Telair
AIR CONDITIONER

WORKING MANUAL

Silent 7300H

Group TELECO

GB

CONTENTS

GENERAL FEATURES

Air conditioner power components:

1. Compressor: 30A/240VAC relay.
2. External fan: one speed, 5A/240VAC relay.
3. Four-way valve: 5A/240VAC relay.
4. Internal fan: Three-speed motor

REMOTE-CONTROLLED FUNCTIONS

1. Operating modes: Automatic, cooling and heating
2. Ventilation speeds: Automatic, high, medium and low. When the speed is set to automatic, the corresponding remote control display is as follows: ventilation speed indicator increasing from left to right (rotating) with a 0.5 second interval.
3. Temperature: Adjustment range: 16-31°C.

AIR CONDITIONER CONTROL FUNCTIONS

1. Defrosting: automatic defrosting of the condensing unit with probe.
2. High temperature protection (heat pump): automatic by evaporator temperature measurement with probe.
3. Anti-freeze protection (conditioning): automatic by evaporator temperature measurement with probe.
4. 3-minute delay before compressor restart as a compressor protective measure.
5. Directional (cold/hot) control valve with 3 minutes' delay.
6. Protection against faults caused by failure to cool or failure to heat.

DIFFUSER DISPLAY FUNCTIONS

1. Ambient temperature and error codes (in the event of air conditioner failure) are shown on the 2-digit display.
2. RED LED power-on indicator
3. LED operation indicators: RED for HEATING, GREEN for COOLING.
4. Emergency and Auto-diagnostic button

ELECTRONIC CONTROL BOARD: CONNECTIONS

Control unit components

(Ⅰ)This control unit mainly consists of: a control panel, display and receiving board, infrared remote control etc.
The electronic control board controls the following elements:
Compressor, four-way valve, external fan, internal fan, control probe.

The display board (on the diffuser) includes:

1. A 2 digit lighted display, Power-on LED, Two-colour LED for the cooling/heating operating modes.

(1) Power-on RED LED:
This light goes on when power is connected.

(2) Operating mode TWO-COLOUR LED:
Red Light On: Heating and Green Light On: Cooling.

(3) 2 DIGIT display unit:
Displays the ambient temperature and error codes (in the event of air conditioner failure).

Emergency push-button

If you have lost your remote control or are otherwise unable to use it, the air conditioner may be started by pressing the emergency button.

Note: The code Tr mentioned in the technical features refers to the vehicle internal temperature, while Tp refers to the Evaporator probe temperature and Ts refers to the pre-set temperature.

Sensor (PROBE) models and characteristics

(1) Ambient temperature sensor:

Casing: resin, R(25)=5K, B=3274±1%;
Cable length 500 mm, black cable.

(2) Evaporator temperature sensor:

Casing: Φ 5 mm copper or steel pipe with length 25 mm, R(25)=5K, B=3274±1%;
Cable length 500 mm, white cable.

Fault and Auto-diagnostic Display

This control device detects any type of fault by sampling and checking; the faults are shown on a display unit. The faults are described and displayed in the following table:

Fault	Displayed error code
Ambient temperature sensor fault……..	E1
Evaporator temperature sensor fault…….	E2
No Coolant Gas or……	E4
Evaporator Probe not in its housing or…….....	E4
External Fan fault…….….	E4

Remarks:

1. When a fault is detected affecting the air conditioner, the display unit shows the corresponding error codes instead of temperature indications.
2. Ambient temperature probe faults and evaporator temperature probe faults are checked and displayed when the air conditioner is on standby.
3. Error codes will flash according to a 2Hz frequency.

Compressor protection

Ⅰ. The compressor is designed to immediately start when the air conditioner is switched on for the first time.

Ⅱ. The compressor needs a 3 minutes' delay to restart after each stop.

Ⅲ. When the operating mode is changed (hot/cold), the compressor will stop for at least 3 minutes for protective purposes.

COOLING MODE

1. Temperature adjustment range: 16°C-31°C
2. Compressor operating conditions in the cooling mode:

a) Tr = Vehicle Inside Temperature
Ts = Selected Temperature

When Tr≥Ts+1°C, the compressor and external fan will start, and the internal fan will turn at the pre-set ventilation speed;
When Tr≤Ts-1°C, the compressor and external fan will stop, and the internal fan will turn at the pre-set ventilation speed.

b) When anti-freeze protection is selected in the cooling mode, the compressor will stop.

3.External fan working condition:
In the cooling mode, the external fan will turn in synch with the compressor.

4. Internal fan working condition:

a) The internal fan rotation speed can be set to high, medium, low and automatic.

b)When automatic speed is selected, the internal fan will turn according to the following conditions:

Tr≧Ts+4°C, high speed ventilation;

Tr≧Ts+2°C e ＜Ts+4°C, medium speed ventilation;

Tr＜Ts+2°C, low speed ventilation.

5)Anti-freeze protection in the cooling mode

a) In the cooling mode, if the compressor is running and Tp (Evaporator Probe Temperature) is lower than or equal to -2°C for three minutes, the anti-freeze protection system is operated. The compressor and external fan will stop, and the internal fan will turn at the pre-set ventilation speed.

b) In the anti-freeze protection mode, when Tp≥6°C, the protection system stops, the fan will turn according to its original operating mode, while the compressor and external fan will restart (after the required 3-minutes' safety delay).

6) Protection in case of failure to cool (error E4).
After 5 minutes of continuous compressor operation, the evaporator probe temperature must be lower than the ambient temperature by 3°C. If the temperature difference cannot be achieved during the first minute of continuous compressor operation, the temperature display begins to flash. If after 5 more minutes of compressor operation the temperature difference is not lower than 3°C, the conditioner goes off and the display unit reads error code "E4".

HEATING MODE

1) Temperature adjustment range: 16°C-31°C

2) Compressor operating conditions in the heating mode:
Tr: Vehicle Inside Temperature
Ts: Selected Temperature

When Tr≤Ts-1°C, the compressor and external fan will start.
When Tr≥Ts+1°C, the compressor and external fan will stop;

3) External fan working condition:

a) When the compressor stops, the external fan also stops.

b) During heating for condenser defrosting, the compressor starts and the external fan is stopped.

c) As a protective measure against evaporator overheating, the external fan is stopped.

4) Internal fan working condition:

a) The internal fan rotation speed can be set to high, medium, low and automatic.

b) When automatic speed is selected, the internal fan will turn according to the following conditions:

Tr≤Ts-4°C, high speed ventilation;
Tr≤Ts-2°C, medium speed ventilation;
Tr>Ts-2°C, low speed ventilation.

5) Four-way valve working condition:

1. The four-way valve will open 2 seconds before the heating compressor start.
2. During heating for condenser defrosting, the compressor starts and the four-way valve closes (cycle reversal from Heating to Cooling).
3. During heating, the four-way valve is open. When the air conditioner goes off, the four-way valve closes after a 1 minute delay.
4. During heating, when the working mode is switched to cooling, the four-way valve closes after a 1 minute delay.

6) Evaporator overheating protection:
Tp= Evaporator Probe Temperature

1. When Tp<56°C, the compressor and external fan are operating.
2. When Tp≥56°C and Tip<62°C, the compressor is operating and the external fan is stopped.
3. When Tp≥62°C, the compressor and the external fan stop; they will restart when Tp≤42°C.

7) Protection in case of failure to Heat (ERROR E4):
After 5 minutes of continuous compressor operation, the temperature difference between Tp and Tr must be greater than or equal to 3°C. If the temperature difference cannot be achieved after the first minute of continuous compressor operation, the temperature display begins to flash. If after 5 more minutes of compressor operation the right temperature difference can still not be achieved, the air conditioner goes off and the display unit reads error code “E4”.

8) Condensing unit defrosting
If the outside temperature is very low (close to 0 °C), when the air conditioner is operating in the heat pump mode, the condensing unit tends to form surface ice reducing its efficiency. When this happens, the electronic control unit starts the DEFROSTING procedure, which is carried out according to the following steps:

(1) After approximately 50 minutes of air conditioner operation in the heat pump mode, if the temperature detected by the anti-freeze probe on the condenser is lower than– 5°C the DEFROSTING operation is started.

(2) The compressor and the external fan stop.

(3) After 45 seconds, power to the 4-way valve is disconnected and the valve goes to its cooling position.

(4) The internal fan is also stopped.

(5) After 15 seconds from the 4-way valve stop, the compressor restarts for the cooling phase with the external fan stopped. During this phase, the compressor will send hot gas to the condensing unit, heating it up and causing the ice to melt.

(6) When the temperature of the probe on the condensing unit reaches + 10° C, or after 8 minutes of operation, the compressor stops.

(7) After 45 seconds, the 4-way valve is powered on and switches back to its Heating position.

(8) After 5 seconds the external fan starts again.

(9) After 10 seconds, the compressor starts again, too, and the air conditioner resumes heat pump mode operation.

AUTOMATIC OPERATION MODE

1) How to access the automatic operation mode:

Access to the automatic operation mode can be obtained by working the emergency switch or by using the remote control; the control unit will automatically select heating, cooling or ventilation according to the vehicle inside temperature.

2) Temperature adjustment range: 16-31°C.

In the automatic operation mode, the initial temperature setting is 24°C. The remote control may be used to change the temperature.

3) Relationship between the operating mode and Tr in the automatic operation mode

A) When you enter the automatic operation mode first, the internal fan will turn in the low ventilation mode for approximately 10 seconds; then the air conditioner operating mode will be selected according to the vehicle inside temperature.

1. When the ambient temperature is higher than Ts+1°C, the control unit will set the cooling mode automatically.
2. When the ambient temperature is lower than Ts-1°C, the control unit will set the heating mode automatically.
3. When the ambient temperature is lower than or equal to Ts+1°C and higher than or equal to Ts-1°C, the control unit will set the ventilation mode automatically and only the internal fan will turn.
4. Internal fan ventilation speed: automatic ventilation for cooling and heating, low speed ventilation for ventilation mode. To change the ventilation speed, press the remote control key controlling the ventilation speed.

EMERGENCY OPERATION

1) The emergency push-button can be used to operate the air conditioner (in the event of remote control failure) and to turn it off.
2) After operating the emergency button, the automatic operation mode is selected.
3) If the air conditioner had been turned on by using the emergency button, the remote control can still be used to modify all the settings.

AUTO DIAGNOSTICS

1) When the air conditioner is installed for the first time, by pressing and holding down the emergency button you will cause the control unit to activate auto-diagnostics procedures. The operations carried out are the following:

1 A prolonged sound signal is heard, meanwhile, the power-on light and the operating mode (red and green) lighted indicator light up for 0.5 seconds;

2 The display unit lights up for 0.5 seconds (one by one);

3 The internal fan turns at high ventilation speed for 2 seconds and then stops;

4 The internal fan turns at medium ventilation speed for 2 seconds and then stops;

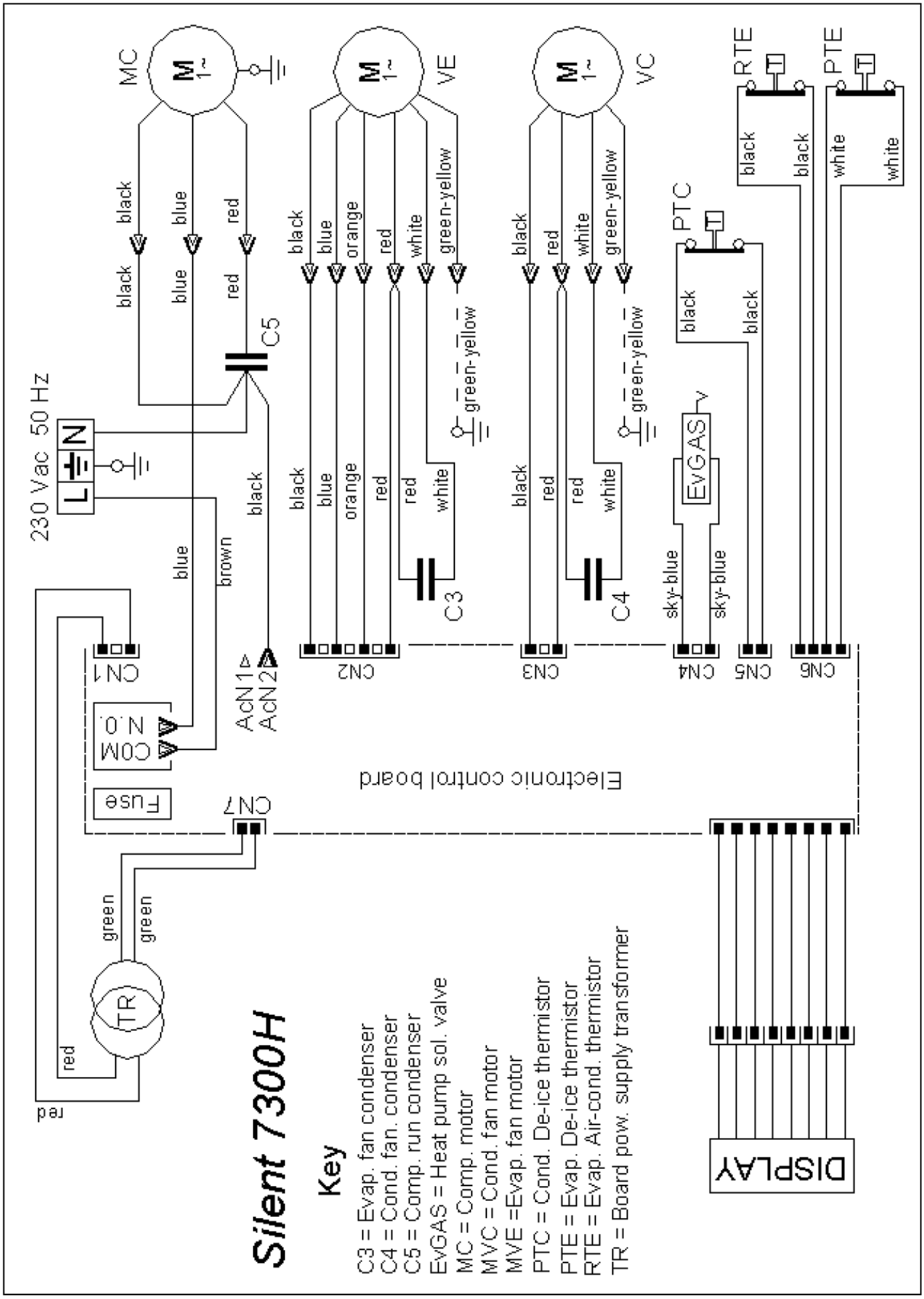
5 The internal fan turns at low ventilation speed for 2 seconds and then stops;

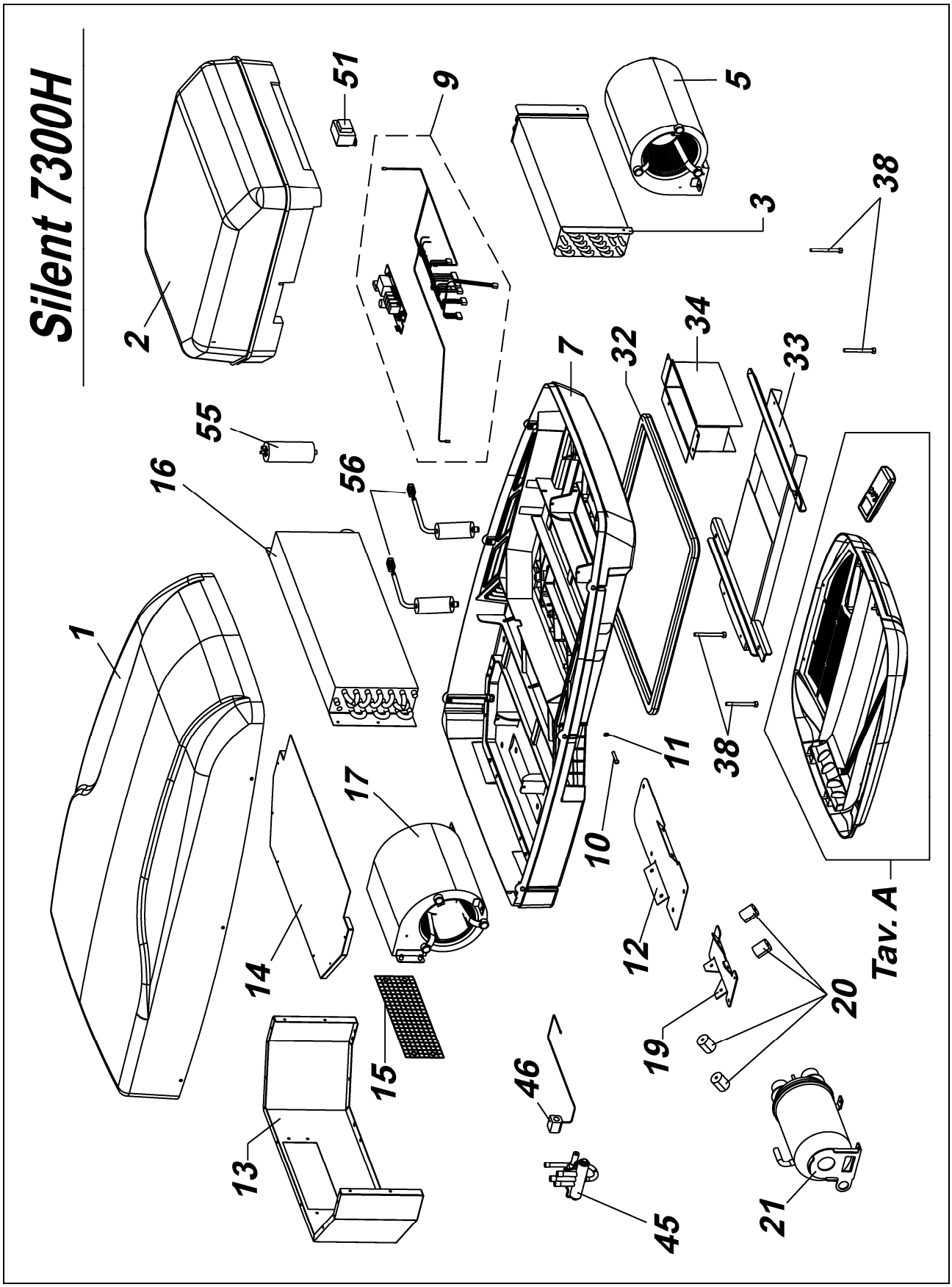
6 The external fan turns for 1 second;

7 The 4-way valve operates for 1 second;

8 The compressor works;

2) At the end of this procedure, the air conditioner is automatically set to standby mode.


Silent 7300H
Key
C3 = Evap. fan condenser
C4 = Cond. fan. condenser
C5 = Comp. run condenser
EvGAS = Heat pump sol. valve
MC = Comp. motor
MVC = Cond. fan motor
MVE =Evap. fan motor
PTC = Cond. De-ice thermistor
PTE = Evap. De-ice thermistor
RTE = Evap. Air-cond. thermistor
TR = Board pow. supply transformer
230 Vac 50 Hz
L
N
MC
VE
VC
C5
C3
C4
PTC
RTE
PTE
EvGAS
TR
Fuse
COM
N.O.
AcN1
AcN2
CN1
CN2
CN3
CN4
CN5
CN6
CN7
Electronic control board
DISPLAY
black
blue
red
orange
white
green-yellow
sky-blue
green
brown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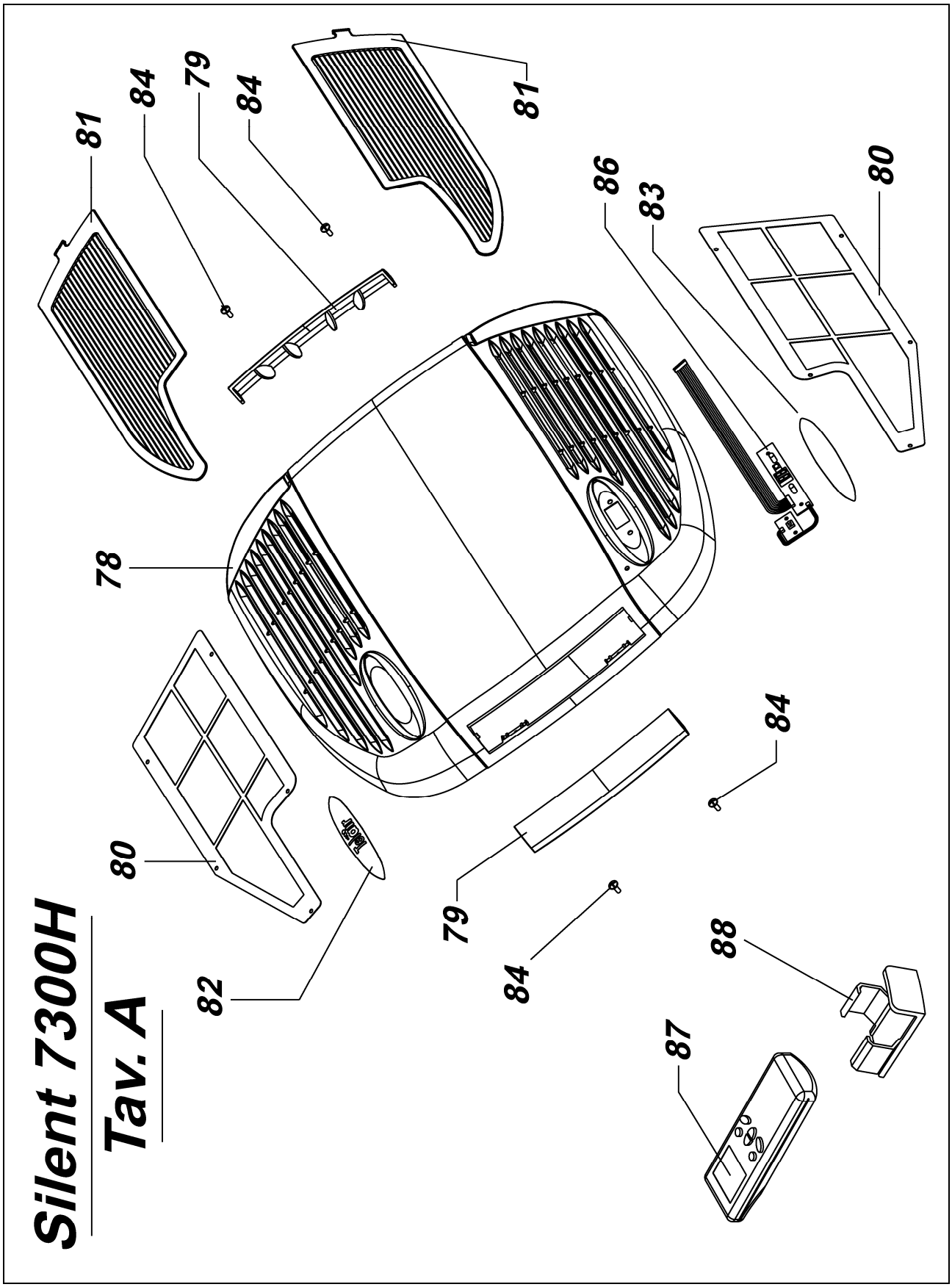
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Pos. / Code / Q.tà	Descrizione / Description	Dèsignation / Bezeichnung	Denomination / Descripcion
1 / 03476 / n. 1	Coperchio superiore in plastica Plastic top cover	Capot supérieur en plastique Oberer Deckel aus Kunststoff	Bovenste deksel van plastic Tapa superior de plástico
2 / 03493 / n. 1	Coperchio dell'evaporatore Evaporator cover	Couvercle de l'évaporateur Deckel des Verdampfers	Deksel van de verdamper Tapa del evaporador
3 / 03482 / n. 1	Evaporatore completo Complete evaporator	Évaporateur complet Verdampfer, komplett	Complete verdamper Evaporador completo
5 / 03919 / n. 1	Ventilatore centrifugo dell'evaporante Centrifugal fan of the evaporator	Ventilateur centrifuge de l'évaporateur Zentrifugallüfter des Verdampfers	Centrifugaalventilator van de verdamper Ventilador centrífugo del evaporador
7 / 03643 / n. 1	Fondo in plastica grigio antracite Anthracite grey plastic bottom	Fond en plastique gris anthracite Kunststoffbasis, Anthrazitgrau	Onderkant van plastic, antracietgrijs Fondo de plástico gris marengo
9 / 03944 / n. 1	Cablaggio elettrico completo Full electric wiring	Câblage électrique complet Verkabelung, komplett	Complete elektrische bedrading Cableado eléctrico completo
10 / 03378 / n. 6	Vite M 5X16 per fissaggio coperchio superiore Screw M 5X16 for top cover fastening	Vis M 5X16 pour fixation capot supérieur Schraube M 5X16 für Befestigung des oberen Deckels	Schroef M 5X16 voor bevestiging van bovenste deksel Tornillo M 5X16 para fijar la tapa superior
11 / 03500 / n. 6	Dado M5 per fissaggio coperchio superiore Nut M5 for top cover fastening	Écrou M5 pour fixation capot supérieur Mutter M5 für Befestigung des oberen Deckels	Moer M5 voor bevestiging van bovenste deksel Tuerca M5 para fijar la tapa superior
12 / 03485 / n. 1	Staffa per antivibranti per la base del compressore Vibration mount bracket for the compressor base	Bride pour disp. antivibrations pour base du compresseur Bügel für Schwingungsdämpfer für Kompressorbasis	Beugel voor trillingsdempers voor onderkant van de compressor Estribo para anti-vibrantes para la base del compresor
13 / 03478 / n. 1	Scatola del condensatore Condenser casing	Boîtier du condenseur Kondensatorgehäuse	Behuizing van de condensator Caja del condensador
14 / 03477 / n. 1	Coperchio del condensatore Condenser cover	Couvercle du condenseur Deckel des Kondensators	Deksel van de condensator Tapa del condensador
15 / 03503 / n. 1	Rete metallica Wire net	Grille métallique Metallgitter	Metalen rooster Red metálica
16 / 04198 / n. 1	Condensatore completo Complete condenser	Condenseur complet Kondensator, komplett	Complete condensator Condensador completo
17 / 03480 / n. 1	Ventilatore del condensatore Condenser fan	Ventilateur du condenseur Lüfter des Kondensators	Ventilator van de condensator Ventilador del condensador
19 / 03484 / n. 1	Staffa fissaggio compressore Compressor fastening bracket	Bride de fixation compresseur Befestigungsbügel für Kompressor	Bevestigingsbeugel voor de compressor Estribo de fijación compresor
20 / 03486 / n. 4	Antivibrante per la base del compressore Vibration mount for the compressor base	Disp. antivibrations pour base du compresseur Schwingungsdämpfer für Kompressorbasis	Trillingsdemper voor de onderkant van de compressor Anti-vibrador para la base del compresor
21 / 04197 / n. 1	Compressore rotativo Rotative compressor	Compresseur rotatif Rotationskompressor	Roterende compressor Compresor rotativo
32 / 03497 / n. 1	Guarnizione in gomma rotonda d=26 Round rubber gasket d=26	Joint en caoutchouc rond d=26 Rundgummidichtung D=26	Ronde rubber afdichting d=26 Guarnición de goma redonda d=26
33 / 03499 / n. 1	Tunnel fissaggio condizionatore Air-conditioner fastening tunnel	Goulotte de fixation climatiseur Befestigungstunnel für Klimaanlage	Bevestigingstunnel voor airconditioner Túnel de fijación acondicionador

Pos/Code/Q.tà	Descrizione/Description	Dèsignation/Bezeichnung	Denomination/Descripcion
34 / 03498 / n. 1	Condotto uscita aria dall'evaporatore Duct for air outlet from evaporator	Conduite de sortie de l'air de l'évaporateur Luftausgangskanal aus Verdampfer	Luchtuitlaatkanaal uit de verdamper Conducto salida aire del evaporador
38 / 05522 / n. 4	Vite di fissaggio M6x100 Fastening screw M6x100	Vis de fixation M6x100 Befestigungsschraube M6x100	Bevestigingsschroef M6x100 Tornillo de fijación M6x100
45 / 03337 / n. 1	Elettrovalvola 4 vie DSF - 4/230 V 4-way solenoid valve DSF - 4/230 V	Électrovanne 4 voies DSF - 4/230 V 4-Wege-Magnetventil DSF - 4/230 V	4 - weg elektromagneetklep DSF - 4/230 V Electroválvula de 4 vías DSF - 4/230 V
46 / 03475 / n. 1	Bobina x elettrovalvola 4 vie Coil for 4-way solenoid valve	Bobine pour électrovanne 4 voies Spule für 4-Wege-Magnetventil	Spoel voor 4-weg elektromagneetklep Bobina para electroválvula de 4 vías
51 / 02487 / n. 1	Trasformatore per impianto elettrico Transformer for electric system	Transformateur pour circuit électrique Transformator für Elektroanlage	Transformator voor elektrische installatie Transformador para instalación eléctrica
55 / 03504 / n. 1	Condensatore 15 uF 450 V Condenser 15 uF 450 V	Condensateur 15 uF 450 V Kondensator 15 uF 450 V	Condensator 15 uF 450 V Condensador 15 uF 450 V
56 / 03505 / N. 2	Condensatore 3 uF 450 V Condenser 3 uF 450 V	Condensateur 3 uF 450 V Kondensator 3 uF 450 V	Condensator 3 uF 450 V Condensador 3 uF 450 V
78 / 03511 / n. 1	Diffusore interno Indoor diffuser	Diffuseur interne Innendiffusor	Inwendige stromingsspreider Difusor interno
79 / 03512 / n. 2	Aletta per diffusore interno Fin for indoor diffuser	Ailette pour diffuseur interne Rippe für Innendiffusor	Lamel voor inwendige stromingsspreider Aleta para difusor interno
80 / 03509 / n. 2	Cornice portafiltro antipolvere Dust filter holding frame	Cadre porte-filtre anti-poussière Staubfilter-Tragrahmen	Draagprofiel voor stoffilter Marco portafiltro anti-polvo
81 / 03510 / n. 2	Filtro antipolvere Dust filter	Filtre-antipoussière Staubfilter	Stoffilter Filtro anti-polvo
82 / 03492 / n. 2	Coperchio trasparente con logo Telair Transparent cover with Telair logo	Couvercle transparent avec logo Telair Transparenter Deckel mit Telair-Logo	Doorzichtige deksel met Telair logo Tapa transparente con logo Telair
83 / 03491 / n. 2	Coperchio trasparente del display Transparent display cover	Couvercle transparent pour afficheur Transparenter Displaydeckel	Doorzichtige displayafdekking Tapa transparente del display
84 / 03409 / n. 4	Vite 3,5x25 per fissaggio diffusore Screw 3.5x25 for diffuser fastening	Vis 3,5x25 pour fixation diffuseur Schraube 3,5x25 für Diffusorbefestigung	Schroef 3,5x25 voor bevestiging van de stromingsspreider Tornillo 3,5x25 para fijar el difusor
86 / 03489 / n. 1	Scheda elettrica del display Electric display board	Carte électrique de l'afficheur Displaykarte	Elektrische displaykaart Tarjeta eléctrica del display
87 / 03487 / n. 1	Telecomando Remote control	Télécommande Fernbedienung	Afstandsbediening Mando a distancia
88 / 03514 / n. 1	Porta Telecomando Remote control holder	Support de télécommande Fernbedienungshalter	Afstandsbedieningshouder Porta-mando a distancia

WORKING MANUAL

Silent 7300H

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AIR CONDITIONER

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