS500)



PARTS INDEX

A. timed solenoid drain

- | | | | | | |
|------|-------|--------------------------------------|-------|-----|---|
| 1. | MC | compressor | 27. | | gas charge point (location only) |
| 2. | | refrigerant condenser | 28. | | water pressostatic valve |
| 3. | EVI-2 | fan motor | 29. | | high pressure tap (location only) |
| 4. | | evaporator | 30. | QF1 | general automatic switch |
| 5. | | separator | 30a. | QF2 | fan motor automatic switch |
| 6. | | insulation | 31. | KM2 | fan motor contactor |
| 7. | | expansion capillary | 32. | KM1 | compressor motor contactor |
| 8. | | refrigerant filter | 33. | TC1 | auxiliary transformer |
| 9. | | hot gas valve | 35. | | power cable inlet (location only) |
| 10. | | air-air heat exchanger | 36. | | remote control cable entry point (location only) |
| 11. | | dew point thermometer | 37. | | electronic control |
| 12. | PV | fan pressure switch | 38. | | temperature sensor NTC |
| 13. | HL | on lamp (green) | 39. | | cable grommet |
| 14. | QS | main disconnect switch | 40. | | liquid separator |
| 15. | HP | high pressure switch | T0. | | dew point temperature sensor |
| 16. | ST | high temperature thermostat | SK | | overload protector |
| 17. | | low pressure manometer | KM | | compressor relay |
| 18. | | compressor valve | TH1 | | fan motor thermal protection |
| 19. | HLA | alarm lamp (red) | FU1 | | electronic control fuse |
| 21. | C1-Cs | compressor starting capacitor | FU4-5 | | auxiliary transformer fuses |
| 21a. | C-Cr | compressor run capacitor | FU6-7 | | auxiliary fuse |
| 22. | C2 | fan motor run capacitor | KA | | starting relay |
| 24. | | power cable | KA1 | | high pressure alarm relay |
| 25. | | thermometer sensor pocket | KA2 | | general alarm - warning relay |
| 26. | LP | low pressure switch (not applicable) | QF | | residual current circuit - breaker (by installer) |
| | | | (B) | | remove bridge if "remote on-off" is installed |

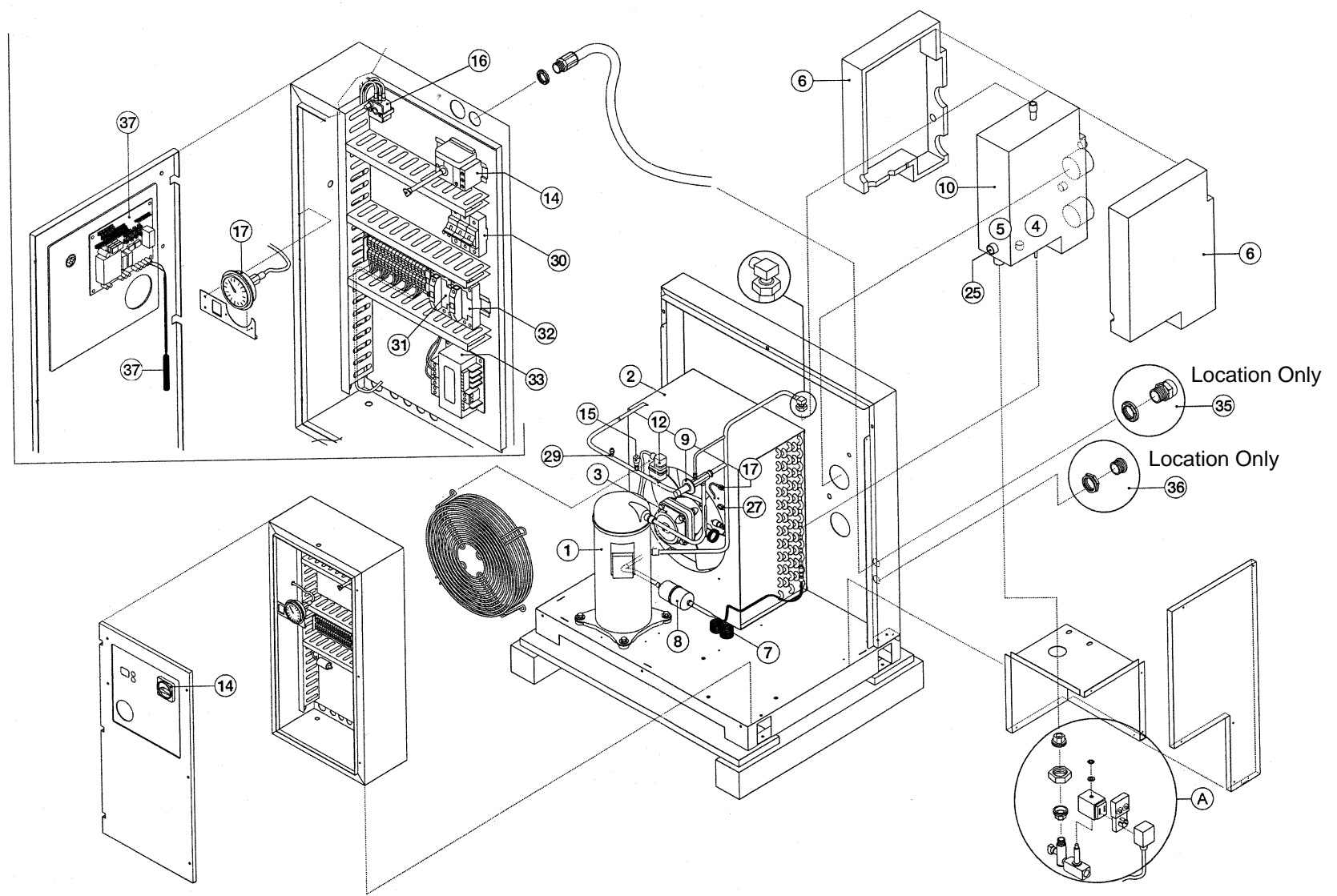
NOTES:

DESCRIPTION**PART NUMBERS**

	50	75	100	150	200
A. timed solenoid drain	42512095	42512095	42512095	42512103	42512103
1. compressor	*	*	*	*	*
2. refrigerant condenser	*	*	*	*	*
3. fan motor	*	*	*	*	*
4. evaporator	*	*	*	*	*
5. separator	*	*	*	*	*
6. insulation	38027421	38027421	38027438	38027439	38027447
7. expansion capillary	54640628	54640636	54640644	54640651	54640669
8. refrigerant filter	92451236	92451236	89234272	89234272	89234272
9. hot gas valve	38003901	38003901	38003901	38003919	38003919
10. air-air heat exchanger	*	*	*	*	*
11. dew point thermometer	89236145	89236145	89236145	89236145	89236145
12. fan pressure switch	38003968	38003968	38003968	38003968	38003968
13. main switch (TS50-TS75) or on lamp (green) (TS100-TS200)	89236079	89236079	-----	-----	-----
14. main switch (TS100-TS200)	-----	-----	38003976	38003976	38003976
15. high pressure switch (TS50-TS200)	89240857	89240857	89240857	89240857	89240857
16. high temperature thermostat	38004024	38004024	38004024	38004024	38004024
19. alarm lamp (red) TS50-TS200	38027801	38027801	38027801	38027801	38027801
21. compressor starting capacitor (TS50-TS100)	22075303	22075303	22075311	-----	-----
21a. compressor run capacitor (TS100-TS200)	-----	-----	22075311	38027579	38027561
22. fan motor run capacitor (TS100-TS200)	-----	-----	38027785	38027777	38027777
24. power cable	38027819	38027819	38027819	38027819	38027819
25. thermometer sensor pocket	38027454	38027454	38027454	38027454	38027454
30. cable grommet	54668116	54668116	54668116	54668116	54668116
31. foot mount (Qty. 4)	38013876	38013876	38013876	38013876	-----
evaporator o-ring, small	38007738	38007738	38007738	38007738	38007738
evaporator o-ring, large	-----	-----	38027504	38027504	38007746
rotalock, small	54669148	54669148	54669148	54669148	54669148
rotalock, large	38027587	38027587	38027587	38027587	38027587

----- = Not Applicable * - See Fig 3B on Page 33 for part numbers

Fig. 3 Parts List and Location (TS250-TS500)

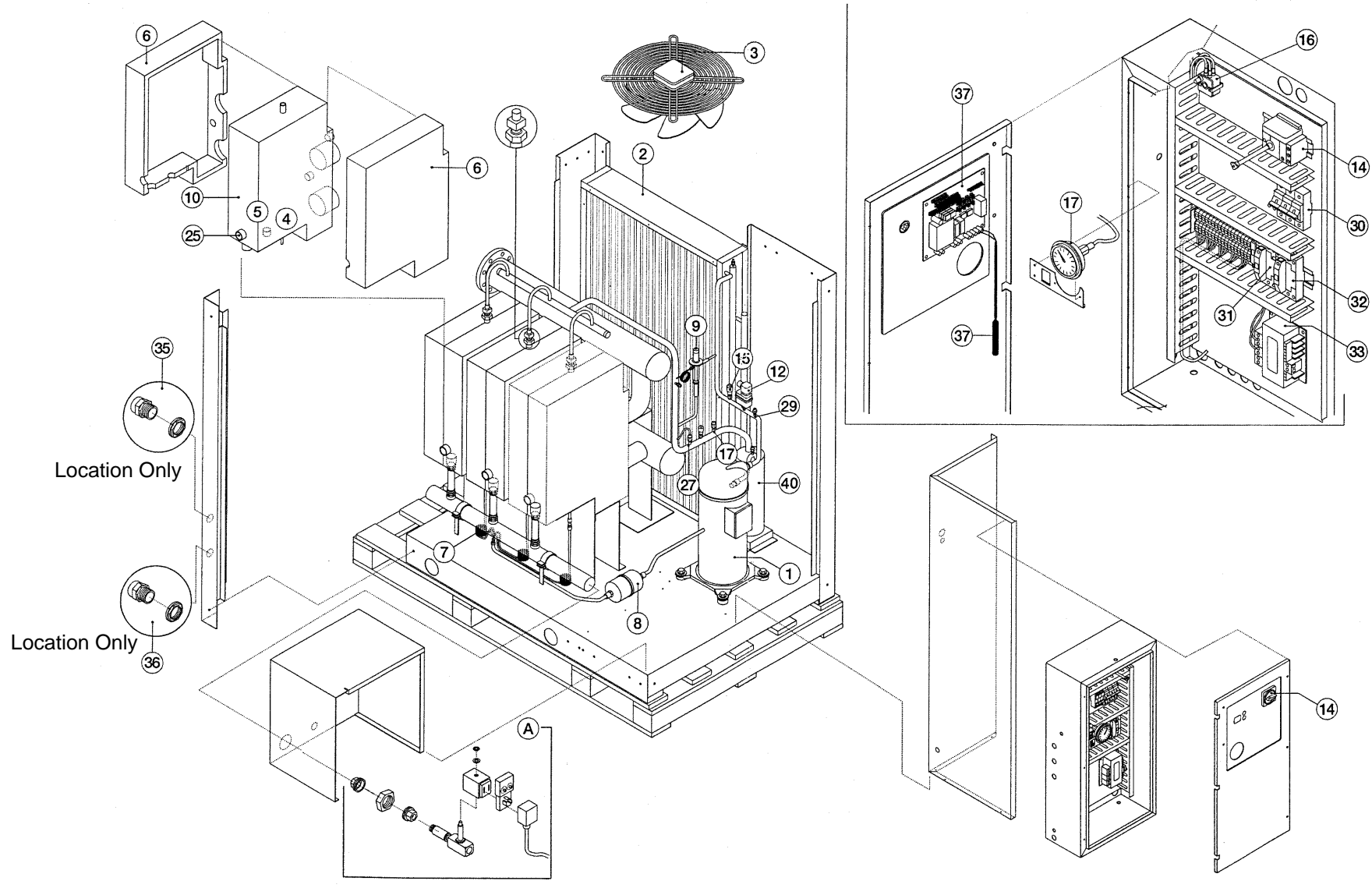


DESCRIPTION**PART NUMBERS**

	<u>250</u>	<u>325</u>	<u>400</u>	<u>500</u>
A. timed solenoid drain	42512103	42512103	42512103	42512103
1. compressor	*	*	*	*
2. refrigerant condenser	*	*	*	*
3. fan motor	*	*	*	*
4. evaporator	*	*	*	*
5. separator	*	*	*	*
6. insulation	38027397	38027397	38007763	38027413
7. expansion capillary	54640685	54640685	54640719(2)	54640719(2)
8. refrigerant filter	89234280	89234280	89234280	89234280
9. hot gas valve	38003927	38003927	38003927	38003927
10. air-air heat exchanger	*	*	*	*
12. fan pressure switch	38003968	38003968	38003968	38003968
14. main switch	38003984	38003984	38003984	38003984
15. high pressure switch	89240857	89240857	89240857	89240857
16. high temperature thermostat	38004024	38004024	38004024	38004024
17. low pressure manometer	38004032	38004032	38004032	38004032
25. thermometer sensor pocket	38027454	38027454	38027454	38027454
30. general automatic switch	#	#	#	#
30A. fan motor automatic switch	#	#	#	#
31. fan motor contractor	#	#	#	#
32. compressor motor contactor	#	#	#	#
33. auxiliary transformer	#	#	#	#
37. electronic control/temperature sensor	38010286	38010286	38010286	38010286
evaporator o-ring, small	38007738	38007738	38007738	38007738
evaporator o-ring, large	38027504	38027504	38027504	38027504
rotalock, small	54669148	54669148	-----	-----
rotalock, large	38027587	38027587	38027587	3802758

----- = Not Applicable # - See Electrical Parts List Fig 9 * - See Fig 3B on Page 33 for part numbers

Fig. 3 Parts List and Location (TS700-TS1400)



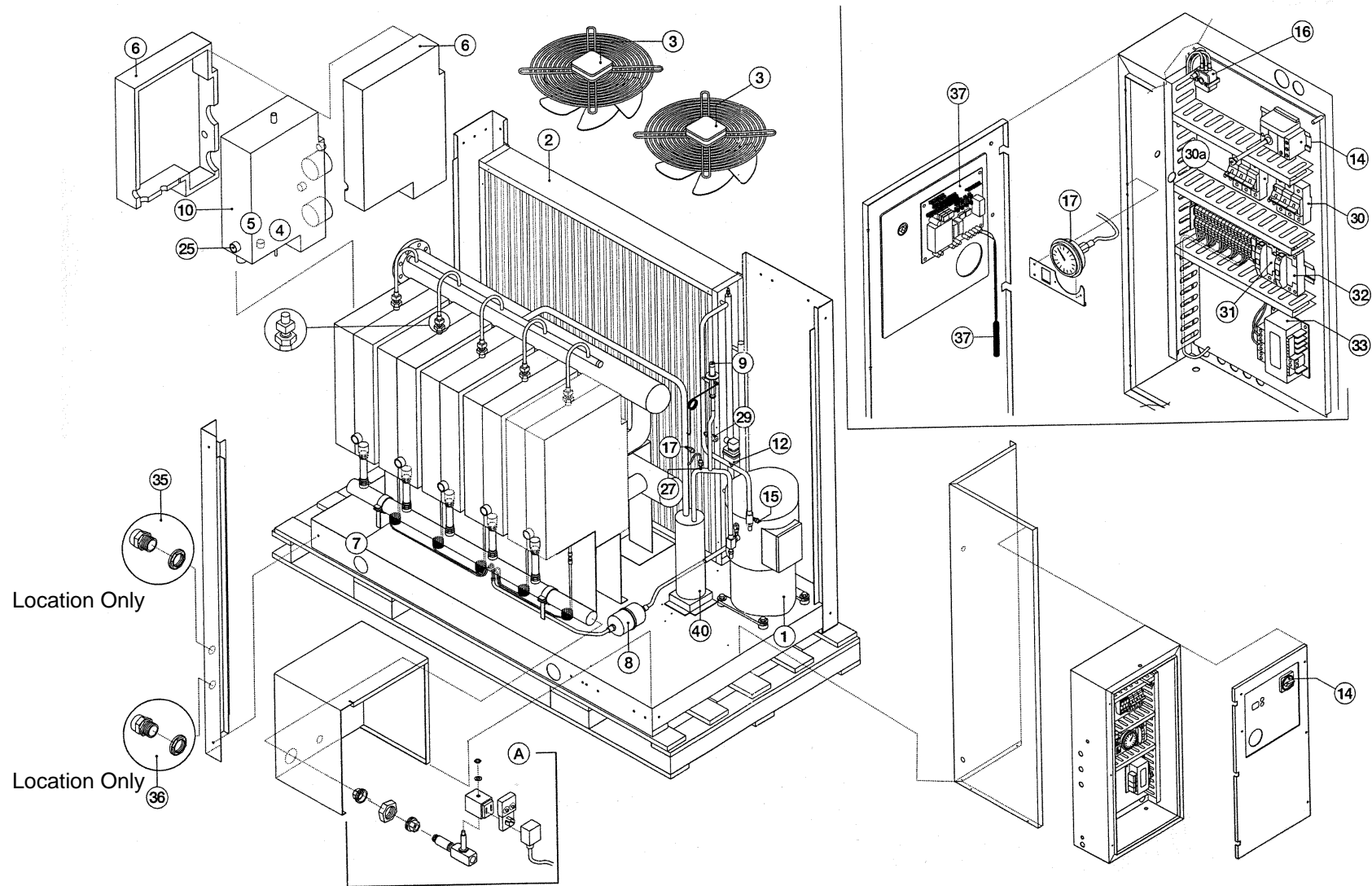
DESCRIPTION**PART NUMBERS**

	<u>700</u>	<u>800</u>	<u>1000</u>	<u>1200</u>	<u>1400</u>
A. timed solenoid drain	42512103	42512103	42512103	42512103	-----
1. compressor	*	*	*	*	*
2. refrigerant condenser	*	*	*	*	*
3. fan motor	*	*	*	*	*
4. evaporator	*	*	*	*	*
5. separator	*	*	*	*	*
6. insulation	38027397	38007753	38027413	38027413	38007753
7. expansion capillary			54640768		
7. expansion capillaries			54641105		54640784
7. expansion capillaries	54640743	54640750	54640776	54640776	54641121
7E. expansion capillaries	54641071	54641097	54641113	54641113	54641139
8. refrigerant filter	89241699	89241699	89241699	89241699	89241699
9. hot gas valve	38003935	38003935	38003935	38003935	38003935
10. air-air heat exchanger	*	*	*	*	*
12. fan pressure switch	38003968	38003968	38003968	38003968	38003968
14. main switch	38003992	38003992	38003992	38003992	38003992
15. high pressure switch	89240857	89240857	89240857	89240857	89240857
16. high temperature thermostat	38004024	38004024	38004024	38004024	38004024
17. low pressure manometer	38004032	38004032	38004032	38004032	38004032
25. thermometer sensor pocket	38027454	38027454	38027454	38027454	38027454
30. general automatic switch	#	#	#	#	#
30A. fan motor automatic switch	#	#	#	#	#
31. fan motor contractor	#	#	#	#	#
32. compressor motor contactor	#	#	#	#	#
33. auxiliary transformer	#	#	#	#	#
37. electronic control/temperature sensor	38010286	38010286	38010286	38010286	38010286
40. liquid separator	38027512	38027512	38027620	38027520	38027520
evaporation o-ring, small	38007738	38007738	38007738	38007738	38007738
evaporation o-ring, large	38007746	38007746	38007746	38007746	38007746
rotalock, small	54669148	54669148	54669148	54669148	54669148
rotalock, large	38027587	38027587	38027587	38027587	38027587

----- = Not Applicable # - See Electrical Parts List Fig 9

* - see Fig 3B on Page 33 for part numbers

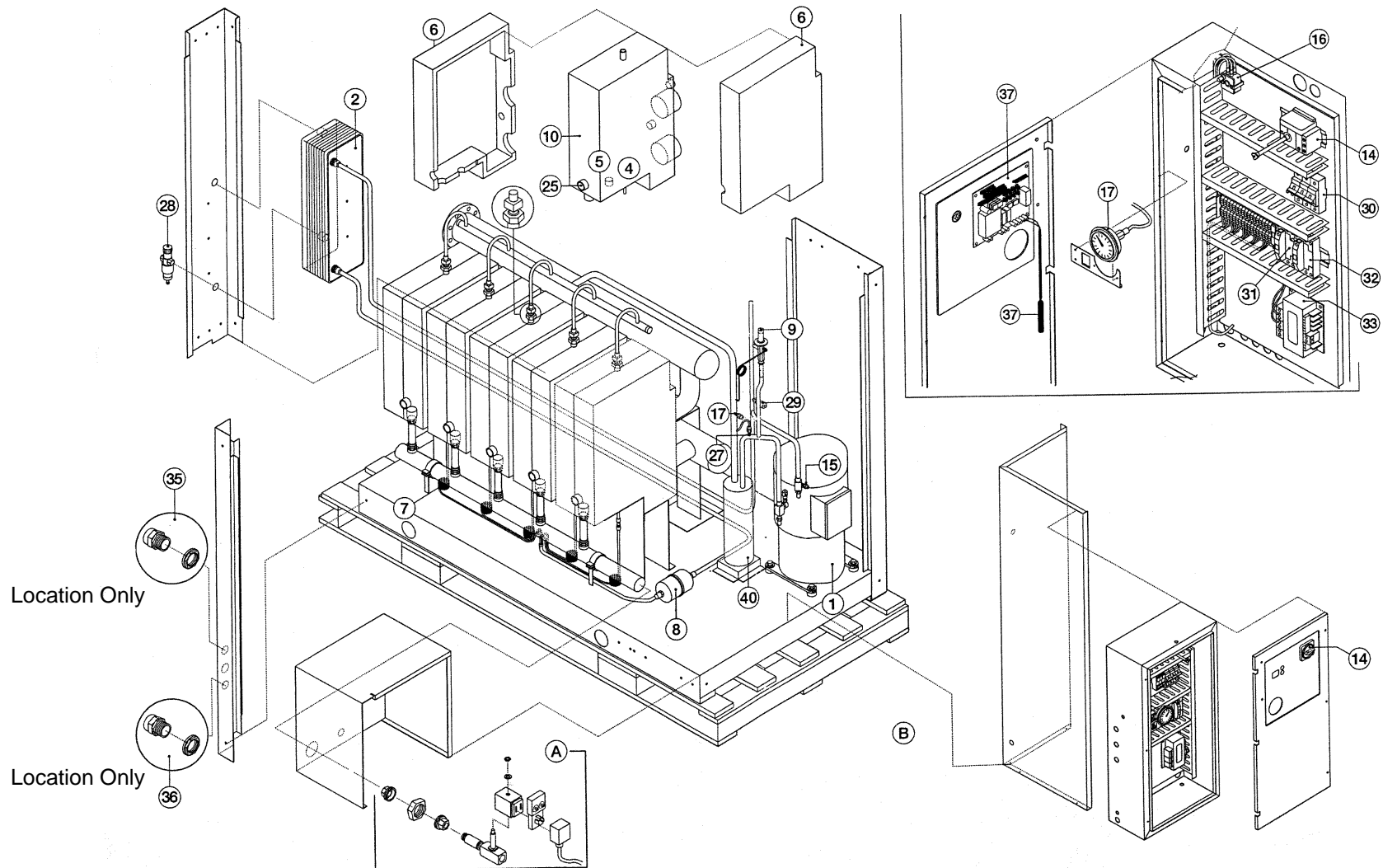
Fig. 3 Parts List and Location (TS1650-TS3000) aircooled



DESCRIPTION**PART NUMBERS**

	<u>1650</u>	<u>2000</u>	<u>2400</u>	<u>3000</u>
A. timed solenoid drain	-----	-----	-----	-----
1. compressor	*	*	*	*
2. refrigerant condenser	*	*	*	*
3. fan motor	*	*	*	*
4. evaporator	*	*	*	*
5. separator	*	*	*	*
6. insulation	38007753	38007753	38007753	38007753
7. expansion capillary				54640800
7. expansion capillaries		54640792	54640792	54640834
7. expansion capillaries	54640826	54641147	54641147	54641253
7. expansion capillaries	54641120	54641154	54641154	54641261
7. expansion capillaries	54641238	54641170	54641170	54641279
7E. expansion capillaries	54641246	54641188	54641188	54641287
8. refrigerant filter	89241699	89241699	89241699	89241699
9. hot gas valve	38003943	38003943	38003943	38003943
10. air-air heat exchanger	*	*	*	*
12. fan pressure switch	38003968	38003968	38003968	38003968
14. main switch	38004008	38004008	38004008	38004008
15. high pressure switch	89240857	89240857	89240857	89240857
16. high temperature thermostat	38004024	38004024	38004024	38004024
17. low pressure manometer	38004032	38004032	38004032	38004032
25. thermometer sensor pocket	38027454	38027454	38007454	38027454
28. pressostatic water valve	91197343	91197368	91197368	91197368
30. general automatic switch	#	#	#	#
30a. fan motor automatic switch	#	#	#	#
31. fan motor contractor	#	#	#	#
32. compressor motor contractor	#	#	#	#
33. auxiliary transformer	#	#	#	#
37. electronic control/temperature sensor	38010286	38010286	38010286	38010286
40. liquid separator	38027538	38027538	38027538	38027546
evaporation o-ring, small	38007738	38007738	38007738	38007738
evaporation o-ring, large	38007746	38007746	38007746	38007746
rotalock, small	54669148	54669148	54669148	54669148
rotalock, large	38027587	38027587	38027587	38027587
suction rotalock valve	-	91157701	91157701	-----
discharge rotalock valve	38028205	38028205	38028205	-----

----- = Not Applicable # - See Electrical Parts List Fig 9 * - see Fig 3B on Page 33 for part numbers

Fig. 3 Parts List and Location (TS1650-TS3000) Watercooled

DESCRIPTION**PART NUMBERS**

	<u>1650</u>	<u>2000</u>	<u>2400</u>	<u>3000</u>
A. timed solenoid drain	----	----	----	----
1. compressor	*	*	*	*
2. refrigerant condenser	*	*	*	*
3. fan motor	*	*	*	*
4. evaporator	*	*	*	*
5. separator	*	*	*	*
6. insulation	38007753	38007753	38007753	38027413
7. expansion capillary				
7. expansion capillaries				54640800
7. expansion capillaries		54640792	54640792	54640834
7. expansion capillaries	54640826	54641147	54641147	54641253
7. expansion capillaries	54641120	54641154	54641154	54641261
7. expansion capillaries	54641238	54641170	54641170	54641279
7E. expansion capillaries	54641246	54641188	54641188	54641287
8. refrigerant filter	89241699	89241699	89241699	89241699
9. hot gas valve	38003943	38003943	38003943	38003943
10. air-air heat exchanger	*	*	*	*
12. fan pressure switch	38003968	38003968	38003968	38003968
14. main switch	38004008	38004008	38004008	38004008
15. high pressure switch	89240857	89240857	89240857	89240857
16. high temperature thermostat	38004024	38004024	38004024	38004024
17. low pressure manometer	38004032	38004032	38004032	38004032
25. thermometer sensor pocket				
28. pressostatic water valve	91197343	91197368	91197368	91197368
30. general automatic switch	#	#	#	#
30A. fan motor automatic switch	#	#	#	#
31. fan motor contractor	#	#	#	#
32. compressor motor contactor	#	#	#	#
33. auxiliary transformer	#	#	#	#
37. electronic control/temperature sensor	38010286	38010286	38010286	38010286
40. liquid separator	38027538	38027538	380227538	38027546
evaporation o-ring, small	38007738	38007738	38007738	38007738
evaporation o-ring, large	38007746	38007746	38007746	38007746
rotalock, small	54669148	54669148	54669148	54669148
rotalock, large	38027587	38027587	38027587	38027587
suction rotalock valve	-	91157701	91157701	-----
discharge rotalock valve	38028205	38028205	38028205	-----

----- = Not Applicable # - See Electrical Parts List Fig 9 * - see Fig 3B on Page 33 for part numbers

Ref Nbr	Description	TS50	TS75	TS100	TS150	TS200
1	Enclosure, 3 sided	38010849	38010849	38013868	38013868	38013868

Ref Nbr	Description	TS250	TS325	TS400	TS500
1	Front panel	38027009	38027009	38027009	38027009
2	Rear panel	38005302	38005302	38005302	38005302
3	Top panel	38328019	38328019	38328019	38328019
4	Left side panel	38328001	38328001	38328001	38328001
5	Right side panel	38027017	38027017	38027017	38027017
6	Compressor shield	38027025	38027025	38027025	38027025

Ref Nbr	Description	TS700	TS800	TS100	TS1200	TS1400	TS1650	TS2000	TS2400	TS3000
1	Front panel	38027058	38027058	38027058	38027058	38027058	38027058	38027058	38027058	38027058
2	Rear panel	38027108	38027108	38027108	38027108	38027116	38027140	38027140	38027140	38027140
3	Top panel	38027033	38027033	38027033	38027033	38027033	38027132	38027132	38027132	38027132
4	Left side panel	38027041	38027041	38027041	38027041	38027041	38027124	38027124	38027124	38027124
5	Dividor panel	38019949	38019949	38019949	38019949	38019949	38019949	38019949	38019949	38019949
*	Condensor top panel	38027165	38027165	-	-	-	-	-	-	-
*	Air filter support angle	38027157	38027157	38027157	38027157	38027157	38027173	38027173	38027173	38027173
8	Right front corner	38027074	38027074	38027074	38027074	38027074	38027074	38027074	38027074	38027074
9	Right rear corner	38027066	38027066	38027066	38027066	38027066	38027066	38027066	38027066	38027066
10	Left front corner	38027082	38027082	38027082	38027082	38027082	38027082	38027082	38027082	38027082
11	Left rear corner	38027090	38027090	38027090	38027090	38027090	38027090	38027090	38027090	38027090

* = Item not illustrated

- = Not applicable

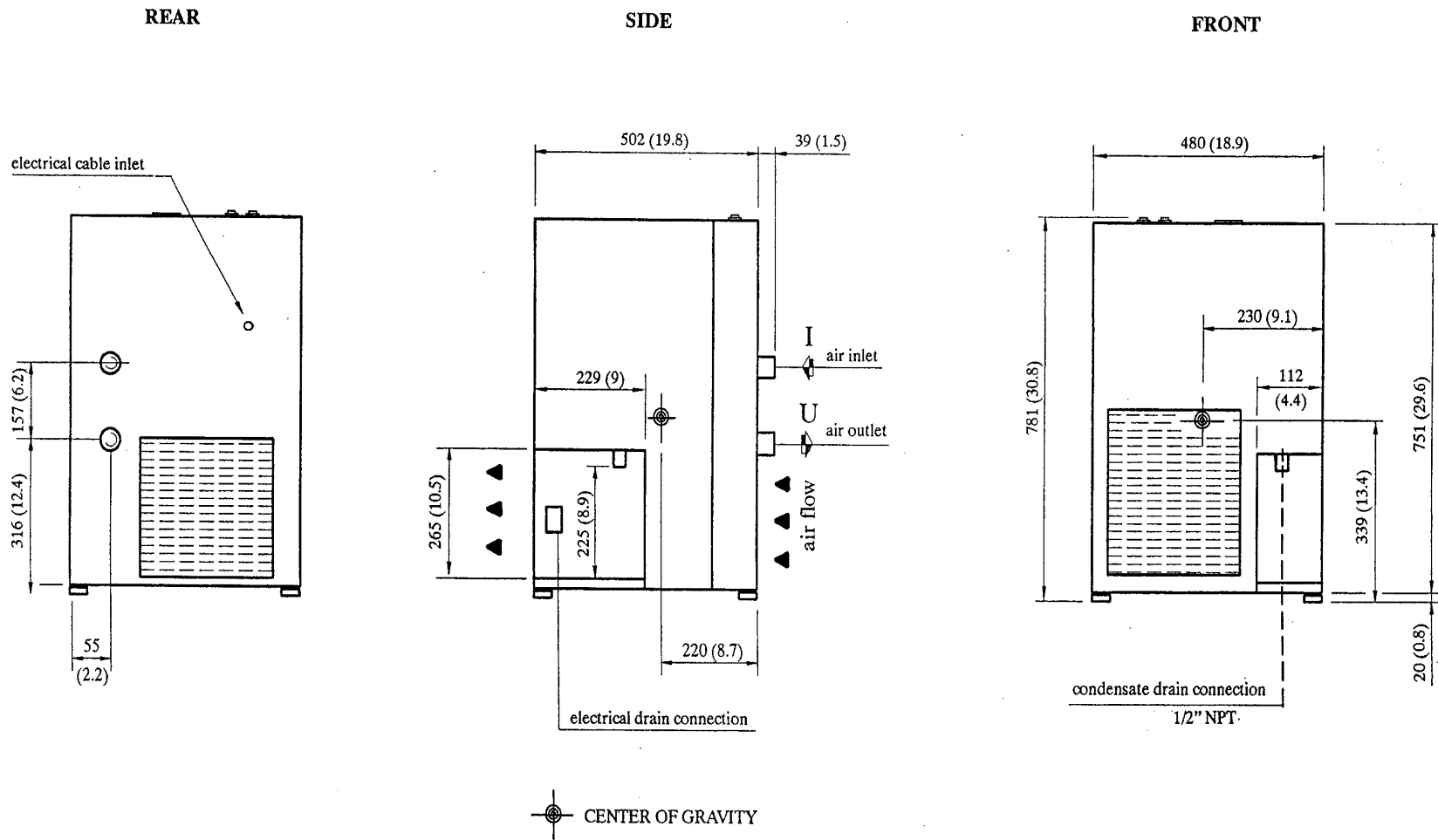
Locate Ref Nbr on Decal Location drawing Fig. 2.

Fig 3B Spare Parts List (see Fig. 3)

Model	50	75	100	150	200	250	325	400	500	700	800	1000	1200	1400	1650	2000	2400	3000	
1. ●	38003554		38003562	38003570															
1. ■			38003588	38003596	38003604	38003612													
1. *					38003653			38003661	38003679		38003687		38003695	38003703		38003711	38003729		
2. (A)	89328280	89328298	38003752		89328322				89328830		89328355			89328371		89328389	38003760		
2. (W)									91101170		38003778				91111013				
3. ●	38003802	38003810																	
3. ■		38003802	38003828		38003844														
3. *					38003851				38003877										
4. 5. 6. 10. (*)	89328488	89328496		89328504	89328512	89328520	89328538	89328512	89328520	8938538		89328520			89328538				
4. 5. 6. 10. (**)	89327985	89327993		89328009	89328017	89328025	89328033	89328017	89328025	89328033		89328025			89328033				
8.	92451236	89234272			89234280				89241699										
9.	38003901		38003919		38003927				38003935				38003943			2X 38003935			
11.	89236145																		
12.	38003968																		
13.	89236079																		
14.	38003976			38003984				38003992				38004008							
15.	89240857																		
16.	38004024																		
17.	38004032																		
28.									91198341				91197343			91197368			
37.	38004040																		
38.	89328108																		

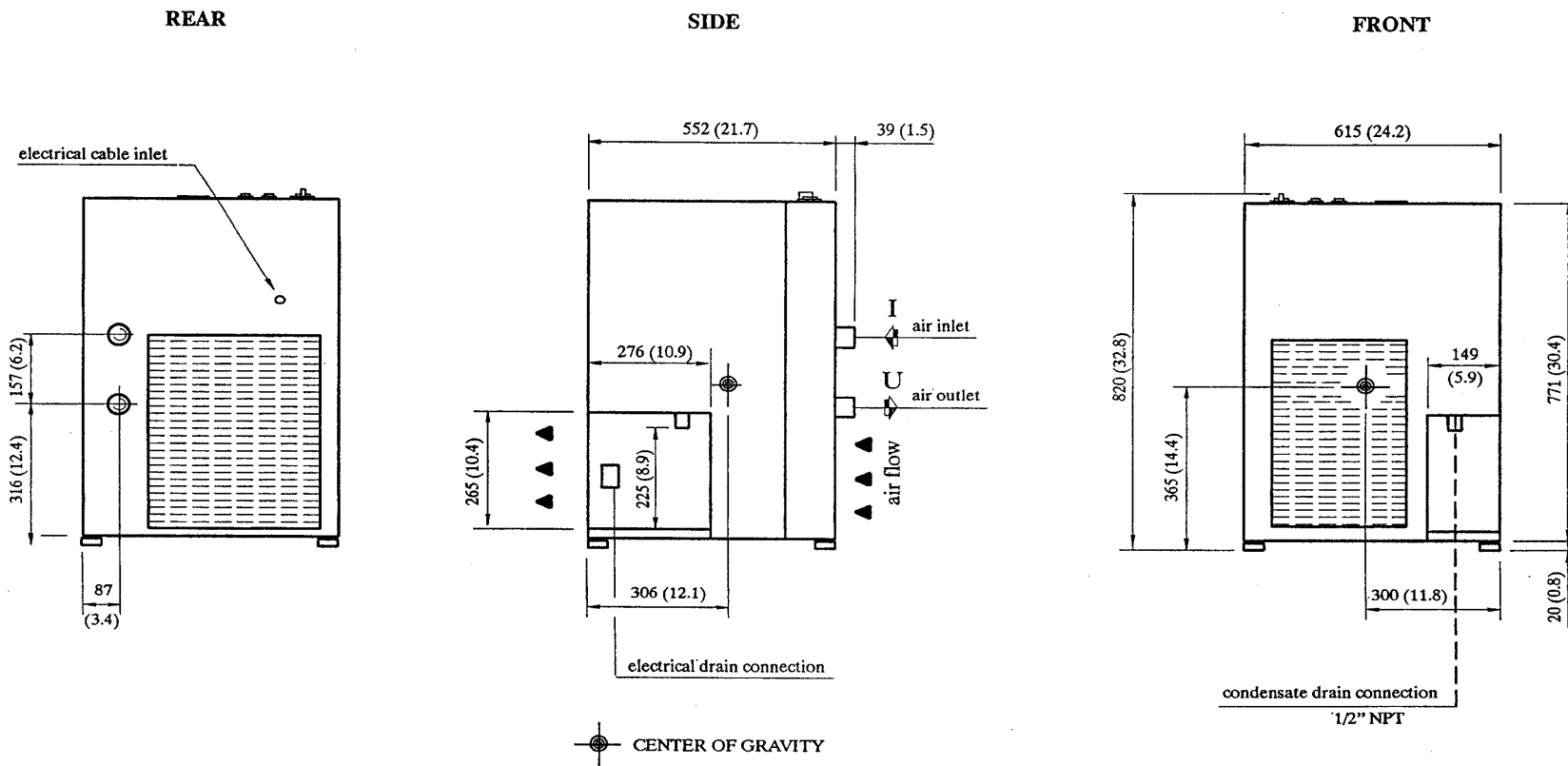
- Power supply 115V 1Ph ~ 60Hz
- Power supply 208/230V 1 Ph ~ 60Hz
- * Power supply 460V 3Ph ~ 60Hz
- (*) 12 bar 175 psi (A) Air
- (**) 16 bar 232 psi (W) Water

Fig. 4 Overall dimensions TS50 - TS75



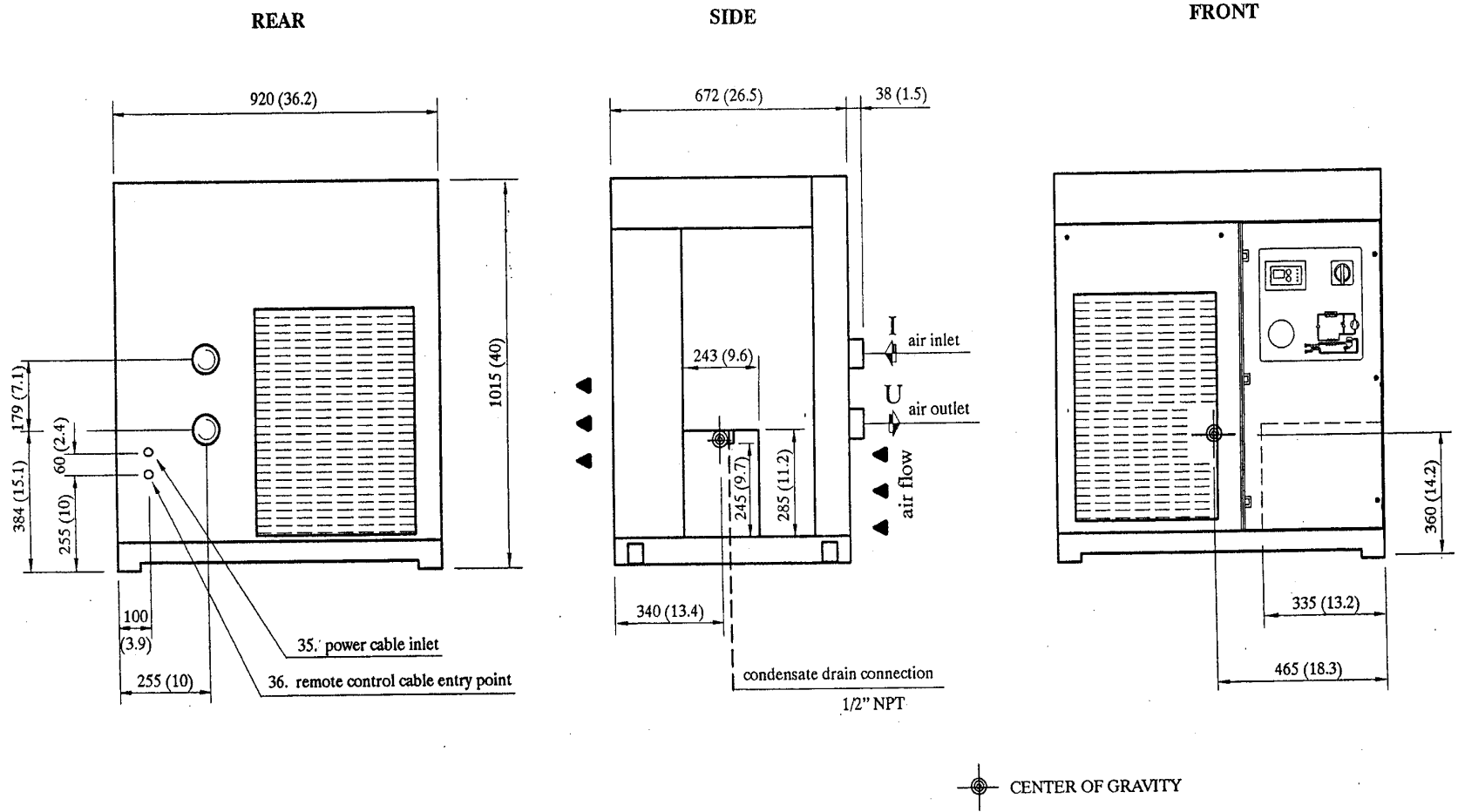
NOTE: () distance expressed in inches.

Fig. 4 Overall dimensions TS100 - TS200



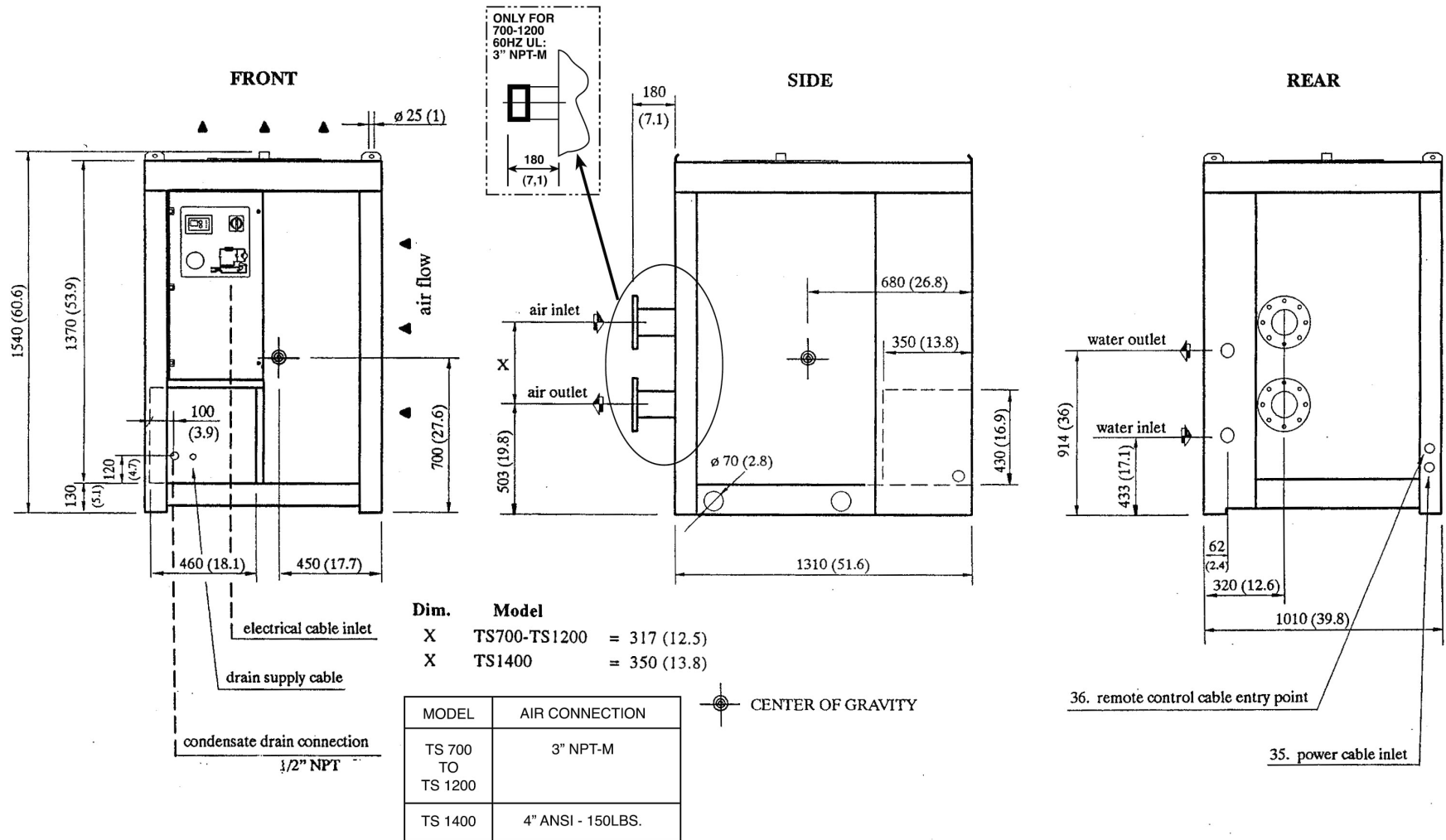
NOTE: () distance expressed in inches.

Fig. 4 Overall dimensions TS250 - TS500



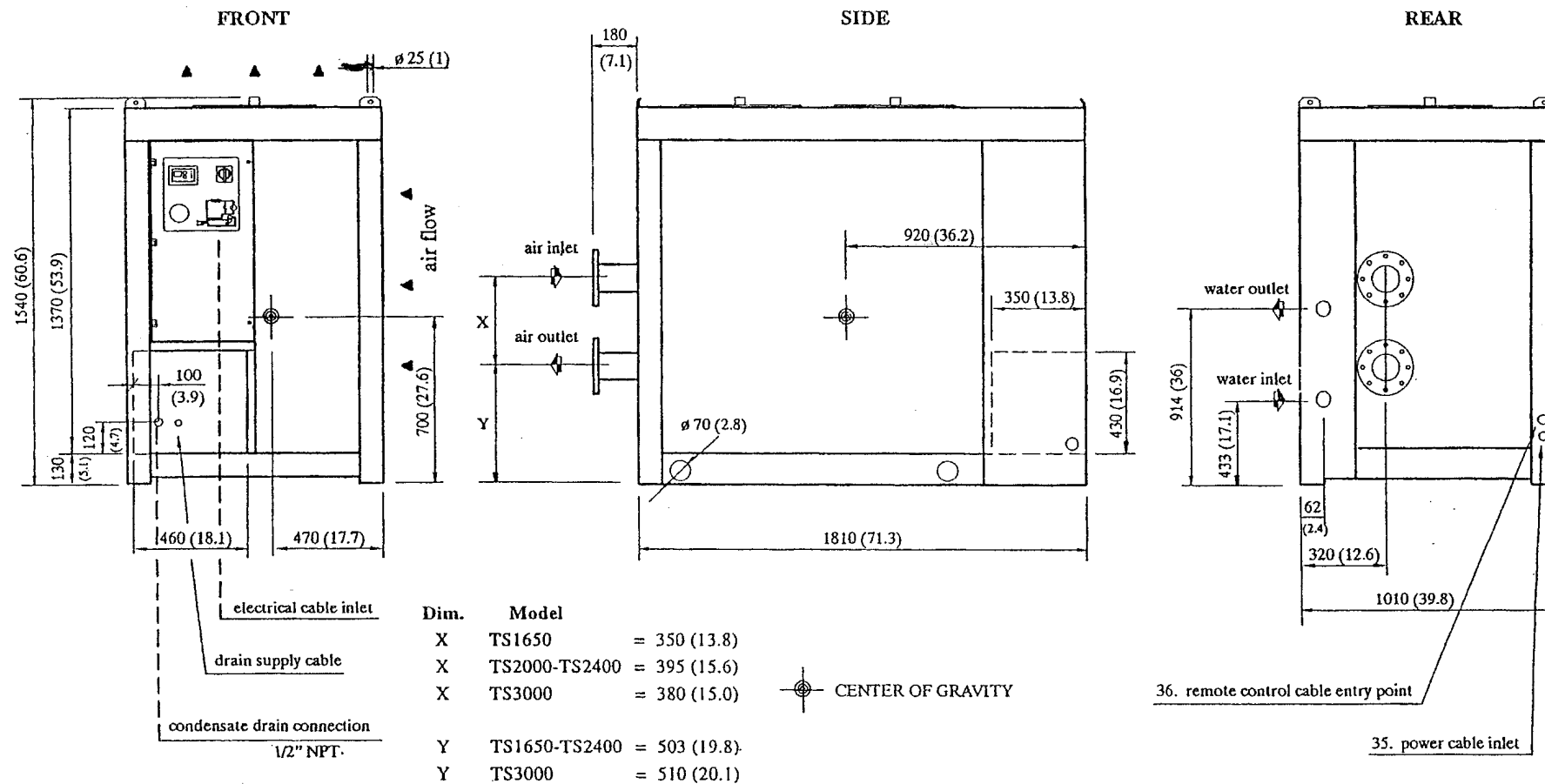
NOTE: () distance expressed in inches.

Fig. 4 Overall dimensions TS700 - TS1400 aircooled



NOTE: () distance expressed in inches.

Fig. 4 Overall dimensions TS1650 - TS3000



NOTE: () distance expressed in inches.

Fig. 4A Weights

Model	weight		refrigerant / charge R407C		F.L.A. (A)		air connections	max air pressure
	(Kg)	(lb)	(Kg)	(OZ)	115V 1 ~ 60 Hz	208/230V 1 ~ 60Hz		
TS50	63	139	0.66	23	8.1		1" NPT	12 bar (175 psi)
TS75	63	139	0.66	23	8.1			
TS100	65	143	0.66	23	10.1		1.5" NPT	
TS150	66	146	0.84	30		8.5		
TS175	68	150	1.00	35				
TS200	70	154	1.10	39		10		

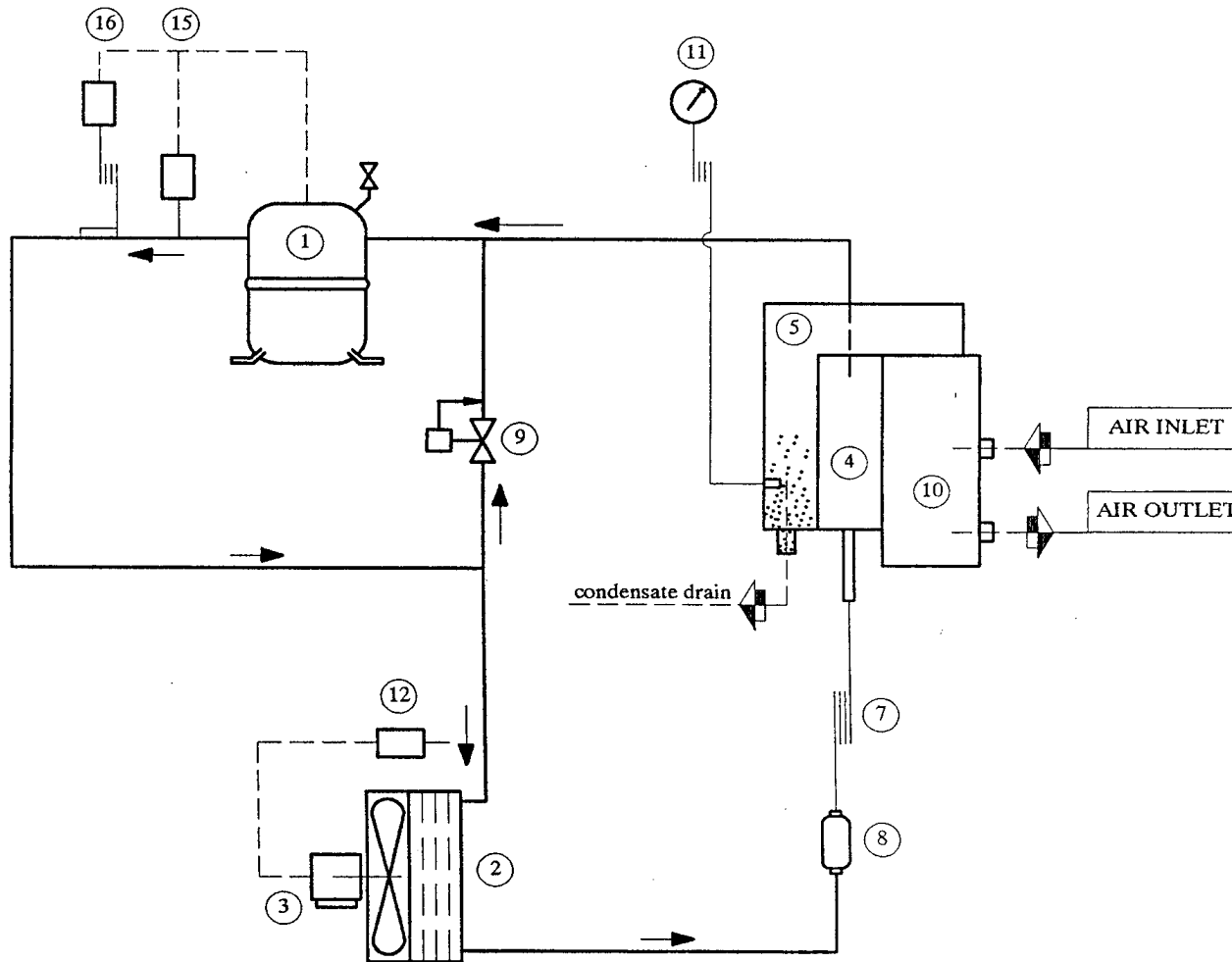
Fig. 4A Weights

Model	weight		refrigerant / charge R407C		F.L.A. (A) 208/230V 1 ~ 60Hz	F.L.A. (A) 460V 3 ~ 60Hz	water connections	air connections	max air pressure
	(Kg)	(lb)	(Kg)	(OZ)					
TS250 TS325	140	309	2.20	78	17.8	4.2	2" NPT	12 bar (175 psi)	
TS400	144	317	2.10	74	-				
TS500	150	331	2.00	71	-				
TS700	400	882	3.10 (A) 2.30 (W)	109 (A) 81 (W)	-	7.9 (A) 6.6 (W)	.75" NPT		
TS800	420	926	3.60 (A) 2.30 (W)	127 (A) 81 (W)	-				
TS1000 TS1200	450	992	4.80 (A) 3.30 (W)	169 (A) 116 (W)	-				
TS1400	470	1,036	5.50 (A) 3.30 (W)	194 (A) 116 (W)	-	14.6 (A) 13.3 (W)	1" NPT		4" ANSI 150 LBS
TS1650	550	1,213	7.00 (A) 5.00 (W)	247 (A) 176 (W)	-	20.5 (A) 17.9 (W)			
TS2000	580	1,279	7.50 (A) 6.00 (W)	265 (A) 212 (W)	-		23.5 (A) 20.9 (W)		1.5" NPT
TS2400	590	1,301	10.00 (A) 6.70 (W)	353 (A) 236 (W)	-				
TS3000	660	1,456	10.00 (A) 5.70 (W)	353 (A) 201 (W)	-	28.2 (A) 25.6 (W)			

(A) Air (W) Water

NOTES:

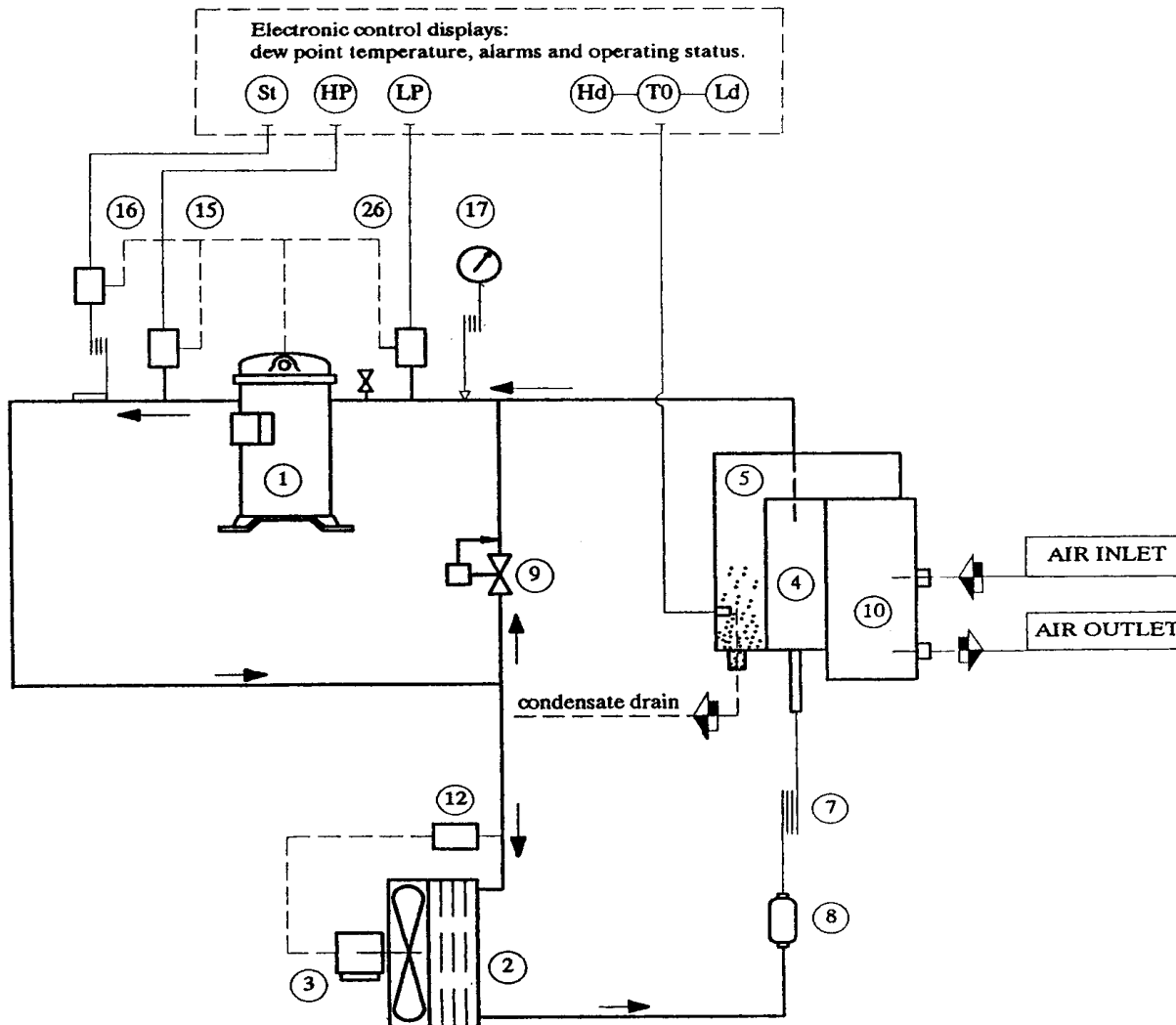
Fig. 6 Refrigerant diagram TS50 - TS200 (see Fig. 3)



1. compressor
2. refrigerant condenser
3. fan motor
4. evaporator
5. separator
7. expansion capillary
8. refrigerant filter
9. hot gas valve
10. air - air heat exchanger
11. dew point thermometer
12. fan pressure switch
15. high pressure switch
16. high temperature thermostat

Refrigerant R407C

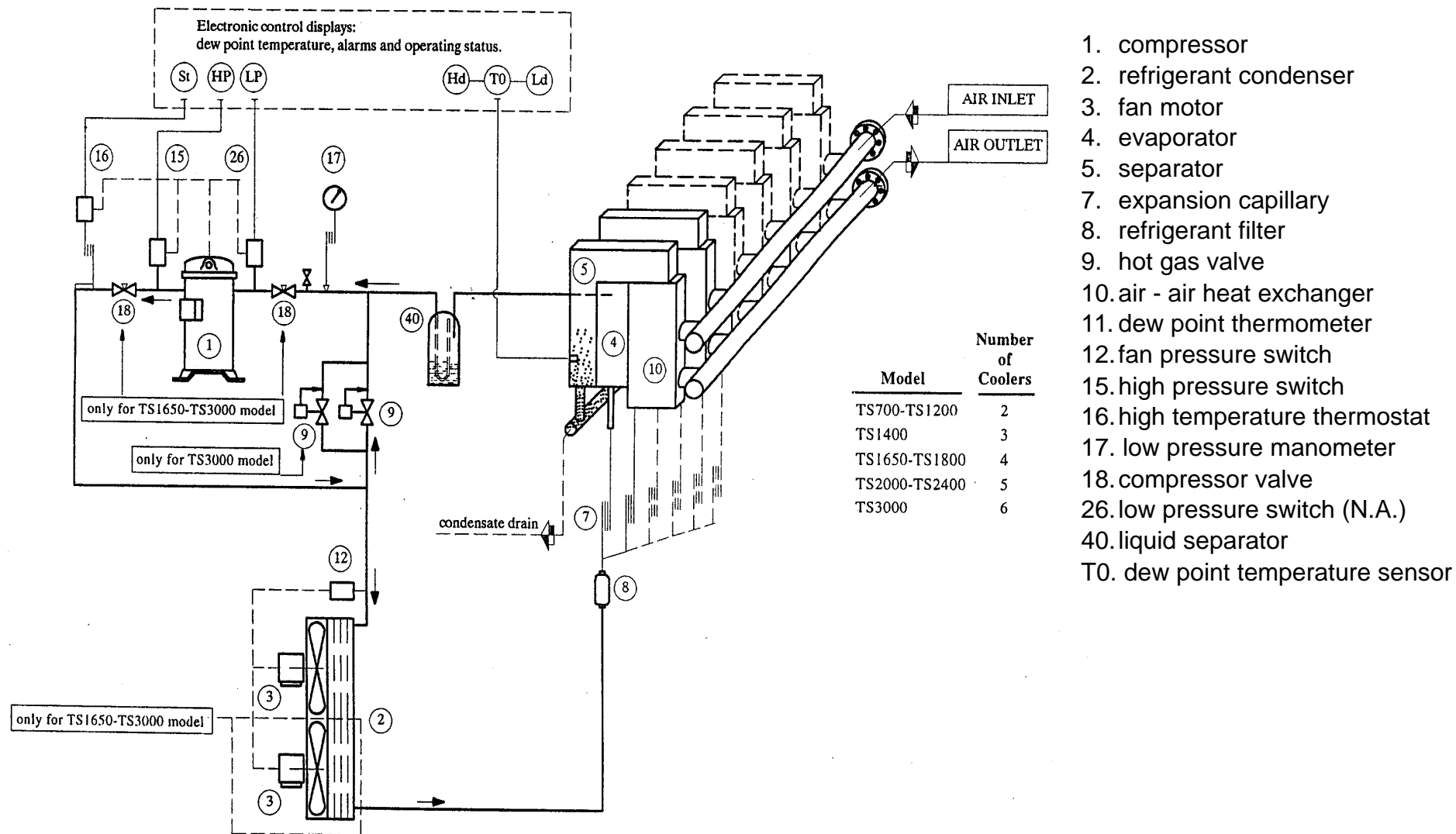
Fig. 6 Refrigerant diagram TS250 - TS500 (see Fig. 3)



1. compressor
2. refrigerant condenser
3. fan motor
4. evaporator
5. separator
7. expansion capillary
8. refrigerant filter
9. hot gas valve
10. air - air heat exchanger
12. fan pressure switch
15. high pressure switch
16. high temperature thermostat
17. low pressure manometer
26. low pressure switch (N.A.)
- T0. dew point temperature sensor

Refrigerant R407C

Fig. 6 Refrigerant diagram TS700 - TS3000 (see Fig. 3)



Refrigerant R407C

Fig. 6 Refrigerant diagram TS700 - TS3000 watercooled (see Fig. 3)

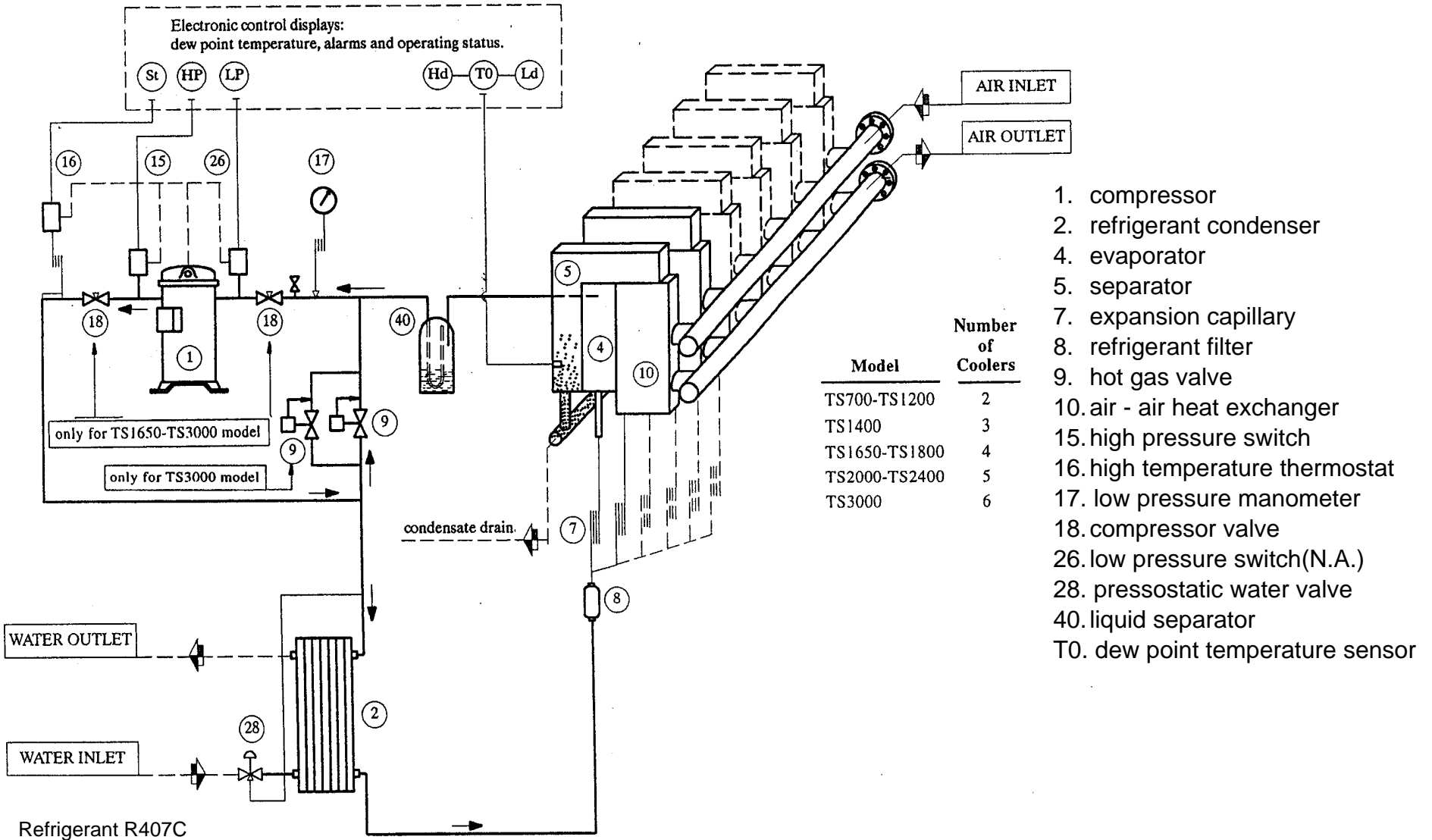


Fig. 7 Calibration

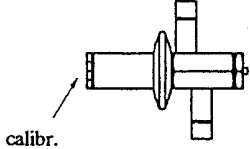
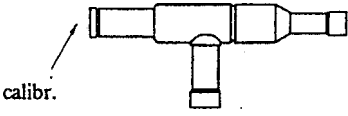
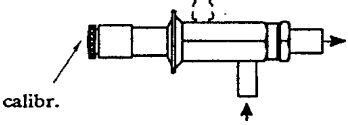
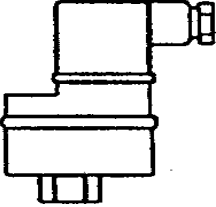
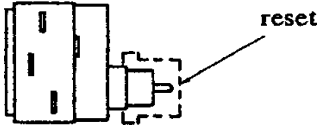
MODEL	COMPONENT LIST	SETTING	NOTES	
TS50 - TS100				
TS150 - TS500			<p>⑨ Hot gas Valve</p>	<p>69.6 Psig (4.8 bar) (+0.1, -0)</p> 
TS700 - TS3000				
TS50 - TS3000	<p>⑫ Fan pressure switch</p>	<p>START: 240.8 Psig (16.6 bar) DIFF: 60.9 Psig (4.2 bar) STOP: 180 Psig (12.4 bar)</p>		
TS50 - TS3000	<p>⑯ High temperature thermostat (ST)</p>	<p>248° F (120° C)</p>		

Fig. 7 Calibration

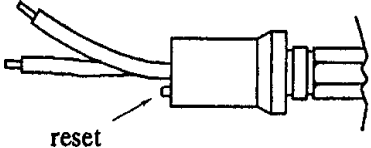
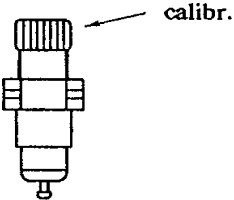
COMPONENT LIST		SETTING	NOTES
TS50 - TS3000	<p>⑮ High pressure switch (HP)</p>	<p>STOP: 377 Psig (26 bar) START: 253.8 Psig (17.5 bar)</p>	
TS700 - TS3000	<p>⑳ Water pressostatic valve</p>	<p>232 Psig (16 bar) (+1, -0)</p>	

Fig. 8 Electrical diagram TS50 - TS75

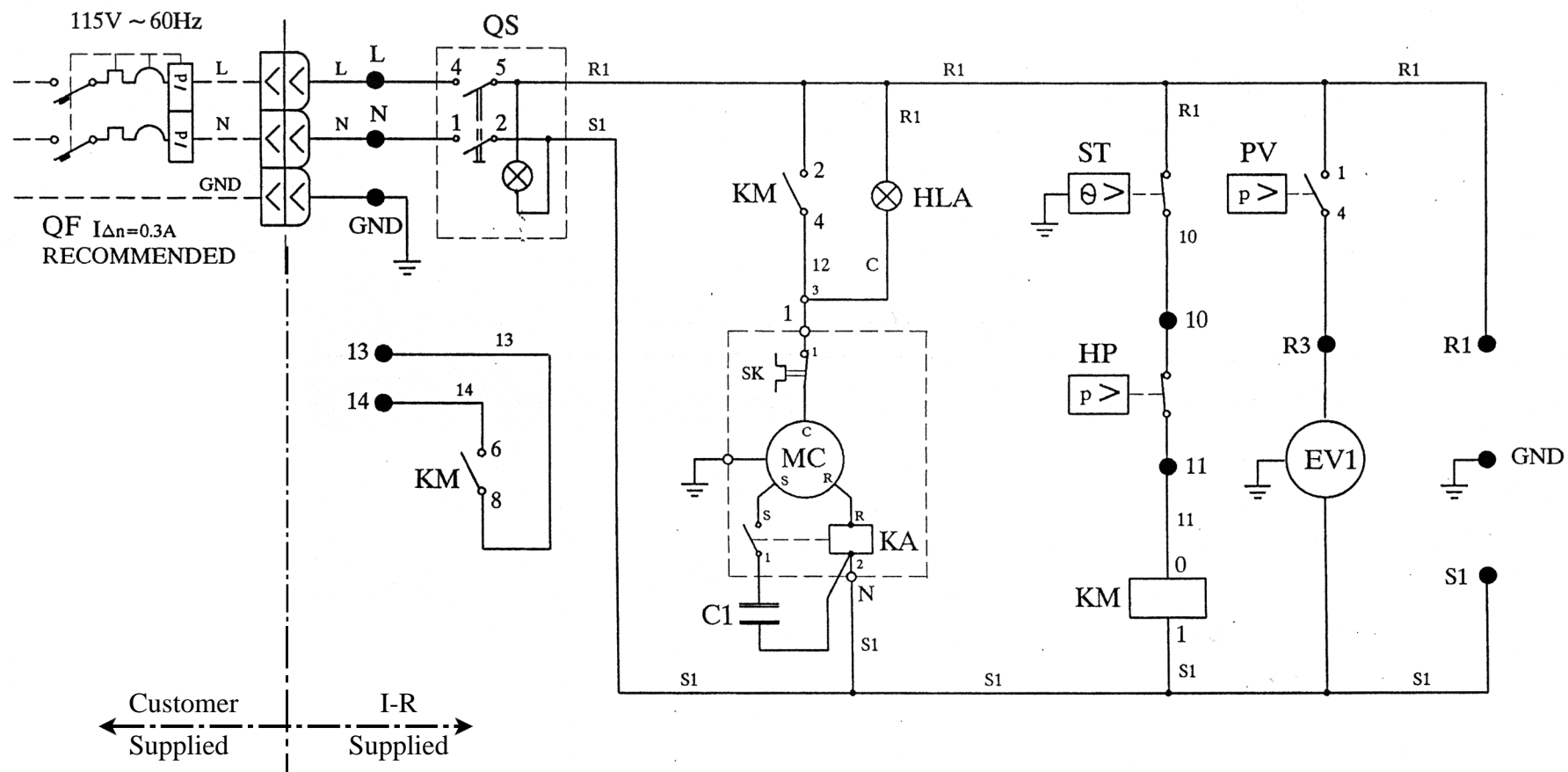


Fig. 8 Electrical diagram TS150 - TS200

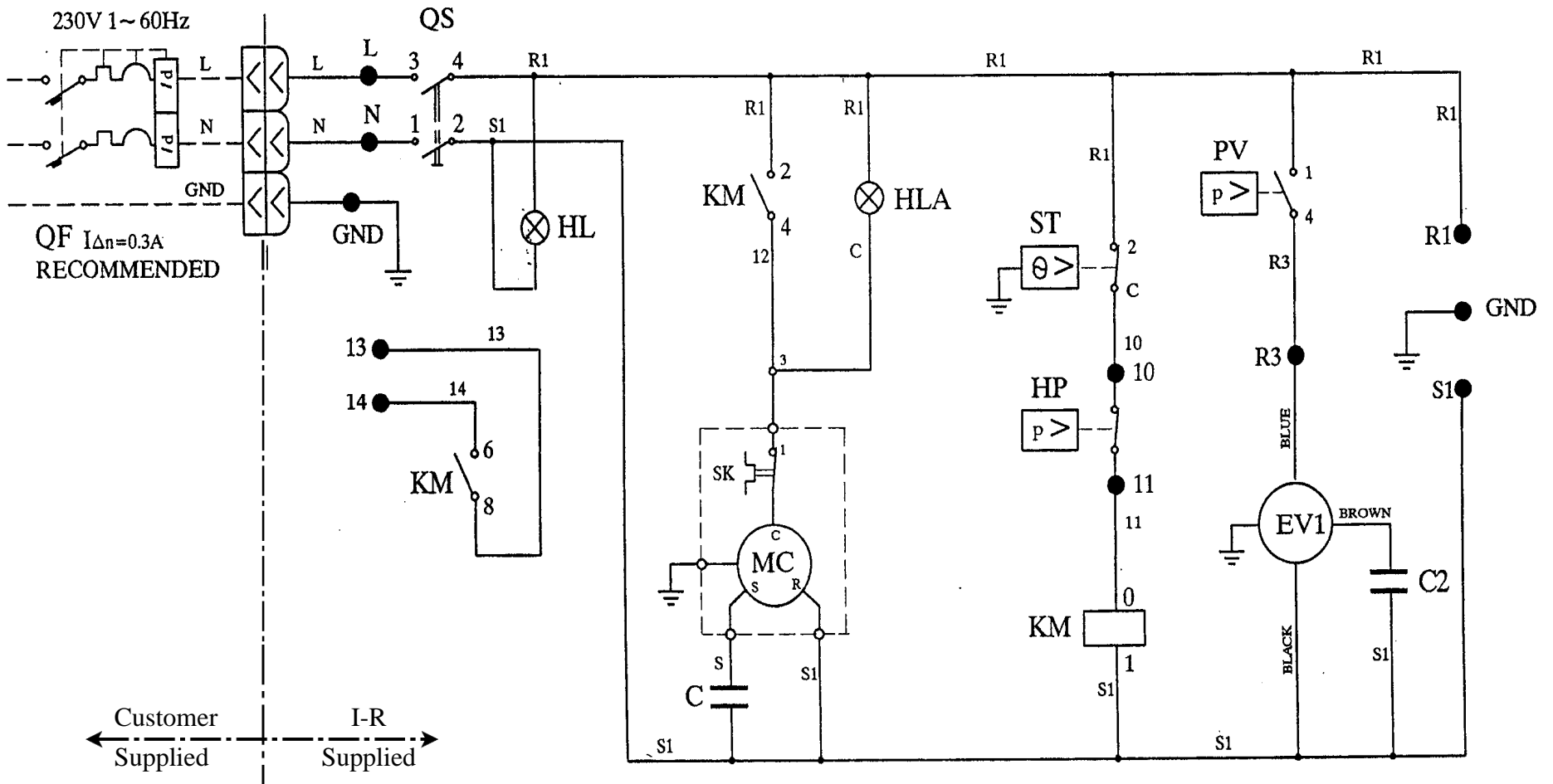


Fig. 8 Electrical diagram TS250 - TS325

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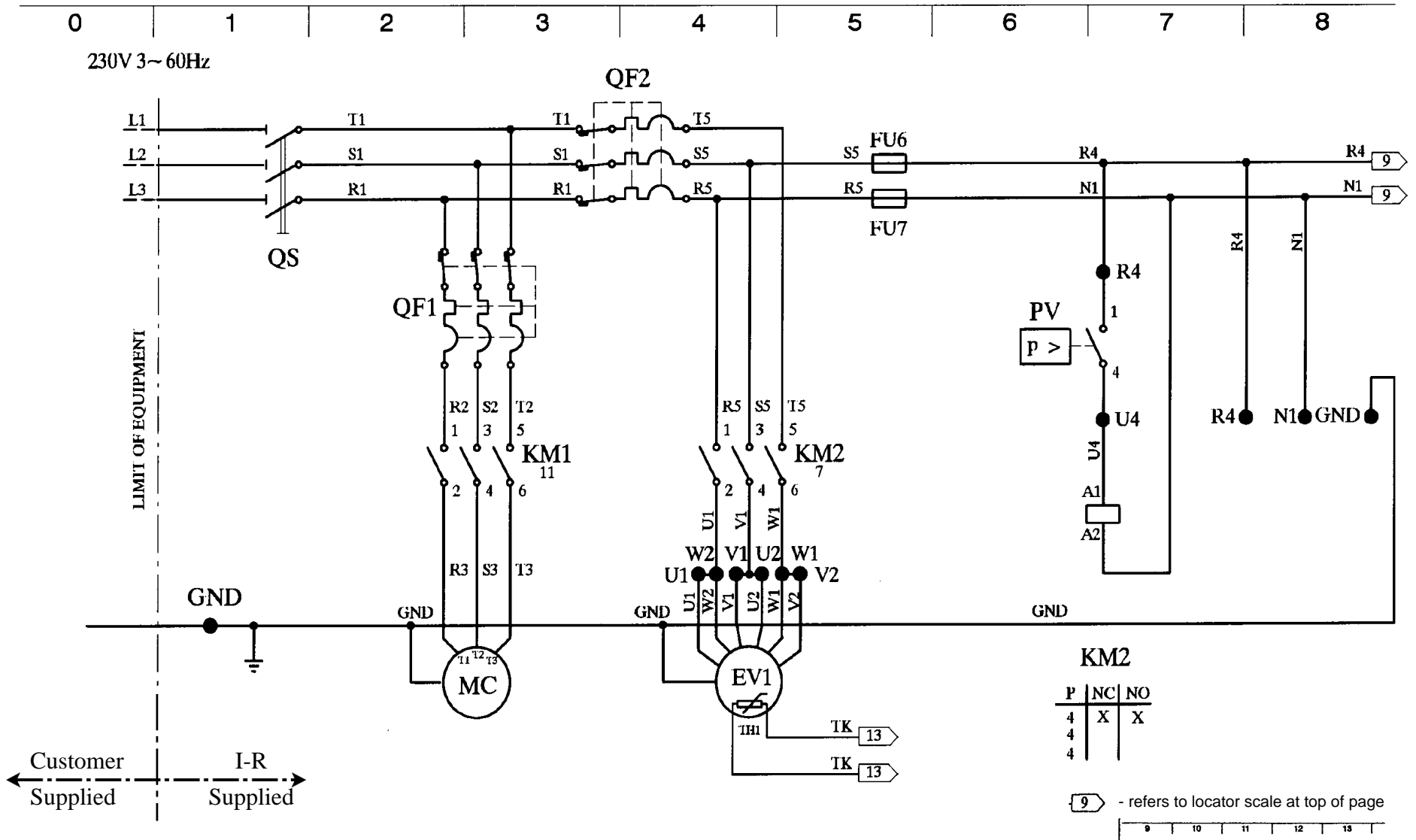


Fig. 8 Electrical diagram TS250 - TS500

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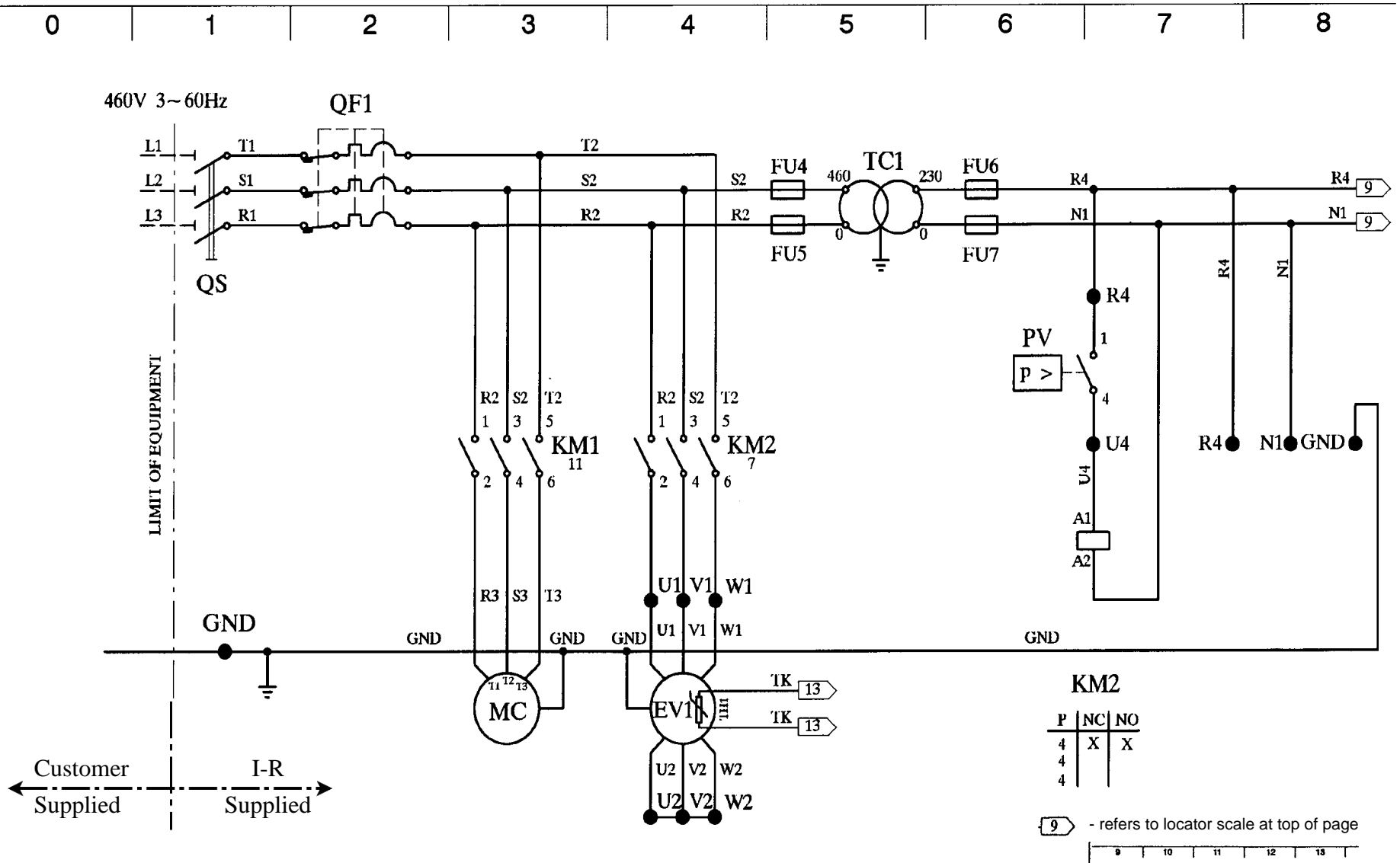


Fig. 8 Electrical diagram TS250 - TS500

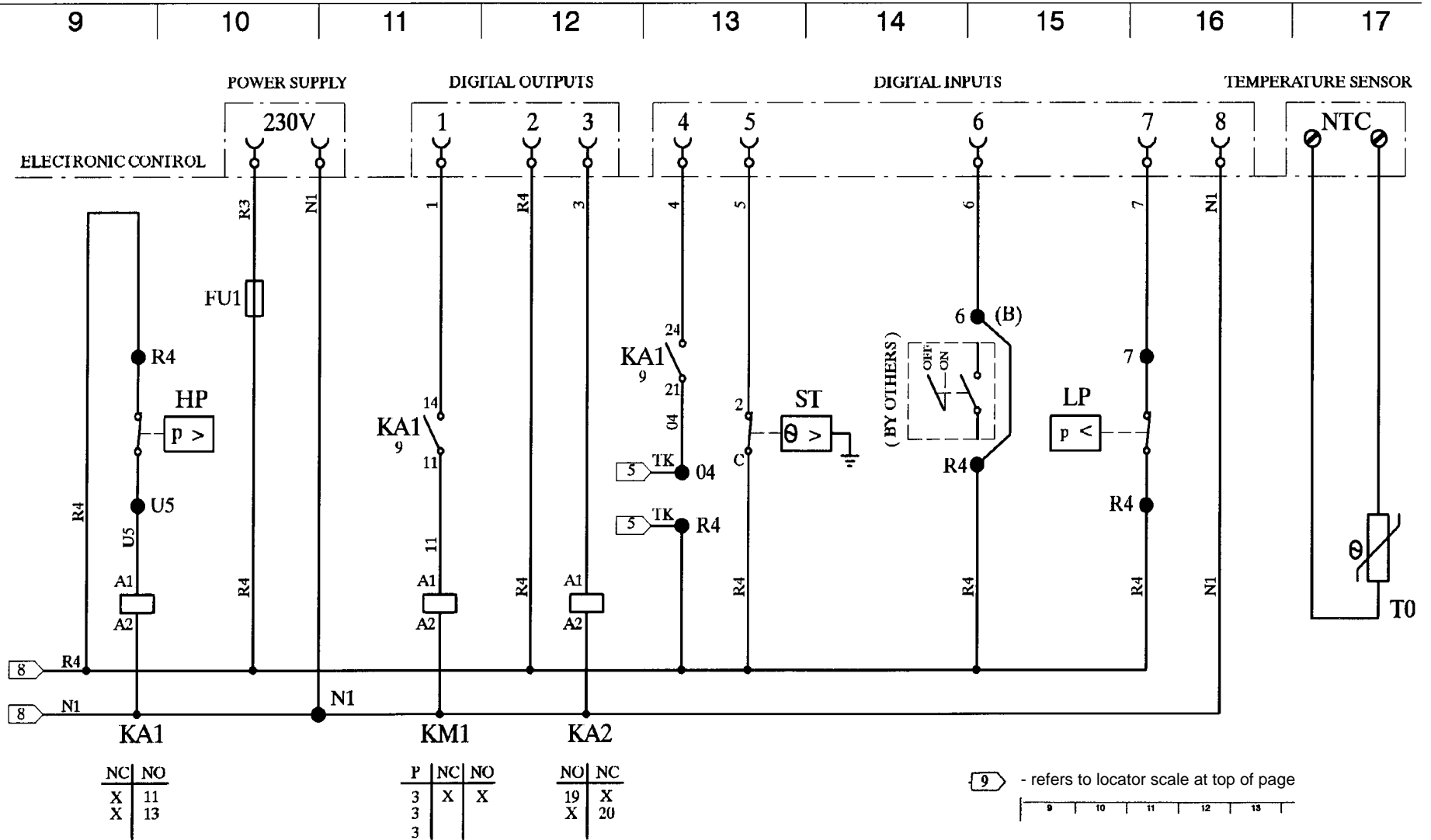


Fig. 8 Electrical diagram TS250 - TS500

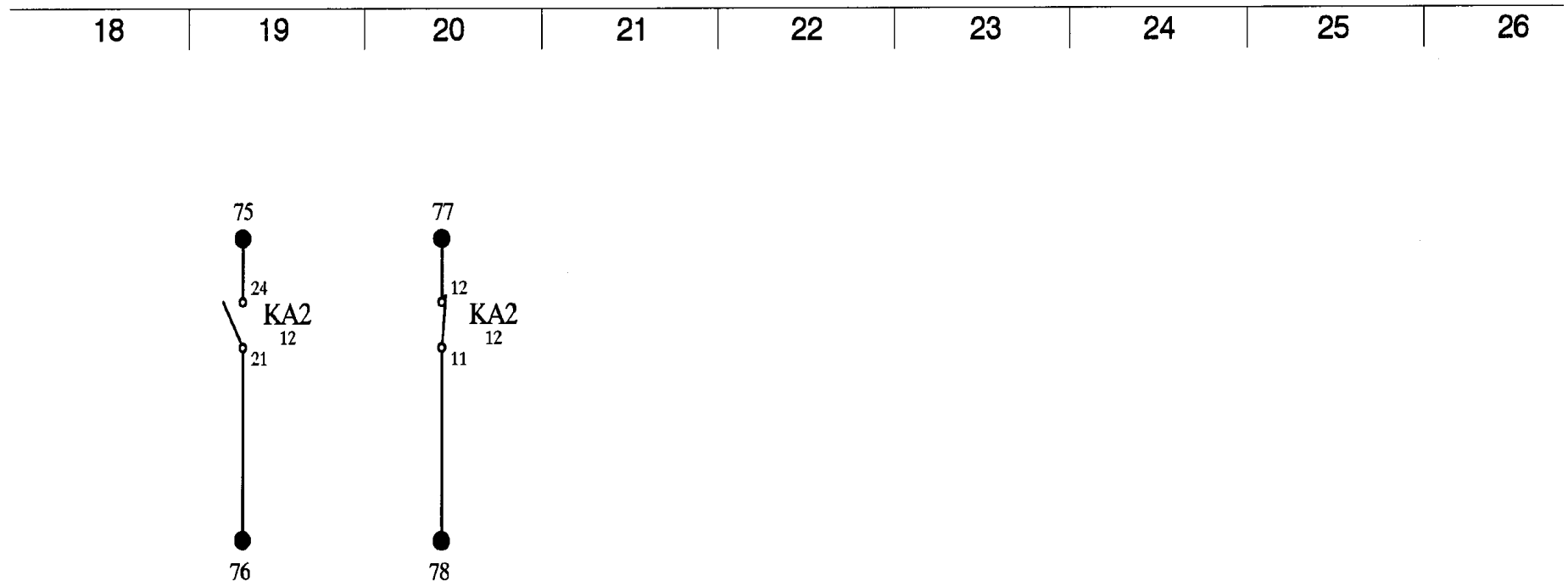


Fig. 8 Electrical diagram TS250 - TS500

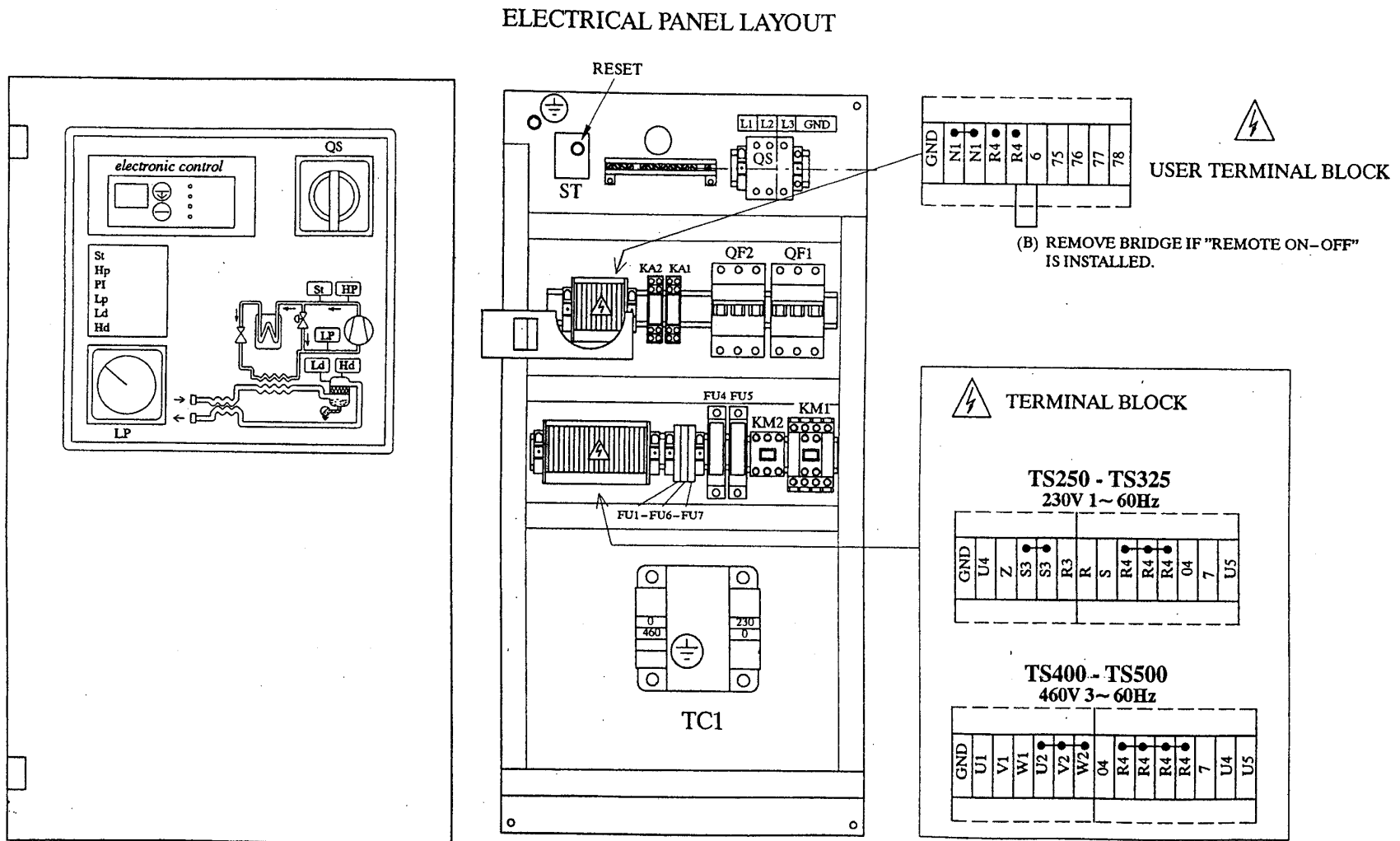


Fig. 8 Electrical diagram TS700 - TS1400

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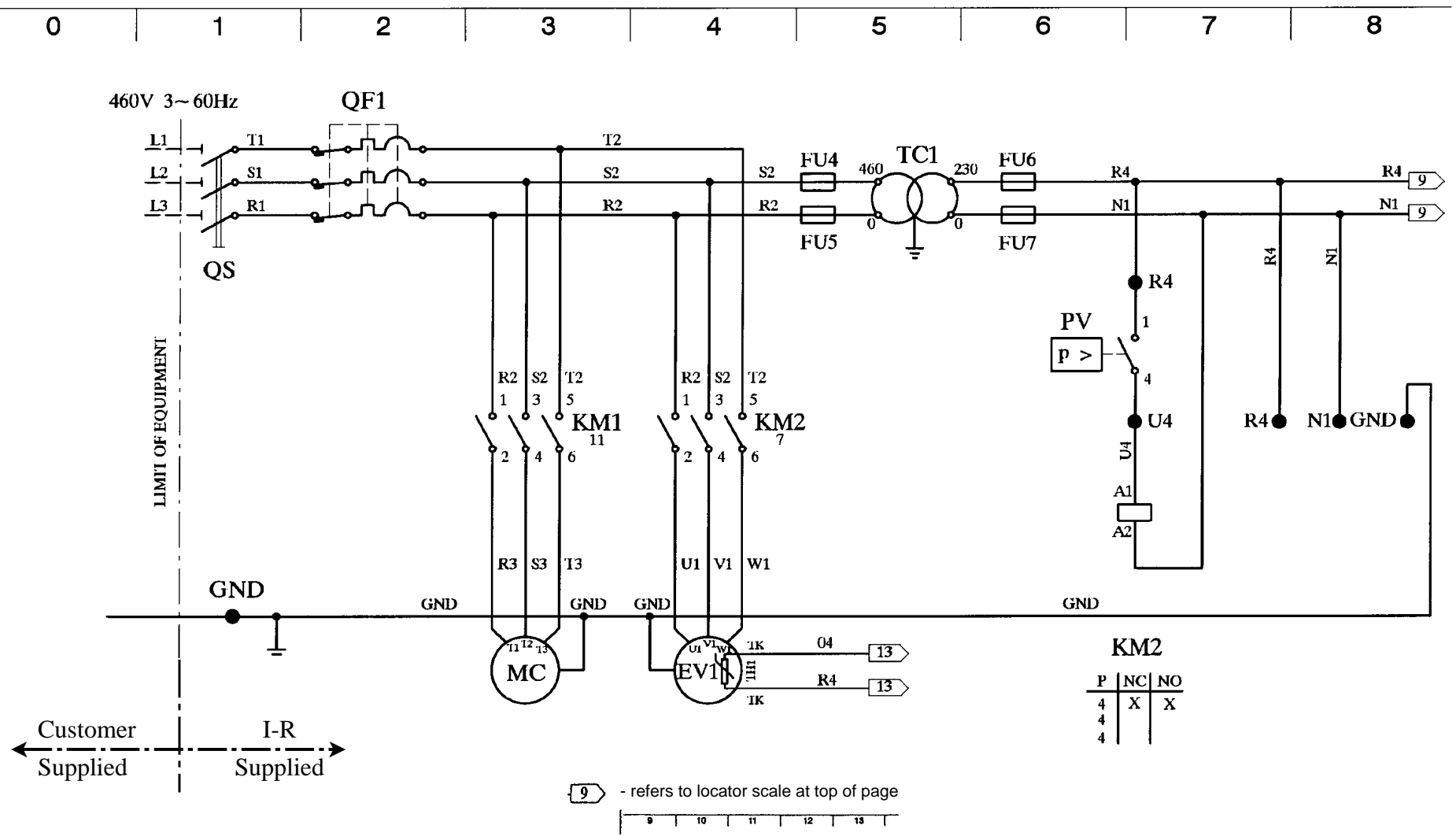


Fig. 8 Electrical diagram TS700 - TS1400

to page 58

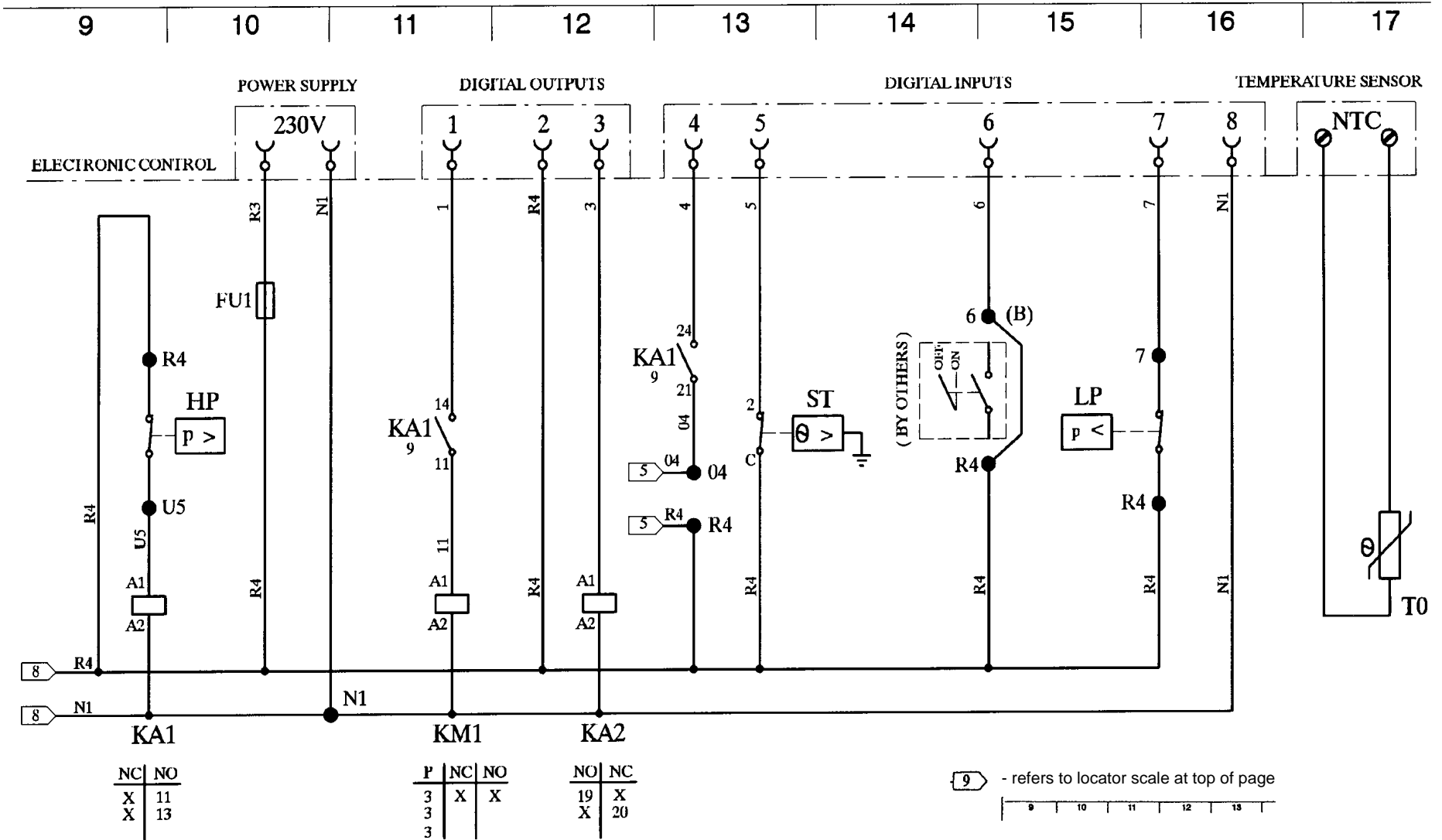


Fig. 8 Electrical diagram TS700 - TS1400

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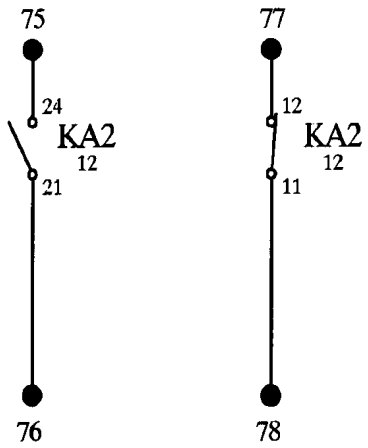


Fig. 8 Electrical diagram TS700 - TS1400

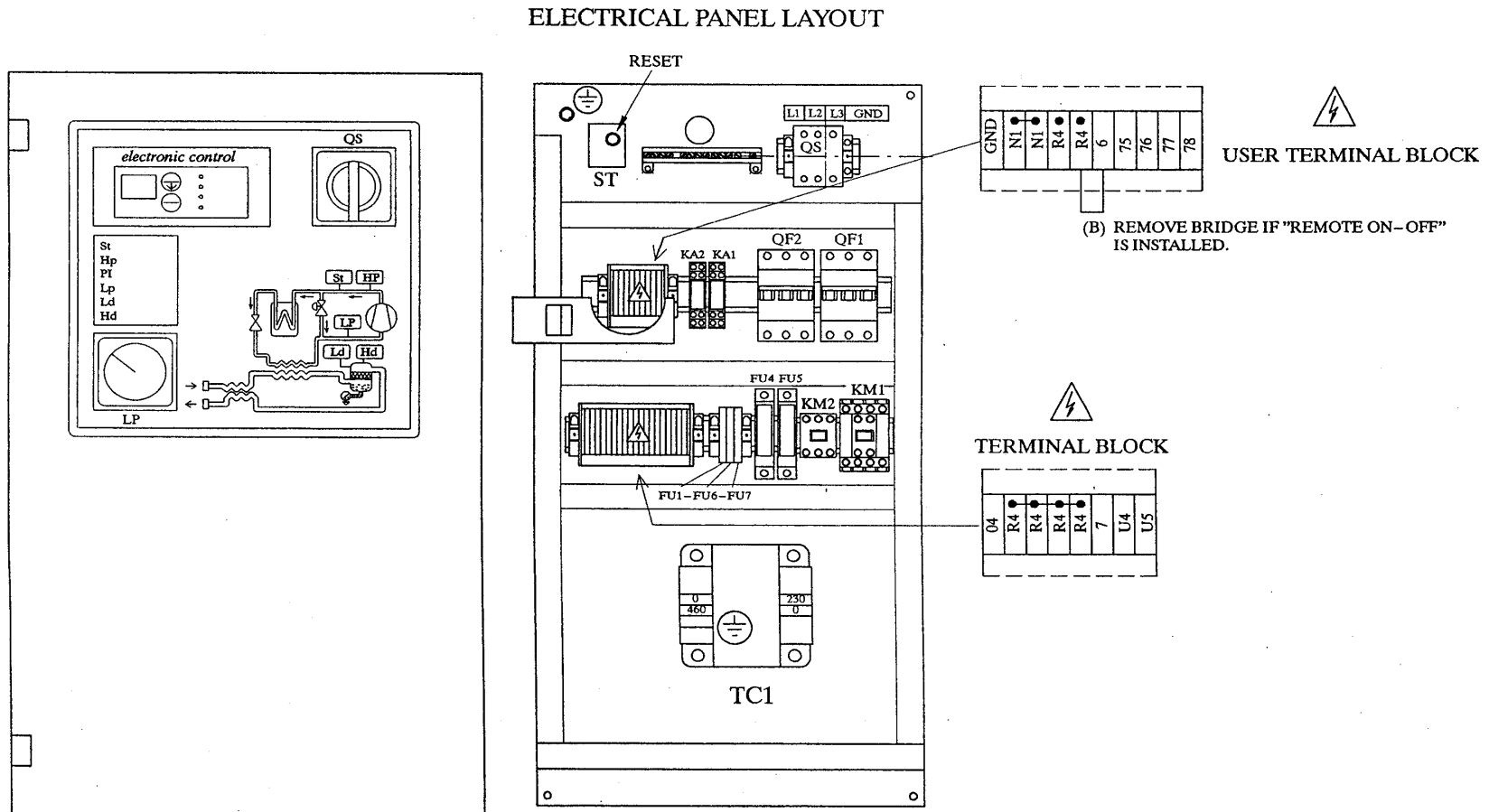


Fig. 8 Electrical diagram TS1650 - TS3000

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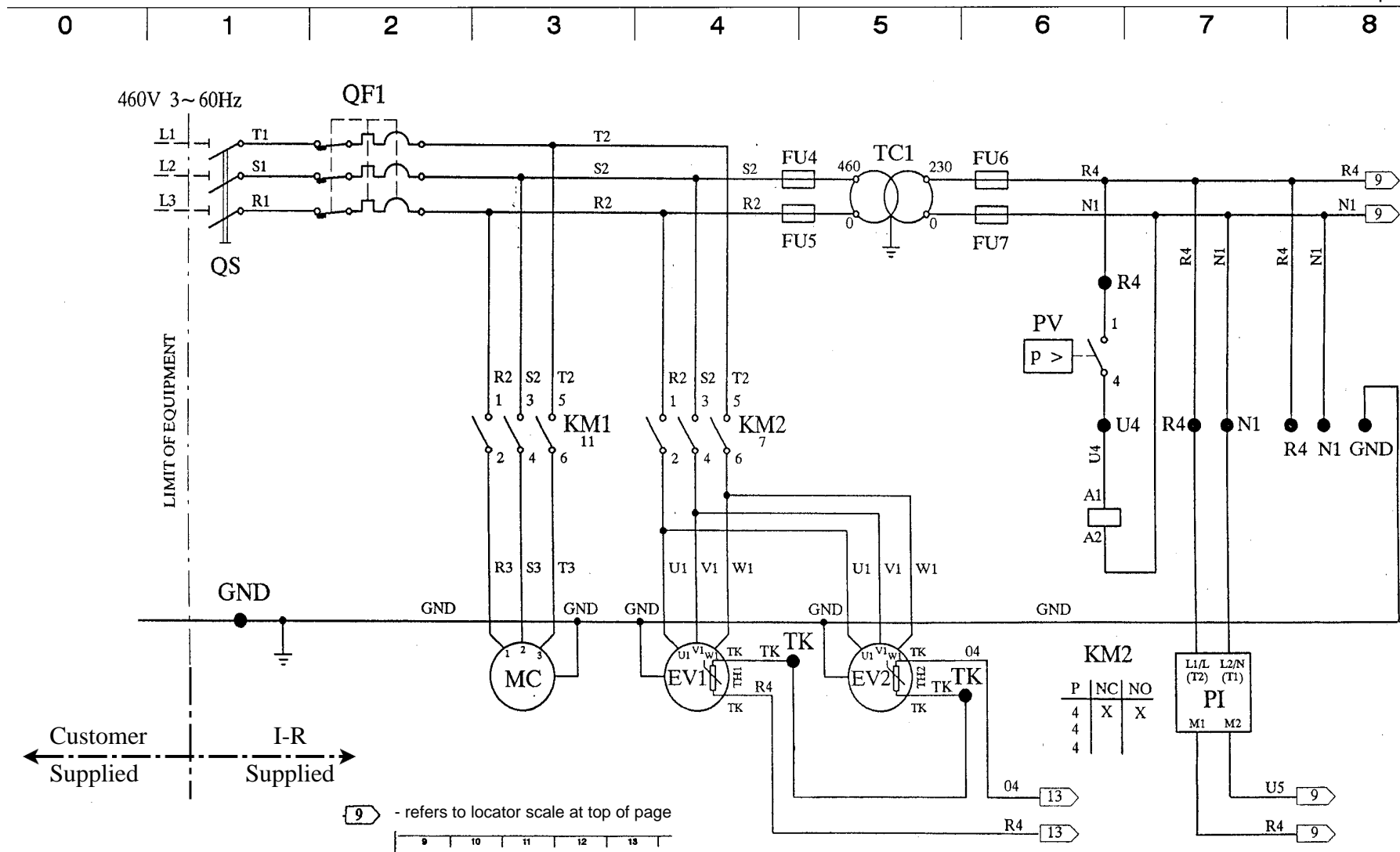


Fig. 8 Electrical diagram TS1650 - TS3000

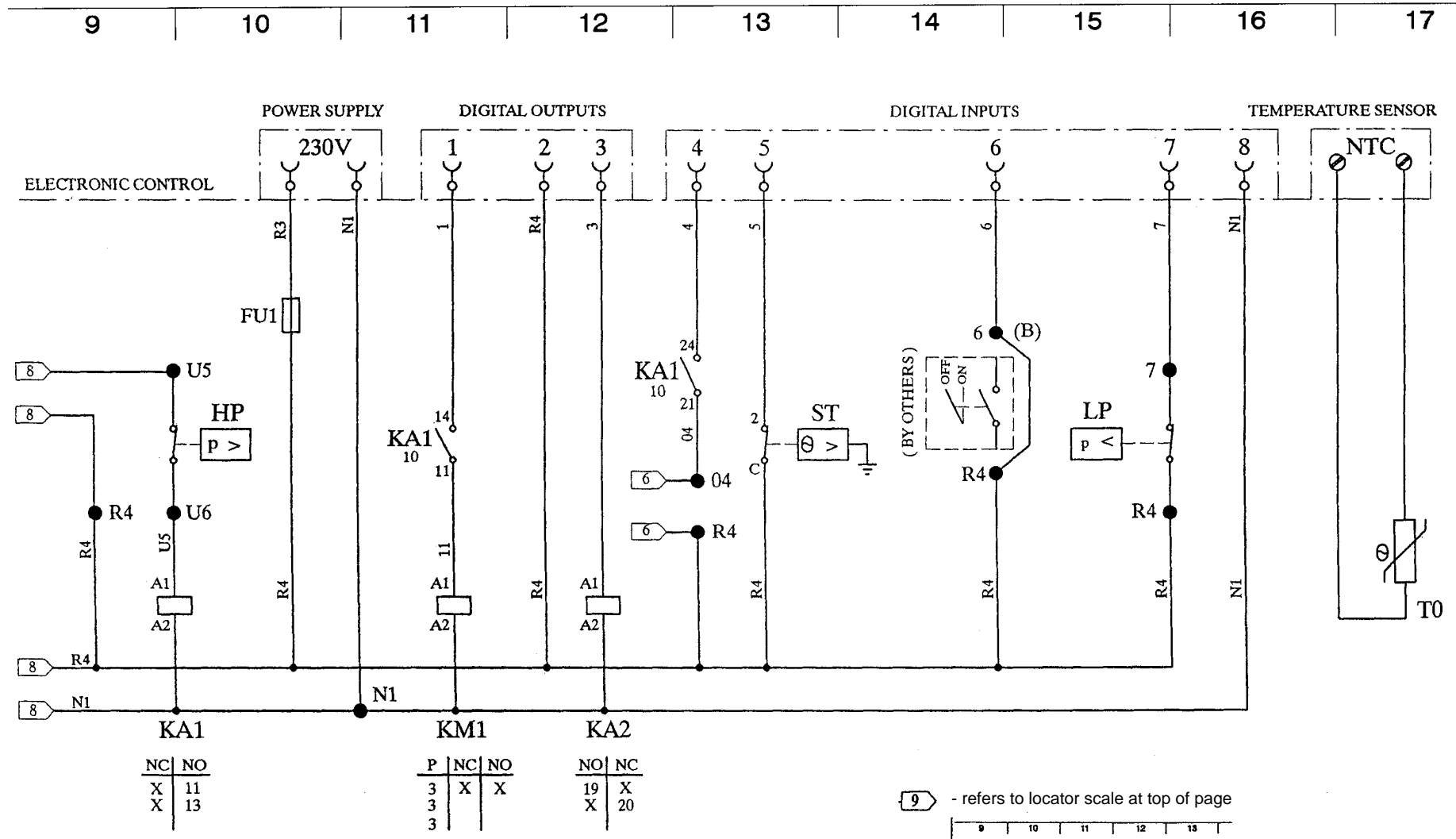


Fig. 8 Electrical diagram TS1650 - TS3000

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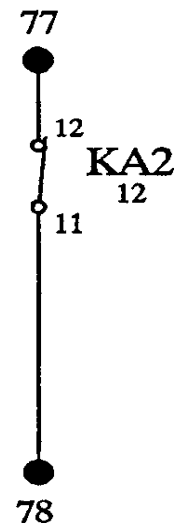
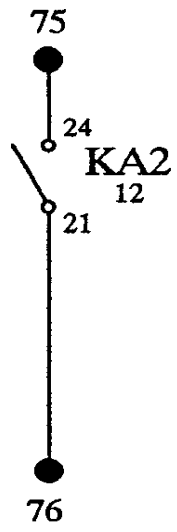


Fig. 8 Electrical diagram TS1650 - TS3000

ELECTRICAL PANEL LAYOUT

